Murillo, Kacy

Subject: RE: City of Little Rock Class 4 Landfill 2021 AEIR (AFIN 60-01071, Permit 0266-S4J)

From: Jason Ghidotti [mailto:jjg@ftn-assoc.com]
Sent: Tuesday, August 9, 2022 3:53 PM
To: Cusher, Annette
Subject: Re: City of Little Rock Class 4 Landfill 2021 AEIR (AFIN 60-01071, Permit 0266-S4J)

Not sure what happened there. I think I hit reply instead of forward.

Jason J Ghidotti, PE*
FTN Associates, Ltd.
3 Innwood Circle, Suite 220
Little Rock, Arkansas 72211
(501)225-7779
*Arkansas

AFIN: 60-01071
PMT#: 0266-S4J
Received
By Kacy Murillo at 11:03 am, Aug 10, 2022
DOC ID#: 82447
TO: AC>FILE <KM

From: Cusher, Annette <Cusher@adeq.state.ar.us>
Sent: Tuesday, August 9, 2022 3:44 PM
To: Jason Ghidotti <jjg@ftn-assoc.com>
Subject: RE: City of Little Rock Class 4 Landfill 2021 AEIR (AFIN 60-01071, Permit 0266-S4J)

Could you please attach the report?

From: Jason Ghidotti [mailto:jjg@ftn-assoc.com]
Sent: Tuesday, August 9, 2022 3:44 PM
To: Cusher, Annette; Bennett, Richard
Cc: Charles, Nathan; Kyle Templet
Subject: Re: City of Little Rock Class 4 Landfill 2021 AEIR (AFIN 60-01071, Permit 0266-S4J)

Annette,

Thanks for letting me know you didn't receive this.

Jason

Jason J Ghidotti, PE*
FTN Associates, Ltd.
3 Innwood Circle, Suite 220
Little Rock, Arkansas 72211
(501)225-7779
*Arkansas

From: Jason Ghidotti
Sent: Thursday, June 30, 2022 10:50 AM
To: Cusher, Annette <cusher@adeq.state.ar.us>; Richard Bennett (bennett@adeq.state.ar.us)

ANNUAL ENGINEERING INSPECTION REPORT (AEIR) FORM Reporting Year: 2021

Note: Check applicable landfill class. **Class 1 (Reg 22.423(b)) ___ , Class 3 (22.522(a)) ____ , Class 4 (22.619(b)) X**

Facility Name: Little Rock Class 4 Landfill AFIN: 60-01071 Permit #: 0266-S4J Landfill Class: 4

Report Submittal Date: June 30, 2022 Date of Landfill Site Inspection by Certifying Engineer: March 25, 2022

Complete the form as indicated
Instructions are bolded and italicized.

COLUMN TO BE COMPLETED BY REPORTER

Item	Regulation Reference	Item Description	Report Information/Comments/Remarks	Attachment Reference
1	22.423(b)(1) 22.522(a)(1) 22.619(b)(1)	Remaining volume in current cell.	a) 151,498 cubic yards	**C**
		Projected date of opening new cell.	b) Date: 2027	
2	22.423(b)(2) 22.522(a)(2) 22.619(b)(2)	Remaining volume of all permitted units.	a) 606,804 cubic yards	**C**
		Total air space used during the reporting period.	b) 20,299 cubic yards	
		Estimated remaining site life (years) based on utilization rate during the reporting period. ***Note: Itemize current permitted unit/cell information - use attachment if necessary.***	c) Landfill Unit/Cell remaining life: Cell 1, 0.0 years. Cell 2, 0.0 years. Cell 3, 6.8 years. d) Entire permitted landfill: 23 years remaining life. Notes: • Landfill lifetimes are calculated using the total permitted air space remaining and are based on a 3-year average disposal rate with a 1% annual projected increase.	**C**

3	22.423(b)(3) 22.522(a)(3) 22.619(b)(3)	Documentation of fill progression in compliance with permit plans, specs and operating plan and narrative. ***Note: Provide narrative regarding fill progression during the reporting period. Be specific about landfill unit/cell designations (example: Cell 1, Phase A completely filled; Cell 2, Phase A, 50% full, being filled south to north as of December 31). Specifically note any overfill conditions.***	a) Progression narrative: Cells 1 and 2 are considered completed per the permit. Cell 3, the current active cell, has been filled in lifts from west to east. Approximately 56.9% of Cell 3 has been used to date.	**B**
4	22.423(b)(4) 22.522(a)(4) 22.619(b)(4)	Documentation of compliance with regulatory operating requirements, permit conditions, approved operating plan, and other applicable regulations. ***Note: Review current operating plans, and permit conditions. Include photographs of engineer's inspection as Attachment A. Check for weekly/monthly operational logs, waste volume records in and out of landfill, unauthorized waste form sheets, waste cover maintenance, stormwater reports to ADEQ, and wet weather repair information.***	a) Weekly/monthly operational logs exist (Y/N)? Y b) Photos of AEIR inspection attached (Y/N)? Y c) Waste volume in and out records exist (Y/N)? Y d) Unauthorized waste forms exist (Y/N)? Y e) Daily/weekly cover adequate at time of inspection (Y/N)? Y f) Alternative Daily Cover (ADC) Plan located onsite (Y/N)? N/A Operations in compliance with ADC Plan (Y/N)? N/A g) Liquid Waste Management (LWM) Plan located onsite (Y/N)? N/A Operations in compliance with LWM Plan (Y/N)? N/A h) Liquids received to be bulked during reporting period: N/A gallons N/A tons i) Waste cover of inactive areas maintained adequately (Y/N)? Y j) Net amount of waste disposed in landfill during reporting period: _____ cubic yards 9,081 tons k) Leachate head level less than 1' on liner at time of inspection (Y/N)?N/A	
5	22.423(b)(5) 22.522(a)(5) 22.619(b)(5)	Updated contour map that depicts: ***Note: Provide updated drawing(s) and final cover permit drawing as Attachment B – discuss any discrepancies. Max. contour interval = 2 feet)***	a) Updated contour drawing attached (Y/N)? Y b) Final cover permit drawing attached (Y/N)? Y c) *List all discrepancies here:* None identified. d) Is there an overfill condition (Y/N)? N	**B**
		(i) horizontal and vertical extent of active and inactive fill areas;		
		(ii) status of all permitted units/cells; ***(Note: Label all active (working face, bulking area, and stockpiles), inactive, closed and interim cover areas)***.	a) Currently, does the facility have sufficient on-site quantities and types of soils for liner and cover construction of permitted units/cells (Y/N)? N b) If not, where will deficiency shortfalls be obtained (be specific)? GCL or Clay Liner material from offsite c) Is the current Design Narrative earthwork balance accurate (Y/N)? Y	
		(iii) survey grid (required by 22.426); ***Note: Include benchmarks and horizontal controls***		

		(iv) Location of other visible surface features or improvements (e.g., roads, buildings, gas control systems, etc..); ***Note: Include leachate risers, manholes, monitoring wells, gas wells, etc.***		
		(v) the person responsible for gathering the survey data and the date survey data was taken to prepare the map. *Reminder: Reporting period is calendar year. Survey data should be collected to reflect the AEIR reporting period.*	a) Name: Terracon Consultants, Inc. b) Name of person using the data to produce contour map: Jason J Ghidotti, PE c) Date survey data was collected: January 14, 2022 *Note: Survey was flown and processed by Terracon Consultants Inc. by a licensed unmanned aerial vehicle pilot for the City of Little Rock.*	
6	22.423(b)(6) 22.522(a)(6) 22.619(b)(6)	Quantity, location, and characteristics of leachate collected, recirculated, and disposed. ***Note: Provide analytical report as Attachment C. Provide brief narrative on this form in space provided about leachate sources, how leachate is collected, measured and disposed. Also, explain how the leachate head on the landfill liner is monitored and measured.***	a) Leachate Collected: N/A gallons b) Leachate Disposed: N/A gallons c) Leachate Recirculated: N/A gallons d) Leachate Recirculation Plan exists (Y/N)? N/A ADEQ approval Doc # _____ e) Leachate operating records exist (Y/N)? N/A f) Leachate analytical report attached (Y/N)? N/A g) Leachate narrative (collection, measurements and disposal): Leachate drains to the west end of each cell where it is discharged to the facility stormwater pond. h) Leachate narrative (verifying <1' head on liner system): N/A	
7	22.423(b)(7) 22.522(a)(7) 22.619(b)(7)	Maintenance of stormwater controls and best management practices for erosion control. ***Note: List any upset conditions during the reporting period (i.e., washouts, etc…). Also, include narrative about vegetation maintenance and repair.***	a) ***Briefly list maintenance activities and upset conditions here:*** Vegetation was well established on the north, south, west and east sides of Cells 1 and 2.	**A**
8	22.423(b)(8) 22.619(b)(8)	Status of capping and closure of completed areas. ***Note: List areas with acreage that have received interim or final cover. Include total landfilled area acreage not yet under final certified closed cover.*** ***Note: "Certified closed" means the facility has received an approval letter from ADEQ accepting the engineer's closure certification report.***	a) Unit/cell Cell 1, 2.1 acres. Intrm or Final Cover (I/F): I Unit/cell Cell 2, 2.4 acres. Intrm or Final Cover (I/F): I Unit/cell Cell 3, 4.5 acres. Intrm or Final Cover (I/F): N/A e) Acres of disposed waste not under final certified cover: 9.0 acres f) Acres of disposed waste area that have interim cover: 4.5 acres	

9	22.423(b)(9) 22.522(a)(8) 22.619(b)(9)	Status of remedial or corrective action activities. ***Note: List corrective action events during reporting period (e.g., seeps and erosion correction, leachate spills, unauthorized waste handling and removal, etc…), and indicate whether action was taken in response to an ADEQ inspection.***	a) ***Briefly list corrective actions events here:*** Routine inspections noted no violations. b) Were any of the corrective actions taken in response to an ADEQ inspection (Y/N)? N c) Current status of corrective actions: N/A. d) Did corrective actions permanently solve the conditions (Y/N)? N/A ***Explain briefly:***	
10	22.423(b)(10) 22.522(a)(9) 22.619(b)(10)	Updated Financial Assurance documentation as required by Chapter 14. ***Note: Include copy of most recent financial assurance documentation as Attachment D. Also, include updated closure and post closure cost estimated as an attachment– recommend to use the Closure Costs and Post-closure Care Costs Worksheet located at ADEQ - Solid Waste - Technical Branch Home Page Specific links to the worksheets:*** http://www.adeq.state.ar.us/solwaste/branch_technical/pdfs/closure_costs_worksheet.xlsx ***and*** http://www.adeq.state.ar.us/solwaste/branch_technical/pdfs/post_closure_care_costs_worksheet.xlsx***. . Show detailed calculations of cost items in tabular format with specific item breakdowns. Also, show source of unit cost information and/or inflationary factor adjustments – use ADEQ factors where applicable. If updated unit cost information is used instead of inflationary factors, show the source of unit cost information. Confirm estimates are based on largest area ever requiring final cover.***	a) Size of the facility property under current permit? 240 acres b) Size of actual permitted disposal area? 18 acres c) What is the current total permitted disposal area that contains disposed waste but is not certified closed? 9.1 acres d) Updated closure cost estimate amount: $ 1,165,219 e) Is the closure cost estimate based on the largest area ever requiring closure (Y/N)? Y f) Is the existing closure financial assurance adequate for acreage not yet certified closed (Y/N)?: Y g) Updated post closure care cost estimate amount: $ 23,881 h) Is the existing post closure care financial assurance adequate for all permitted areas (Y/N)?: Y i) Is the financial assurance mechanism a trust fund (Y/N)? N j) Are the sources of information for updated unit cost line items shown on the cost estimate calculations (Y/N?): Y k) Do the unit cost items for soil cover material include actual third-party cost of materials and labor (Y/N)? Y	**C**
11	22.423(b)(11) 22.522(a)(10) 22.619(b)(11)	Revised or updated facility Closure Plan in accordance with Chapter 13. ***Note: Provide updated Closure Plan as Attachment E if facility obtained a permit modification during the reporting period that affects the closure and/or post closure care.***	a) Was an updated Closure Plan required during this reporting period (Y/N)?: N b) Is an updated Closure Plan attached herein (Y/N)? N	

12	22.423(b)(12) 22.522(a)(11) 22.619(b)(12)	Other items that affect compliance. ***Note: Include an ADEQ enforcement activity summary (solid waste, water, air, hazardous waste related) and, status of operating and permit fees. Also, include brief narrative concerning groundwater monitoring reports, landfill gas, leachate recirculation, alternate daily cover, etc…***	a) Are there current ADEQ enforcement actions (Y/N)? N b) Summary of enforcement actions: _____ c) Are operating and permit fees payments up-to-date (Y/N)? Y If not explain: _____ Additional Information: d) Does the facility monitor groundwater (Y/N)?: N/A If so, is it detection monitoring or assessment monitoring? _____ e) What is the groundwater analytical sampling frequency? ___ months f) Does the facility collect landfill gas (Y/N)?: N/A g) Does the facility have a Gas Monitoring Plan (Y/N)? N/A h) Does the facility have gas monitoring probes (Y/N)? N/A i) Does the facility use an alternate daily cover (ADC) (Y/N)? N If so, what type of ADC is used: _____ If so, list document id# approving ADC: _____ j) Does the facility have a Liquid Waste Management (LWM) Plan (Y/N)? N/A If so, list document id# approving the LWM Plan: _____ k) Date and document id # of currently approved Operating Plan and Narrative: Date: 08-08-11 Doc#: *60665* l) Date and document id # for currently approved Closure/Post Closure Plan: Date: 08-08-11 Doc#: *60665* m) Date and document id # of currently approved Permit Drawings: Date: 08-08-11 Doc#: *60665* n) Date and document id # of currently approved Design Narrative: Date: 08-08-11 Doc#: *60665* o) Are weigh scales utilized at the landfill (Y/N)? Y p) Does the final cap include a synthetic liner (Y/N)? N q) Does the final cap include clay liner (Y/N)? Y r) Total current permitted landfill volume: 1,217,800 cubic yards	

13	22.423(b) 22.522(a) 22.619(b)	Certification of AEIR Report: "I have inspected the landfill site and have prepared this report to reflect operational compliance with permit conditions, permit plans, specifications, narrative, and all applicable regulations"	a) Arkansas Licensed Engineer: Name: Jason J. Ghidotti, PE Date: 06/30/2022 b) License Number: 10031 c) ***Attach seal here:***  	

ATTACHMENT A

Annual Engineering Inspection Photos



Photo 1: South Slope of Cells 1 and 2, from the south.



Photo 2: Facility sedimentation and stormwater ponds looking north.



Photo 3: Disposal activities, Cell 3 looking northwest.



Photo 4: North slope of Cells 1 and 2, from the north.



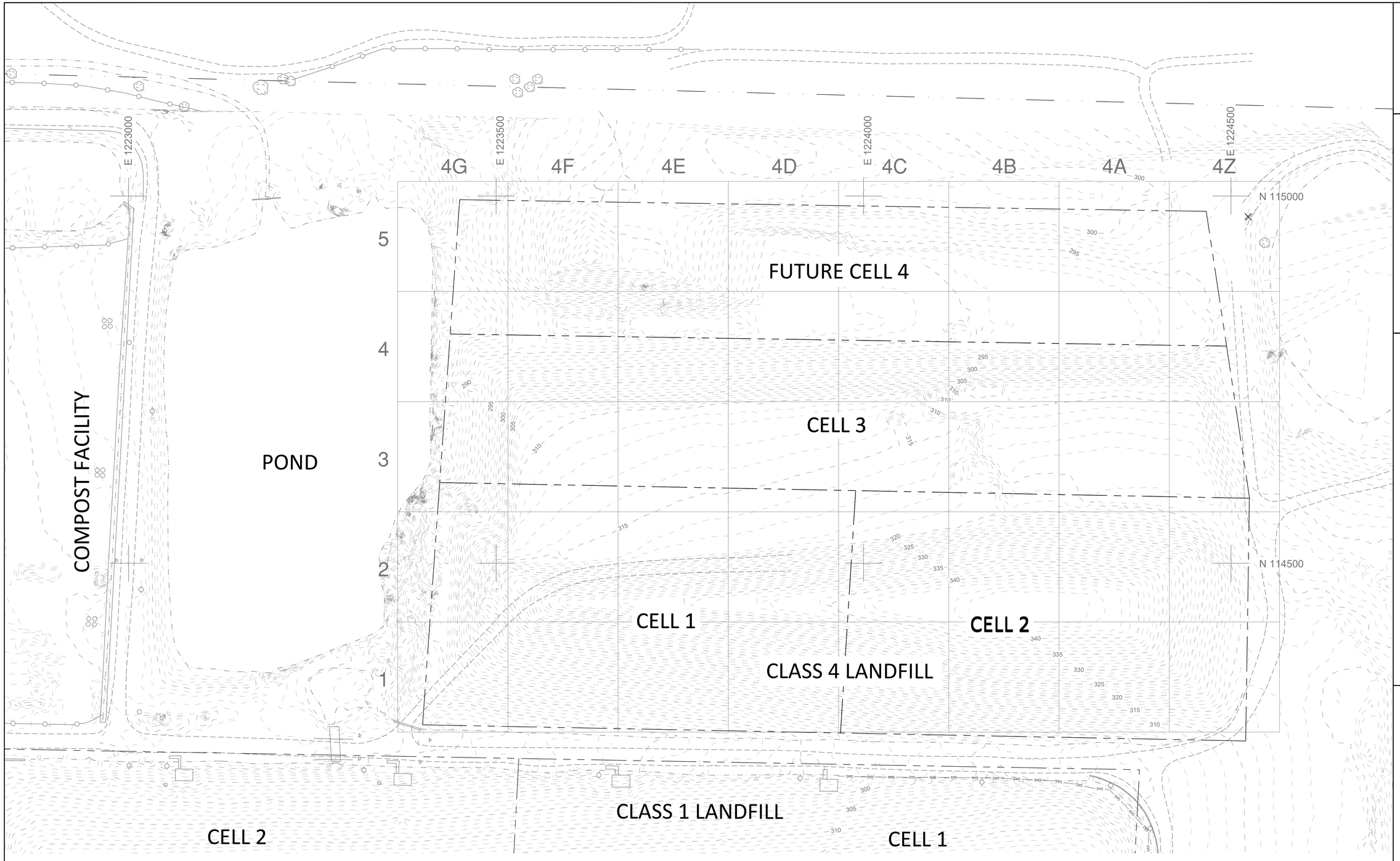
Photo 5: East slope of Cells 1 and 2, from the east.



Photo 6: Top of Cells 1 and 2, from the east.

ATTACHMENT B

Figures



LEGEND

- 300 — EXISTING INDEX CONTOUR (5')
- EXISTING INTERVAL CONTOUR (1')
- EXISTING EDGE OF WATER
- EXISTING GRAVEL ROAD
- CELL BOUNDARY
- SITE SURVEY GRID

NOTES:

1. EXISTING CONTOURS ARE BASED ON JANUARY 14, 2022 UAS SURVEY PROVIDED BY TERRACON FOR THE CITY OF LITTLE ROCK. ADDITIONAL FEATURE DATA FROM 2006 AERIAL SURVEY.

N

0 60
Scale in Feet

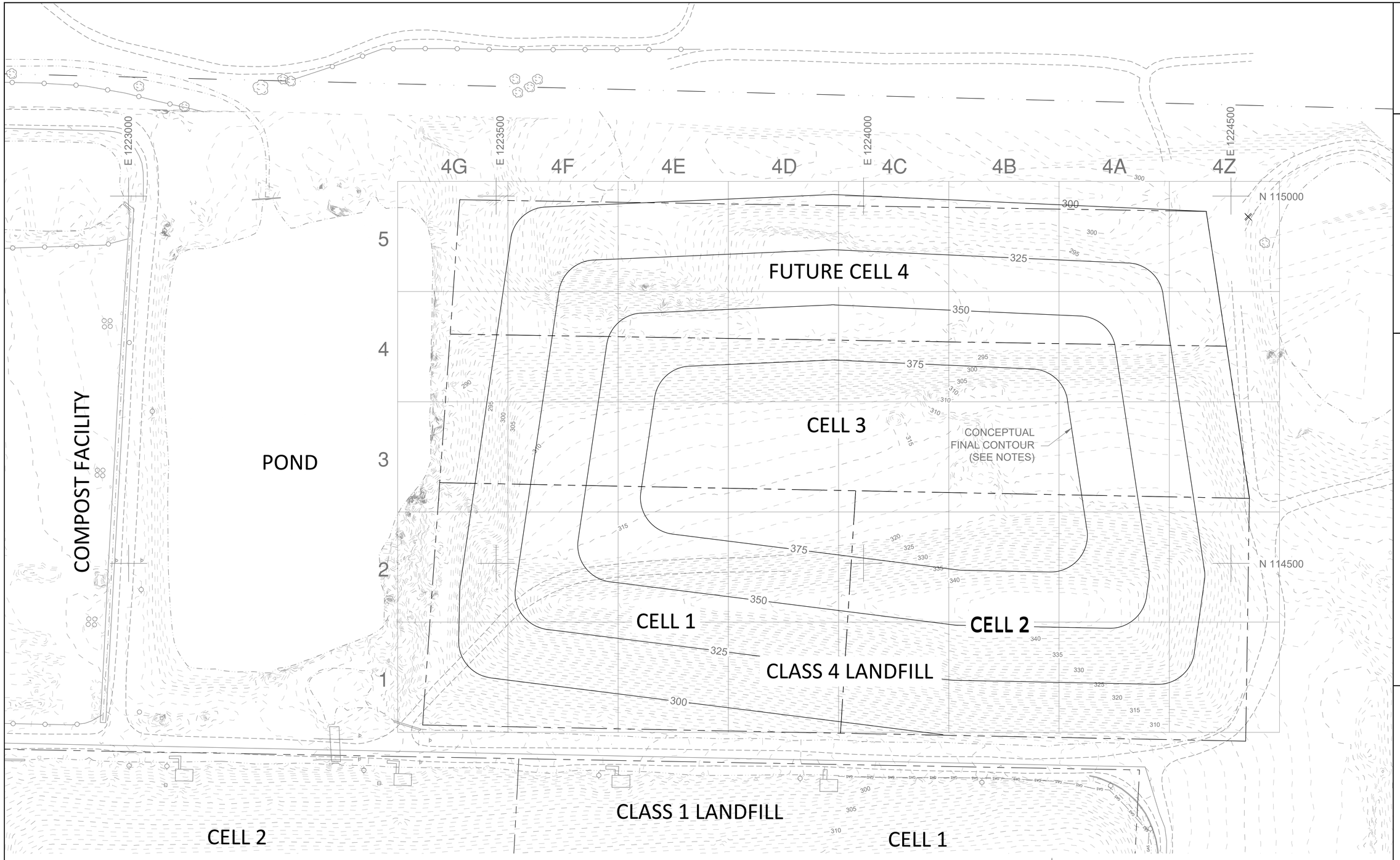
R:\PROPOSALS\04010-2808-001\DRAFT\2021 AEIR\CAD\04010-2808-001-C3D01 CL4-FIGURES.DWG

ETN Associates, Ltd.
water resources / environmental consultants

CITY OF LITTLE ROCK
CLASS 4 LANDFILL
2022 ANNUAL ENGINEERING INSPECTION REPORT
LITTLE ROCK, ARKANSAS

FIGURE 1
EXISTING CONDITIONS

DRAWN BY:	FILE NAME:
KJS	CL4-FIGURES.DWG
APPROVED:	PROJECT NO.
JJS	04010-2808-001
SCALE: 1" = 60'	DATE: 06/28/22
SHEET NO. FIGURE 1	



LEGEND

- 300 — EXISTING INDEX CONTOUR (5')
- EXISTING INTERVAL CONTOUR (1')
- EXISTING EDGE OF WATER
- EXISTING GRAVEL ROAD
- CELL BOUNDARY
- SITE SURVEY GRID
- 300 — APPROXIMATE TOP CONTOUR

NOTES:

1. EXISTING CONTOURS ARE BASED ON JANUARY 14, 2022 UAS SURVEY PROVIDED BY TERRACON FOR THE CITY OF LITTLE ROCK. ADDITIONAL FEATURE DATA FROM 2006 AERIAL SURVEY.

- FINAL CONTOURS SHOWN ARE CONCEPTUAL AND ARE BASED UPON THE CURRENTLY PERMITTED TOP. ACCORDING TO AVAILABLE HISTORICAL PERMIT DOCUMENTATION, THE LANDFILL FOOTPRINT CHANGED BUT THE PERMITTED FINAL CONTOURS WERE NOT REVISED ACCORDINGLY.

N

0 60
Scale in Feet

R:\PROPOSALS\04010-2808-001\DRAFT\2021 AEIR\CAD\04010-2808-001-C3D01 CL4-FIGURES.DWG

ETN Associates, Ltd.
water resources / environmental consultants

CITY OF LITTLE ROCK
CLASS 4 LANDFILL
2022 ANNUAL ENGINEERING INSPECTION REPORT
LITTLE ROCK, ARKANSAS

FIGURE 2
FINAL GRADES

DRAWN BY: KJS	FILE NAME: CL4-FIGURES.DWG
APPROVED: BBS	PROJECT NO. 04010-2808-001
SCALE: 1" = 60'	DATE: 06/28/22
SHEET NO. FIGURE 2	

ATTACHMENT C

Financial Assurance

ftn Associates Ltd.
water resources / environmental consultants

ANNUAL FINANCIAL ASSURANCE UPDATE
CITY OF LITTLE ROCK LANDFILL
SOLID WASTE PERMIT NOS. 0266-S1, 0266-S4J, AND 0031-SCYW

APRIL 15, 2022

ANNUAL FINANCIAL ASSURANCE UPDATE
CITY OF LITTLE ROCK LANDFILL
SOLID WASTE PERMIT NOS. 0266-S1, 0266-S4J, AND 0031-SCYW

Prepared for

City of Little Rock
Department of Public Works
Division of Solid Waste Services
10803 Ironton Cutoff
Little Rock, AR 72206

Prepared by

FTN Associates, Ltd.
3 Innwood Circle, Suite 220
Little Rock, AR 72211

FTN No. R04010-2808-001

April 15, 2022

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1.0 INTRODUCTION

The City of Little Rock (CLR) owns and operates two landfills (Class 1 and Class 4 landfills) and a yard waste composting facility in accordance with Permit Nos. 0266-S1, 0266-S4J, and 0031-SCYW, respectively, as issued by the Arkansas Department of Energy and Environment, Division of Environmental Quality (DEQ). The design and operation of the facilities is regulated by Arkansas Pollution Control and Ecology Commission (APCEC) *Regulation No. 22, Solid Waste Management Rules*. This regulation requires landfill facilities to prepare site-specific closure and post-closure plans based on the landfill utilization sequence, final cover system design, and future use of the site. Based on the closure and post-closure plans, each landfill facility is required to estimate the cost for closure and post-closure care and update these cost estimates on an annual basis to consider inflation. In addition, Regulation No. 22 requires composting facilities to estimate closure costs and update these costs on an annual basis. These cost estimates provide the basis for financial assurance as required by Chapter 14 of Regulation No. 22.

Governmental Accounting Standards Board Statement No. 18 (GASB 18) establishes standards and requirements for landfill cost analysis and depreciation for accounting purposes. According to GASB 18, the cost for each landfill cell should be fully depreciated when it is filled to capacity. In addition, a liability should be recognized as capacity is used over the estimated operating life of the landfill. This liability would include items such as cell construction costs, general landfill development costs, closure costs, and post-closure care costs.

The following information provides a summary of the design, landfill utilization sequence, development schedule, closure plan, and post-closure plan. Based on this information, cost estimates are provided associated with the closure of the facility and post-closure care period. It is understood that these cost estimates will be used as the basis for updating financial assurance to comply with the requirements of Regulation No. 22 and GASB 18.

1.1 Site Location and General Layout

The facilities are located at 10803 Ironton Cutoff in southeast Little Rock. Figure 1.1 illustrates the general geographic location of the site. Figure 1.2 illustrates the general layout and orientation of the site.

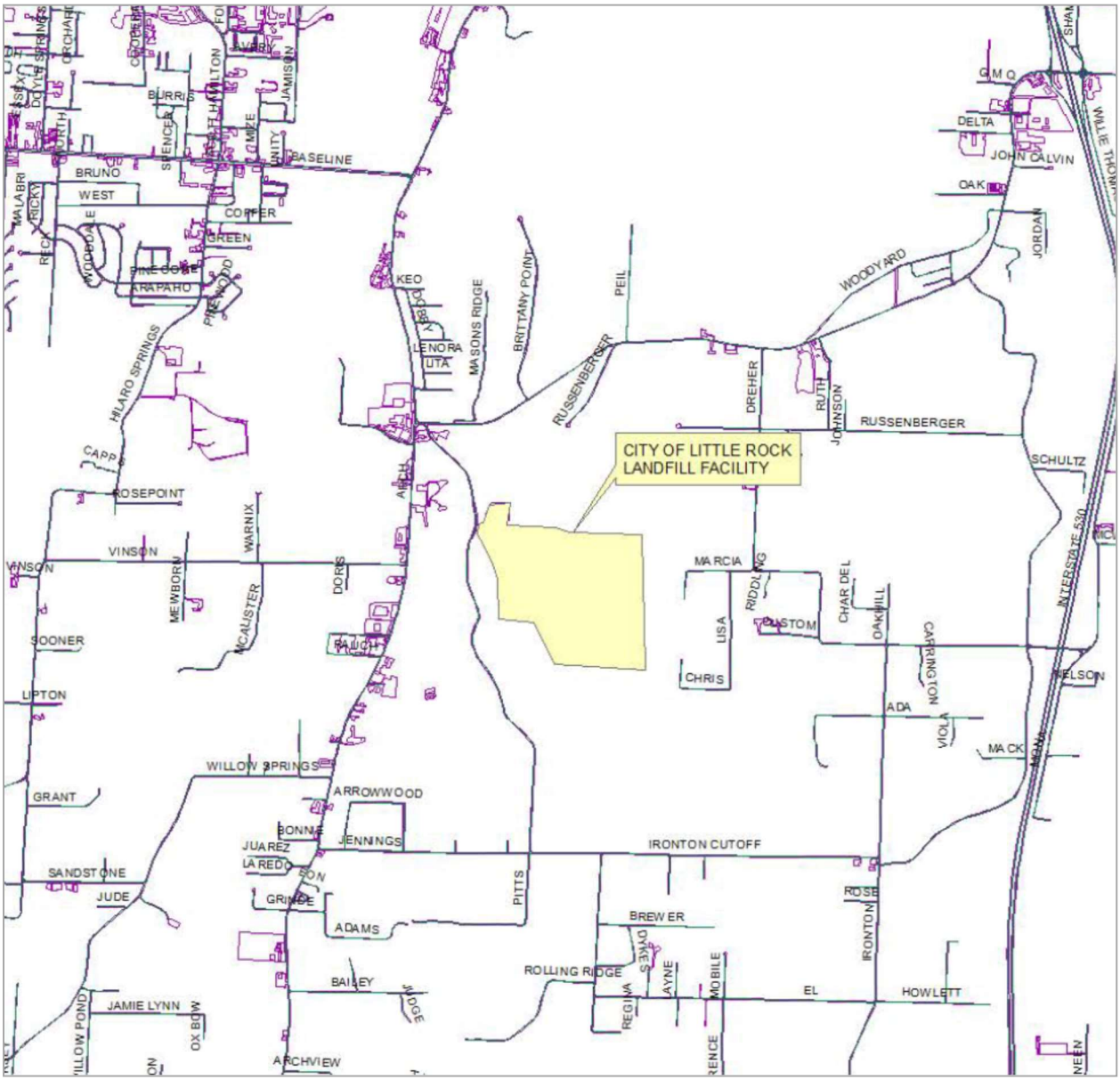


Figure 1.1. Site location map.

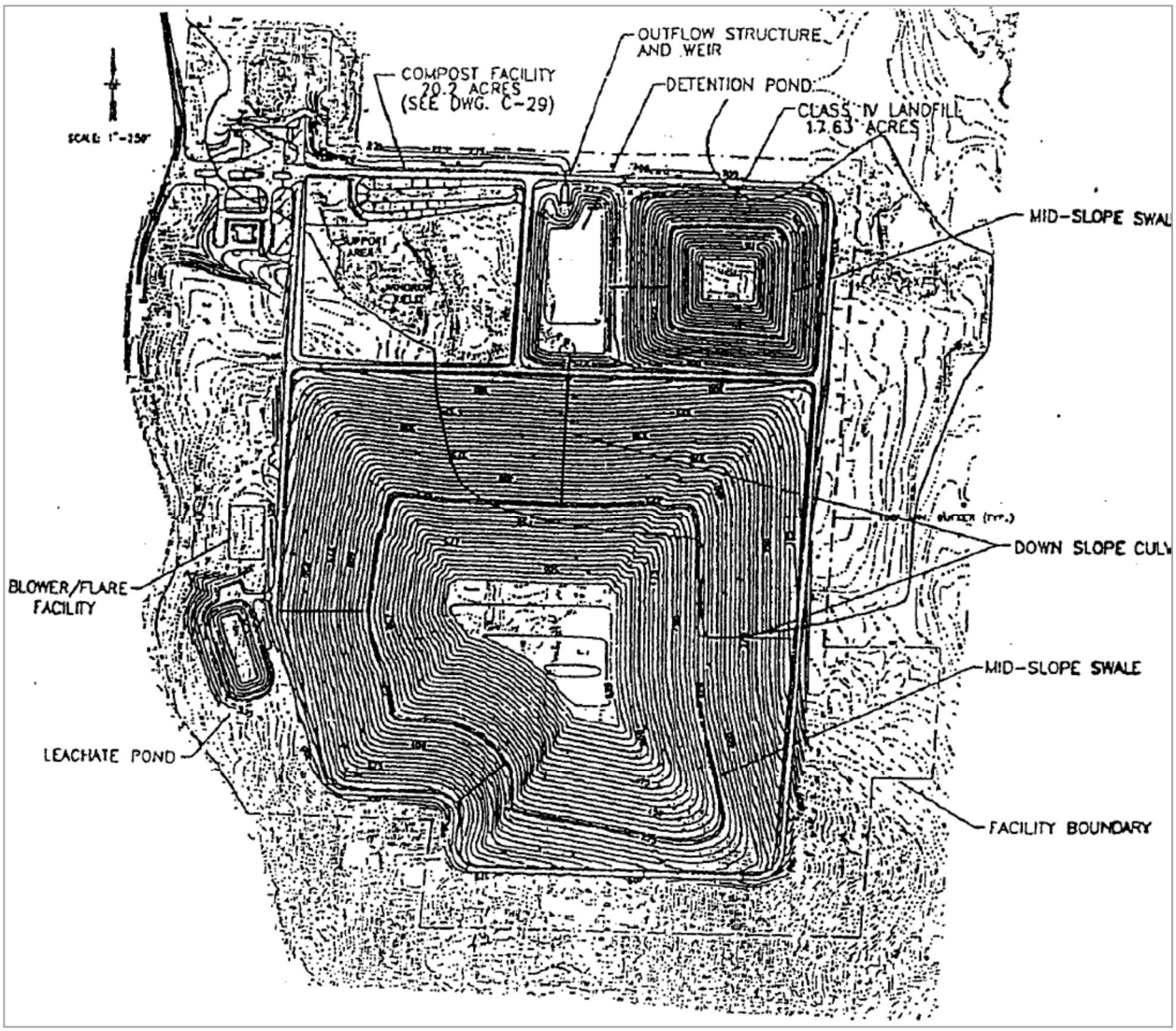


Figure 1.2. General site layout.

1.2 Background Information

The Class 1 and Class 4 landfills were designed and permitted to comply with Subtitle D of Title 40 Code of Federal Regulations (CFR) Part 258, and both landfills began accepting waste in 1993. Household waste materials and non-hazardous industrial waste (NHIW) are disposed at the facility's Class 1 landfill, and construction/demolition (C&D) wastes are disposed at the Class 4 landfill. Yard waste is processed at the composting facility in order to produce compost, mulch, and boiler fuel.

2.0 DESIGN AND OPERATIONAL CONSIDERATIONS

Class 1 landfills can accept all types of household waste including putrescible waste, non-hazardous industrial waste, and commercial waste. Due to the nature of the waste materials received, specific siting, design, and operating standards must be considered when developing Class 1 landfills. These standards assist in minimizing the potential for environmental impact associated with the waste disposal operations.

Class 4 landfills, as defined by Regulation No. 22, are eligible to receive non-hazardous C&D waste, furniture, appliances, and other materials that are considered inert. These materials are generally considered "non-putrescible" because they degrade very slowly or not at all. Due to the nature of the waste stream, less-stringent environmental controls are required for Class 4 landfills.

Composting facilities, as defined by Regulation No. 22, are eligible to receive yard waste and other vegetative materials such as grass clippings, leaves, and shredded or chipped brush and tree limbs.

At the CLR solid waste facility, the Class 1, Class 4, and composting operations are managed in separate areas. The Class 1 and Class 4 landfills are divided into cells of varying capacity in order to effectively control the incoming waste stream while managing the separation of leachate and stormwater runoff. For the Class 1 landfill, cell construction generally involves clearing, excavation to established subgrade, preparation of a clay liner, installation of geomembrane (60-mil high-density polyethylene [HDPE]), construction of a leachate collection system, construction of a road for landfill operations, and construction of related drainage improvements. A Class 4 waste disposal cell is similar in design but generally does not include a geomembrane and a leachate collection system. Once a cell or isolated waste disposal area has been prepared, the construction must be certified by an Arkansas-licensed professional engineer and approved by the DEQ Regulated Waste Program, formerly the Solid Waste Management Division.

As waste is deposited in a prepared cell, interim cover soil or an approved alternate daily cover material must be installed on a regular basis to control blowing litter, fires, and disease

vectors. During the utilization of a cell, waste is confined to the smallest practical area using heavy compaction equipment. In addition, measures are employed to divert, collect, and manage leachate derived from the waste disposal operations (Class 1 landfill only).

As a portion of a landfill cell is filled to the designed and permitted capacity, that portion of the cell or area of the landfill unit is "closed" in accordance with state and federal regulations. Depending on the landfill unit, closure may consist of placing an impermeable final layer on the landfill, providing topsoil, seeding, constructing drainage or erosion control improvements, installing gas collection systems, and constructing other environmental controls.

After the final cell of the landfill is filled to permitted capacity, and final closure work is completed, there is a mandatory post-closure care period that varies from 30 years for the Class 1 landfill to 2 years for the Class 4 landfill. During this time, CLR must maintain the site by repairing erosion and settlement associated with the Class 1 and Class 4 waste disposal areas. In addition, all systems and environmental controls at the site, including the groundwater monitoring system, leachate collection and treatment systems, and landfill gas control systems, must be maintained.

The CLR composting facility was built in accordance with Regulation No. 22 to include a surface that can withstand heavy equipment loads as well as stormwater management controls to prevent ponding and run-on to the work area. Incoming yard waste materials are processed to produce boiler fuel, mulch, and compost.

2.1 Landfill Operations

In Arkansas, each landfill is required to have a written operating plan that identifies, among other things, the operating sequence of the landfill. CLR has developed operating plans for both the Class 1 and Class 4 waste disposal areas.

The Class 1 landfill is to be developed in nine landfill cells or units. Cells 1 through 8 require bottom liner and leachate collection system construction. Cell 9 expands the height of the landfill by filling over Cells 1 through 8. As portions of each landfill cell are filled to capacity, portions of those areas of the landfill are closed. These areas are designated in the original permit and operating plan as "closure areas." It should be noted that closure areas do not correspond in

size with cell areas. As the landfill is developed, closure work is done only on those areas of the landfill that will not receive waste in the future, primarily completed outer slopes.

To date, Cells 1, 2 and 4 of the Class 1 landfill have been filled to the capacities listed in the original permit, and partial closure of Cells 1 and 2 has been completed. A permanent grass cover has been established on portions of Cells 1 and 2. Partial closure of the east slope of Cell 4 was completed in 2021.

As the footprint of the landfill expands, waste can be placed at higher elevations. During 2016, waste in Cells 1, 2 and 4 reached levels within Cell 9, the upper cell covering Cells 1 through 8. Operationally, it is more cost effective to maximize the height of the open area before expanding horizontally by constructing a new cell.

Originally, the Class 1 cells were to be developed in sequence from one through nine. Due to the cost of rock excavation in Cell 3, the planned utilization sequence has changed. In the future, disposal operations will move to the western, remaining portion of Cell 5, and progress to Cells 3, 6, 7, and 8. Waste will continue to be placed within Cell 9 as the landfill develops.

For the Class 4 landfill, the unit is divided into four operating cells that are to be developed in sequence from Cells 1 through 4. As of the date of this report, Cells 1 and 2 are at capacity and filling operations have moved to Cell 3. The next cell to be developed at the Class 4 landfill will be Cell 4. Figure 2.1 illustrates the revised general layout and orientation of the Class 1 and Class 4 waste disposal areas.

2.2 Final Cover System Design

According to applicable state (DEQ) and federal (EPA) solid waste management regulations, municipal solid waste landfills (Class 1, as defined by Regulation No. 22) must be designed and constructed with a final cover system that will minimize infiltration of surface water while controlling drainage and preventing erosion of soils. The final cover system also serves to reduce landfill gas emissions that can adversely affect air quality.

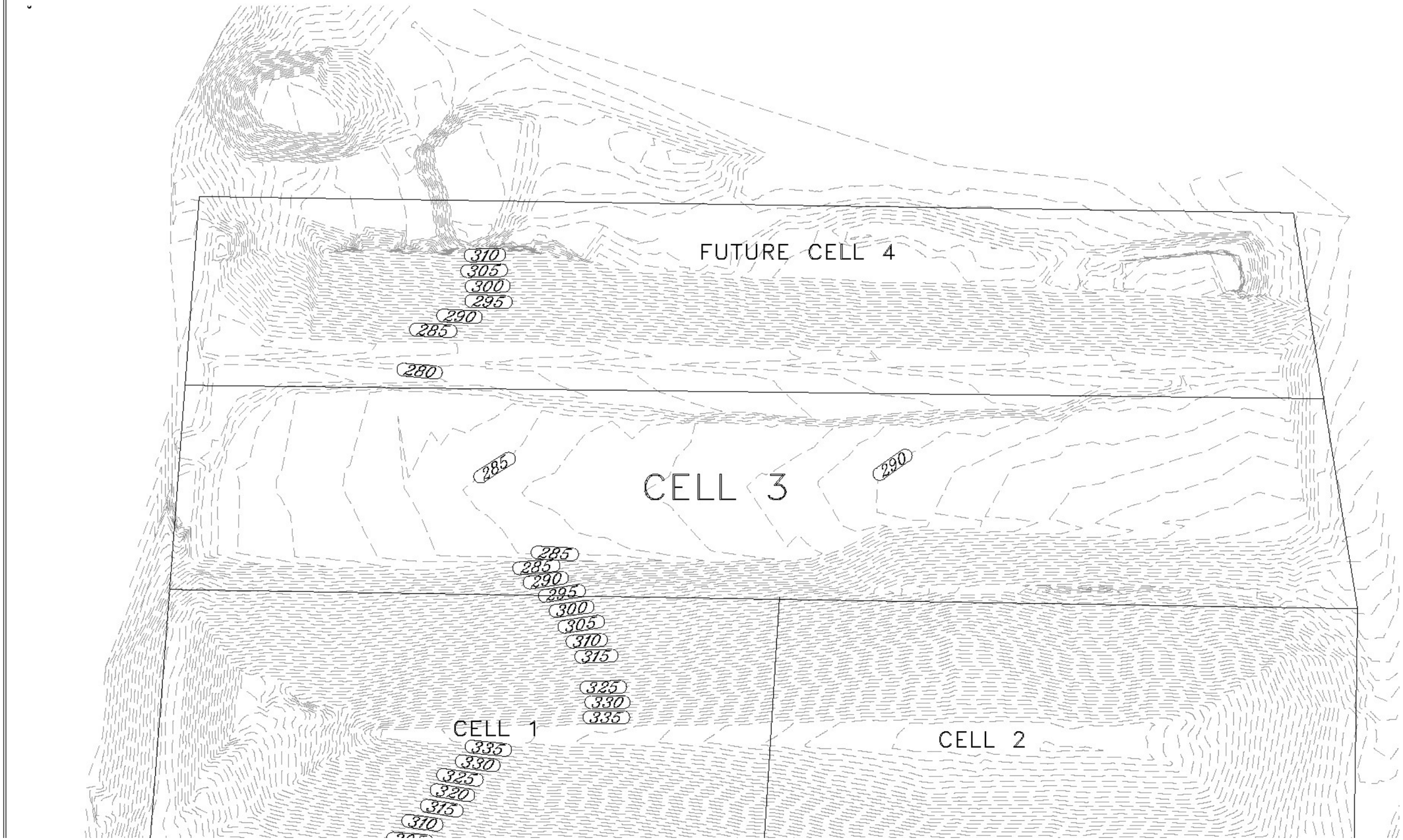


Figure 2.1. Revised general layout of Class 4 waste disposal areas.

The final cover system design for the Class 1 landfill includes the following general cross-section from top to bottom:

- A 6-inch topsoil layer;
- A 12-inch protective cover layer (onsite sandy, silty soil);
- A 12-inch drainage layer of sand, or a geocomposite, or geotextile;
- A geomembrane layer (40-mil very-low-density polyethylene [VLDPE]);
- A compacted clay cover (24-inch minimum thickness, $k \leq 1.0x10^{-7}$ cm/s); and
- A 12-inch foundation layer (onsite sandy, silty soil).

On March 29, 2004, DEQ approved an alternative final cover system for the closure of Cells 2 through 9. The alternative final cover system design includes the following general cross-section from top to bottom:

- A vegetative cover/erosion layer with a minimum thickness of 18 inches,
- A protective cover with a minimum thickness of 18 inches,
- A drainage geocomposite layer,
- A low-permeability geosynthetic clay liner (GCL), and
- Daily and intermediate cover layers over the waste (with a minimum thickness of 18 inches).

The Class 4 waste disposal area will receive a final cover system that includes at least 24 inches of compacted clay cover and 6 inches of topsoil. The compacted clay cover for the Class 4 waste disposal area must demonstrate a maximum hydraulic conductivity of $1.0x10^{-5}$ cm/s.

The final cover systems for both the Class 1 and Class 4 waste disposal areas will be placed over the entire surface of the completed portions of the landfill as soon as practicable once final contours are achieved. Once the final cover layers have been placed, the completed areas will be graded and hydroseeded. Erosion control measures will be employed as needed and required to control soil loss from the area.

2.3 Closure Requirements

Each landfill owner or operator must have a written closure plan, as required by Regulation No. 22, describing the steps necessary to close all facility operations at any point during its active life, and an estimate of the cost to hire a third party to conduct closure activities. The plan is developed as part of the initial permitting of the facility and updated as necessary.

2.4 Post-Closure Care Requirements

Each landfill owner or operator must have a written post-closure care plan, as required by Regulation No. 22, that describes the monitoring and maintenance that will be performed during the post-closure care period, a description of planned land uses, and the person or office responsible for post-closure activities. This plan is also developed as part of the initial permitting of the facility and updated as necessary.

3.0 FACILITY CAPACITY AND UTILIZATION PROJECTIONS

The following sections summarize the landfill disposal capacities and utilization rates for both the Class 1 and Class 4 landfills based on information gathered by CLR and FTN. This information is used in Section 4.0 as the basis for cost analysis and cost projections for financial assurance and depreciation as required by Chapter 14 of Regulation No. 22 and GASB 18.

3.1 Capacity and Utilization of the Class 1 Landfill

The Class 1 landfill occupies an area of approximately 110 acres and has an estimated permitted volume, including waste and earthen cover, of 19,860,298 cubic yards (CY). It is estimated that the permitted volume will hold 8,003,987 tons of Class 1 waste as measured at the scale house. Table 3.1 provides a summary of the acreage by cell and associated waste disposal capacity.

Table 3.1. Cell acreage and associated waste disposal capacities, Class 1 landfill.

Cell/ Area	Cell Acreage [1][4] (Acres)	Partial Closure Area [4] (Acres)	Estimated Volume [2][4] (CY)	Estimated Waste [3][5] (Tons)
1	12.30	4.22	821,527	331,942
2	12.60	4.41	1,269,075	527,340
3	12.00	7.82	865,800	338,203
4	18.86	16.61	2,280,617	1,094,284
5 EAST	6.36	0.00	1,676,654	654,943
5 WEST	9.80	0.00	2,728,831	1,065,950
6	11.00	7.00	2,146,200	838,359
7	17.08	23.04	4,507,970	1,760,926
8	10.00	25.50	2,131,300	832,539
9	0.00	21.40	1,432,324	559,502
TOTAL	**110.00**	**110.00**	**19,860,298**	**8,003,987**

Notes:
[1] Cells 1 and 2 updated in 1999 to reflect actual surveyed area of the completed cells.
[2] Volumes for Cell 1 and 2 are final measured volumes.
[3] Cell 1 and Cell 2 tonnage is actual amount recorded.
[4] Closure Area and Estimated Volume and Waste reflect the 2001 size increase of Cells 4 and 5. and the corresponding decrease in size of Cell 7.
[5] Estimated tons for Cells 3 through 9 calculated as Estimated Volume/2.56.

A survey of all landfill units is conducted on an annual basis to accurately measure and monitor the utilization of the site. The volumes calculated from the survey data are compared to actual gate tons received during the same time period, as measured at the scale house. A ratio of cubic yards of landfill space used to tons of waste received is calculated to assess the overall performance of the landfill and to calculate appropriate rates for depreciation. Table 3.2 provides a summary of the historical "in place" waste volumes and tonnages for the Class 1 landfill.

3.1.1 Estimated Remaining Life of the Class 1 Landfill

Estimates of remaining site life can vary greatly depending on assumptions made for short-term and future growth in the service area. A number of factors can influence the landfill life, including the total number of operating landfills in the region, population growth, recycling diversion rates, and industrial growth. Four different scenarios for determining the remaining Class 1 landfill life are presented in Table 3.3.

For purposes of annual financial projections, it is recommended that the 5-year historical average landfill utilization rate plus and a 1% annual growth rate used for this year and years after. Under this scenario, the timing of cell construction, closure, and post-closure care would be approximately as described in Table 3.4.

3.1.2 Depletion of the Class 1 Landfill

Currently Cells 1, 2, 4, and 5 have been constructed and have a combined area of approximately 60 acres and a combined volume of around 8,777,000 CY per the permit, not including the additional space in Cell 9. An aerial drone survey was performed in January 2022 to measure the total volume of waste and daily/weekly cover that has been placed in the open cells. According to information provided by CLR, the open cells received 132,439 tons of waste, and approximately 311,820 CY of permitted landfill volume (airspace) was used during the 13-month period from mid-December 2020 through mid-January 2022, the dates of the surveys. As shown in Table 3.2, for 2021, the landfill achieved an airspace utilization rate of 2.35 CY per ton of waste and an effective waste density of 849 pounds per cubic yard.

Table 3.2. Utilization rate summary, Class 1 landfill.

Year	Gross Fill Volume [1]		Waste Tonnage		Landfill Utilization [2]		Effective Waste Density [3]		Daily/Intermediate Cover		
	This Year (CY)	To Date (CY)	This Year (TONS)	To Date (TONS)	This Year (CY/TON)	To Date (CY/TON)	This Year (LBS/CY)	To Date (LBS/CY)	This Year (CY)	To Date (CY)	Percent of Fill (%/YEAR)
1993	17,920	17,920	3,122	3,122	5.74	5.74	--	--	--	--	--
1994	215,036	232,956	83,793	86,915	2.57	2.68	779	746	48,945	48,945	23%
1995	211,731	444,687	118,890	205,805	1.78	2.16	1,123	926	89,290	138,235	42%
1996	242,590	687,277	76,222	282,027	3.18	2.44	628	821	61,109	199,344	25%
1997	264,366	951,643	93,993	376,020	2.81	2.53	711	790	71,560	270,904	27%
1998	230,140	1,181,783	87,695	463,715	2.62	2.55	762	785	78,681	349,585	34%
1999	174,950	1,356,733	85,270	548,985	2.05	2.47	975	809	90,566	440,151	52%
2000	202,920	1,559,653	84,557	633,542	2.40	2.46	833	812	93,461	533,612	46%
2001	225,293	1,784,946	86,118	719,660	2.62	2.48	764	806	77,957	611,569	35%
2002	157,269	1,942,215	79,584	799,244	1.98	2.43	1,012	823	70,006	681,575	45%
2003	187,610	2,129,825	75,047	874,291	2.50	2.44	800	821	97,895	779,470	52%
2004	192,998	2,322,823	76,257	950,548	2.53	2.44	790	818	70,784	850,254	37%
2005	206,062	2,528,885	71,518	1,022,066	2.88	2.47	694	808	83,818	934,072	41%
2006	232,333	2,761,218	97,770	1,119,836	2.38	2.47	842	811	84,083	1,018,155	36%
2007	261,334	3,022,552	113,311	1,233,147	2.31	2.45	867	816	86,606	1,104,761	33%
2008	228,998	3,251,550	106,942	1,340,089	2.14	2.43	934	824	67,325	1,172,086	29%
2009	159,997	3,411,547	97,346	1,437,435	1.64	2.37	1,217	843	51,207	1,223,293	32%
2010	162,109	3,573,656	87,406	1,524,841	1.85	2.34	1,078	853	61,270	1,284,563	38%
2011	250,402	3,824,058	93,131	1,617,972	2.69	2.36	744	846	92,454	1,377,017	37%
2012	221,129	4,045,187	97,699	1,715,671	2.26	2.36	884	848	98,687	1,475,704	45%
2013	211,617	4,256,804	131,758	1,847,429	1.61	2.30	1,245	868	117,821	1,593,525	56%
2014	272,415	4,529,219	106,137	1,953,566	2.57	2.32	779	863	82,340	1,675,865	30%
2015	263,673	4,792,892	124,617	2,078,183	2.12	2.31	945	867	92,556	1,768,421	35%
2016	254,940	5,047,832	118,704	2,196,887	2.15	2.30	931	870	118,892	1,887,313	47%
2017	261,030	5,308,862	115,074	2,311,961	2.27	2.30	882	871	88,371	1,975,684	34%
2018	274,980	5,583,842	123,796	2,435,757	2.22	2.29	900	872	99,725	2,075,409	36%
2019	221,670	5,805,512	129,706	2,565,463	1.71	2.26	1,170	884	90,014	2,165,423	41%
2020	153,610	5,959,122	77,985	2,643,448	1.97	2.25	1,015	887	58,132	2,223,555	32%
2021	311,820	6,270,942	132,439	2,775,887	2.35	2.26	849	885	140,322	2,363,877	37%
Cell Estimates[4]: Total Cell 1:	**0**	**1,045,142**		**462,641**	--	--	--	--	--	--	--
Total Cell 2:	**42,214**	**1,372,449**		**607,526**	--	--	--	--	--	--	--
Total Cell 4:	**0**	**3,011,472**		**1,333,054**	--	--	--	--	--	--	--
Total Cell 5:	**269,606**	**841,879**		**372,665**	--	--	--	--	--	--	--
5-Year Average:	**248,768**	--	**117,763**		**2.10**	**2.27**	**963**	**880**	**96,928**	--	**36%**
Planned Average:	--	--	--	--	--	**2.25**	--	**1,042**	--	--	--

[1] Total in-place landfill volume utilized for waste and earthen/grindings berms and cover, in cubic yards.
[2] Cubic yard volume of landfill space utilized per ton of waste.
[3] Effective density of compacted waste in landfill with soil berms, roads and interim cover.
[4] Amounts estimated for each cell includes fill into upper cell, Cell 9.

Table 3.3. Projections of remaining life, Class 1 landfill[1].

Scenario	Projected 2021 Waste (CY)	Estimated Site Life (years)
Current Utilization Rate, No Growth	311,820	49
Current Utilization Rate Plus 1% Annual Growth	314,938	39
5-Year Historical Average Utilization Rate Plus 1% Annual Growth	251,256	44
5-Year Historical Average Utilization Rate Plus 3% Annual Growth	256,231	33

(1) As of December 2021

Table 3.4. Projection of useful life based on 5-year average utilization rate and 1% growth, Class 1 landfill.

End of Year	Operation in Cell	Volume Added in New Construction	Volume Depleted	Total Depleted To Date	Constructed Volume Remaining
1993	1	821,527	17,920	17,920	803,607
1994	1		215,036	232,956	588,571
1995	1		211,731	444,687	376,840
1996	1		242,590	687,277	134,250
1997	1&2	1,260,019	264,366	951,643	1,129,903
1998	2		230,140	1,181,783	899,763
1999	2		174,950	1,356,733	724,813
2000	2		202,920	1,559,653	521,893
2001	2		225,293	1,784,946	296,600
2002	2		157,269	1,942,215	139,331
2003	2&4	2,239,718	187,610	2,129,825	2,191,439
2004	4		192,998	2,322,823	1,998,441
2005	4		206,062	2,528,885	1,792,379
2006	4		232,333	2,761,218	1,560,046
2007	4		261,334	3,022,552	1,298,712
2008	4		228,998	3,251,550	1,069,714
2009	4		159,997	3,411,547	909,717
2010	4		162,109	3,573,656	747,608
2011	4		250,402	3,824,058	497,206
2012	4		221,129	4,045,187	276,077
2013	4		211,617	4,256,804	64,460
2014	4 & 5 E	1,676,654	272,415	4,529,219	1,468,699
2015	5 EAST		263,673	4,792,892	1,205,026
2016	5 EAST		254,940	5,047,832	950,086
2017	5 EAST		261,030	5,308,862	689,056
2018	5 EAST		274,980	5,583,842	414,076
2019	5 EAST		221,670	5,805,512	192,406
2020	5E & 5W	2,728,831	153,610	5,959,122	2,767,627
2021	5 WEST		311,820	6,270,942	2,455,807
2022	5 WEST		251,256	6,522,198	2,204,551
2023	5 WEST		253,768	6,775,966	1,950,783
2024	5 WEST		256,306	7,032,272	1,694,477
2025	5 WEST		258,869	7,291,141	1,435,608

Table 3.4. Projection of useful life based on 5-year average utilization rate and 1% growth, Class 1 landfill (continued).

End of Year	Operation in Cell	Volume Added in New Construction	Volume Depleted	Total Depleted To Date	Constructed Volume Remaining
2026	5 WEST		261,458	7,552,599	1,174,150
2027	5 WEST		264,072	7,816,672	910,077
2028	5 WEST		266,713	8,083,385	643,364
2029	5 WEST		269,380	8,352,765	373,984
2030	5 WEST		272,074	8,624,839	101,910
2031	5 W & 3/6	3,012,000	274,795	8,899,634	2,839,115
2032	3/6		277,543	9,177,176	2,561,573
2033	3/6		280,318	9,457,495	2,281,254
2034	3/6		283,121	9,740,616	1,998,133
2035	3/6		285,953	10,026,569	1,712,180
2036	3/6		288,812	10,315,381	1,423,368
2037	3/6		291,700	10,607,081	1,131,668
2038	3/6		294,617	10,901,698	837,051
2039	3/6		297,563	11,199,261	539,488
2040	3/6		300,539	11,499,800	238,949
2041	3/6 & 7	4,507,970	303,544	11,803,345	4,443,374
2042	7		306,580	12,109,925	4,136,794
2043	7		309,646	12,419,570	3,827,149
2044	7		312,742	12,732,312	3,514,407
2045	7		315,870	13,048,182	3,198,537
2046	7		319,028	13,367,210	2,879,509
2047	7		322,218	13,689,429	2,557,290
2048	7		325,441	14,014,869	2,231,850
2049	7		328,695	14,343,564	1,903,155
2050	7		331,982	14,675,546	1,571,173
2051	7		335,302	15,010,848	1,235,871
2052	7		338,655	15,349,503	897,216
2053	7		342,041	15,691,545	555,174
2054	7		345,462	16,037,006	209,713
2055	7 & 8	2,131,300	348,916	16,385,923	1,992,096
2056	8		352,406	16,738,329	1,639,690
2057	8		355,930	17,094,258	1,283,761
2058	8		359,489	17,453,747	924,272
2059	8		363,084	17,816,831	561,188
2060	8		366,715	18,183,546	194,473
2061	8 & 9	1,482,279	370,382	18,553,928	1,306,370
2062	9		374,086	18,928,013	932,285
2063	9		377,827	19,305,840	554,458
2064	9		381,605	19,687,445	172,853
2065	9		172,853	19,860,298	0
			Final Closure	**06/15/2065**	
Totals		**19,860,298**	**19,860,298**		

Filling of Cell 1 was completed in July 1997. Filling of Cell 2 was completed in October 2003, and filling of Cell 4 was completed in June 2014. Therefore, the cost for the original construction of Cells 1 and 2 should be fully depreciated. Likewise, since the partial closure for Cells 1 and 2 have been completed, the estimated cost for closure of Cells 1 and 2 should be fully recognized. During 2021, approximately 4.6 acres of the planned 16.6 acres (see Table 3.1) of Cell 4 were closed. Therefore, 27.7% of the estimated cost for closure of Cell 4 should be realized.

By comparing the volumes that have been filled to date to the permitted landfill volumes, a percentage can be calculated for the current depletion of each cell and the total landfill. As shown in Table 3.5, 100% of the capacity of Cells 1, 2, and 4 has been utilized. Approximately 19% of Cell 5 and 74% of Cell 9 have been utilized, equating to 31.6% of the total landfill capacity being utilized as of January 2022. These amounts are based upon capacities listed in the Class 1 permit.

Table 3.5. Landfill depletion by cell, Class 1 landfill[1].

Cell	Permitted Total Volume (CY)	Estimated Volume Used to Date (CY)	Estimated Utilization To Date (%)	Usable Remaining Volume [2] (CY)	Usable Remaining Life [3] (Years)	Permitted Remaining Volume (CY)	Permitted Remaining Life [3] (Years)
Constructed Cells:							
Cell 1	821,527	821,527	100.0%	0	0.0	0	0
Cell 2	1,269,075	1,269,075	100.0%	0	0.0	0	0
Cell 4	2,280,617	2,280,617	100.0%	0	0.0	0	0
Cell 5	4,405,485	841,879	19.1%	2,452,500	9.8	3,563,606	14
Cell 9	1,432,324	1,057,844	73.9%	1,202,800	4.8	4,124,634	16
TOTAL	**8,776,704**	**6,270,942**	**71.4%**	**3,655,300**	**14.5**	**7,688,240**	**30**
All Cells:							
Cells 1-9	19,860,298	6,270,942	31.6%			13,589,356	44
Depreciation of Capital Improvements:							
	Construction Cost for Cell 1		100.0%				
	Construction Cost for Cell 2		100.0%				
	Construction Cost for Cell 4		100.0%				
	Construction Cost for Cell 5		100.0%				
	General Class 1 Landfill Capital Improvements		31.6%				
Depreciation of Capital Improvements:							
	Cell 1 Phased Closure Cost		100.0%				
	Cell 2 Phased Closure Cost		100.0%				
	Cell 4 Phased Closure Cost		(4.6 acres closed) 27.7%				
	Cell 5 Phased Closure Cost		(Internal Cell) N/A				
	Class 1 Post Closure Care Cost		13.6%				

[1] As of February 2021 (date of waste survey)
[2] Usable remaining volume/life based upon estimated maximum fill elevation before a new cell must be constructed....
[3] Based on 5-year historical average utilization rate plus 1% annual growth (Table 3.4)

3.2 Capacity and Utilization of the Class 4 Landfill

The Class 4 landfill occupies an area of approximately 18 acres and has a permitted volume including waste and weekly cover of 1,217,800 CY. It is estimated that the permitted volume will hold 900,052 tons of Class 4 waste. A summary of the Class 4 landfill capacity is provided in Table 3.6.

Table 3.6. Landfill capacity summary, Class 4 landfill.

Cell	Total Area (acres)	Phased Closure Area (acres)	Gross Volume (CY)	Total Waste Capacity (tons)
1	4.5	2.1	181,860	127,925
2	4.5	2.1	229,100	195,812
3	4.3	2.3	351,534	251,095
4	4.7	11.5	455,306	325,220
TOTAL	**18.0**	**18.0**	**1,217,800**	**900,052**

A summary of historical landfill volumes and tons received associated with the Class 4 landfill is shown in Table 3.7.

3.2.1 Estimated Remaining Life of the Class 4 Landfill

Estimates of remaining site life can vary greatly depending upon the assumptions made for short-term and future growth in the service area. A number of factors can influence the landfill life, including the total number of operating landfills in the region, population growth, recycling diversion rates, and industrial growth. For purposes of annual financial projections, it is recommended that the 3-year historical average landfill utilization rate plus 1% be used for the year 2022, with a 1% annual growth rate thereafter. Under this scenario, the timing of cell construction, closure, and post-closure care would be approximately as described in Table 3.8. The Class 4 landfill is projected to last approximately 23 years under these assumptions.

Table 3.7. Utilization rate summary, Class 4 landfill.

Year	Gross Fill Volume [1]		Waste Tonnage		Landfill Utilization [2]		Effective Waste Density [3]		Daily/Intermediate Cover	
	This Year (CY)	To Date (CY)	This Year (TONS)	To Date (TONS)	This Year (CY/TON)	To Date (CY/TON)	This Year (LBS/CY)	To Date (LBS/CY)	This Year (CY)	Percent of Fill (%/YEAR)
1993	1,524	1,524	343	343	4.44	4.44	450	450	--	--
1994	18,284	19,808	3,675	4,018	4.97	4.93	402	406	--	--
1995	18,284	38,092	16,030	20,049	1.14	1.90	1,753	1,053	--	--
1996	47,896	85,988	20,053	40,101	2.39	2.14	837	933	--	--
1997	71,411	157,399	73,161	113,262	0.98	1.39	2,049	1,439	--	--
1998	24,555	181,954	10,775	124,037	2.28	1.47	878	1,363	--	--
1999	33,489	215,443	36,430	160,467	0.92	1.34	2,176	1,490	--	--
2000	20,135	235,578	17,937	178,403	1.12	1.32	1,782	1,515	--	--
2001	25,348	260,926	37,197	215,600	0.68	1.21	2,935	1,653	--	--
2002	33,550	294,476	15,002	230,602	2.24	1.28	894	1,566	--	--
2003	17,424	311,900	9,253	239,855	1.88	1.30	1,062	1,538	--	--
2004	13,582	325,482	11,879	251,735	1.14	1.29	1,749	1,547	--	--
2005	16,904	342,386	10,249	261,984	1.65	1.31	1,213	1,530	--	--
2006	15,160	357,546	10,612	272,596	1.43	1.31	1,400	1,525	--	--
2007	32,200	389,746	22,950	295,546	1.40	1.32	1,425	1,517	--	--
2008	3,108	392,854	2,220	297,766	1.40	1.32	1,429	1,516	--	--
2009	3,570	396,424	2,550	300,316	1.40	1.32	1,429	1,515	--	--
2010	8,879	405,303	15,051	315,367	0.59	1.29	3,390	1,556	--	--
2011	3,500	408,803	8,150	323,517	0.43	1.26	4,657	1,583	--	--
2012	2,100	410,903	6,526	330,043	0.32	1.24	6,215	1,606	--	--
2013	20	410,923	14	330,057	1.42	1.25	1,409	1,606	--	--
2014	24,706	435,629	12,813	342,870	1.93	1.27	1,037	1,574	--	--
2015	27,523	463,152	16,481	359,351	1.67	1.29	1,198	1,552	--	--
2016	44,658	507,810	16,400	375,751	2.72	1.35	1,042	1,480	13,173	29%
2017	18,655	526,465	19,678	395,429	0.95	1.33	2,659	1,502	3,855	21%
2018	19,370	545,835	12,463	407,892	1.55	1.34	1,555	1,495	3,343	17%
2019	27,592	573,427	13,314	421,206	2.07	1.36	1,111	1,469	3,622	13%
2020	17,270	590,697	8,420	429,626	2.05	1.37	1,313	1,455	4,445	22%
2021	20,240	610,937	9,081	438,707	2.23	1.39	1,128	1,436	4,140	18%
Total Cell 1:	**0**	**181,860**	**--**	**127,925**	**--**	**1.42**	**--**	**1,407**	**--**	**--**
Total Cell 2:	**0**	**229,100**	**--**	**202,132**	**--**	**1.13**	**--**	**1,765**	**--**	**--**
Total Cell 3:	**20,240**	**199,977**	**--**	**108,650**	**--**	**1.84**	**--**	**1,087**	**--**	**--**
3-Year Average:	**22,321**	**--**	**10,565**	**--**	**--**	**1.38**	**1,184**	**--**	**--**	**--**
Planned Average:		**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**

(1) Total in-place landfill volume utilized for waste and earthen berms and cover, in cubic yards.
(2) Cubic yard volume of landfill space utilized per ton of waste.
(3) Effective density of compacted waste in landfill not including earth used for cover, in pounds per total cubic yard.

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Table 3.8. Projection of useful life based on 3-year average utilization rate and 1% growth, Class 4 landfill.

End of Year	Operation in Cell	Volume Added in New Construction	Volume Depleted	Total Depleted to Date	Constructed Volume Remaining
1993	1	181,860	1,524	1,524	180,336
1994	1		18,284	19,808	162,052
1995	1		18,284	38,092	143,768
1996	1		47,896	85,988	95,872
1997	1		71,411	157,399	24,461
1998	1&2	229,100	24,555	181,954	229,006
1999	2		33,489	215,443	195,517
2000	2		20,135	235,578	175,382
2001	2		25,348	260,926	150,034
2002	2		33,550	294,476	116,484
2003	2		17,424	311,900	99,060
2004	2		13,582	325,482	85,478
2005	2		16,904	342,386	68,574
2006	2		15,160	357,546	53,414
2007	2		32,200	389,746	21,214
2008	2		3,108	392,854	18,106
2009	2		3,570	396,424	14,536
2010	2		8,879	405,303	5,657
2011	2		3,500	408,803	2,157
2012	2		2,100	410,903	57
2013	2		20	410,923	37
2014	3	351,534	24,706	435,629	326,865
2015	3		27,523	463,152	299,342
2016	3		44,658	507,810	254,684
2017	3		18,655	526,465	236,029
2018	3		19,370	545,835	216,659
2019	3		27,592	573,427	189,067
2020	3		17,270	590,697	171,797
2021	3		20,240	610,937	151,557
2022	3		22,544	633,481	129,013
2023	3		22,769	656,250	106,244
2024	3		22,997	679,247	83,247
2025	3		23,227	702,474	60,020
2026	3		23,459	725,934	36,560
2027	3		23,694	749,627	12,867
2028	3&4	455,306	23,931	773,558	444,242
2029	4		24,170	797,728	420,072
2030	4		24,412	822,140	395,660
2031	4		24,656	846,796	371,004
2032	4		24,902	871,698	346,102
2033	4		25,152	896,850	320,950
2034	4		25,403	922,253	295,547
2035	4		25,657	947,910	269,890
2036	4		25,914	973,824	243,976
2037	4		26,173	999,996	217,804
2038	4		26,434	1,026,431	191,369

Table 3.8. Projection of useful life based on 3-year average utilization rate and 1% growth, Class 4 landfill (continued).

End of Year	Operation in Cell	Volume Added in New Construction	Volume Depleted	Total Depleted to Date	Constructed Volume Remaining
2039	4		26,699	1,053,130	164,670
2040	4		26,966	1,080,096	137,704
2041	4		27,235	1,107,331	110,469
2042	4		27,508	1,134,839	82,961
2043	4		27,783	1,162,622	55,178
2044	4		28,061	1,190,683	27,117
2045	4		27,117	1,217,800	0
			Final Closure:	12/19/2045	
	Totals	**1,217,800**	**1,217,800**		

3.2.2 Depletion of the Class 4 Landfill

Currently, Cells 1 and 2 have been filled to capacity and fill operations are ongoing in Cell 3. Filling of Cell 1 of the Class 4 landfill was completed in July 1999. Filling of Cell 2 was completed in June 2014. Therefore, the cost for the original construction of Cell 1 should be fully depreciated. Likewise, the estimated cost for closure of Cell 1 should be fully recognized.

Since going into service in 2014, Cell 3 has received 199,977 CY of waste. Therefore, 57% of the Cell 3 volume has been utilized and 57% of the Cell 3 construction and closure cost should be depreciated as of December 31, 2021.

By comparing the landfill volumes that have been filled to date to the permitted landfill volumes, a percentage can be calculated for the current depletion of the total landfill. As shown in Table 3.9, roughly 50% of the total Class 4 landfill capacity has been utilized.

3.3 Utilization of the Composting Facility

The composting site occupies an area of approximately 20 acres, which comprises an 11.4-acre paved working surface, a 2.4-acre compost runoff pond, and 6.2 acres of access, drainage, and buffer areas. Maximum design storage capacity of the site is 30,000 tons.

Table 3.9. Landfill depletion by cell, Class 4 landfill[1].

Cell	Permitted Total Volume (CY)	Estimated Volume Used to Date (CY)	Estimated Percent Utilization to Date	Permitted Remaining Volume (CY)	Permitted Remaining Life[2] (years)
Constructed Cells					
Cell 1	181,860	181,860	100.0%	0	0
Cell 2	229,100	229,100	100.0%	0	0
Cell 3	351,534	199,977	56.9%	151,557	6.5
Total	**762,494**	**610,937**	**80.1%**	**151,557**	**6.5**
All Cells					
Cells 1-4	1,217,800	610,937	50.2%	606,863	23
Depreciation of Capital Improvements					
Construction Cost for Cell 1			100.0%		
Construction Cost for Cell 2			100.0%		
Construction Cost for Cell 3			56.9%		
General Class 4 Landfill Capital Improvements			50.2%		
Depreciation of Capital Improvements					
Cell 1 Closure Cost			100.0%		
Cell 2 Closure Cost			100.0%		
Cell 3 Closure Cost			0.0%		
Class 4 Post-Closure Care Cost			50.2%		

(1) As of January 2022.
(2) Based on 3-year historical average utilization rate plus 1% annual growth (Table 3.8).

4.0 COST ESTIMATES

The following information provides cost estimates for the closure of the composting facility, and cell preparation, closure, and post-closure care associated with the Class 1 and Class 4 landfills. Unit costs for the estimates are based on actual construction/maintenance costs associated with similar operations in Arkansas.

4.1 Closure Liability of the Class 1 Landfill

The costs for landfill closure associated with the Class 1 landfill are summarized in Table 4.1. These costs are based on the design considerations outlined in Section 2 and the facility closure plan. The current estimated cost per acre for landfill closure is shown below. According to Regulation No. 22, estimates involving closure for the purpose of establishing financial assurance are to be updated at least annually to consider inflation, design changes, etc.

Table 4.1. Estimated closure costs per acre, Class 1 landfill.

Item Description	Unit Cost for Closure Areas with Acreage Between:		
	0 and 10 Acres	10 and 20 Acres	20 and 30 Acres
Topsoil/compost layer	$9,806.25	$8,828.23	$7,945.41
Soil cover layer	$23,861.12	$21,481.35	$19,333.23
Geocomposite	$20,403.99	$18,369.02	$16,532.13
GCL	$22,244.06	$20,025.56	$18,023.02
Subgrade preparation (foundation by CLR)	$2,646.97	$2,382.98	$2,144.68
Seeding	$2,532.50	$2,279.92	$2,051.93
Gas collection wells	$9,227.06	$8,306.80	$7,476.13
Drainage improvements	$14,347.76	$12,916.80	$11,625.13
Erosion control	$2,596.96	$2,337.96	$2,104.16
Mobilization	$15,195.00	$13,679.54	$12,311.59
Preparation of plans and specifications	$5,065.00	$4,559.85	$4,103.86
Construction quality assurance	$11,577.14	$10,422.51	$9,380.26
Contingencies - 5%	$6,975.19	$6,279.53	$5,651.58
Total Closure Cost per Acre	**$146,479.00**	**$131,870.04**	**$118,683.12**
Largest area (acres) ever needing final cover (combined acreage of Area 3/6 and Cell 7)			69.26
Largest area unit Closure Cost ($/acre)			$118,683.12
Total Financial Assurance Closure Cost			**$8,219,992.66**

(1) Cost per acre, as estimated based on 2020 bid unit prices. Adjusted by DEQ Inflation factor (2021: 1.013)
(2) Includes letdowns, swales, toe drains, culverts, ditches...
(3) Includes permitting, pre- and post-construction BMPs, and maintenance...

The estimated costs associated with each Class 1 landfill closure area are summarized in Table 4.2.

Table 4.2. Closure sequence and associated cost estimates, Class 1 landfill.

Event	Acreage Added	Acreage Closed	Total Acreage Needing Final Cover	Approximate Year[1]	Estimated Closure Cost[2]
Construction of Cell 1	12.30	0.00	12.30	1993	
Construction of Cell 2	12.60	0.00	24.90	1997	
Closure of Area 1 [2]		4.22	20.68	2000	COMPLETED
Construction of Cell 4	18.86	0.00	39.54	2002	
Closure of Area 2 [2]		4.41	35.13	2004/2005	COMPLETED
Construction of Cell 5 EAST 40%	6.36	0.00	41.49	2014	
Closure of Area 4 [5]		5.50	35.99	2021	COMPLETED
Construction of Cell 5 WEST 60%	9.80	0.00	45.79	2020	
Construction of Cell 3/6[3]	23.00	0.00	68.79	2031	
Closure of Area 5		16.61	52.18	2033	N/A [4]
Construction of Cell 7	17.08	0.00	69.26	2041	
Closure of Area 3/6 [3]		14.82	54.44	2043	$1,954,313.97
Construction of Cell 8	10.00	0.00	64.44	2055	
Closure of Area 7		23.04	41.40	2057	$2,734,459.01
Filling in Area 9, No Construction	0.00	0.00	41.40	2061	
Closure of Area 8		25.50	15.90	2063	$3,026,419.47
Final Closure, Area 9		15.90	0.00	2065	$2,096,733.62
Totals	**110.00**	**110.00**			**$9,811,926.07**

[1]Based on 5-year historical average LF utilization plus 1% annual growth (see Table 3.4)
[2]Cell 3 and Cell 6 will be constructed together and are hereby noted as Cell 3/6
[3]See Table 4.1 for Estimated Closure Costs per Acre...
[4]Cell 5 is internal cell. No closure required....

To satisfy state and federal regulations (Regulation No. 22 and Subtitle D of 40 CFR 258), the largest area of the landfill that will need final cover at one time must be determined. This area will not correspond to the largest closure area identified in Table 4.2, but rather would be the largest open (unclosed) area that would have to be closed should state or federal regulators order the landfill to close before it reaches the end of its operating life. This is a worst-case scenario.

As can be seen from Table 4.2, the largest area needing final cover during the operating life of the landfill (69.26 acres) occurs when Cell 7 is placed in service but before the partial closure designated for Cells 3 and 6 is completed. This is projected to potentially occur in 2041 (see Table 4.2). The projected cost for this closure in December 2021 dollars would be

$8,219,993 (see Table 4.1). After Cells 3 and 6 are closed, financial assurance liability would be reduced for the remainder of the operating life. The final closure liability is projected to occur around 2065 when Cell 9 is filled to capacity (Table 3.4). At that time, $2,096,734 (in December 2021 dollars) would be needed to perform closure activities (Table 4.2).

4.2 Post-Closure Liability of the Class 1 Landfill

The current post-closure liability is estimated to be $8,666,620 (see Table 4.3) and post-closure is projected to begin in 2066. Because so many costs are fixed, this liability will remain substantially the same regardless of the actual year final closure occurs or the number of landfill cells that are actually constructed and filled. However, the estimated post-closure care cost is reviewed and adjusted each year (if needed) to consider inflation as required by the regulations.

Liability associated with certain landfill fixed costs such as pump station and force main construction, treatment facilities, leachate injection systems, roads, and drainage improvements should be depreciated throughout the operating life of the landfill. Also, the financial capability of CLR to cover this cost must be demonstrated and assured with an acceptable financial assurance mechanism as required by the regulations.

4.3 Closure Liability of the Class 4 Landfill

The current estimated cost per acre for closure of the Class 4 landfill is shown in Table 4.4. Each year these costs are updated based on the current inflation rate or actual current costs. This report shows current costs as of December 2021. It should be noted that the Class 4 landfill does not have to meet the same stringent closure criteria as the Class 1 landfill.

Table 4.3. Post-closure cost estimate, Class 1 landfill.

Item Description	Basis of Cost	Units	Estimated Quantity	12/2020 Unit Cost (1)	12/2020 Total Cost
Site Inspection	Includes site inspection and summary report, quarterly for 30 years	Each	4	$1,215.60	$4,862.40
Groundwater Monitoring	Semiannual sampling, analysis, and report writing for 12 GW wells	$/well	24	$3,427.32	$82,255.60
Groundwater Well Maintenance	Twelve GW wells, maintenance and occasional replacement as needed	$/well	12	$420.40	$5,044.74
Gas Monitoring	Eight locations tested quarterly for monitoring	$/well	32	$354.55	$11,345.60
Gas Probe & Gas Meter	Eight gas probes, general maintenance and replacement as needed	$/well	8	$5,576.57	$44,612.52
Leachate Collection System	Annual O&M of leachate collection and recirculation systems	Each	1	$17,423.60	$17,423.60
Leachate Treatment	Leachate Treatment cost at Little Rock Wastewater Utility	gallons	100,000	$0.00	$405.20
Leachate Pre-treatment	Costs associated with pumping then aerobically treating leachate	gallons	100,000	$0.00	$405.20
Pump Station Maintenance	Pump Station Maintenance, Including pumps and electrical	Each	6	$4,052.00	$24,312.00
Electrical Power	Electrical power costs	kilowatts	175,000	$0.12	$21,273.00
Gas System Operation & Maintenance	O&M Costs for gas extraction and methane flaring system	system	1	$43,052.50	$43,052.50
Site Maintenance	Site Maintenance. Assumes one acre of surface repair each year	Acre	1	$3,545.50	$3,545.50
Site Mowing	Site Mowing. Assumes four mowings per year	Acre	117	$141.82	$16,592.94
Administration	General expenses for administration and supervision	Lump sum	1	5%	$13,756.54
Total Annual Cost for Post-Closure Care					**$288,887.34**
Total Post-Closure Cost for 30 Years					**$8,666,620.20**

1) Cost per acre, as estimated based on 2020 actual unit prices. Adjusted by DEQ Inflation factor (2021: 1.013).

Table 4.4. Estimated closure costs per acre, Class 4 landfill.

Item Description	Cost per Acre[(1)]
Clay Liner	$47,427.58
Soil Cover Layer	$15,574.94
Subgrade Preparation	$2,646.97
Seeding	$2,532.50
Mobilization	$1,519.50
Preparation of Plans and Specifications	$2,127.30
Construction Quality Assurance	$5,166.30
Contingencies - 5%	$3,849.75
Total Closure Cost per Acre	**$80,844.85**
Total Financial Assurance Closure Cost	**$1,115,658.87**

(1) Cost per acre, as estimated based on 2020 bid unit prices. Adjusted by DEQ Inflation factor (2021: 1.013)

To satisfy state and federal regulations, a worst-case scenario must be determined using the largest area of the Class 4 landfill that will ever need final cover, should state regulators order the landfill to close before it reaches the end of its operating life. As can be seen from Table 4.5, the largest area ever needing final cover during the operating life of the landfill (13.8 acres) occurs when Cell 4 is placed in service but before partial closure of Cell 3 is completed. This is projected to occur around 2028 (see Table 3.8). The projected cost for closure of this area in December 2021 dollars would be $1,115,659 (see Table 4.4).

Table 4.5. Closure sequence and associated cost estimates, Class 4 landfill.

Event	Acreage Added	Acreage Closed	Total Acreage Needing Final Cover	Approximate Year	Estimated Closure Cost[(1)]
Construction of Cell 1	4.5	0.0	4.5	1993	---
Construction of Cell 2	4.5	0.0	9.0	1998	---
Construction of Cell 3	4.3	0.0	13.3	2015	---
Closure of Area 1	0.0	2.1	11.2	2023	$169,774.18
Closure of Area 2	0.0	2.1	9.1	2023	$169,774.18
Construction of Cell 4	4.7	0.0	13.8	2028	
Closure of Area 3	0.0	2.3	11.5	2032	$185,943.14
Closure of Area 4	0.0	11.5	0.0	2046	$929,715.72
Total	**18**	**18**			**$1,455,207.22**
2021 Closure Cost per Acre	**$80,844.85**				

After Cell 3 is closed, financial assurance liability is reduced for the remainder of the operating life. The final closure liability is projected to occur around 2045 when Cell 4 is filled to capacity (Table 3.8). At that time, $929,716 would be needed to perform closure activities (Table 4.5).

4.4 Post-Closure Liability of the Class 4 Landfill

The current post-closure liability is projected to be $22,865 (see Table 4.6) and post-closure is projected to begin around 2045. This liability will remain substantially the same regardless of the actual year final closure occurs. The financial capability of CLR to cover this cost must be demonstrated and assured with an acceptable financial assurance mechanism as required by regulation.

Table 4.6. Post-closure cost estimate, Class 4 landfill.

Item	Basis of Cost	Units	Estimated Quantity	Unit Cost(1)	Total Cost/Year
Site inspection	Quarterly site inspection and summary report for 2 years	each	4	$1,215.60	$4,862.40
Site maintenance	Assumes one acre of surface needs repair each year	acre	1	$3,545.50	$3,545.50
Site mowing	Assumes four mowing per year	acre	14	$141.82	$1,985.48
Administration	General expense for administration and supervision (10%)	lump sum	1	--	$1,039.34
Total Annual Cost for Closure Care					**$11,432.72**
Total Post-Closure Cost for 2 Years					**$22,865.44**

(1) Cost per acre, as estimated based on 2020 actual unit prices. Adjusted by DEQ Inflation factor (2021: 1.013)

4.5 Closure Liability of the Composting Facility

The current estimated closure cost for the composting facility, in December 2021 dollars, is $190,064, as shown in Table 4.7. As required by DEQ, the cost is calculated by multiplying the maximum design storage capacity of 36,000 tons by 150% (45,000 tons), subtracting 36,000 tons that would be distributed to other CLR agencies, and multiplying the remainder (9,000 tons) by the cost to process and remove the remaining materials ($21.12 per ton).

Table 4.7. Estimated closure costs for yard waste composting facility.

Item Description	Units	Estimated Quantity	Unit Cost[(1)]	Total Cost
Hauling & redistribution of compost material to parks	ton	36,000	$0.00	$0.00
Processing and distribution of remaining yard waste by private contractor	ton	9,000	$21.12	$190,064.23
Total Financial Assurance Closure Cost				**$190,064.23**

(1) Cost per acre, as estimated by Edwards Engineering, P.A. on January 2008 adjusted annually for inflation

5.0 REQUIREMENTS FOR FINANCIAL ASSURANCE

Under state and federal regulations, each facility owner or operator must provide financial assurance to the state permitting authority. The purpose is to show that the owner or operator has the financial ability to close the composting facility and, for the Class 1 and Class 4 landfills, to close the largest open area of each landfill and to conduct post-closure care. A financial assurance mechanism must be in place throughout the operating life of the facilities, and the instrument must be updated annually.

Originally, CLR used a "contract of obligation" as the mechanism to satisfy financial assurance. A contract of obligation is essentially a resolution from the City Board recognizing the liability associated with landfill operations, a pledge to meet that obligation, and an agreement to allow the state to garnish turn-back money if CLR fails to fully meet the obligations. However, since that time, changes in state law removed the contract of obligation from the list of acceptable financial assurance mechanisms.

In 2002, CLR decided to utilize a financial test as the financial assurance mechanism. Under this option, an accounting demonstration is used to show that sufficient funds are available to meet all needs for closure and post-closure care. If a successful demonstration can be made, the governing body can use that demonstration to guarantee financial assurance through a formal resolution.

According to DEQ, the total amount to be placed in the financial assurance instrument is calculated as 100% of the combined closure cost estimates plus 20% of the combined post-closure cost estimates. Table 5.1 provides a summary of closure and post-closure costs for all three facilities.

The total financial assurance amount for the whole facility is the sum of the financial assurance for the Class 1 landfill, the Class 4 landfill, and the composting facility. Therefore, $11,119,065 must be guaranteed by the financial assurance instrument utilized by CLR.

Table 5.1. Summary of closure and post-closure cost estimates for the Class 1 and Class 4 landfills and the composting facility.

Line Item		Cost
100% of Closure Cost Estimates of Class 1 Landfill	From Table 4.1	$8,219,993
20% of Post-Closure Cost Estimates of Class 1 Landfill	From Table 4.3	$1,733,324
Total Financial Assurance for the Class 1 Landfill		**$9,953,317**
100% of Closure Cost Estimates of Class 4 Landfill	From Table 4.4	$1,115,659
20% of Post-Closure Cost Estimates of Class 4 Landfill	From Table 4.6	$4,573
Total Financial Assurance for the Class 4 Landfill		**$1,120,232**
100% of Closure Cost Estimates of the Composting Facility	From Table 4.7	$190,064
Total Financial Assurance for the Composting Facility		**$190,064**
TOTAL FINANCIAL ASSURANCE		**$11,263,613**