

Ada County Solid Waste Management

Ada County Landfill North Ravine Cell and Hidden Hollow Cell **Operation Plan, Closure Plan, and Post-Closure Plan**



Dave Case, Commissioner Jim Tibbs, Commissioner Rick Visser, Commissioner Ada County Landfill Plans

Operation, Closure, and Post-Closure Plans for the Ada County Landfill

Prepared for Ada County

February 2017





MAIN OFFICE • 707 N. ARMSTRONG PL. • BOISE, ID 83704-0825 PHONE (208) 375-5211 • FAX (208) 327-8500 • cdhd.idaho.gov

"Healthy People in Healthy Communities"

17-0237

April 18, 2017

Ada County Solid Waste Management Attn: Ted Hutchinson 200 West Front Street Boise, Idaho 83702

Re: Ada Co Landfill Operations Plan update

Dear Mr. Hutchinson:

Central District Health Department has reviewed the revised Ada County Landfill Operations, Closure, and Post-Closure Plans for recertification, signed and stamped by a State of Idaho registered professional engineer on 02-16-2017.

The revised Ada County Landfill Operations, Closure, and Post-Closure Plans meets the requirements established by Idaho Solid Waste Facilities Act 39-7419 for recertification and can now be considered *Recertified* as of the date of this letter.

If you have any questions or concerns, please contact me at 327-8517.

Sincerely,

) Booly

Lori Badigian, R.E.H.S. Senior Environmental Health Specialist

cc: Ted Hutchinson, Ada County Craig Caldwell, P.E. Jack Gantz, DEQ

SERVING ADA, BOISE, ELMORE AND VALLEY COUNTIES

Introduction

These Operation, Closure, and Post-Closure Plans were developed for Ada County to operate the Ada County Landfill (Landfill) in accordance with the federal Resource Conservation and Recovery Act (RCRA) Subtitle D Federal revised criteria (40 CFR 258) and associated state regulations (Idaho Title 39 Chapter 74) regarding municipal solid waste landfills (MSWLF). These plans will be reviewed and revised periodically in response to changes that occur in the federal, state, or county regulatory framework; technological innovations; or changes in the County's solid waste management plan.

The purpose of these plans is to provide information regarding operational, closure, and, post closure aspects of the Landfill. The criteria for the Operation Plan are found in Idaho statutes 39-7412(01-11) and federal regulations at 40 CFR 258.20-29. The criteria for the Closure Plan are found in Idaho statutes 39-7415 (1-4) and the federal regulations at 40 CFR 258.60. The criteria for the Post-Closure Plan are found in Idaho statutes 397415 (1-4) and the federal regulations at 40 CFR 258.61. The criteria for Financial Assurance for Closure, Post-Closure Care and Corrective Action are found in Idaho statutes 39-7417 (01-08) and 40 CFR 258.70-75.

The procedures in these 2017 plans have been reviewed and updated from the 2014 plans. These procedures have been followed for many years and have a proven track record for effectively managing the Landfill in accordance with the regulations.

The plan has been organized into Operation, Closure, and Post Closure with Financial Assurance Plan sections. The organization of each section is aligned with regulatory requirements with subsections further aligned to key aspects of the regulations. Supplemental operations, closure, and post closure information and details are included to provide a comprehensive description of Ada County's overall landfill management practices and procedures where prudent.

Each plan includes the regulations that the plan addresses. Each section of the Operation Plan begins with the regulations specific to that section. The regulations for the Closure and Post-Closure Plans are included in the first section of each plan.

Certification of Compliance

The following certify that the Operation Plan, Closure Plan, and Post-Closure Plan complies with standards of operation in accordance with Idaho Code.



ENGINEER'S STAMP

Owner/Operator Certification

The Operation Plan, Closure Plan, and Post-Closure Plan are approved by Ada County.

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Scott Williams Director, Ada County Operations

2/18/17

stchens

Ted Hutchinson Deputy Director, Ada County Landfill

17/17

Date

\BOIFPP01\PROJ\ADACOUNTYCOMMISSION\319077\2017 OPERATIONS PLAN RENEWAL

Ada County Landfill Plan

Operation Plan for the Ada County Landfill

Prepared for Ada County

February 2017

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1.0 Purpose

This Operation Plan provides information regarding operation procedures of the Ada County Landfill (Landfill). The plan was developed for the operation of the Hidden Hollow Cell (HHC) and North Ravine Cell (NRC) in accordance with state statutes (Idaho 39-7412 (01-11)) and federal regulations (40 CFR 258.20-29).

State statute (Idaho 39-7419 (2)) requires this Operation Plan to be recertified at intervals of no more than three (3) years.

Regulations pertaining to each section of this plan are presented at the beginning of the section.

2.0 Master Plan

2.1 Site History



EXHIBIT 1 LOCATION MAP

Ada County opened the current Hidden Hollow Landfill Cell (HHC) on 240 acres of leased property in 1972. In 1984 Ada County purchased the leased property and an additional 2,000 acres (approximately) of surrounding property to provide a buffer zone for HHC operations and to provide the space necessary for municipal solid waste (MSW) landfill capacity into the future. Additional property purchases since 1984 have added to the Ada County Landfill property area. Currently the Ada County Landfill property boundary includes approximately 2,700 acres (see Exhibit 1, Location Map, and Exhibit 2A, Master Site Plan).

The Ada County Commissioners have direct oversight of the Ada County Landfill (Landfill). The Director of the Ada County Operations Department provides supervision and direction to the Landfill Manager who manages dayto-day activities of the Solid Waste Management Department.

The management of the Ada County landfill is an Operations Department and Solid Waste management responsibility, although other Ada County Departments and Elected Officials provide additional support services to the Landfill. The Civil Division of the Prosecutors, the Clerk-Auditor-Recorder, and the Treasurer's Office also provide direct support to the Landfill's business plan. The County's Administrative Services Department, the County's Energy Specialist and the County's Project Manager routinely assist the Landfill with special projects. Ada County and the Solid Waste Management Department together provide MSW disposal services for Ada County residences, business, and institutions.

Out-of-county MSW is not accepted at the Landfill, except for solid waste generated by Bogus Basin Recreation Area in Boise County. The Landfill served more than 148,265 customers in 2016, of which 86,823 were self-haulers. The remaining portion came from commercial trash haulers. In all, approximately 630,000 tons of waste was deposited in the Ada County Landfill in 2016. In addition to MSW landfilling, Ada County Solid Waste Management Department is responsible for many waste-recycling programs that are available to all county residents, and closely coordinates solid waste management and recycling programs with city programs.

As the Hidden Hollow Cell approached its capacity to efficiently handle the entire MSW stream generated in Ada County, the Board of Ada County Commissioners elected to develop a new MSW landfill cell within the current Ada County Landfill property and set the first quarter of 2007 as the target date to begin receiving MSW at the new cell. The new MSW cell, the North Ravine Cell (NRC) is now capable of handling Ada County's entire MSW stream.

This decision was reached following a review of MSW disposal options and a public participation program that provided information for the Board to select the best option for Ada County.

The Ada County Landfill *Master Plan*, including the HHC and NRC, Landfill facilities, and supporting infrastructure are shown in Exhibit 2A, *Master Site Plan*.

The Ada County Landfill *Scales Site Plan*, showing the landfill scales infrastructure project currently under construction, is shown in Exhibit 2B, *Scales Site Plan*.



OP EXHIBIT 2A.dgn





NOTES:

1. AERIAL PHOTO TAKEN AUGUST 2016.





2.2 General Operations

The Board of Ada County Commissioners sets landfill operating hours. The hours of operation are from 7:00 a.m. to 6:00 p.m. Monday through Friday and 8:00 a.m. to 6:00 p.m. on Saturday. The Landfill is closed Sundays and New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day. The facility operates throughout the year. During heavy rainfall, gravel or other suitable earthen materials are placed on unpaved haul roads to alleviate slick or muddy conditions. The Landfill contractor using the contractor's equipment removes snow from haul roads. Lighting is provided at the truck scales and at the office building. Mobile lighting units (trailer-mounted generators with banks of floodlights) are available onsite to provide temporary lighting for emergency or for special conditions. Current commercial and public tipping fees are included in the Facility Operating Record. Exhibit 3 is a list of key personnel, their phone numbers, and pertinent agency phone numbers and emergency numbers.

EXHIBIT 3

Ada County Landfill Telephone Directory

Ada County Commissioners	Telephone		
Dave Case, Commissioner	287-7000		
Jim Tibbs, Commissioner, Chairman	287-7000		
Rick Visser, Commissioner	287-7000		
Ada County Operations/Solid Waste Management	Telephone		
Scott Williams, Director	287-7100		
Landfill Offices	Telephone		
Main Office	577-4725		
Household Hazardous Waste Collection Facility	577-4736		
Solid Waste Management Department Personnel	Mobile Telephone		
Ted Hutchinson, Deputy Director	941-5657		
Justin McConnell, Environmental Systems Coordinator	941-5653		
Kurt Hunt, Landfill Operations Supervisor	941-5652		
Ken Wall, Hazardous Material Coordinator	941-5656		
Emergency	Telephone		
Landfill Office	577-4725		
Fire Department: North Ada County Fire and Rescue	911		
North Ada County Fire and Rescue—Non-emergency number	375-0906		
Paramedics	911		
Ada County Sheriff's Office (including bomb squad)	911		
Hospitals: Saint Alphonsus St. Luke's	367-2121 381-2222		
County, State, and Federal Agencies	Telephone		
Fire Marshall	334-4370		
Poison Control Center	1-800-542-6319 1-800-732-6985		
Central District Health Department	375-5221		
Idaho Department of Environmental Quality	373-0550 (Regional Office) 373-0502 (State Office)		
USEPA—Emergency Response: Spills	378-5751		
Chemtrec—Chemical Transport Emergency Center	1-800-424-9300		

2.3 Special Wastes, Recycling, and Diversion Activities

2.3.1 Hazardous Materials Collection Program

Ada County, in cooperation with the cities in the county, offers a Hazardous Materials Collection Program. The program is restricted to Ada County households, and limits waste quantities to household exempt waste as defined in CFR 40 261.4 b(1) or Conditionally Exempt Small Quantity Generators as defined in 40 CFR Part 261.5. Typical wastes accepted through the program include: paints, pesticides, herbicides, fuel, solvents, motor oil, batteries, and similar materials. These materials are processed through the Hazardous Materials Facility at the Landfill for recycle or disposal at appropriate hazardous waste disposal facilities. The Ada County Landfill facilities are used to process and handle the city-sponsored household hazardous waste collection events held in Boise, Eagle, Garden City, Kuna, Meridian, and Star.

2.3.2 Diversion and Recycling Programs

Landfill operations also include numerous diversion and recycling programs to reduce landfilling, promote recycling, and eliminate potentially hazardous substances from being landfilled (see Section 3.15 for additional details). Wastes handled in these programs include waste oil, batteries, refrigeration units, electronics, cathode ray tubes (CRTs – television and computer monitors), paints, fluorescent lights, tires, and wood wastes. Details of the Hazardous Materials Facility Program are presented in Section 3.15 of this plan.

2.4 Ada County Landfill Fill Plan

The current fill plan splits incoming waste loads between the HHC and the NRC. Generally, loads that can be dumped without manual off-loading are sent to the NRC and loads that must be manually off-loaded are sent to the HHC. The filling plan reserves the remainder of HHC airspace to handle small self hauler loads until approximately September 30, 2017 at which time the HHC will begin closure activities.

2.4.1 Hidden Hollow Cell

Beginning in the early 1970s the Hidden Hollow Cell (HHC) began accepting MSW. The HHC occupies the head of a natural ravine in the Boise foothills. The HHC filling began in the bottom of the ravine with daily cover soils excavated from the ravine side slopes and intermediate ridges within the ravine. The MSW was layered in the ravine starting at the toe of the existing cell and filled up the ravine. The HHC has an estimated capacity of 13,655,000 cubic yards at the completion grade. The area of the HHC footprint is approximately 108 acres. As of August 4, 2016, the HHC had approximately 129,000 cubic yards of remaining capacity. The active Landfill surface area is steadily diminishing as Landfill side slopes are filled, continually reducing the top active cell surface operating area.

2.4.2 North Ravine Cell

Construction of Stage 1 of NRC was completed in January 2007. Stage 1 includes the cell infrastructure (paved access road, leachate handling system, etc.) and 20 acres of lined cell. Stage 2 of the NRC was completed in December 2009 and added 35 acres of lined cell. As of August 4, 2016, the Stage 1 and 2 liner areas had approximately 2,357,000 cubic yards of remaining airspace capacity. The NRC MSW fill is placed in rectangular layers. The NRC incorporates the current state-of-the-art, liner, leachate, and gas collection systems. The NRC lined area will be built out in stages to accommodate Ada County's municipal solid waste disposal needs. The design area of the NRC is approximately 260 acres, and it has a capacity of approximately 70,000,000 cubic yards. The vertical filling plan uses a significantly smaller waste filling area and greater fill heights. The vertical filling plan allows smaller cell floor areas to be constructed for each subsequent stage, with the frequency of stages timed to keep pace with solid waste disposal needs.

Exhibit 4, *Conceptual NRC Staging Plan*, presents the conceptual staging plan for build-out of the NRC. Stages 1 and 2 cell construction are completed and are currently being filled. The actual number and size of each stage will be based on Ada County MSW disposal needs and budget.

Appendix 1, *Ada County Landfill Waste Filling Plans,* presents the detailed design drawings showing plan and section views of the HHC and NRC filling plans. These stamped and signed engineering drawings are updated as needed for guidance and surveying needs for the daily operations of the landfill. Also included are typical lift filling patterns for NRC lifts A through E, which have been standardized for the next several expansions of the NRC.



2.5 Foothills Recreation and Wildlife Space

More than 30 years ago Ada County began purchasing the foothills property where the Hidden Hollow and North Ravine landfill cells are now located. The County now owns about 2,710 acres including and surrounding the landfill cells in the north Ada County foothills. The north Ada County foothills have become a popular recreation destination and to preserve this element that contributes to Ada County's high quality of life, County Commissioners have used the landfill acreage to develop trails, parks, and wildlife preservation areas. In 2007 the Ada County Commissioners dedicated landfill buffer property to wildlife habitat, open space, and biking and hiking trails. Fences have been constructed to separate public access park areas from the risks present at the landfill operations areas. A long-term partnership has been established between Ada County, the City of Eagle, Ridge to Rivers, and the Southwest Idaho Mountain Biking Association to plan, construct, and maintain outdoor recreation facilities and wildlife habitat areas on the Ada County Landfill property.

2.5.1 Parks

Ada County has worked with the City of Eagle to provide land for a 4-acre skateboard park that now sits on the western edge of the landfill property. Ada County has also set an additional 81 acres aside for park development in this area and an adjoining 182 acres for foothills trails. Since the skateboard park construction, a bike park consisting of a BMX bike track and practice runs, and over 4-miles of mixed use trails has been constructed. In early 2014 the Ada County Commissioners voted to sell 34-acres of the park to the City of Eagle for additional park development. The 34-acres includes the skate park and BMX bike areas. In late 2016 the Commissioners voted to sell an additional 11.9-acres to the City of Eagle for additional park development.

On the eastern edge of the landfill property, another 198-acres has been set aside for mixed use foothills trails. This area includes a developed trail head parking area and restrooms along Seaman's Gulch Road.

2.5.2 Wildlife Preserve Areas

Areas of the landfill property not designated for landfill purposes, trails, or parks have been designated plant and wildlife habitat areas. The landfill property is an important corridor and lay-over area for wildlife traveling between the Boise foothills and the Boise River. Currently more than 1,500 acres of county owned landfill property in the foothills have been set aside for wildlife preservation where hunting is strictly prohibited. Approximately 100 acres of county owned landfill property has also been set aside to protect the endangered plant species aasea allium, also known as Aasea's Onion.



2.5.3 Healthy Hills Initiative

In August, 2009, a wildfire quickly burned through the Eagle Bike Park on the Ada County landfill property and threatened nearby homes. Community concern after the wildfire triggered the Healthy Hills Initiative to "Provide science-based restoration, wildfire reduction, management strategies, and educational opportunities to maintain and enhance land health in the Boise Foothills." Ada County teamed with local volunteers, the City of Eagle and Eagle Fire Department, scientists from the USDA Agricultural Research Service, the Bureau of Land Management, Environmental Conservation Services Incorporated, and the Natural Resource Conservation Service to restore the popular foothills recreation area and establish a demonstration area on the landfill property to educate the public.



Team scientists implemented erosion controls and sowed native plants on the burned area to restore wildlife habitat, maintain recreational trails, rehabilitate fire lines, and prevent invasive weeds from taking over, all-the-while thinking of educational opportunities for school districts and interpretive signs that would explain the restoration process. The Healthy Hills Initiative aims to provide educational opportunities for all grade levels,

including college. A significant amount of studies and scientific monitoring are involved in burned area restoration, and will provide ample opportunities for local schools to get involved.

Anticipated ongoing Healthy Hills partners are the City of Eagle, Boise and Meridian School Districts, and local colleges and universities. The resultant healthy landscape model on the landfill property, supporting many uses, will be replicable elsewhere in the Boise Foothills and the Great Basin.

3.0 Standards for Operation

3.1 Incoming Waste Evaluation

3.1.1 Applicable Regulations

Title 39, Health and Safety; Chapter 74, Idaho Solid Waste Facilities Act. 39-7412. Standards for Operation.

Owners or operators of all MSWLF units shall:

(1) Implement a program for detecting and preventing disposal of regulated hazardous wastes as provided in 40 CFR 258.20;

Title 40: Protection of Environment; Part 258—Criteria for Municipal Solid Waste Landfills, Subpart C— Operating Criteria. § 258.20 Procedures for excluding the receipt of hazardous waste.

- (a) Owners or operators of all MSWLF units must implement a program at the facility for detecting and preventing the disposal of regulated hazardous wastes as defined in part 261 of this chapter and polychlorinated biphenyls (PCB) wastes as defined in part 761 of this chapter. This program must include, at a minimum:
 - (1) Random inspections of incoming loads unless the owner or operator takes other steps to ensure that incoming loads do not contain regulated hazardous wastes or PCB wastes;
 - (2) Records of any inspections;
 - (3) Training of facility personnel to recognize regulated hazardous waste and PCB wastes; and
 - (4) Notification of State Director of authorized States under Subtitle C of RCRA or the EPA Regional Administrator if in an unauthorized State if a regulated hazardous waste or PCB waste is discovered at the facility.
- (b) For purposes of this section, regulated hazardous waste means a solid waste that is a hazardous waste, as defined in 40 CFR 261.3, that is not excluded from regulation as a hazardous waste under 40 CFR 261.4(b) or was not generated by a conditionally exempt small quantity generator as defined in §261.5 of this chapter.

3.1.2 How Ada County Landfill Fulfills Requirements

3.1.2.1 Landfill Policy

It is Ada County's policy to randomly interview drivers and inspect loads delivered to the Landfill. Special attention is given to customers having a higher possibility of waste with a potential hazardous waste classification (for example, industrial sludge waste and new industrial customers).

A solid waste is a regulated hazardous waste if it meets any of the following: it is listed in Subpart D of 40 CFR Part 261; it exhibits a hazardous characteristic as defined in Subpart C of 40 CFR Part 261; or, it is a mixture containing a listed hazardous waste and a nonhazardous solid waste. Hazardous waste characteristics are ignitability, corrosivity, reactivity, and toxicity. PCB wastes that are addressed by the program include the following:

- Mineral oil and dielectric fluids containing PCBs
- Contaminated soil, dredged material, sewage sludge, rags, and other debris from a release of PCBs
- Transformers and other electrical equipment containing dielectric fluids
- Hydraulic machines

Signs at the entry scales and near the tipping area inform customers that hazardous waste, PCB waste, radioactive waste, and liquid waste are not accepted at the Landfill and that incoming loads will be examined for such materials.

3.1.2.2 Procedures

Procedures for preventing placement of unacceptable waste into the Landfill are described in the following text. They include the following:

- Inspections of delivered loads at the Landfill face
- Records of inspections
- Training of facility personnel to recognize regulated hazardous waste and PCB wastes
- Notification of the Idaho Department of Environmental Quality (DEQ) or the EPA Regional Administrator if a regulated hazardous waste or PCB waste is discovered at the facility

3.1.2.2.1 Inspections

Through interviews and visual inspections, all loads delivered to the Landfill are examined for unacceptable waste. Landfill personnel observe load contents at the unloading area and check containers and container labels for prohibited wastes. A load is refused if hazardous waste items or unacceptable wastes are identified during the inspection.

Landfill personnel such as Landfill Technicians, Hazardous Materials Coordinator, Landfill Operations Coordinator, and Environmental Controls Coordinator, are trained to identify regulated hazardous or PCB wastes, or other wastes that are not acceptable for disposal at the facility. Inspections include interviews of drivers regarding load contents by landfill personnel, and physical examination of the contents at a designated area for load screening. Exhibit 5, *Waste Screening Procedure*, is a flow chart showing the process used by screeners to identify, accept, or refuse solid waste. An inspection is considered satisfactory if the landfill personnel knows the nature of the materials received in the Landfill and is able to discern whether the materials are potentially unacceptable wastes. The description of the responsibilities and duties of the landfill personnel are as follows:

- Interview drivers and examine loads of delivered solid waste to determine if loads contain hazardous materials, potentially hazardous materials, or prohibited wastes.
- Direct Landfill customers with non-regulated hazardous materials (household quantities) to the temporary storage area or to the Hazardous Materials Facility.
- Inform Landfill customers that disposal of regulated hazardous materials (non-household), PCB wastes, or other prohibited waste, is unlawful and or prohibited.

- Provide Landfill customers with information regarding proper disposal of regulated wastes or rejected waste loads, if appropriate, and/or refer customers to Landfill Management for further information.
- Assist in unloading, at the temporary storage site, non-leaking, sealed containers of non-regulated quantities of hazardous materials when deemed necessary.
- Assist in unloading household non-regulated hazardous wastes, such as latex paint, oilbased paint, and paint related materials, herbicides, insecticides, automotive batteries, and motor oil for diversion to the Hazardous Materials Facility.
- Direct Landfill customers with tires and refrigeration units to the respective temporary handling areas.
- Transfer containers of used motor oil and antifreeze to the bulk storage holding tank.
- Open and examine containers of waste for prohibited waste, reject prohibited waste, and direct disposal of acceptable wastes.
- Periodically check the disposal area for unacceptable wastes, and if detected, move household non-regulated hazardous wastes or recyclable waste to the temporary storage area. If unloaded potentially regulated hazardous waste is identified, complete the Waste Screening Checklist and notify Landfill Management.
- Keep work area clean and otherwise as directed by Landfill Management.
- Receive asbestos waste, direct asbestos waste to the asbestos waste area within the Hidden Hollow Cell, and complete the Special Waste Disposal Certification certifying disposal of the asbestos wastes.



CH2MHILL

3.1.2.2.2 Record Keeping

Records are kept of each inspection using the *Ada County Solid Waste Daily Inspection Form* (see Exhibit 6a). Additional records are kept using the *Action Taken* form for each inspection where action is taken (see Exhibit 6b). These records are included and maintained in the facility Operating Record (discussed later in this section). Inspection records include the following information (if available):

- Date and time wastes were delivered
- Type of waste
- Source of waste
- Vehicle and driver identification
- Pertinent observations made by landfill personnel

Samples of forms used by onsite personnel include the following:

- Ada County Solid Waste Daily Inspection Form (Exhibit 6A)
- Action Taken (Exhibit 6B)
- Special Waste Disposal Certification (Exhibit 7)
- Asbestos Waste Shipment Record (Exhibit 8)

3.1.2.2.3 Training

The waste-screening program at the Landfill is provided through Ada County personnel. The personnel performing the inspections interview drivers and examine load contents. Personnel examining incoming loads have received on-site training using the SWANA (Solid Waste Association of North America) "Waste Screening at MSW Management Facilities" course. Personnel also receive on-the-job practical training. Training includes monthly operational updates, weekly safety updates, and pertinent daily briefings from landfill management.

Ada County Solid Waste Management trains County personnel responsible for managing and overseeing the incoming waste evaluation program. Ada County personnel training emphasizes methods to identify containers and labels typical of hazardous waste and PCB waste. Training typically includes topics such as general hazardous waste management, identification of hazardous wastes, and worker health and safety. These personnel include supervisors, landfill maintenance staff, and gate attendants who may evaluate incoming waste to detect hazardous or unacceptable wastes. Documentation of Ada County personnel training is maintained in the Operating Record.

County supervisory personnel receive training through SWANA (Solid Waste Association of North America), through NAHMMA (North American Household Hazardous Material Management Association), and through other relevant sources. County supervisory personnel are required to keep their certifications current by attending annual sanctioned and required training sessions. County supervisors provide on the job training to landfill support staff, including seasonal and temporary, appropriate to their jobs.

3.1.2.2.4 Notification to Authorities and Proper Management of Wastes

If regulated quantities of hazardous wastes or PCB wastes are unloaded, or discovered after unloading, at the Landfill, Ada County Solid Waste Management will notify the DEQ or EPA, and other appropriate authorities as necessary. Any such waste discovered at the

Landfill after it has been unloaded and abandoned will be managed in accordance with applicable federal and state regulations.

If Ada County personnel discover regulated quantities of hazardous waste or PCB waste while it is still in the possession of the transporter, the owner or operator will be informed that the waste load is rejected, and the waste will remain the responsibility of the transporter. Ada County Solid Waste Management will notify DEQ and EPA regarding information on the transporter and waste load. Ada County will work with DEQ and EPA to identify the generator of the waste.

Ada County Solid Waste Daily Waste Inspection Form					
Date:	Dav: Mon Tues Wed Thurs Fri Sat				
Time In	Time Out				
Circle one					
Rear Loader	Roll Off Self Haul				
Front loader	Trailer Compactor				
Haular	Trailer Compactor				
Float Number					
Driver					
License number					
Generator Name					
Quantity and Type of Waste:	cubic yards				
Date:	Day: Mon Tues Wed Thurs Fri Sat				
Time In	Time Out				
Circle one					
Rear Loader	Roll Off Self Haul				
Front loader	Trailer Compactor				
Hauler	×				
Fleet Number					
Driver					
License number					
Generator Name					
Quantity and Type of Waste:	cubic vards				
Quantity and Type of Waster					
Data:	Dave Mon Tuge Wed Thurs Eri Sat				
Time In	Time Out				
Cincle and					
Circle one	Dell Off Calf Havel				
Rear Loader	Koli Oli Seli Haui				
Front loader	Trailer Compactor				
Hauler					
Fleet Number					
Driver					
License number					
Generator Name					
Quantity and Type of Waste:	cubic yards				
Date:	Day: Mon Tues Wed Thurs Fri Sat				
Time In	Time Out				
Circle one					
Rear Loader	Roll Off Self Haul				
Front loader	Troiler Compostor				
Loular	Hanci Compactor				
Floot Number					
Driver					
Liconco number					
License number					
Generator Name					
Quantity and Type of Waste:	cubic yards				
Waste Received by:					
Time:	Date:				
Report completed by:					

ACTION TAKEN

Date:	Day: Mon Tues Wed Thurs Fri Sat			
Time In:	Time Out:			
Circle one				
Rear Loader	Roll Off Self Haul			
Front loader	Trailer Compactor			
Hauler				
Fleet Number				
Driver				
License No.				
Generator Name				
Generator Phone:	Contact Name:			
Quantity and Type of Waste: cubic yards				

Actions Taken:

Waste Received by:				
Time:	Date:			
	_			
Report completed by:				



200 West Front Street Boise Idaho 83702 Special Waste Disposal Certificate

Not for Asbestos

Name of Firm:		
Name of Person		
Phone Number:		
Disposal Site: (Circle One)	Hidden Hollow Cell	North Ravine Cell
Disposal Date & Time:		
Waste Type:		
Waste Volume:		
Waste Source:		
Inspector's Comments:		
Inspector's Name:		
Inspector's Title:		· · · · · · · · · · · · · · · · · · ·
Inspector's Signature		



Asbestos Disposal Certificate

Date (M/D/Y): —		-	Time:	
Disposing party:	Contractor		Home Owner	Other 🛛
	Other Description:			
Name:				
Firm:				8
Address:	-			
Phone:				
Transporter:				
above)				
Transporter address:				
Transporter phone:				
Transporter Signature				
Waste Type:				······
Waste Volume:				
Waste Source:				
Inspectors Comments:				
	1			
Inspector's Name & Title				
			•	

Inspector's Signature

3.1.2.3 Hazardous and PCB Wastes

Operators of the Landfill are prepared to handle hazardous and PCB wastes that are inadvertently unloaded and left at the facility. Empty 55-gallon drums are available onsite to contain wastes. A list of names and telephone numbers of the nearest haulers licensed to transport hazardous and PCB waste is maintained onsite. Personnel who operate the Hazardous Materials Facility are hazardous waste health and safety trained and will be the staff directed to handle/package hazardous and PCB waste.

If found onsite, hazardous or PCB waste will be containerized, if necessary, moved to the Hazardous Materials Facility, and stored for less than 90 days and in accordance with procedures required by 40 CFR 262.34. PCB waste will be managed in accordance with 40 CFR 761.

Hazardous waste management procedures include the following requirements:

- The waste will be placed in tanks or containers.
- The date of receipt of the waste will be clearly marked and visible on the container.
- The container will be clearly marked with the words "Hazardous Waste."
- Ada County's Hazardous Material Coordinator is the emergency coordinator who is responsible for coordinating emergency response measures.
- The name and telephone number of the Hazardous Material Coordinator and the number of the fire department are posted next to the facility phone.
- The waste must be packaged in accordance with Department of Transportation (DOT) regulations under 49 CFR Parts 173, 178, and 179. The container must be properly labeled and marked. A placard, in accordance with DOT regulations, must be displayed on hazardous waste materials under 49 CFR Part 172.
- The waste will be properly manifested to a designating a facility permitted to treat, stores, and dispose of the hazardous waste.

Extensions to store hazardous waste beyond 90 days may be requested as outlined in 40 CFR 262.34.

The procedures for PCB waste management include the following requirements:

- Obtain an EPA PCB identification number.
- Properly store the PCB waste.
- Mark containers or items with the words "Caution Contains PCBs."
- Manifest the PCB waste for shipment to permitted incinerator, chemical waste landfill, or high-efficiency boiler (depending on the nature of the PCB waste) for disposal.

3.2 Daily Cover

3.2.1 Applicable Regulations

Title 39, Health and Safety; Chapter 74, Idaho Solid Waste Facilities Act. 39-7412. Standards for Operation.

Owners or operators of all MSWLF units shall:

(2) Provide for daily cover as provided in 40 CFR 258.21. Alternative materials or cover frequency other than daily cover may be used only as specified by the MSWLF plan of operation;

Title 40: Protection of Environment; Part 258—Criteria for Municipal Solid Waste Landfills, Subpart C— Operating Criteria. 258.21 Cover material requirements.

- (a) Except as provided in paragraph (b) of this section, the owners or operators of all MSWLF units must cover disposed solid waste with six inches of earthen material at the end of each operating day, or at more frequent intervals if necessary, to control disease vectors, fires, odors, blowing litter, and scavenging.
- (b) Alternative materials of an alternative thickness (other than at least six inches of earthen material) may be approved by the Director of an approved State if the owner or operator demonstrates that the alternative material and thickness control disease vectors, fires, odors, blowing litter, and scavenging without presenting a threat to human health and the environment.
- (c) The Director of an approved State may grant a temporary waiver from the requirement of paragraph (a) and
 (b) of this section if the owner or operator demonstrates that there are extreme seasonal climatic conditions that make meeting such requirements impractical.
- (d) The Director of an Approved State may establish alternative frequencies for cover requirements in paragraphs (a) and (b) of this section, after public review and comment, for any owners or operators of MSWLFs that dispose of 20 tons of municipal solid waste per day or less, based on an annual average. Any alternative requirements established under this paragraph must:
 - (1) Consider the unique characteristics of small communities;
 - (2) Take into account climatic and hydrogeologic conditions; and
 - (3) Be protective of human health and the environment.

3.2.2 How Ada County Landfill Fulfills Requirements

Waste-hauling vehicles arrive at the Landfill and pass over the entrance scales where they are weighed. Landfill personnel and signs direct vehicles to the appropriate landfill cell, access road, and working face within the active Landfill area. Waste is unloaded at the working face by the vehicle operator under the direction of the Landfill contractor personnel. Then the Landfill contractor compacts the waste into the landfill face. The size of the working face is maintained large enough to accommodate the expected daily traffic volume, but is kept compact enough to reduce blowing litter and to minimize daily cover operations. The waste is pushed and spread and compacted in layers to achieve compaction. Compaction equipment traverses the length of the working face, making multiple passes up/down the working face slope until optimal compaction is achieved. Litter screens are positioned around the general fill area perimeter to minimize scattering of windblown litter.

Daily cover soil material is spread to a minimum depth of 6 inches over each day's refuse to control disease vectors, fires, odors, blowing litter, and scavenging. Daily cover consists of sandy soil obtained from onsite borrow areas.

Intermediate cover consisting of an additional 6-inches of cover soil (1-foot total) is placed daily over completed lifts of refuse where there is clear intention of placing additional refuse within 1-year. Intermediate cover consisting of an additional 18-inches of compacted

cover soil (2-feet total) is placed over completed lifts of refuse where it will be more than 1year before additional refuse is placed. Intermediate cover is also placed 2-feet deep (total), within 1-week, on completed refuse lifts that have been brought to final grade and elevation. All daily and intermediate cover soil is obtained from onsite soil borrow areas. Straw is spread on an annual basis over bare soil side slopes completed to final grade, and cat-tracked, to control erosion and for aesthetic purposes.

The Landfill filling face and daily cover operations are carefully managed by Landfill operators to ensure that storm water runoff from the Landfill waste placement and compaction areas is controlled and contained within the working area. During stormy

weather periods, storm water containment soil berms are graded around the working Landfill face area (includes diversion on the upper deck where wastes are unloaded and containment on the lower face toe that advances as wastes are filled and compacted). The berms are positioned to divert or contain storm water runoff



from the fill placement area within the area. Exhibit 9, *Storm Water Control Berm Location at Landfill Filling Face*, illustrates where storm water berms are placed around the active fill face. As the fill face advances, storm water is entrained in the advancing fill face. Storm water runoff from the fill face is a comparably rare event for the Landfill because of the arid climate, dry nature of the wastes delivered, the high permeability and water adsorption capacity of the wastes being compacted, and the high permeability of the sandy daily cover soil. The soil berms provide an added measure of protection to contain potential runoff within the working face.

3.2.3 Alternate Daily Cover Pilot Program

On October 26, 2010, the State of Idaho Department of Environmental Quality (IDEQ), at the recommendation of the Central District Health Department (CDHD), approved a pilot program to begin using an alternative cover system to replace some daily soil cover. On March 26, 2012, the IDEQ, at the recommendation of the CDHD extended the Test Period until such time that all the remaining HHC LFG wells are installed and operating for 6 months. At this time the remaining HHC LFG wells have not been installed pending final closure.

The Tarpomatic system has been chosen by the Landfill Contractor and Ada County. As the name implies, tarps are used to cover the exposed waste. The tarps are deployed at the end of each operations day to cover the waste for the night, and rolled up each morning. One day a week, soil cover will be used to completely cover the waste, providing a definite fire break in the waste fill.



At the end of a successful pilot program, the alternative cover system will be approved for continued use at Ada County Landfill. In the long term, it is anticipated that the alternative daily cover will reduce operations costs directly by reducing the effort to cover the waste at the end of each shift. It will also indirectly reduce operations costs by saving air space in the landfill by reducing the volume of daily cover soil that is incorporated into the landfill. This will extend the landfill cell life, reducing air space replacement costs.


Ada County Landfill



3.3 Vector Control

3.3.1 Applicable Regulations

Title 39, Health and Safety; Chapter 74, Idaho Solid Waste Facilities Act. 39-7412. Standards for Operation.

Owners or operators of all MSWLF units shall:

(3) Provide disease vector control as provided in 40 CFR 258.22;

Title 40: Protection of Environment; Part 258—Criteria for Municipal Solid Waste Landfills, Subpart C— Operating Criteria. § 258.22 Disease vector control.

- (a) Owners or operators of all MSWLF units must prevent or control on-site populations of disease vectors using techniques appropriate for the protection of human health and the environment.
- (b) For purposes of this section, *disease vectors* means any rodents, flies, mosquitoes, or other animals, including insects, capable of transmitting disease to humans.

3.3.2 How Ada County Landfill Fulfills Requirements

Vectors (disease-carrying organisms) are controlled at the Landfill by waste compaction and by daily cover application. Vector control is primarily achieved by daily application of a minimum of 6 inches of cover soil or by deploying weighted tarps on all open refuse areas at the Landfill. The daily cover reduces feeding and breeding of insects, birds, and rodents. The thickness



and composition of the daily cover soil material inhibits rodents from burrowing into the refuse and prevents most insect larvae from emerging. The daily cover also controls access to the refuse by birds and other scavengers during the night hours.

Application of cover at the end of each operating day is generally sufficient to control disease vectors; however, additional measures are available to enhance vector control as needed. Additional measures may include the following:

- Reducing the size of the working face
- Increasing cover thickness or density
- Increasing cover placement frequency
- Changing cover type to an alternative daily cover system
- Targeted application of repellents, insecticides, or rodenticides
- Diverting, composting, or processing organic waste prior to disposal
- Predatory or reproductive control of insect, bird, and animal populations

Another potential source of vectors are vectors that may reach the Landfill from offsite waste transport. Offsite waste transport may include residential and commercial route collection vehicles and self-haulers. These types of potential offsite transport modes will be carefully scrutinized if disease vectors at the Landfill become a problem. Measures available to reduce disease vectors are as follows:

- Keeping collection vehicles and transfer stations covered
- Emptying and cleaning collection vehicles and transfer stations
- Targeted use of repellents, insecticides, or rodenticides
- Reproductive control.

Birds are the main vectors at the Landfill. Experience at the Landfill has shown that birds can be effectively controlled by managing the filling sequence to maintain a limited open working face and use of daily cover minimizes refuse availability and exposure to birds. If current measures are insufficient to control an increased bird-feeding problem, reducing the working face and/or increasing the frequency of daily cover application can enhance Landfill daily cover operations. Additionally, Landfill personnel can use a variety of bird control measures that have been used successfully at other landfills (for example population reduction, population dispersion, and behavior disruption). Typical bird control techniques include pyrotechnics (noise-making devices) or a suspended barrier system to discourage bird flight.

3.4 Methane Monitoring and Control

3.4.1 Applicable Regulations

Title 39, Health and Safety; Chapter 74, Idaho Solid Waste Facilities Act. 39-7412. Standards for Operation.

Owners or operators of all MSWLF units shall:

(4) Implement a program of routine methane monitoring and control as provided in 40 CFR 258.23;

Title 40: Protection of Environment; Part 258—Criteria for Municipal Solid Waste Landfills, Subpart C—Operating Criteria. § 258.23 Explosive gases control.

- (a) Owners or operators of all MSWLF units must ensure that:
 - The concentration of methane gas generated by the facility does not exceed 25 percent of the lower explosive limit for methane in facility structures (excluding gas control or recovery system components); and
 - (2) The concentration of methane gas does not exceed the lower explosive limit for methane at the facility property boundary.
- (b) Owners or operators of all MSWLF units must implement a routine methane monitoring program to ensure that the standards of paragraph (a) of this section are met.
 - (1) The type and frequency of monitoring must be determined based on the following factors:
 - (i) Soil conditions;
 - (ii) The hydrogeologic conditions surrounding the facility;
 - (iii) The hydraulic conditions surrounding the facility; and
 - (iv) The location of facility structures and property boundaries.
 - (2) The minimum frequency of monitoring shall be quarterly.
- (c) If methane gas levels exceeding the limits specified in paragraph (a) of this section are detected, the owner or operator must:
 - (1) Immediately take all necessary steps to ensure protection of human health and notify the State Director;
 - (2) Within seven days of detection, place in the operating record the methane gas levels detected and a description of the steps taken to protect human health; and
 - (3) Within 60 days of detection, implement a remediation plan for the methane gas releases, place a copy of the plan in the operating record, and notify the State Director that the plan has been implemented. The plan shall describe the nature and extent of the problem and the proposed remedy.
 - (4) The Director of an approved State may establish alternative schedules for demonstrating compliance with paragraphs (c) (2) and (3) of this section.
- (d) For purposes of this section, *lower explosive limit* means the lowest percent by volume of a mixture of explosive gases in air that will propagate a flame at 25°C and atmospheric pressure.
- (e) The Director of an approved State may establish alternative frequencies for the monitoring requirement of paragraph (b)(2) of this section, after public review and comment, for any owners or operators of MSWLFs that dispose of 20 tons of municipal solid waste per day or less, based on an annual average. Any alternative monitoring frequencies established under this paragraph must:
 - (1) Consider the unique characteristics of small communities;
 - (2) Take into account climatic and hydrogeologic conditions; and
 - (3) Be protective of human health and the environment.

3.4.2 How Ada County Landfill Fulfills Requirements

The methane monitoring network is comprised of two major components:

- Methane monitoring where gas may accumulate within Landfill facilities
- Methane monitoring at the Ada County Landfill property line

3.4.2.1 Methane Monitoring at Facility Structures

Methane monitoring is performed quarterly in structures at the Ada County Landfill where gas migration may pose a danger. Facility structures where gas migration may pose a danger typically have basements, foundation stem walls, skirting, or are constructed as slab on grade, and are near the Landfill. Based on these criteria, the Landfill Office, Scale House, Public Restrooms near the Scale House, semi-permanent offices at the Scale House, Waste Contractor's site, LFG generator contractor's site, Household Hazardous Materials Collection Facility, Flare Control Building, Scrubber Control Building, and NRC Leachate Control Building are monitored for methane.

Other structures located at the Ada County Landfill do not pose a danger and are not monitored for methane are as follows:

• Structures on Ada County Landfill property that are outside of the potential area of gas migration (the radio tower building, storage containers northwest of the HHC, the warehouses in the Goose Creek drainage west of the NRC, the irrigation pump building at the old landfill entrance along Seaman's Gulch Road, and the groundwater remediation building located along the old landfill entrance road).

3.4.2.2 Methane Monitoring at Methane Monitoring Wells

In accordance with 40 CFR 258.23, the Ada County methane monitoring well network monitors landfill gas migration outside of the NRC and HHC, at the Ada County Landfill property boundary. The Ada County methane monitoring well network consists of six wells (M-8, M-9, M-10, M-11, M-12, and M-13). The locations of the wells are shown in Exhibit 10, *Methane Monitoring Network*. Well construction details have previously been submitted to DEQ and are included in the Operating Record.

Methane monitoring wells are completed within the vadose zone based on soil conditions, hydraulic conditions, and structural controls. Beneath the Ada County Landfill, the vadose zone soils generally consist of permeable fine-to-coarse-grained sand beds of the fluvial/deltaic sediments of the Pierce Gulch Formation.

3.4.2.3 Methane Sampling Methods

3.4.2.3.1 Methane Sampling at Facility Structures

Within each structure (Landfill Office, Scale House, Public Restrooms near the Scale House, semi-permanent offices at the Scale House, Waste Contractor's site, LFG generator contractor's site, Household Hazardous Materials Collection Facility, Flare Control Building, Scrubber Control Building, and NRC Leachate Control Building) repeated fixed gas (carbon dioxide, oxygen, and methane) measurements are made for 5 minutes while walking around the inside of the structure using a Landtec GEM 2000 landfill gas monitor (or equivalent). The maximum reading is recorded in a logbook along with the location of that reading.



3.4.2.3.2 Methane Sampling at Methane Monitoring Wells

Each wellhead is sealed to prevent the leakage of ambient air into the casing. To collect a vapor sample, sample tubing is attached to the gas sample-tap at the wellhead. The well is purged of a minimum of three casing volumes of air using an eccentric vacuum pump, or equivalent, at a rate of 20 to 30 liters per minute. The flow rates are monitored with an inline rotometer. During purging, fixed gases (carbon dioxide, oxygen, and methane) readings are taken using a Landtec GEM 2000 landfill gas monitor (or equivalent) and recorded in a logbook at a rate of one measurement per well purge volume.

3.4.2.4 Lower Explosive Level Criteria and Reporting

If methane levels exceed the LEL at the facility boundary (5 percent methane) or if methane levels exceed 25 percent of the LEL (1.25 percent methane) as measured inside any structure, the following steps are followed in accordance with 40 CFR 258.23:

- 1. Immediately take all necessary steps to ensure protection of human health and notify the Idaho Central District Health Department Director.
- 2. Within 7 days of detection, place in the Operating Record the methane gas levels detected and a description of the steps taken to protect human health.
- 3. Within 60 days of detection, implement a remediation plan for the methane gas releases, place a copy of the plan in the Operating Record, and notify the state director that the plan has been implemented. The plan shall describe the nature and extent of the problems remedied.

3.5 Groundwater Monitoring and Corrective Action

This section presents a summary of groundwater monitoring operations for the Ada County Landfill. A more detailed and comprehensive description of the Landfill's groundwater monitoring program is provided in the groundwater characterization and monitoring plans previously submitted to DEQ and included in the Operating Record.

3.5.1 Applicable Regulations

Title 39, Health and Safety; Chapter 74, Idaho Solid Waste Facilities Act. 39-7410. Ground Water Monitoring Design.

- (2) Ground water monitoring program. All monitoring programs shall be conducted in a manner consistent with the guidance of relevant portions of appendix F per the "Federal Register" of October 9, 1991. The schedule for compliance as provided by 40 CFR 258.50 shall apply unless an alternative schedule is approved by the director.
 - (a) A ground water monitoring system must be installed that consists of a sufficient number of wells, installed at appropriate locations and depths, to conform with the requirements of 40 CFR 258.51(a) and (d).
 - (b) A multiunit ground water monitoring system may be constructed instead of separate ground water monitoring systems for each MSWLF unit as provided in 40 CFR 258.51(b).
 - (c) Monitoring wells must be cased in a manner that maintains the integrity of the monitoring well bore hole as provided in 40 CFR 258.51(c). Wells must be constructed in such a manner as to prevent contamination of the samples, the sampled strata, and between aquifers and water bearing strata, and in accordance with Idaho department of water resources, well construction standards and the monitoring well standards of the national ground water association.
- (3) Point of compliance. For each MSWLF unit, the relevant point of compliance shall be set as a function of site and monitoring program design subject to the approval of the director. The relevant point of compliance for purposes of MSWLF unit design, well location and corrective action shall be:
 - (a) Located within the flow pathway(s) predicted from the results of the hydrogeologic investigation;
 - (b) No more than one hundred fifty (150) meters downgradient from the waste management unit boundary;
 - (c) On contiguous property owned, or otherwise subject to possessory rights by the MSWLF owner;
 - (d) Shall be identified by the qualified professional on all reports and documents pertaining to analysis of ground water protection measures; and (e) Determined in consideration of factors provided in 40 CFR 258.40(d).
- (4) Ground water characterization, sampling and analysis requirements.
 - (a) The ground water monitoring system must include sampling and analysis procedures consistent with 40 CFR 258.53.
 - (b) Monitoring wells shall be tested for the constituents listed in 40 CFR 258, appendix I, plus temperature, unless otherwise authorized by the Director as provided in 40 CFR 258.54.
 - (c) Background values will be based on an independent sample from each well sampled at three (3) month intervals in a one (1) year period.
- (5) Detection monitoring program.
 - (a) Detection monitoring is required throughout the active life and post-closure care period at MSWLF units as provided in 40 CFR 258.54 at all ground water monitoring wells as defined in 40 CFR 258.51(a)(1) and (a)(2) for constituents listed in 40 CFR 258, appendix I.
 - (b) Each well shall be monitored on a semiannual basis after background characterization. Alternative constituents and sampling frequency may be approved by the director based upon considerations as defined in 40 CFR 258.54 (a)(2) and (b). Requests for alternative constituents or frequency shall be based on a report certified by a qualified professional.
 - (c) Each ground water sample event must include a determination of the ground water surface elevation, flow direction and rate.

Title 39, Health and Safety; Chapter 74, Idaho Solid Waste Facilities Act. 39-7414. Assessment Monitoring and Corrective Action.

- (1) These standards apply whenever a statistically significant increase over background has been detected for one (1) or more constituents listed in 40 CFR 258, appendix I or an alternative list approved in accordance with 40 CFR 258.54(a)(2).
- (2) Assessment monitoring programs shall be performed in accordance with 40 CFR 258.55.
- (3) Assessment of corrective measures shall be performed in accordance with 40 CFR 258.56.
- (4) Selection of remedy shall be performed in accordance with 40 CFR 258.57.
- (5) Implementation of corrective action program shall be performed in accordance with 40 CFR 258.58.

Title 40: Protection of Environment; Part 258—Criteria for Municipal Solid Waste Landfills, Groundwater Monitoring and Corrective Action. § 258.50 to .58.

§ 258.50 Applicability.

- (a) The requirements in this part apply to MSWLF units, except as provided in paragraph (b) of this section.
- (b) Ground-water monitoring requirements under §258.51 through §258.55 of this part may be suspended by the Director of an approved State for a MSWLF unit if the owner or operator can demonstrate that there is no potential for migration of hazardous constituents from that MSWLF unit to the uppermost aquifer (as defined in §258.2) during the active life of the unit and the post-closure care period. This demonstration must be certified by a qualified ground-water scientist and approved by the Director of an approved State, and must be based upon:
 - (1) Site-specific field collected measurements, sampling, and analysis of physical, chemical, and biological processes affecting contaminant fate and transport, and
 - (2) Contaminant fate and transport predictions that maximize contaminant migration and consider impacts on human health and environment.
- (c) Owners and operators of MSWLF units, except those meeting the conditions of §258.1(f), must comply with the ground-water monitoring requirements of this part according to the following schedule unless an alternative schedule is specified under paragraph (d) of this section:
 - Existing MSWLF units and lateral expansions less than one mile from a drinking water intake (surface or subsurface) must be in compliance with the ground-water monitoring requirements specified in §§258.51–258.55 by October 9, 1994;
 - (2) Existing MSWLF units and lateral expansions greater than one mile but less than two miles from a drinking water intake (surface or subsurface) must be in compliance with the ground-water monitoring requirements specified in §§258.51–258.55 by October 9, 1995;
 - (3) Existing MSWLF units and lateral expansions greater than two miles from a drinking water intake (surface or subsurface) must be in compliance with the ground-water monitoring requirements specified in §§258.51–258.55 by October 9, 1996.
 - (4) New MSWLF units must be in compliance with the ground-water monitoring requirements specified in §\$258.51–258.55 before waste can be placed in the unit.
- (d) The Director of an approved State may specify an alternative schedule for the owners or operators of existing MSWLF units and lateral expansions to comply with the ground-water monitoring requirements specified in §§258.51–258.55. This schedule must ensure that 50 percent of all existing MSWLF units are in compliance by October 9, 1994 and all existing MSWLF units are in compliance by October 9, 1994 and all existing MSWLF units are in compliance by October 9, 1996. In setting the compliance schedule, the Director of an approved State must consider potential risks posed by the unit to human health and the environment. The following factors should be considered in determining potential risk:
 - (1) Proximity of human and environmental receptors;
 - (2) Design of the MSWLF unit;
 - (3) Age of the MSWLF unit;
 - (4) The size of the MSWLF unit; and
 - (5) Types and quantities of wastes disposed including sewage sludge; and

- (6) Resource value of the underlying aquifer, including:
 - (i) Current and future uses;
 - (ii) Proximity and withdrawal rate of users; and
 - (iii) Ground-water quality and quantity.
- (e) Owners and operators of all MSWLF units that meet the conditions of §258.1(f)(1) must comply with all applicable ground-water monitoring requirements of this part by October 9, 1997.
- (f) Once established at a MSWLF unit, ground-water monitoring shall be conducted throughout the active life and post-closure care period of that MSWLF unit as specified in §258.61.
- (g) For the purposes of this subpart, a *qualified ground-water scientist* is a scientist or engineer who has received a baccalaureate or post-graduate degree in the natural sciences or engineering and has sufficient training and experience in groundwater hydrology and related fields as may be demonstrated by State registration, professional Certifications, or completion of accredited university programs that enable that individual to make sound professional judgments regarding ground-water monitoring, contaminant fate and transport, and corrective-action.
- (h) The Director of an approved State may establish alternative schedules for demonstrating compliance with §258.51(d)(2), pertaining to notification of placement of certification in operating record; §258.54(c)(1), pertaining to notification that statistically significant increase (SSI) notice is in operating record; §258.54(c) (2) and (3), pertaining to an assessment monitoring program; §258.55(b), pertaining to sampling and analyzing appendix II constituents; §258.55(d)(1), pertaining to placement of notice (appendix II constituents detected) in record and notification of notice in record; §258.55(d)(2), pertaining to sampling for appendix I and II to this part; §258.55(g), pertaining to notification (and placement of notice in record) of SSI above ground-water protection standard; §§258.55(g)(1)(iv) and 258.56(a), pertaining to assessment of corrective measures; §258.57(a), pertaining to selection of remedy and notification of placement in record; §258.58(f), pertaining to notification of placement in record (alternative corrective action measures); and §258.58(f), pertaining to notification of placement in record (certification of remedy completed).

[56 FR 51016, Oct. 9, 1991; 57 FR 28628, June 26, 1992, as amended at 58 FR 51547, Oct. 1, 1993; 60 FR 52342, Oct. 6, 1995]

§ 258.51 Ground-water monitoring systems.

- (a) A ground-water monitoring system must be installed that consists of a sufficient number of wells, installed at appropriate locations and depths, to yield ground-water samples from the uppermost aquifer (as defined in §258.2) that:
 - (1) Represent the quality of background ground water that has not been affected by leakage from a unit. A determination of background quality may include sampling of wells that are not hydraulically upgradient of the waste management area where:
 - (i) Hydrogeologic conditions do not allow the owner or operator to determine what wells are hydraulically upgradient; or
 - (ii) Sampling at other wells will provide an indication of background ground-water quality that is as representative or more representative than that provided by the upgradient wells; and
 - (2) Represent the quality of ground water passing the relevant point of compliance specified by Director of an approved State under §258.40(d) or at the waste management unit boundary in unapproved States. The downgradient monitoring system must be installed at the relevant point of compliance specified by the Director of an approved State under §258.40(d) or at the waste management unit boundary in unapproved States that ensures detection of ground-water contamination in the uppermost aquifer. When physical obstacles preclude installation of ground-water monitoring wells at the relevant point of compliance at existing units, the down-gradient monitoring system may be installed at the closest practicable distance hydraulically down-gradient from the relevant point of compliance specified by the Director of an approved State under §258.40 that ensure detection of groundwater contamination in the uppermost aquifer.
- (b) The Director of an approved State may approve a multiunit ground-water monitoring system instead of separate ground-water monitoring systems for each MSWLF unit when the facility has several units, provided the multi-unit ground-water monitoring system meets the requirement of §258.51(a) and will be as protective of human health and the environment as individual monitoring systems for each MSWLF unit, based on the following factors:

- (1) Number, spacing, and orientation of the MSWLF units;
- (2) Hydrogeologic setting;
- (3) Site history;
- (4) Engineering design of the MSWLF units, and
- (5) Type of waste accepted at the MSWLF units.
- (c) Monitoring wells must be cased in a manner that maintains the integrity of the monitoring well bore hole. This casing must be screened or perforated and packed with gravel or sand, where necessary, to enable collection of ground-water samples. The annular space (i.e., the space between the bore hole and well casing) above the sampling depth must be sealed to prevent contamination of samples and the ground water.
 - (1) The owner or operator must notify the State Director that the design, installation, development, and decommission of any monitoring wells, piezometers and other measurement, sampling, and analytical devices documentation has been placed in the operating record; and
 - (2) The monitoring wells, piezometers, and other measurement, sampling, and analytical devices must be operated and maintained so that they perform to design specifications throughout the life of the monitoring program.
- (d) The number, spacing, and depths of monitoring systems shall be:
 - (1) Determined based upon site-specific technical information that must include thorough characterization of:
 - (i) Aquifer thickness, ground-water flow rate, ground-water flow direction including seasonal and temporal fluctuations in ground-water flow; and
 - (ii) Saturated and unsaturated geologic units and fill materials overlying the uppermost aquifer, materials comprising the uppermost aquifer, and materials comprising the confining unit defining the lower boundary of the uppermost aquifer; including, but not limited to: Thicknesses, stratigraphy, lithology, hydraulic conductivities, porosities and effective porosities.
 - (2) Certified by a qualified ground-water scientist or approved by the Director of an approved State. Within 14 days of this certification, the owner or operator must notify the State Director that the certification has been placed in the operating record.

§ 258.53 Ground-water sampling and analysis requirements.

- (a) The ground-water monitoring program must include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide an accurate representation of ground-water quality at the background and downgradient wells installed in compliance with §258.51(a) of this part. The owner or operator must notify the State Director that the sampling and analysis program documentation has been placed in the operating record and the program must include procedures and techniques for:
 - (1) Sample collection;
 - (2) Sample preservation and shipment;
 - (3) Analytical procedures;
 - (4) Chain of custody control; and
 - (5) Quality assurance and quality control.
- (b) The ground-water monitoring program must include sampling and analytical methods that are appropriate for ground-water sampling and that accurately measure hazardous constituents and other monitoring parameters in ground-water samples. Ground-water samples shall not be field-filtered prior to laboratory analysis.
- (c) The sampling procedures and frequency must be protective of human health and the environment.
- (d) Ground-water elevations must be measured in each well immediately prior to purging, each time ground water is sampled. The owner or operator must determine the rate and direction of ground-water flow each time ground water is sampled. Ground-water elevations in wells which monitor the same waste management area must be measured within a period of time short enough to avoid temporal variations in ground-water flow which could preclude accurate determination of ground-water flow rate and direction.

- (e) The owner or operator must establish background ground-water quality in a hydraulically upgradient or background well(s) for each of the monitoring parameters or constituents required in the particular groundwater monitoring program that applies to the MSWLF unit, as determined under §258.54(a) or §258.55(a) of this part. Background ground-water quality may be established at wells that are not located hydraulically upgradient from the MSWLF unit if it meets the requirements of §258.51(a)(1).
- (f) The number of samples collected to establish ground-water quality data must be consistent with the appropriate statistical procedures determined pursuant to paragraph (g) of this section. The sampling procedures shall be those specified under §258.54(b) for detection monitoring, §258.55 (b) and (d) for assessment monitoring, and §258.56(b) of corrective action.
- (g) The owner or operator must specify in the operating record one of the following statistical methods to be used in evaluating ground-water monitoring data for each hazardous constituent. The statistical test chosen shall be conducted separately for each hazardous constituent in each well.
 - (1) A parametric analysis of variance (ANOVA) followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's mean and the background mean levels for each constituent.
 - (2) An analysis of variance (ANOVA) based on ranks followed by multiple comparisons procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's median and the background median levels for each constituent.
 - (3) A tolerance or prediction interval procedure in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper tolerance or prediction limit.
 - (4) A control chart approach that gives control limits for each constituent.
 - (5) Another statistical test method that meets the performance standards of §258.53(h). The owner or operator must place a justification for this alternative in the operating record and notify the State Director of the use of this alternative test. The justification must demonstrate that the alternative method meets the performance standards of §258.53(h).
- (h) Any statistical method chosen under §258.53(g) shall comply with the following performance standards, as appropriate:
 - (1) The statistical method used to evaluate ground-water monitoring data shall be appropriate for the distribution of chemical parameters or hazardous constituents. If the distribution of the chemical parameters or hazardous constituents is shown by the owner or operator to be inappropriate for a normal theory test, then the data should be transformed or a distribution-free theory test should be used. If the distributions for the constituents differ, more than one statistical method may be needed.
 - (2) If an individual well comparison procedure is used to compare an individual compliance well constituent concentration with background constituent concentrations or a ground-water protection standard, the test shall be done at a Type I error level no less than 0.01 for each testing period. If a multiple comparisons procedure is used, the Type I experiment wise error rate for each testing period shall be no less than 0.05; however, the Type I error of no less than 0.01 for individual well comparisons must be maintained. This performance standard does not apply to tolerance intervals, prediction intervals, or control charts.
 - (3) If a control chart approach is used to evaluate ground-water monitoring data, the specific type of control chart and its associated parameter values shall be protective of human health and the environment. The parameters shall be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentration values for each constituent of concern.
 - (4) If a tolerance interval or a predictional interval is used to evaluate ground-water monitoring data, the levels of confidence and, for tolerance intervals, the percentage of the population that the interval must contain, shall be protective of human health and the environment. These parameters shall be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentration values for each constituent of concern.

- (5) The statistical method shall account for data below the limit of detection with one or more statistical procedures that are protective of human health and the environment. Any practical quantitation limit (pql) that is used in the statistical method shall be the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility.
- (6) If necessary, the statistical method shall include procedures to control or correct for seasonal and spatial variability as well as temporal correlation in the data.
 - (i) The owner or operator must determine whether or not there is a statistically significant increase over background values for each parameter or constituent required in the particular ground-water monitoring program that applies to the MSWLF unit, as determined under §§258.54(a) or 258.55(a) of this part.
- (1) In determining whether a statistically significant increase has occurred, the owner or operator must compare the ground-water quality of each parameter or constituent at each monitoring well designated pursuant to §258.51(a)(2) to the background value of that constituent, according to the statistical procedures and performance standards specified under paragraphs (g) and (h) of this section.
- (2) Within a reasonable period of time after completing sampling and analysis, the owner or operator must determine whether there has been a statistically significant increase over background at each monitoring well.

§ 258.54 Detection monitoring program.

- (a) Detection monitoring is required at MSWLF units at all ground-water monitoring wells defined under §§258.51 (a)(1) and (a)(2) of this part. At a minimum, a detection monitoring program must include the monitoring for the constituents listed in appendix I to this part.
 - (1) The Director of an approved State may delete any of the appendix I monitoring parameters for a MSWLF unit if it can be shown that the removed constituents are not reasonably expected to be in or derived from the waste contained in the unit.
 - (2) The Director of an approved State may establish an alternative list of inorganic indicator parameters for a MSWLF unit, in lieu of some or all of the heavy metals (constituents 1–15 in appendix I to this part), if the alternative parameters provide a reliable indication of inorganic releases from the MSWLF unit to the ground water. In determining alternative parameters, the Director shall consider the following factors:
 - (i) The types, quantities, and concentrations of constituents in wastes managed at the MSWLF unit;
 - The mobility, stability, and persistence of waste constituents or their reaction products in the unsaturated zone beneath the MSWLF unit;
 - (iii) The delectability of indicator parameters, waste constituents, and reaction products in the ground water; and
 - (iv) The concentration or values and coefficients of variation of monitoring parameters or constituents in the groundwater background.
- (b) The monitoring frequency for all constituents listed in appendix I to this part, or in the alternative list approved in accordance with paragraph (a)(2) of this section, shall be at least semiannual during the active life of the facility (including closure) and the post-closure period. A minimum of four independent samples from each well (background and downgradient) must be collected and analyzed for the appendix I constituents, or the alternative list approved in accordance with paragraph (a)(2) of this section, during the first semiannual sampling event. At least one sample from each well (background and downgradient) must be collected and analyzed during subsequent semiannual sampling events. The Director of an approved State may specify an appropriate alternative frequency for repeated sampling and analysis for appendix I constituents, or the alternative list approved in accordance with paragraph (a)(2) of this section, during the active life (including closure) and the post-closure care period. The alternative frequency during the active life (including closure) and the post-closure care period. The alternative frequency during the active life (including closure) shall be no less than annual. The alternative frequency shall be based on consideration of the following factors:
 - (1) Lithology of the aquifer and unsaturated zone;
 - (2) Hydraulic conductivity of the aquifer and unsaturated zone;
 - (3) Ground-water flow rates;

- (4) Minimum distance between upgradient edge of the MSWLF unit and downgradient monitoring well screen (minimum distance of travel); and
- (5) Resource value of the aquifer.
- (c) If the owner or operator determines, pursuant to §258.53(g) of this part, that there is a statistically significant increase over background for one or more of the constituents listed in appendix I to this part or in the alternative list approved in accordance with paragraph (a)(2) of this section, at any monitoring well at the boundary specified under §258.51(a)(2), the owner or operator:
 - (1) Must, within 14 days of this finding, place a notice in the operating record indicating which constituents have shown statistically significant changes from background levels, and notify the State director that this notice was placed in the operating record; and
 - (2) Must establish an assessment monitoring program meeting the requirements of §258.55 of this part within 90 days except as provided for in paragraph (c)(3) of this section.
 - (3) The owner/operator may demonstrate that a source other than a MSWLF unit caused the contamination or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in ground-water quality. A report documenting this demonstration must be certified by a qualified ground-water scientist or approved by the Director of an approved State and be placed in the operating record. If a successful demonstration is made and documented, the owner or operator may continue detection monitoring as specified in this section. If, after 90 days, a successful demonstration is not made, the owner or operator must initiate an assessment monitoring program as required in §258.55.

§ 258.55 Assessment monitoring program.

- (a) Assessment monitoring is required whenever a statistically significant increase over background has been detected for one or more of the constituents listed in the appendix I to this part or in the alternative list approved in accordance with §258.54(a)(2).
- (b) Within 90 days of triggering an assessment monitoring program, and annually thereafter, the owner or operator must sample and analyze the ground water for all constituents identified in appendix II to this part. A minimum of one sample from each downgradient well must be collected and analyzed during each sampling event. For any constituent detected in the downgradient wells as a result of the complete appendix II analysis, a minimum of four independent samples from each well (background and downgradient) must be collected and analyzed to establish background for the constituents. The Director of an approved State may specify an appropriate subset of wells to be sampled and analyzed for appendix II constituents during assessment monitoring. The Director of an approved State may delete any of the appendix II monitoring parameters for a MSWLF unit if it can be shown that the removed constituents are not reasonably expected to be in or derived from the waste contained in the unit.
- (c) The Director of an approved State may specify an appropriate alternate frequency for repeated sampling and analysis for the full set of appendix II constituents required by §258.55(b) of this part, during the active life (including closure) and post-closure care of the unit considering the following factors:
 - (1) Lithology of the aquifer and unsaturated zone;
 - (2) Hydraulic conductivity of the aquifer and unsaturated zone;
 - (3) Ground-water flow rates;
 - Minimum distance between upgradient edge of the MSWLF unit and downgradient monitoring well screen (minimum distance of travel);
 - (5) Resource value of the aquifer; and
 - (6) Nature (fate and transport) of any constituents detected in response to this section.
- (d) After obtaining the results from the initial or subsequent sampling events required in paragraph (b) of this section, the owner or operator must:
 - (1) Within 14 days, place a notice in the operating record identifying the appendix II constituents that have been detected and notify the State Director that this notice has been placed in the operating record;

- (2) Within 90 days, and on at least a semiannual basis thereafter, resample all wells specified by §258.51(a), conduct analyses for all constituents in appendix I to this part or in the alternative list approved in accordance with §258.54(a)(2), and for those constituents in appendix II to this part that are detected in response to paragraph (b) of this section, and record their concentrations in the facility operating record. At least one sample from each well (background and downgradient) must be collected and analyzed during these sampling events. The Director of an approved State may specify an alternative monitoring frequency during the active life (including closure) and the post-closure period for the constituents referred to in this paragraph. The alternative frequency for appendix I constituents, or the alternative list approved in accordance with §258.54(a)(2), during the active life (including closure) shall be no less than annual. The alternative frequency shall be based on consideration of the factors specified in paragraph (c) of this section;
- (3) Establish background concentrations for any constituents detected pursuant to paragraph (b) or (d)(2) of this section; and
- (4) Establish ground-water protection standards for all constituents detected pursuant to paragraph (b) or
 (d) of this section. The ground-water protection standards shall be established in accordance with paragraphs (h) or (i) of this section.
- (e) If the concentrations of all appendix II constituents are shown to be at or below background values, using the statistical procedures in §258.53(g), for two consecutive sampling events, the owner or operator must notify the State Director of this finding and may return to detection monitoring.
- (f) If the concentrations of any appendix II constituents are above background values, but all concentrations are below the ground-water protection standard established under paragraphs (h) or (i) of this section, using the statistical procedures in §258.53(g), the owner or operator must continue assessment monitoring in accordance with this section.
- (g) If one or more appendix II constituents are detected at statistically significant levels above the ground-water protection standard established under paragraphs (h) or (i) of this section in any sampling event, the owner or operator must, within 14 days of this finding, place a notice in the operating record identifying the appendix II constituents that have exceeded the ground-water protection standard and notify the State Director and all appropriate local government officials that the notice has been placed in the operating record. The owner or operator also:
 - (i) Must characterize the nature and extent of the release by installing additional monitoring wells as necessary;
 - Must install at least one additional monitoring well at the facility boundary in the direction of contaminant migration and sample this well in accordance with §258.55(d)(2);
 - (iii) Must notify all persons who own the land or reside on the land that directly overlies any part of the plume of contamination if contaminants have migrated off-site if indicated by sampling of wells in accordance with §258.55 (g)(1); and
 - (iv) Must initiate an assessment of corrective measures as required by §255.56 of this part within 90 days; or
 - (2) May demonstrate that a source other than a MSWLF unit caused the contamination, or that the SSI increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in ground-water quality. A report documenting this demonstration must be certified by a qualified ground-water scientist or approved by the Director of an approved State and placed in the operating record. If a successful demonstration is made the owner or operator must continue monitoring in accordance with the assessment monitoring program pursuant to §258.55, and may return to detection monitoring if the appendix II constituents are at or below background as specified in §258.55(g) including initiating an assessment of corrective measures.
- (h) The owner or operator must establish a ground-water protection standard for each appendix II constituent detected in the ground-water. The ground-water protection standard shall be:
 - (1) For constituents for which a maximum contaminant level (MCL) has been promulgated under section 1412 of the Safe Drinking Water Act (codified) under 40 CFR part 141, the MCL for that constituent;
 - (2) For constituents for which MCLs have not been promulgated, the background concentration for the constituent established from wells in accordance with §258.51(a)(1); or

- (3) For constituents for which the background level is higher than the MCL identified under paragraph (h)(1) of this section or health based levels identified under §258.55(i)(1), the background concentration.
- (i) The Director of an approved State may establish an alternative ground-water protection standard for constituents for which MCLs have not been established. These ground-water protection standards shall be appropriate health based levels that satisfy the following criteria:
 - The level is derived in a manner consistent with Agency guidelines for assessing the health risks of environmental pollutants (51 FR 33992, 34006, 34014, 34028, Sept. 24, 1986);
 - (2) The level is based on scientifically valid studies conducted in accordance with the Toxic Substances Control Act Good Laboratory Practice Standards (40 CFR part 792) or equivalent;
 - (3) For carcinogens, the level represents a concentration associated with an excess lifetime cancer risk level (due to continuous lifetime exposure) with the 1×10⁻⁶ range; and
 - (4) For systemic toxicants, the level represents a concentration to which the human population (including sensitive subgroups) could be exposed to on a daily basis that is likely to be without appreciable risk of deleterious effects during a lifetime. For purposes of this subpart, systemic toxicants include toxic chemicals that cause effects other than cancer or mutation.
- (ii) [Reserved]
- (j) In establishing ground-water protection standards under paragraph (i) of this section, the Director of an approved State may consider the following:
 - (1) Multiple contaminants in the ground water;
 - (2) Exposure threats to sensitive environmental receptors; and
 - (3) Other site-specific exposure or potential exposure to ground water.

§ 258.56 Assessment of corrective measures.

- (a) Within 90 days of finding that any of the constituents listed in appendix II to this part have been detected at a statistically significant level exceeding the ground-water protection standards defined under §258.55 (h) or
 (i) of this part, the owner or operator must initiate an assessment of corrective measures. Such an assessment must be completed within a reasonable period of time.
- (b) The owner or operator must continue to monitor in accordance with the assessment monitoring program as specified in §258.55.
- (c) The assessment shall include an analysis of the effectiveness of potential corrective measures in meeting all of the requirements and objectives of the remedy as described under §258.57, addressing at least the following:
 - The performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts, and control of exposure to any residual contamination;
 - (2) The time required to begin and complete the remedy;
 - (3) The costs of remedy implementation; and
 - (4) The institutional requirements such as State or local permit requirements or other environmental or public health requirements that may substantially affect implementation of the remedy(s).
- (d) The owner or operator must discuss the results of the corrective measures assessment, prior to the selection of remedy, in a public meeting with interested and affected parties.

§ 258.57 Selection of remedy.

- (a) Based on the results of the corrective measures assessment conducted under §258.56, the owner or operator must select a remedy that, at a minimum, meets the standards listed in paragraph (b) of this section. The owner or operator must notify the State Director, within 14 days of selecting a remedy, a report describing the selected remedy has been placed in the operating record and how it meets the standards in paragraph (b) of this section.
- (b) Remedies must:

- (1) Be protective of human health and the environment;
- (2) Attain the ground-water protection standard as specified pursuant to §§258.55 (h) or (i);
- (3) Control the source(s) of releases so as to reduce or eliminate, to the maximum extent practicable, further releases of appendix II constituents into the environment that may pose a threat to human health or the environment; and
- (4) Comply with standards for management of wastes as specified in §258.58(d).
- (c) In selecting a remedy that meets the standards of §258.57(b), the owner or operator shall consider the following evaluation factors:
 - (1) The long- and short-term effectiveness and protectiveness of the potential remedy(s), along with the degree of certainty that the remedy will prove successful based on consideration of the following:
 - (i) Magnitude of reduction of existing risks;
 - Magnitude of residual risks in terms of likelihood of further releases due to waste remaining following implementation of a remedy;
 - (iii) The type and degree of long-term management required, including monitoring, operation, and maintenance;
 - Short-term risks that might be posed to the community, workers, or the environment during implementation of such a remedy, including potential threats to human health and the environment associated with excavation, transportation, and redisposal of containment;
 - (v) Time until full protection is achieved;
 - Potential for exposure of humans and environmental receptors to remaining wastes, considering the potential threat to human health and the environment associated with excavation, transportation, redisposal, or containment;
 - (vii) Long-term reliability of the engineering and institutional controls; and
 - (viii) Potential need for replacement of the remedy.
 - (2) The effectiveness of the remedy in controlling the source to reduce further releases based on consideration of the following factors:
 - (i) The extent to which containment practices will reduce further releases;
 - (ii) The extent to which treatment technologies may be used.
 - (3) The ease or difficulty of implementing a potential remedy(s) based on consideration of the following types of factors:
 - (i) Degree of difficulty associated with constructing the technology;
 - (ii) Expected operational reliability of the technologies;
 - (iii) Need to coordinate with and obtain necessary approvals and permits from other agencies;
 - (iv) Availability of necessary equipment and specialists; and
 - (v) Available capacity and location of needed treatment, storage, and disposal services.
 - (4) Practicable capability of the owner or operator, including a consideration of the technical and economic capability.
 - (5) The degree to which community concerns are addressed by a potential remedy(s).
- (d) The owner or operator shall specify as part of the selected remedy a schedule(s) for initiating and completing remedial activities. Such a schedule must require the initiation of remedial activities within a reasonable period of time taking into consideration the factors set forth in paragraphs (d) (1)–(8) of this section. The owner or operator must consider the following factors in determining the schedule of remedial activities:
 - (1) Extent and nature of contamination;
 - (2) Practical capabilities of remedial technologies in achieving compliance with ground-water protection standards established under §258.55 (g) or (h) and other objectives of the remedy;

- (3) Availability of treatment or disposal capacity for wastes managed during implementation of the remedy;
- (4) Desirability of utilizing technologies that are not currently available, but which may offer significant advantages over already available technologies in terms of effectiveness, reliability, safety, or ability to achieve remedial objectives;
- (5) Potential risks to human health and the environment from exposure to contamination prior to completion of the remedy;
- (6) Resource value of the aquifer including:
 - (i) Current and future uses;
 - (ii) Proximity and withdrawal rate of users;
 - (iii) Ground-water quantity and quality;
 - (iv) The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituent;
 - (v) The hydrogeologic characteristic of the facility and surrounding land;
 - (vi) Ground-water removal and treatment costs; and
 - (vii) The cost and availability of alternative water supplies.
- (7) Practicable capability of the owner or operator.
- (8) Other relevant factors.
- (e) The Director of an approved State may determine that remediation of a release of an appendix II constituent from a MSWLF unit is not necessary if the owner or operator demonstrates to the satisfaction of the Director of the approved State that:
 - (1) The ground-water is additionally contaminated by substances that have originated from a source other than a MSWLF unit and those substances are present in concentrations such that cleanup of the release from the MSWLF unit would provide no significant reduction in risk to actual or potential receptors; or
 - (2) The constituent(s) is present in ground water that:
 - (i) Is not currently or reasonably expected to be a source of drinking water; and
 - (ii) Is not hydraulically connected with waters to which the hazardous constituents are migrating or are likely to migrate in a concentration(s) that would exceed the ground-water protection standards established under §258.55 (h) or (i); or
 - (3) Remediation of the release(s) is technically impracticable; or
 - (4) Remediation results in unacceptable cross-media impacts.
- (f) A determination by the Director of an approved State pursuant to paragraph (e) of this section shall not affect the authority of the State to require the owner or operator to undertake source control measures or other measures that may be necessary to eliminate or minimize further releases to the ground-water, to prevent exposure to the ground-water, or to remediate the ground-water to concentrations that are technically practicable and significantly reduce threats to human health or the environment.

§ 258.58 Implementation of the corrective action program.

- (a) Based on the schedule established under §258.57(d) for initiation and completion of remedial activities the owner/operator must:
 - (1) Establish and implement a corrective action ground-water monitoring program that:
 - (i) At a minimum, meet the requirements of an assessment monitoring program under §258.55;
 - (ii) Indicate the effectiveness of the corrective action remedy; and
 - (iii) Demonstrate compliance with ground-water protection standard pursuant to paragraph (e) of this section.
 - (2) Implement the corrective action remedy selected under §258.57; and

- (3) Take any interim measures necessary to ensure the protection of human health and the environment. Interim measures should, to the greatest extent practicable, be consistent with the objectives of and contribute to the performance of any remedy that may be required pursuant to §258.57. The following factors must be considered by an owner or operator in determining whether interim measures are necessary:
 - (i) Time required to develop and implement a final remedy;
 - Actual or potential exposure of nearby populations or environmental receptors to hazardous constituents;
 - (iii) Actual or potential contamination of drinking water supplies or sensitive ecosystems;
 - (iv) Further degradation of the ground-water that may occur if remedial action is not initiated expeditiously;
 - (v) Weather conditions that may cause hazardous constituents to migrate or be released;
 - (vi) Risks of fire or explosion, or potential for exposure to hazardous constituents as a result of an accident or failure of a container or handling system; and
 - (vii) Other situations that may pose threats to human health and the environment.
- (b) An owner or operator may determine, based on information developed after implementation of the remedy has begun or other information, that compliance with requirements of §258.57(b) are not being achieved through the remedy selected. In such cases, the owner or operator must implement other methods or techniques that could practicably achieve compliance with the requirements, unless the owner or operator makes the determination under §258.58(c).
- (c) If the owner or operator determines that compliance with requirements under §258.57(b) cannot be practically achieved with any currently available methods, the owner or operator must:
 - Obtain certification of a qualified ground-water scientist or approval by the Director of an approved State that compliance with requirements under §258.57(b) cannot be practically achieved with any currently available methods;
 - (2) Implement alternate measures to control exposure of humans or the environment to residual contamination, as necessary to protect human health and the environment; and
 - (3) Implement alternate measures for control of the sources of contamination, or for removal or decontamination of equipment, units, devices, or structures that are:
 - (i) Technically practicable; and
 - (ii) Consistent with the overall objective of the remedy.
 - (4) Notify the State Director within 14 days that a report justifying the alternative measures prior to implementing the alternative measures has been placed in the operating record.
- (d) All solid wastes that are managed pursuant to a remedy required under §258.57, or an interim measure required under §258.58(a)(3), shall be managed in a manner:
 - (1) That is protective of human health and the environment; and
 - (2) That complies with applicable RCRA requirements.
- (e) Remedies selected pursuant to §258.57 shall be considered complete when:
 - (1) The owner or operator complies with the ground-water protection standards established under §§258.55(h) or (i) at all points within the plume of contamination that lie beyond the ground-water monitoring well system established under §258.51(a).
 - (2) Compliance with the ground-water protection standards established under §§258.55(h) or (i) has been achieved by demonstrating that concentrations of appendix II constituents have not exceeded the ground-water protection standard(s) for a period of three consecutive years using the statistical procedures and performance standards in §258.53(g) and (h). The Director of an approved State may specify an alternative length of time during which the owner or operator must demonstrate that concentrations of appendix II constituents have not exceeded the ground-water protection standard(s) taking into consideration:
 - (i) Extent and concentration of the release(s);

- (ii) Behavior characteristics of the hazardous constituents in the ground-water;
- (iii) Accuracy of monitoring or modeling techniques, including any seasonal, meteorological, or other environmental variabilities that may affect the accuracy; and
- (iv) Characteristics of the ground-water.
- (3) All actions required to complete the remedy have been satisfied.
- (f) Upon completion of the remedy, the owner or operator must notify the State Director within 14 days that a certification that the remedy has been completed in compliance with the requirements of §258.58(e) has been placed in the operating record. The certification must be signed by the owner or operator and by a qualified ground-water scientist or approved by the Director of an approved State.
- (g) When, upon completion of the certification, the owner or operator determines that the corrective action remedy has been completed in accordance with the requirements under paragraph (e) of this section, the owner or operator shall be released from the requirements for financial assurance for corrective action under §258.73.

3.5.2 How Ada County Landfill Fulfills Requirements

The groundwater monitoring compliance program is comprised of four major components:

- Groundwater detection/assessment monitoring at the HHC
- Groundwater detection monitoring at the NRC
- Groundwater Remediation (corrective action) at the HHC
- Groundwater Monitoring Reporting

3.5.2.1 Groundwater Detection/Assessment Monitoring at the Hidden Hollow Cell

3.5.2.1.1 Program Summary

This section summarizes the semiannual groundwater detection and assessment monitoring program for the HHC at the Ada County Landfill. In accordance with 40 CFR §258.54 and .55 and associated state regulations [Idaho 39-7410], the Ada County Groundwater Detection/Assessment Monitoring well network at the HHC monitors groundwater quality at the boundary of the HHC.

The HHC groundwater detection monitoring well network consists of six wells (wells B-2, B-6A, B-7, B-8, B-10, and B-11). The locations the wells are shown in Exhibit 11, *Groundwater Monitoring Well Network*. The sampling frequency, analytical parameters and purpose of each HHC detection monitoring well are listed in Exhibit 11A. Well B-7 is an upgradient well used to establish background concentrations of the monitored parameters. The other five wells are downgradient wells located at the point of compliance established for the Landfill cell. The wells are located and constructed as specified in 40 CFR §258.51 of the Subtitle D regulations.

The HHC detection monitoring wells are completed within the uppermost water-bearing unit. Beneath the HHC, the uppermost water-bearing unit soils generally consist of permeable fine-to-coarse-grained sand beds of the fluvial/deltaic sediments of the Pierce Gulch Formation. Groundwater detection monitoring network well construction details for the HHLF have previously been submitted to DEQ and are included in the Operating Record.

Pursuant to Subtitle D regulations, one year of quarterly monitoring for background concentrations of Appendix I and II constituents was completed in 1995. Subsequent semiannual groundwater monitoring for Appendix I and II constituents is conducted in April and October.

Background and semiannual monitoring at the HHC indicate that semivolatile organic compounds, pesticides, and herbicides are generally below detection limits. Appendix I and II inorganics have consistently been below groundwater protection standards or, in many cases, below detection limits. However, Appendix I, volatile organic compounds (VOCs), have been detected above maximum contaminant levels (MCLs) in several of the HHC monitoring wells. As a result, detection monitoring for Appendix I constituents and assessment monitoring for Appendix II constituents has been implemented at the six HHC detection monitoring wells, in accordance with 40 CFR §258.55. Detection monitoring for Appendix I constituents only (VOCs and metals) is performed at each of the six HHC detection monitoring wells in April of each year. Assessment monitoring for Appendix II constituents (VOCs, metals, semi-volatile organic compounds, herbicides, and pesticides) is performed at each of the six HHC detection monitoring wells in October of each year. In addition to the Appendix II assessment monitoring discussed above, an assessment monitoring [program that monitors the nature and extent of the VOC plume has been implemented at the HHC pursuant to 40 CFR §258.55. Since 1990, 60 monitoring wells have been installed downgradient of the HHC to characterize the nature and extent of the groundwater VOC plume. A subset of 21 of these 60 wells have been designated as downgradient assessment monitoring wells. The 21 assessment monitoring wells were selected on the basis that they would effectively monitor the distribution of Appendix I VOCs downgradient of the HHC; that is, they effectively monitor the interior (core) of the plume where VOC concentrations are the highest and define the horizontal and vertical limits of contamination. Exhibit 11A lists the 21 assessment monitoring wells and groups them into the uppermost, intermediate, and deep water-bearing units that influence the migration of contaminants downgradient of the HHC. The locations of the wells are shown in Exhibit 11, Groundwater Monitoring Well *Network.* Detailed discussions of the detection and assessment monitoring plan for the HHC is presented in the Standard Operating Procedures (SOPs) submittals, which have been approved by the DEQ and are part of the Operating Record. Detection and assessment monitoring methods are briefly described below.

The nature and extent of the VOC plume has been characterized and a groundwater remediation system has been operating since 1998 to capture the contaminant plume. A brief description of the HHC groundwater remediation system is presented in Section 3.5.2.3.





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GROUNDWATER DETECTION MONITORING WELL GROUNDWATER ASSESSMENT MONITORING WELL GROUNDWATER MONITORING WELL GROUNDWATER EXTRACTION WELL WATER SUPPLY WELL DOMESTIC WATER WELL GROUNDWATER INJECTION WELL ACHD TEST WELL

Exhibit 11 HHC GROUNDWATER MONITORING WELL NETWORK Ada County Landfill

CH2MHILL

Exhibit 11A

HHC Monitoring Program Summary

Well	Location Relative to the HHC	Sampling Frequency ¹	Analytes Sampled	Monitoring Purpose
HHC Ground	water Detection Monitoring W	'ells ²		
B-2	Downgradient	semi-annual	App I: VOC, metals	Downgradient point-of-compliance well
		annual	App II: compounds	
B-6A	Downgradient	semi-annual	App I: VOC, metals	Downgradient point-of-compliance well
		annual	App II: compounds	
B-7	Upgradient	semi-annual	App I: VOC, metals	Upgradient, background water quality well
		annual	App II: compounds	
B-8	Downgradient	semi-annual	App I: VOC, metals	Downgradient point-of-compliance well
D 10		annual	App II: compounds	
B-10	Downgradient	semi-annual	App I: VOC, metals	Downgradient point-of-compliance well
D 11	Downgradiant	annuai	App II: compounds	Doumaradiant paint of compliance well
D-11	Downgradient	appual	App I: VOC, metals	Downgradient point-or-compliance weil
	mont Monitoring Wolls	arinuai	App II. compounds	
	Neter Dessing Unit(s)			
<u>uppermost v</u>	valer-Bearing Unit(S)		App Is VOC	
B-1	Downgradient, WBU-1°	semi-annuai	App I. VOC	Monitor the lateral vestern extent of the VOC plume
B-9	Downgradient	semi-annual	App I: VOC	Monitor the lateral eastern extent of the VOC plume
B-18	Downgradient	annual (October)	App I: VOC	Monitor the lateral western extent of the VOC plume
B-38	Downgradient, WBU-1	semi-annual	App I: VOC	Monitor the lateral western extent of the VOC plume
B-42	Downgradient	semi-annual	App I: VOC	Monitor the lateral western extent of the VOC plume
B-44	Downgradient	semi-annual	App I: VOC	Monitor the lateral eastern extent of the VOC plume
B-45	Downgradient	semi-annual	App I: VOC	Monitor the lateral eastern extent of the VOC plume
B-47	Downgradient	annual (October)	App I: VOC	Monitor the lateral western extent of the VOC plume
Intermediate	Water-Bearing Unit(s)			
B-24	Downgradient, WBU-3	semi-annual	App I: VOC	Monitor the downward vertical migration of the VOC plume near the toe of the HHC
B-39	Downgradient, WBU-4	semi-annual	App I: VOC	Monitor the central to lateral western extent of the VOC plume
B-48	Downgradient, WBU-4	semi-annual	App I: VOC	Monitor the VOC plume downgradient of the landfill property boundary
B-52	Downgradient, WBU-2	semi-annual	App I: VOC	Monitor the VOC plume downgradient of the landfill property boundary
B-56	Downgradient, WBU-3	semi-annual	App I: VOC	Monitor the VOC plume downgradient of the landfill property boundary
EW-6 ⁴	Downgradient, WBU-4	semi-annual	App I: VOC	Monitor the VOC plume at the downgradient landfill property boundary
EW-7 ⁴	Downgradient, WBU-4	semi-annual	App I: VOC	Monitor the VOC plume at the downgradient landfill property boundary
EW-9	Downgradient, WBU-4	semi-annual	App I: VOC	Monitor the lateral eastern extent of the VOC plume at the landfill property boundary
EW-10	Downgradient, WBU-4	semi-annual	App I: VOC	Monitor the lateral western extent of the VOC plume at the landfill property boundary
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Exhibit 11A

HHC Monitoring Program Summary

Well	Location Relative	Sampling	Analytes	
ID	to the HHC	Frequency ¹	Sampled	Monitoring Purpose
Deep Water	-Bearing Unit(s)			
B-29	Downgradient, WBU-4 or 5	semi-annual	App I: VOC	Monitor the downward vertical migration of the VOC plume near the toe of the HHC
B-50	Downgradient, WBU-3	semi-annual	App I: VOC	Monitor the downward vertical migration of the VOC plume near the toe of the HHC
B-51	Downgradient, WBU-3	semi-annual	App I: VOC	Monitor the downward vertical migration of the VOC plume near the toe of the HHC
EW-11	Downgradient, WBU-5	semi-annual	App I: VOC	Monitor the downward vertical migration of the VOC plume near the property boundary
HHC Remed	iation Monitoring Wells			
EW-2	Downgradient, WBU-1	semi-annual	App I: VOC	Monitor VOC removal rate at the extraction well
EW-3	Downgradient, WBU-1	semi-annual	App I: VOC	Monitor VOC removal rate at the extraction well
EW-4	Downgradient, WBU-1	semi-annual	App I: VOC	Monitor VOC removal rate at the extraction well
EW-6	Downgradient, WBU-4	semi-annual	App I: VOC	Monitor VOC removal rate at the extraction well
EW-7	Downgradient, WBU-4	semi-annual	App I: VOC	Monitor VOC removal rate at the extraction well
EW-9	Downgradient, WBU-4	semi-annual	App I: VOC	Monitor VOC removal rate at the extraction well
B-12	Downgradient, WBU-3	semi-annual	App I: VOC	Monitor VOC trends over time in the uppermost water-bearing unit downgradient of extraction wells EW-1, -2, & -3
B-15	Downgradient, WBU-4	semi-annual	App I: VOC	Monitor VOC trends over time in uppermost water-bearing unit near landfill property boundary
B-28	Downgradient, WBU-1	semi-annual	App I: VOC	Monitor VOC in uppermost water-bearing unit directly downgradient of extraction wells EW-1, -2, & -3
B-30	Downgradient, WBU-2	semi-annual	App I: VOC	Monitor VOC migration into intermediate water-bearing unit directly below extraction wells EW-1, -2, & -3
B-35	Downgradient, WBU-1	semi-annual	App I: VOC	Monitor VOC trends over time in the uppermost water-bearing unit directly downgradient of extraction wells EW-1, -2, & -3
B-48	Downgradient, WBU-4	semi-annual	App I: VOC	
D-10 ⁵	Downgradient, WBU-4	semi-annual	App I: VOC	Monitor off-property VOC trends in domestic well south of Hill Rd. near leading edge of plume
D-12 ⁵	Downgradient, WBU-4	semi-annual	App I: VOC	Monitor off-property VOC trends in domestic well south of Hill Rd. near leading edge of plume
D-18 ⁵	Downgradient, WBU-4	semi-annual	App I: VOC	Monitor off-property VOC trends in domestic well south of Hill Rd. near leading edge of plume

¹Semi-annual sampling frequency - Appendix I compounds at the detection, assessment, and remediation monitoring wells are sampled every year in April and October.

²Annual sampling frequency - Appendix II compounds are sampled annually in October.

³The WBU- designation is based on the water-bearing units along the core of the HHC VOC plume as depicted in *Hidden Hollow Cell Groundwater Data Review Ada County Landfill* (CH2M, 2010).

⁴The well also serves as a HHC remediation monitoring well.

⁵The WBU for the domestic wells is estimated (CH2M, 2010).

3.5.2.1.2 Groundwater Monitoring Methods

Prior to collecting groundwater samples from any well at the Ada County Landfill, water levels are collected at all monitoring wells and piezometers (including all HHC and NRC detection, assessment, and remediation monitoring wells) at the Ada County Landfill in order to get a representative snapshot of groundwater elevations and flow directions across the entire site. Static water levels are measured at the Landfill using an electric well sounder.

A potentiometric surface map showing the groundwater flow direction, is generated from the static water level elevations recorded. In general, the historical groundwater flow direction is predominantly to the southwest. Following the collection of water level data, detection and assessment monitoring wells are initially purged of stagnant well bore water and then sampled for the analysis of constituents listed in Appendix I and Appendix II of the RCRA Subtitle D regulations, as applicable. All samples are unfiltered. Sample and laboratory analytical procedures are those stipulated in the Environmental Protection Agency (EPA) Test Methods Manual SW-846.

A field logbook is maintained during each detection or assessment monitoring event. The logbook provides a description of all field activities, including weather observations, field conditions, water level measurements, field parameter measurements, purge volumes, sample identification and methodology, sample depth and appearance, date and time of sample collection, decontamination procedures, and general field comments and observations.

3.5.2.2 Groundwater Detection Monitoring at the NRC

3.5.2.2.1 Program Summary

This section summarizes the semiannual groundwater detection monitoring program for the NRC at the Ada County Landfill. In accordance with 40 CFR §258.54 and .55 and associated state regulations [Idaho 39-7410], the Ada County Groundwater Detection Monitoring well network at the NRC monitors groundwater quality at the boundary of the NRC.

The NRC groundwater monitoring well network consists of 12 wells (wells MW-101 through MW-112) and five piezometers (P-1, P-2, P-3, P-5, and P-6). The locations of the wells and piezometers are shown in Exhibit 12, *NRC Groundwater Monitoring Well Network*. The sampling frequency, analytical parameters, and purpose of each NRC detection monitoring well are listed in Exhibit 12A. Wells MW-101, MW-102, and MW-103 are upgradient wells used to establish background concentrations of the monitored parameters. The other nine wells are downgradient wells located at the point of compliance established for the Landfill cell. The wells are located and constructed as specified in 40 CFR §258.51 of the Subtitle D regulations.

Groundwater monitoring wells are completed within the uppermost water-bearing unit. Beneath the NRC, the uppermost water-bearing unit soils generally consist of permeable fineto-coarse-grained sand beds of the fluvial/deltaic sediments of the Pierce Gulch Formation. Groundwater monitoring network well construction details for the NRC have previously been submitted to DEQ and are included in the Operating Record. Pursuant to Subtitle D regulations, one year of quarterly monitoring for background concentrations of Appendix I constituents was completed at the NRC in 2007. Subsequent semiannual detection monitoring for Appendix I constituents only is conducted in April and October. An assessment monitoring program for Appendix II constituents (VOCs, metals, semi-volatile organic compounds, herbicides, and pesticides) will be implemented should a release be detected in accordance with 40 CFR §258.54. Detailed discussions of the detection monitoring plan for the NRC is presented in the Standard Operating Procedures (SOPs) submittals, which have been approved by DEQ and are part of the Operating Record.

3.5.2.2.2 Groundwater Monitoring Methods

Groundwater Monitoring methods for the NRC are the same as described for the HHC (See Section 3.5.2.1), with one exception. Ever since the NRC monitoring wells were installed in 2007, several of the wells have been difficult to develop due to the low productivity of the aquifer matrix which, in turn, has resulted in high turbidity levels in some wells. The high turbidity caused some metal concentrations to be elevated, thus were not representative of actual metal concentrations in groundwater at the NRC. To correct this problem, the sampling protocol was modified in 2013 to ensure that more representative groundwater metal samples would be collected. To do this, both filtered and unfiltered samples are now collected from all NRC detection monitoring wells for Appendix I metals. All Appendix I VOC samples are still unfiltered.

3.5.2.3 Groundwater Remediation (Corrective Action) Program

The groundwater remediation program at the HHC is briefly summarized below. A more detailed discussion of the program can be found in the progress reports and associated addenda, which have been submitted to the DEQ and are included in the Operating Record. Groundwater monitoring of the remediation system wells was conducted on a quarterly basis from April 1998 to March 2010 and semi-annually, thereafter, in addition to the semiannual detection and assessment monitoring activities stipulated in the Subtitle D regulations.

3.5.2.3.1 Background Information

Since early 1998, Ada County has been actively capturing and treating a shallow groundwater VOC plume that originates from the HHC. The remediation system was designed to intercept the plume approximately 1,500 feet south of the southern toe of the HHC along the old entrance road, treat the water by air stripping, and recharge the treated groundwater back into the shallow aquifer.

Five extraction wells were originally installed along the old entrance road. In order to enhance the treatment efficiency of the remediation system, an additional six extraction wells were installed at the mouth of Seaman's Gulch; five were installed in the spring of 2000 and one of the six was installed in December 2012. Currently, six extraction wells are operating; two at the mouth of Seaman's Gulch (EW-6, EW-7, and EW-9) and three along the old entrance road (EW-2, EW-3, and EW-4). The remaining six extraction wells either do not yield enough water or are consistently too low or non-detect in VOC concentrations to warrant treatment. Approximately 25 to 59 gallons per minute (1.1 to 2.5 million gallons per month) of groundwater is presently being pumped from extraction wells EW-2, EW-3, EW-4, EW-6, EW-7, and EW-9, and routed via buried PVC piping to an air stripper unit located along the old entrance road.

The treated water from the air stripper is then routed down the west side of the ravine below the air stripper building, where it is discharged onto the ground in the ravine. The water percolates back into the ground within a few hundred feet of the surface discharge point. The air stripper effluent is of good water quality and has always been non-detect for all analyzed Appendix IVOCs after treatment. The locations of the extraction wells and the air stripper are shown in Exhibit 11, *Remediation System Location Map*.

3.5.2.3.2 Remediation System Maintenance and Operations Program

The groundwater extraction system is routinely serviced and rehabilitated to maximize pumping efficiency, VOC removal, and to prevent damage to the groundwater extraction pumps or air stripper. The operation of the air stripper and extraction pumps is visually inspected routinely for flow from the extraction pumps (at the rotometers) and for flow through the air stripper. System maintenance includes the following components:

- Pressure washing of the interior walls, trays, and risers of the air stripper to remove deposits, as needed.
- Service or replace the dedicated extraction well pumps, as needed.
- Adjust extraction well pump valves to maximize flow, as needed.
- Cleaning and re-developing the extraction well screens with chlorine and air-surging, as needed.
- Cleaning rotometers (flow meters at the stripper), as needed.

3.5.2.3.3 Remediation System/Corrective Action Assessment Monitoring Program

Between April 1998 and March 2010, the remediation system and its monitoring network have been monitored for VOCs on a quarterly basis, and semi-annually, thereafter, to evaluate its effectiveness. Quarterly groundwater quality monitoring for VOCs included the extraction well network and air stripper effluent, seven to 10 downgradient monitoring wells, and three to five downgradient private (domestic) wells located on the south side of Hill Road near the mouth of Seaman's Gulch. Subsequent semi-annual sampling includes the extraction well network and air stripper effluent, six downgradient monitoring wells, and three downgradient private (domestic) wells (D10, D12, D18 on Exhibit 11) located on the south side of Hill Road near the mouth of Seaman's Gulch. Available results indicate that the remediation system effectively captures the VOC plume, causing the plume to retract back toward the landfill property boundary. One VOC, tetrachloroethylene, periodically exceeds MCLs in one downgradient domestic well located near the mouth of Seaman's Gulch. The locations the wells are shown in Exhibit 11, *HHC Groundwater Monitoring Well Network*. Exhibit 11A lists the current set of remediation monitoring wells.

Prior to collecting groundwater samples from the remediation network, static water levels are measured in all remediation system monitoring and extraction wells, and selected other wells and piezometers near the remediation system using an electric well sounder. Following the collection of water level data, the extraction, monitoring, and domestic wells are sampled for VOCs. The monitoring and domestic wells are initially purged of stagnant well bore water before collecting the VOC samples. The extraction wells operate continuously, thus do not require purging before sampling. Sample and laboratory analytical procedures are those stipulated in the Environmental Protection Agency (EPA) Test Methods Manual SW-846. All samples are unfiltered.

A field logbook is maintained during each monitoring event. The logbook provides a description of all field activities, including weather observations, field conditions, water level measurements, field parameter measurements, purge volumes, sample identification and methodology, sample depth and appearance, date and time of sample collection, decontamination procedures, and general field comments and observations.





- TOPSOIL STOCKPILE

- RADIO TOWER

Exhibit 12 NRC GROUNDWATER MONITORING WELL NETWORK Ada County Landfill

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LEGEND

PIEZOMETER VAPOR MONITORING WELL

--- PHASE I UNDERDRAIN - PHASE II UNDERDRAIN

GROUNDWATER DETECTION MONITORING WELL



Exhibit 12A NRC Monitoring Program Summary

	Location			
Well	Relative to	Sampling	Analytes	
ID	the NRC	Frequency'	Sampled ²	Monitoring Purpose
NRC Groun	dwater Detection N	Ionitoring Wells		
MW-101	Upgradient	semi-annual	Appendix I: VOC, metals	NRC upgradient, background water quality well
MW-102	Upgradient	semi-annual	Appendix I: VOC, metals	NRC upgradient, background water quality well
MW-103	Upgradient	semi-annual	Appendix I: VOC, metals	NRC upgradient, background water quality well
MW-104 ³	Downgradient	semi-annual	Appendix I: VOC, metals	Downgradient point of compliance well
MW-105	Downgradient	semi-annual	Appendix I: VOC, metals	Downgradient point of compliance well
MW-106	Downgradient	semi-annual	Appendix I: VOC, metals	Downgradient point of compliance well
MW-107A	Downgradient	semi-annual	Appendix I: VOC, metals	Downgradient point of compliance well
MW-108	Downgradient	semi-annual	Appendix I: VOC, metals	Downgradient point of compliance well
MW-109	Downgradient	semi-annual	Appendix I: VOC, metals	Downgradient point of compliance well
MW-110 ^{3,4}	Downgradient	semi-annual	Appendix I: VOC, metals	Downgradient point of compliance well
MW-111 ^{3,4}	Downgradient	semi-annual	Appendix I: VOC, metals	Downgradient point of compliance well
MW-112 ^{3,4}	Downgradient	semi-annual	Appendix I: VOC, metals	Downgradient point of compliance well
NRC Piezon	neters			
P-1	Upgradient	semi-annual	None	Water level monitoring
P-2	Upgradient	semi-annual	None	Water level monitoring
P-3 ⁵	Downgradient	semi-annual	None	Water level monitoring
P-5	Downgradient	semi-annual	None	Water level monitoring
P-6	Downgradient	semi-annual	None	Water level monitoring
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¹Semi-annual sampling frequency - Appendix I compounds are sampled every year in April and October.

²Appendix II compounds will be sampled on an approved schedule if downgradient detection wells show increase.

³Wells MW-104, -110, -111, -112, and P-3 are point-of-compliance wells that are currently downgradient of undisturbed portions of the NRC. Therefore, until the NRC is expanded to include these wells, these wells represent background conditions at the NRC.

⁴Wells MW-110, -111, and -112 are are directly upgradient of the HHC and are currently downgradient of undisturbed portions of the NRC. Therefore, until the NRC is expanded to include these wells, these wells are potential upgradient/background wells for the HHC and may be subject to Appendix II monitoring if HHC data warrant the additional background samples.

⁵P-3 is a piezometer that is sampled for Appendix I compounds in-lieu of MW-104 when MW-104 is dry.

3.5.2.3.4 Groundwater Monitoring Reporting

Prior to October 2010, separate reports were prepared for each semi-annual detection/assessment monitoring event at the HHC and NRC and each quarterly Monitoring event for the remediation system. Since October 2010, at DEQ's request, the semi-annual detection/assessment and remediation monitoring event reporting for the HHC and NRC are consolidated into a single report. Each report documents sampling and analysis procedures and data, and presents an analysis of the field data and laboratory results. The report includes the following:

- A summary of the field data log
- The results of the laboratory analyses
- Comparison of current and previous Appendix I/II data
- Evaluation of QA/QC sample results
- Statistical comparison of detectable Appendix I/II concentration to background
- Water level and groundwater flow direction results
- Summary of remediation system operations
- Hydrographs for key monitoring wells
- Conclusions
- Recommendations

The reports are submitted to the DEQ and are added to the onsite Ada County Operating Record.

3.6 Ambient Air Quality

3.6.1 Applicable Regulations

Title 39, Health and Safety; Chapter 74, Idaho Solid Waste Facilities Act. 39-7412. Standards for Operation.

Owners or operators of all MSWLF units shall:

- (4) Implement a program of routine methane monitoring and control as provided in 40 CFR 258.23;
- (5) Ensure that MSWLF units do not violate any ambient air quality standard or emission standard from any emission of landfill gases, combustion or any other emission associated with a MSWLF unit as provided in 40 CFR 258.24

Title 40: Protection of Environment; Part 258—Criteria for Municipal Solid Waste Landfills, Subpart C— Operating Criteria. § 258.24 Air criteria.

- (a) Owners or operators of all MSWLFs must ensure that the units not violate any applicable requirements developed under a State Implementation Plan (SIP) approved or promulgated by the Administrator pursuant to section 110 of the Clean Air Act, as amended.
- (b) Open burning of solid waste, except for the infrequent burning of agricultural wastes, silvicultural wastes, landclearing debris, diseased trees, or debris from emergency cleanup operations, is prohibited at all MSWLF units.

3.6.2 How Ada County Landfill Fulfills Requirements

3.6.2.1 Background

Ada County Landfill air pollutant emissions are regulated and controlled under a Title V Air Permit administered by DEQ. The Landfill's air emissions program includes routine methane monitoring and control as required per 40 CFR Subpart WWW and 40 CFR 258.23, and ensures that the Landfill complies with applicable ambient air quality standards or emission standards from any emission of landfill gases, combustion or any other emissions associated with a MSWLF unit as provided in 40 CFR 258.24.

In addition to the Title V Air Permit, Ada County Landfill is subject to the mandatory reporting requirement under the new federal Green House Gas rule. The new federal rule is referenced as 40 CFR Part 98 – Mandatory Greenhouse Gas (GHG) Reporting. According to the General Provision requirements in Subpart A per 98.2, a municipal solid waste landfill must report if the landfill generates methane (CH₄) in amounts equivalent to 25,000 metric tons of carbon dioxide equivalent (CO_{2e}) or more per year. A GHG emissions calculation was prepared for the ACLF based on landfill gas measured and collected at the Flares. The ACLF exceeds the 25,000 metric ton CO_{2e} per year requirement; therefore, ACLF is subject to the GHG Reporting requirements in accordance with Subpart HH –Municipal Solid Waste Landfills.

A GHG annual report will be prepared for data collected for each calendar year starting in 2010. ACLF must report methane generation, methane emissions, and methane destruction resulting from landfill gas collection and combustion. In addition, ACLF must report carbon dioxide, methane, and nitrogen oxide emissions from operation of the wood chipping diesel engines using the calculation methods specified in 40 CFR 98 Subpart C – General Stationary Combustion Sources.

3.6.2.2 Regulated Criteria Pollutant and Air Toxic Emissions Sources

Landfill air pollutant emission sources that are regulated by state and federal standards are as follows:

- Two MSW landfill cells (HHC and NRC) equipped with landfill gas extraction system to control fugitive landfill gas emissions.
- Two enclosed landfill gas flares that combust landfill gas collected from the current Landfill. The landfill gas collection and piping network will be expanded to the new NRC as needed.
- Fugitive dust emissions created from a number of sources: paved and unpaved roads, Landfill equipment, wood chipper and power screen operations, and storage piles.

The Landfill air pollutant emission sources are regulated under a state Title V Operating Permit that ensures that ambient air quality standards and emission standards are achieved. Landfill pollutant emission sources and the air permit program are summarized below. The completed permits and compliance data is included in the Operating Record.3.6.2.2.1 Landfill Gas and the Gas Flare System

Landfill Gas Generation

The decomposition of organic material in the municipal solid waste produces landfill gas. Landfill gas is gas produced in MSW landfills. Landfill gas is typically a mixture of approximately 50 percent methane and 50 percent carbon dioxide by volume, with trace quantities of other compounds. Although extracted landfill gas is comprised of over 99.8 percent methane, carbon dioxide, and air, it contains other gases produced from biodegradation and from products included in the waste stream. For example, it contains traces of odorous gases (hydrogen sulfide and sulfurous organic gases) and some hazardous constituents (solvents and petroleum products contained in house hold wastes). Some of the petroleum-based gas constituents are classified as smog-creating hydrocarbons. The methane in landfill gas is classified as a greenhouse gas. Landfills continue to generate landfill gas long after the landfill has been closed.

Landfill Gas Collection and Control

To control regulated criteria pollutant and air toxic emissions, greenhouse gas emissions, odorous constituents, hazardous and smog producing hydrocarbon gases, the landfill gases are collected using a combination of gas collection wells and horizontal collectors installed within the Landfill (see Exhibit 13, *Landfill Gas Collection Master Plan*). The collected gases are treated to remove excess hydrogen sulfide in a gas scrubber system and are then destroyed by burning them in an enclosed flare



combustor. The combustion system consists of two identical John Zink smokeless flares (Flare 1 and Flare 2) and associated flow control and monitoring devices. The existing system is designed to accommodate LFG flows with a design capacity of up to 4,699 scfm (see Exhibit 14, *Gas Controls System Diagram*). A Permit-to-Construct Permit modification

(PTC No. P-2009.0001 Project 61360) was issued to the ACLF on April 15, 2015 for the consolidation of operations between Ada County Landfill and Hidden Hollow Energy, LLC. This permit modification allows for:

- 1. The flow rates of LFG for combustion in Flare 1 to be a maximum of 2,320 scfm and Flare 2 may combust up to 2,379 scfm of LFG while remaining within the operational controls set by the Title V Operating Permit. The Permit requires the hydrogen sulfide gas in the combusted LFG to be below 600 ppm. The overall destruction efficiency of the landfill gas control system is designed to perform at 98 percent at minimum combustion temperatures of 1,456 and 1,448 degrees Fahrenheit for Flare 1 and Flare 2, respectively. The system is designed to operate 24 hours per day, 7 days per week, with shutdown and startup only occurring during maintenance activities.
- 2. In addition to destruction in control devices Flare 1 and Flare 2, landfill gas is used as fuel and combusted in two 1.6MW electrical generators powered by piston type Caterpillar engines. Hidden Hollow Energy, LLC, (HHE) owns and operates the generation plant.

The future fill plans for the HHC and NRC include installation of horizontal collectors as the Landfill fill is placed, and provisions for future vertical extraction wells after Landfill areas are filled to their final finished grades. Perimeter gas extraction wells are installed along all but the west perimeter of the HHC to control subsurface gas migration. Horizontal gas collectors are being installed in conjunction with the placement of lifts of waste over the remaining Landfill area until final grades are achieved (Exhibit 15, *Hidden Hollow Cell Landfill Gas Collection Plan* and Exhibit 16, *North Ravine Cell Landfill Gas Collection Plan*).










Deep vertical landfill gas extraction wells will be installed to provide for added gas collection and control within the deep interior of the HHC. The landfill gas extraction wells will be installed when the Landfill surface is filled to final grade at the planned well locations.

One or more horizontal collector lines will be connected with subheader piping to a monitoring station where gas is monitored and flow can be adjusted with a valve. Each main subheader connects to the main landfill gas collection header located around the Landfill perimeter. The installed systems will be documented in the Landfill Operating Record.

Landfill Gas to Energy System

A private company, Fortistar Methane Group (Fortistar), White Plains, New York (aka Hidden Hollow Energy, LLC), currently under a separate DEQ Permit to Construct (PTC No P-2009.0098), owns and operates a landfill gas-to-electrical energy system on leased land adjacent to the flare system. This system draws landfill gas from the header pipe feeding the flares and uses the gas in two 2,233 horsepower (1.6MW) Caterpillar G3520 piston engines/generators to produce electrical power. Operation of this system is integrated with the flare and landfill gas collection system operations. Fortistar has expressed interest in expanding the gas to energy system in the future to include two additional engines/generators.

3.6.2.2.2 Wood Chipper

To help reduce the amount of MSW entering the Landfill cell, the Landfill began separating wood waste material (yard wood waste, Christmas trees, stumps/trees, and construction waste lumber etc.). The incoming wood waste stream is handled separately from MSW, and loads are stockpiled in a designated area. Two transfer point emission sources are associated with wood recycling.

3.6.2.2.3 Fugitive Dust

Fugitive Dust from Storage Piles

Woodwaste passes through the chipper and is conveyed to nearby storage pile or is directly loaded onto haul trucks. Storage piles resulting from the chipping process are a source of fugitive dust.

Fugitive Dust from Paved and Unpaved Roads

The roads (both paved and unpaved) within the Landfill generate fugitive dust. Traffic entering and exiting the Landfill access the site from Seamans Gulch Road. A variety of vehicles commonly enter the site and range from personal automobiles to waste sanitation trucks. The three destination points within the Landfill are as follows:

- The main Landfill office located north of the gatehouse can be accessed only by paved roads for Landfill customers.
- Customers accessing the household hazardous waste facility located within the Landfill remain on paved roads and a paved parking lot.

• Customers destined for the HHC or the NRC both use paved and unpaved haul roads. Unpaved haul roads will be maintained within the cells because of the frequent changing of the active portion of the Landfill. Paved haul roads will be maintained from the edge of the two Landfill cells to the Landfill entrance/exit off Seamans Gulch Road.

Emissions from unpaved roads are controlled through surface treatment by wetting the surface. Water helps bind dust particles together, which makes them less likely to become airborne when vehicular traffic passes. The effectiveness of treating the surface depends on the time it takes for the road to dry, which depends on the frequency of water application, amount of water applied, vehicular traffic, and evaporation.

Fugitive Dust from Landfill Operations

Landfill Operations include dozing and grading activities for compressing MSW and applying daily cover. Emission calculations are based on the fugitive dust generated from moving topsoil or other earthen materials during daily operations.

3.6.3 Air Permit Compliance Plan

The Landfill's plan to comply with the air permit and to properly control air pollutant emissions is summarized below.

EXHIBIT 18

HHC and NRC Landfill G	is Collection and Conti	ol Compliance Certification	During Permit Term

Fmissions		Proposed Compliance		Frequency of	
Unit	Citation	Applicable Requirements	Demonstration Method	Certification	
HHC and NRC Landfill Gas Collection and Control	PTC Condition 7	Landfill Gas Stream Hydrogen Sulfide (H ₂ S) Limit. The H ₂ S concentration of the landfill gas being combusted in the flares shall not exceed 600 ppm.	PTC Condition 16 establishes a monitoring that is tiered based on measured concentrations. Per PTC Condition 15, the H_2S concentration shall be measured in ppmv of total collected LFG going to the flares. Three separate measurements shall be collected and averaged to determine the H_2S concentration. Per PTC Condition 17, records shall include all monitored values and the calculated average. The monitor used shall have a certified accuracy of +/- 10%.		
HHC and NRC Landfill Gas Collection and Control	PTC Condition 8and IDAPA 58.01.01.625	Visible Emissions Limit. Shall not exceed 20% opacity for more than 3 minutes in any 60 minute period unless 20% opacity is exceeded because of the presence of uncombined water, nitrogen oxides, and/or chlorine gas.	Per Permit Condition 13, landfill staff perform a see/no see evaluation for each flare of visible emissions. If visible emissions are observed from any flare, a Method 9 opacity test will be performed by the procedures contained in Rule 625.	Quarterly	
HHC and NRC Landfill Gas Collection and Control	PTC Condition 9and IDAPA 58.01.01.786	Particulate Matter Emissions Limit for Incinerators. PM emissions from each of the flares shall not exceed 0.2 pounds per 100 pounds of landfill gas combusted.	Demonstrated compliance with this requirement in previous PTC application submittal to DEQ.	Condition met	
HHC and NRC Landfill Gas Collection and Control	Permit Condition 10and IDAPA 58.01.01.776	Control of Odors – from Flares. No person shall allow, suffer, cause or permit the emission of odorous gases, liquids or solids into the atmosphere in such quantities as to cause air pollution.	The Landfill controls odor by collecting landfill gas and combusting through the enclosed flares. Per Permit Condition 14, the Landfill must maintain records of all odor complaints received (date, description, and validity) and take appropriate corrective action as necessary and date action was taken.	Per odor complaint received	
HHC and NRC Landfill Gas Collection and Control	PTC Condition 55 and IDAPA 58.01.01.130- 136	Excess Emissions . The permittee shall comply with the procedures and requirements of IDAPA 58.01.01.130 – 136 for excess emissions because of startup, shutdown, scheduled maintenance, safety measures, upsets and breakdowns.	Landfill will document and submit excess emission events for the landfill gas control system according to the procedures and requirements Rules 130 – 136.	Per excess emissions event	

EXHIBIT 19

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Emissions Unit	Citation	Applicable Requirements	Proposed Compliance Demonstration Method	Frequency of Certification
HHC and NRC Landfill Gas Collection and Control	PTC Condition 11	Operations and Maintenance Manual. Within 60 days after startup of landfill gas flares, the permittee shall have developed an O&M manual for the landfill gas flares, which describes the procedures that will be followed to comply with General Provision 2 and the manufacturer specifications for the flares. This manual shall remain onsite at all times and shall be made available to DEQ representatives upon request. Within 30 days of O&M manual development the permittee shall submit a copy of the manual to DEQ.	The landfill gas O&M manual is located at the Landfill and is available upon request.	Condition met
HHC and NRC Landfill Gas Collection and Control	PTC Condition 12	LFG Control System. The landfill gas flares shall not exceed the following limits:	The landfill continuously monitors the LFG flow to the flares and the exhaust gas temperature to ensure the flares are being operated within the ranges set forth by the PTC and manufacturer recommendations.	Continuous
HHC and NRC Landfill Gas Collection and Control	PTC Condition 18	Landfill Gas Flowrate Monitoring. The Landfill Gas flowrate shall be monitored and recorded at the same schedule used for the H ₂ S monitoring and recordkeeping to demonstrate compliance with LFG Control System Permit Conditions.	Follow Permit Condition 16 which establishes a monitoring schedule for H ₂ S.	Continuous
HHC and NRC Landfill Gas Collection and Control	PTC Condition 52, IDAPA 58.01.01.157, and 40 CFR 756-757	Performance Test of Landfill Gas Control System. Establish procedures and requirements for test methods and results.	An initial performance test was conducted on March 14 and 15, 2007.	Condition met
HHC and NRC Landfill Gas Collection and Control	PTC Condition 19 and IDAPA 58.01.01.859	Reporting Requirements. The permittee shall submit an annual NMOC report until nonmethane emissions are less than 50 megagrams per year in accordance with IDAPA 58.01.01.859.05.a.ii. The report shall be submitted to DEQ by September 30 each year.	Landfill will prepare and submit an annual NMOC report to DEQ by September 30 each year until the NMOC results are less than 50 megagrams per year.	Annually – by September 30 each year

Emissions Unit	Citation	Applicable Requirements	Proposed Compliance Demonstration Method	Frequency of Certification
HHC and NRC Landfill Gas Collection and Control	PTC Condition 29 through 37	How is compliance determined? (40 CFR 63 Subpart WWW)	The Landfill is required to demonstrate compliance with 40 CFR 60, Subpart WWW.	Required to be in full compliance with this provision by April 28, 2007.
HHC and NRC Landfill Gas Collection and Control	PTC Condition 38 through 44	What records and reports must I keep and submit? (40 CFR 63 Subpart AAAA)	A semiannual report will be prepared and submitted to DEQ every six months to comply with the requirements of 40 CFR Subpart WWW. The semiannual reporting period shall be from October 01 to March 31. The annual reporting period shall be from October 01 to September 30.	Submit semiannual report by April 30 each year for reporting period October 01 to March 31. Submit annual report within 30 days after reporting period of October 01 to September 30.

EXHIBIT 20

HC and NRC Landfill G	Gas Collection and	Control Compliance	Certification Durin	g Permit Term

3.7 Control of Public Access

3.7.1 Applicable Regulations

Title 39, Health and Safety; Chapter 74, Idaho Solid Waste Facilities Act. 39-7412. Standards for Operation.

Owners or operators of all MSWLF units shall:

(6) Provide and control access as provided in 40 CFR 258.25;

Title 40: Protection of Environment; Part 258—Criteria for Municipal Solid Waste Landfills, Subpart C— Operating Criteria. § 258.25 Access requirements.

Owners or operators of all MSWLF units must control public access and prevent unauthorized vehicular traffic and illegal dumping of wastes by using artificial barriers, natural barriers, or both, as appropriate to protect human health and the environment.

3.7.2 How Ada County Landfill Fulfills Requirements

Public access to the Landfill is controlled to prevent illegal dumping, limit public exposure to hazards at the Landfill site, and prevent unauthorized vehicular traffic in accordance with Idaho statute 39-7412(6) and federal regulations at 40 CFR 258.25. Public access to the Landfill is allowed through a gate at the main entrance where operating hours are clearly posted. People bringing refuse to the Landfill are required to stop at the entrance scales by security gate arms. The old main entrance to the Landfill is gated and locked shut. The entire Ada County Landfill property is enclosed by three-strand barbed wire fence. Locked gates are provided at all supplemental Landfill maintenance/access unpaved road entrances at the

perimeter. Permanent "No Trespassing" signs are posted on the perimeter fences and gates. Additional fencing is located within the interior of the Landfill property at strategic locations to further prevent access to the active Landfill areas. Locked gates are provided where the interior fencing crosses unpaved Landfill maintenance/access roads. Additional permanent "No Trespassing" signs are posted at strategic locations along the interior fencing and gates.



3.7.3 Salvaging—Scavenging

To promote human health and safety, salvaging and scavenging are prohibited at the Ada County Landfill. Waste material deposited at the landfill working face is for final disposal.

The Solid Waste Management supports and encourages recycling, particularly wood waste. At the Hidden Hollow Sanitary Landfill, Ada County has a wood waste recycling program. To support the wood recycling program, partial loads of wood waste are allowed to be unloaded in the wood recycling area prior to, or after, unloading other waste materials at the active landfill working face. To encourage total consumption of certain household hazardous materials, Ada County's Household Hazardous Materials Collection Program offers a Material ReUse Exchange Program. Because this program uses material that is not waste, the program is exempt from the prohibition of salvaging and scavenging. Household hazardous materials that are collected by the program, and that are still in the original manufacturer's containers, are sorted and stored for reuse by other patrons who can use the materials for their intended purposes. The Material ReUse Exchange Program is located in Ada County's Household Hazardous Materials Collection Facility.

3.8 Storm Water Control

3.8.1 Applicable Regulations

Title 39, Health and Safety; Chapter 74, Idaho Solid Waste Facilities Act. 39-7412. Standards for Operation.

Owners or operators of all MSWLF units shall:

- (7) Design, construct and maintain a run-on/run-off control system as provided in 40 CFR 258.26 to:
 - (a) Prevent all the run-on of surface waters and other liquids resulting from a maximum flow of a twenty-five
 (25) year storm, or snowmelt into the active portion of the MSWLF unit;
 - (b) Control the collection of the run-off of surface waters and other liquids resulting from a twenty-four (24) hour, twenty-five (25) year storm, or snowmelt, whichever is greater, from the active portion and the closed portions of a MSWLF unit; and
 - (c) Prevent the discharge of pollutants into waters of the United States and the state of Idaho as defined in 40 CFR 258.27;

Title 40: Protection of Environment; Part 258—Criteria for Municipal Solid Waste Landfills, Subpart C— Operating Criteria. § 258.26 Run-on/run-off control systems.

- (a) Owners or operators of all MSWLF units must design, construct, and maintain:
 - (1) A run-on control system to prevent flow onto the active portion of the landfill during the peak discharge from a 25-year storm;
 - (2) A run-off control system from the active portion of the landfill to collect and control at least the water volume resulting from a 24-hour, 25-year storm.
- (b) Run-off from the active portion of the landfill unit must be handled in accordance with §258.27(a) of this part.

§ 258.27 Surface water requirements.

MSWLF units shall not:

- (a) Cause a discharge of pollutants into waters of the United States, including wetlands, that violates any requirements of the Clean Water Act, including, but not limited to, the National Pollutant Discharge Elimination System (NPDES) requirements, pursuant to section 402.
- (b) Cause the discharge of a nonpoint source of pollution to waters of the United States, including wetlands, that violates any requirement of an area-wide or State-wide water quality management plan that has been approved under section 208 or 319 of the Clean Water Act, as amended.

3.8.2 How Ada County Landfill Fulfills Requirements

This section addresses management of all storm water run-off and run-on associated with the HHLF and NRC Landfill cells and its operation areas within the Ada County Landfill property boundaries. The presentation is organized into the HHC and NRC plans. The *Master Drainage Plan* is presented in Exhibit 21. Stormwater and erosion control details are included in Appendix 2, *Ada County Landfill Standard Details*.

3.8.2.1 HHC Storm Water Management Plan

The storm water management plan, components, and features for the HHC are as follows:

• Storm water is defined as surface runoff resulting from precipitation.

- Landfill storm water runoff from the HHC daily, interim, and final cover areas is collected in a concrete channel at the perimeter of the landfill and flows into a 20-acrefoot storm water pond. Collected storm water in the pond is lost by evaporation and infiltration, typically within a period of several days. The pond is generally dry.
- Storm water runoff in operations support areas is contained within the areas by grading. Contained water is lost by evaporation and infiltration.
- Storm water runoff from soil borrow areas is contained within the borrow areas by grading. Contained water is lost by evaporation and infiltration.
- Grading adjacent areas to slope away from the cell prevents storm water run-on to the Landfill.
- Storm water runoff in areas of Ada County property outside the Landfill operations area follow natural drainage patterns.
- Approximately 60 acre-feet of stormwater storage is available for the HHC.

3.8.2.2 NRC Storm Water Management

The storm water management plan for the NRC is based on proven storm water management practices and designs developed and implemented over the 30-year history of the HHC operations. The storm water management plan, components, and features for the NRC are as follows:

 Landfill storm water runoff from NRC's daily, interim, and final cover areas is collected in a diversion ditch and routed to the storm water pond or diverted by site grading to an adjacent operations support area. Berms, ditches, and other runoff control measures are used. Water is lost by

evaporation and infiltration.

 Containment of storm water on the open face is provided by a soil berm at the slope toe of the open face area/daily cover area. The berm is sufficiently high to contain potential storm water runoff at the slope toe.
 Contained runoff is incorporated into the Landfill by infiltration



and encapsulation by the advancing fill face. These operational procedures contain storm water that will ultimately be managed as leachate. When filling operations move to another area of the Landfill, the Landfill open face is covered with an 18-inch-thick intermediate cover soil layer.

• Storm water runoff in operations support areas outside of the lined cell is contained within those operations support areas by the grading design. Water is lost by evaporation and infiltration.

- Drainage basin storm water (runoff from the NRC site areas not yet lined) is storm water that never is exposed to waste, daily cover, or interim cover. The drainage basin storm water is collected in a diversion ditch and routed to the storm water pond. Water is lost by evaporation and infiltration.
- Approximately 27 acre-feet of stormwater storage is available for the NRC.



OP EXHIBIT 21.dgn



DRAINAGE SUB-BASIN (DB-X)	AREA (ACRES)	CONTAINMENT REQUIRED (ACRE-FEET)	DRAINAGE SUB-BASIN CONTAINMENT SURFACE AREA (ACRES)	CONTAINMENT DEPTH (FT)	CONTAINMENT STORAGE (ACRE-FEET)	SAFETY FACTOR
А	57	2.3	3	7	21	9
В	26	1.0	0.4	15	6	6
С	158	6.3	42	1	42	7
D	15	0.6	7	0.5	3.5	6
Е	10	0.4	3	0.5	1.5	4
F	17	0.7	1	7	20	10
G	40	1.6	1	10	20	6
н	54	2.2	3	6	60	8
I	113	4.5	2	10	60	4
J	109	4.4	1.6	12	19	4.4

NOTE: CONTAINMENT REQUIRED BASED ON 25-YEAR, 24-HOUR STORM EVENT OF 2.4 INCHES (FIGURE 28, NOAA ATLAS 2, VOLUME V), STORMWATER RUNOFF BASED ON A CONSERVATIVE RUNOFF COEFFICIENT OF 0.2 FOR STEEP SANDY SOIL (RECOMMENDED "C" COEFFICIENTS FOR "RATIONAL METHOD EQUATION" PEAK RATE OF DISCHARGE; EXHIBIT A, ACHD POLICY MANUAL).

Exhibit 21 MASTER DRAINAGE PLAN

Ada County Landfill



- The upstream reach of the Goose Creek drainage basin is delineated by the ridge line divide on the north, east, and south sides of the NRC site. The drainage basin extends west of the NRC site to the base of the foothills that border State Highway 55 (SH-55) and Old Horseshoe Bend Road. The highway embankment contains the Goose Creek drainage. Storm water runoff from the drainage basin infiltrates into the alluvium in the side ravines and on the valley floor before reaching the highway embankment. No culvert exists beneath SH-55 or Old Horseshoe Bend Road to carry surface flows from Goose Creek drainage to the west into Dry Creek. The NRC storm water system manages runoff to prevent increasing flows to the lower reaches of the drainage that could result in flooding.
- Storm water run-on (runoff from upstream areas flowing onto the NRC site) is prevented by grading adjacent areas to slope away from the NRC into contained areas for evaporation and infiltration.
- Storm water runoff in areas of Ada County property adjacent to and downstream of the NRC site follows natural drainage patterns and evaporates and infiltrates before leaving the property.

3.8.2.2.1 Drainage Basin Storm Water

Drainage basin storm water is storm water runoff from the NRC site drainage basin that has not been impacted by waste management activities. Diversion of drainage basin storm water runoff with berms and channels is required throughout all stages of active Landfill operations to prevent potential storm water run-on to lined cell areas.

The initial area of liner construction is located in the southwest corner of the NRC site. Future areas (stages) of liner construction will progress counterclockwise and up the side slopes within the NRC footprint.

Storm water runoff diversion facilities within the NRC site drainage basin are designed to prevent storm water from running onto the lined cell area. Drainage basin storm water is collected in ditches that divert storm water around the NRC lined cell area. The diversion design will be updated as required to accommodate future stages of liner construction and waste placement. The run-on control facilities for basin storm water runoff are designed for a minimum 25-year, 24-hour precipitation event, in accordance with the requirements of 40 CFR Part 258.26.

Drainage basin storm water is collected in a channel running from east to west down the northern side of Stage 1. Temporary drainage channels and berms are constructed on the upstream side(s) of the lined cell areas to divert storm water runoff to the drainage channel. The drainage channel transitions to a culvert under the west berm. On the downstream side of the west berm, the culvert pipe transitions back to a channel that drains into the storm water pond. Storm water runoff is lost through evaporation and infiltration in the alluvial soils under the storm water pond (see Exhibit 21, *Master Drainage Plan*).

As future cell liner stages are constructed, an increasing portion of the drainage basin area will become part of the lined Landfill and the operations support areas, with a corresponding decrease in the drainage basin storm water being collected in the drainage channel. When construction of the last stage of lined cell floor is completed (in the northwest corner), no drainage basin area flow will remain. The drainage channel will be

removed during the progressive stages of cell floor liner construction. The culvert pipe under the west berm will be plugged, abandoned in place, and covered with liner. A portion of the culvert pipe at the inlet will be removed to prevent possible stress on the cell lining system.

3.8.2.2.2 Landfill Storm Water

Landfill storm water runoff from daily and interim cover areas of the NRC drains respectively to either adjacent Landfill operations support areas where it is impounded on a filling deck, or the storm water pond. Runoff to the storm water pond includes precipitation that percolates into the leachate collection system within lined areas prior to waste placement. It is prevented from mixing with leachate and is diverted into the landfill storm water system. The temporary diversions are removed prior to waste placement beyond the diversion piping.

Landfill operations include construction of diversion berms to prevent runoff from active, exposed waste placement areas from entering the landfill storm water system or storm water pond. Precipitation onto active, exposed waste infiltrates and enters the leachate collection system.

During wet weather periods a soil berm is graded around the active filling Landfill face to contain potential runoff and incorporate it into the waste fill as the working face advances. Additionally, making a final pass over the daily cover with a toothed-wheel compactor enhances the infiltration of storm water. The compactor leaves a waffle pattern on the surface of the cover that enhances infiltration. This infiltrated storm water from the working face ultimately gets managed as leachate.

Landfill surfaces that are below the NRC 100 foot berm road and covered with daily or interim cover will be sloped to the landfill storm water channel located along the east-west cell axis. The landfill storm water channel will be extended (or removed) in stages with the liner construction. The landfill storm water channel transitions to a culvert pipe that runs below the west berm and adjacent to the drainage basin storm water culvert. On the downgradient (west) side of the berm the culvert will transition back to a channel that routes flow to the storm water pond.

Landfill surfaces that are above the NRC 100 foot berm road and covered with daily or interim cover will be graded away from the Landfill to adjacent operations support areas for evaporation and infiltration.

The maximum surface area that will drain to the landfill storm water channel is approximately 75 acres. A 25-acre contingency will be added to account for variations in actual fill placement and area draining to the landfill storm water channel. Therefore, the design of the landfill storm water channel, culvert, and storm water pond is based on a 100-acre drainage area.

The landfill storm water culvert pipe under the west landfill soil berm is oversized to pass debris. The culvert is approximately 36 inches in diameter. The landfill storm water culvert alignment runs approximately parallel to the alignment of the drainage basin storm water culvert described previously.

The storm water pond has a natural sandy soil bottom to promote infiltration and is almost identical in capacity and design to the design of the HHC storm water pond.

The NRC storm water pond has an overflow spillway to protect pond integrity. The spillway is an outlet set lower than the pond containment elevation. The spillway discharges to the drainage basin storm water channel that carries flow to the constructed drainage infiltration areas west of the pond.

The NRC storm water pond design capacity is based on 2 inches of total runoff from 100 acres. This exceeds the minimum required capacity for a 25-year, 24-hour rainfall event. Based on the 25-year, 24-hour criteria, the runoff volume is 6 acre-feet, significantly less than the 20 acre-feet design capacity provided.

3.8.2.2.3 Full Landfill Build-Out

Following completion of the NRC cell liner and starting with placement of fill above the 100 foot berm road, landfill storm water runoff will be graded to adjacent operations support areas. The western slopes of the cell will be graded to the storm water pond. This final storm water management design will be retained through full build-out elevations, and thereafter for post-closure. Berms, ditches, and other control features will be designed to control storm water runoff within the lined NRC limits and in the adjacent operations support areas. Runoff will be diverted away from monitoring installations such as wells, probes, etc.

The final storm water management plan is presented in Exhibit 21, *Master Drainage Plan*. The final NRC evapotranspiration (ET) cover will be divided into nine subbasins that will contribute storm water runoff to containment and storage areas in the adjacent operations support areas and the storm water pond. Exhibit 21, *Master Drainage Plan*, illustrates the approximate limits of the subbasin areas.

3.8.2.2.4 Design Capacities

The design capacities within the containment areas and the runoff within each subbasin are also shown. Runoff volumes are based on the 25-year, 24-hour rainfall event (2.4 inches), and an average runoff coefficient of 0.2, which represents the average runoff coefficient estimated for the subbasin areas. Operations areas and naturally vegetated areas that have high infiltration rates with very low runoff are assigned a runoff coefficient of 0.1. Areas such as temporary unpaved roads will have a higher runoff coefficient of 0.3 because of compaction of the soils. The overall average design coefficient of 0.2 is a reasonable, conservative assumption for the anticipated final conditions. The containment capacities of the operations areas and storm water pond carry safety factors that range from 4 to 10 (as listed in Exhibit 21, *Master Drainage Plan*), demonstrating that the design is conservative.

The storm water pond will retain 2 inches of precipitation runoff from the NRC daily cover and interim cover areas (an extreme event, such as rain on snow). This criterion is conservative compared to the regulatory 25-year, 24-hour storm criterion cited in 40 CFR 258.26. For comparison, 2 inches of runoff equates to applying a very conservative rational method runoff coefficient "C" of 0.83 to the 25-year, 24-hour rainfall of 2.4 inches. The daily cover and interim cover areas of the NRC will have a runoff coefficient much lower than 0.83.

3.8.2.2.5 NRC Storm Water Pond

The storm water pond is constructed primarily below grade by excavating below the existing ground surface. The pond has an emergency overflow spillway sized to pass the design flow through the pond and discharge into the natural Goose Creek dry drainage down gradient from the pond.

The pond bottom is native sand to promote infiltration of impounded water. Perforated piping below the pond bottom collects the sand filtered water and discharges it down gradient in the natural Goose Creek drainage. The natural Goose Creek drainage then flows into five consecutive infiltration areas where the stormwater is infiltrated into the soils or evaporated.

3.9 Leachate Management

3.9.1 Applicable Regulations

See regulations under Section 3.8, Storm Water Control.

3.9.2 How Ada County Landfill Fulfills all Requirements

3.9.2.1 Hidden Hollow Landfill Leachate Collection

The Hidden Hollow Landfill Cell is unlined; therefore, leachate is not collected.

3.9.2.2 NRC Leachate Collection

The leachate collection system for the NRC consists of cell floor and side slope components. On the cell floor, a 12-inch-thick gravel drainage layer with a network of leachate collector pipes configured in a grid pattern, routes leachate to central collection pipes positioned along the centerline drainage slope of the cell bottom (along the east-west axis). The cell floor slopes to the in-cell sump located on the northwest end of the cell floor. The liner sump contains submersible pumps and a piping system to convey leachate to the leachate evaporation pond. For the final stage of NRC build-out to the north of the sump, the interim sump configuration will be retrofitted by adding side slope riser pipes to house leachate pumps and discharge lines and to enable easy removal and reinsertion of the pump(s).

The leachate collection system drainage layer along the cell side slopes is a composite drainage net (CDN). Leachate from the CDN is transmitted down slope towards the toe collector where the leachate will be routed to the in-cell sump. CDN products are manufactured for landfill service and are designed for landfill loads, leachate flow, and resistance to clogging.

The leachate ponds are located in the Landfill's operations area and are managed by Ada County personnel. Ada County will control and monitor the area to limit public access to authorized areas only (as is the case at existing Landfill operations areas). Ada County will employ the measures necessary to prevent public access to all unauthorized areas of Landfill operations. Similarly, Ada County and its contractors are thoroughly experienced in controlling wildlife in Landfill operations areas and will employ the measures necessary to keep wildlife from the pond area if the need arises.

3.9.2.2.2 Sump/Pump Design

The leachate sump is located at the low point of the landfill cell where leachate drains by gravity from the collector pipes positioned along the floor of the cell. Construction of the bottom liner was begun in the southwest portion of the NRC and will proceed counterclockwise to the final stage of development in the northwest portion of the cell. To provide flexibility for future system design, the sump/pump system is constructed in two phases. An interim phase was installed as part of the Stage 1 development of the NRC and will be operable until Landfill development wraps around to the final cell floor area (northwest corner), which is projected to occur in the next 50 years. At that time, the final sump build-out will occur where the system will be retrofitted for waste filling over the top. An example design layout for the final build-out is presented in this section.

In the case of extreme conditions where leachate cannot be pumped to the ponds, additional temporary storage capacity in the sump area is provided. This storage capacity is provided by the lined temporary containment berm on the north side of the Stage 1 liner. Temporary storage provides time to deploy temporary pumps, emergency power, temporary pipeline, or other measures to mitigate pump failure or pipeline failure.



The leachate pump control building is located in the operations support area adjacent to the sump. The pump control building contains electrical equipment, pump controls, and leachate flow monitoring instrumentation. The leachate discharge line is routed up the west berm side slopes to the top perimeter road and to the leachate evaporation ponds. Piping is buried for freeze protection.

3.9.2.2.4 Leachate Evaporation Ponds Plan



The leachate evaporation ponds are referred to as the east and west leachate ponds. The ponds each have a capacity of 5.2 million gallons of leachate (see Exhibit 22, *Leachate Pond Storage Capacity*). The ponds have a perimeter berm system to provide a barrier against storm water run-on into the ponds.

The leachate is discharged into the ponds on concrete inlet structures with energy dissipater curbs arranged in a chevron configuration. The energy dissipaters prevent

erosion of the pond liner protection gravel layer and also provide some amount of aeration to the leachate as it enters the ponds.

EXHIBIT 22 Leachate Pond Storage Capacity



The bottom liner system for the leachate ponds is similar to the bottom liner system in the NRC and consists of the following material layers (in descending order):

- Operations layer consisting of 6 inches (minimum) of crushed rock
- Protective layer consisting of 18 inches of selected native sands
- 60-mil high-density polyethylene (HDPE) flexible membrane liner
- Geosynthetic clay liner (GCL)
- Prepared subgrade

3.9.2.2.5 Operations

A pressurized leachate pipe from the NRC sump/pump system is routed along the NRC perimeter road and directed into either the east pond or west pond. A valve station is placed at a tee to control leachate discharge into the ponds. The valves are also used to isolate the pipeline for static pressure leak testing. The discharge pipes enter the ponds above the highwater level and the leachate cascades down an energy dissipation inlet ramp.

Portable submersible pumps can be used for leachate transfer between the ponds for leachate management options. Leachate pond capacity is managed by evaporation and by trucking excess leachate for treatment at waste water treatment facilities.

In the future, Ada County plans to recirculate excess pond leachate back into the lined NRC once there is adequate waste in the NRC to support the added moisture. Recirculation will

be accomplished by installing infiltration drain lines in the fill lifts to inject the leachate. Recirculated leachate is absorbed into the waste and the moisture is consumed in the anaerobic waste degradation process. Excess leachate recirculates back through the leachate collection system where it is again added back to the filled waste infiltration piping. Prior to initiating recirculation of the leachate, a Research, Development and Demonstration Permit will be applied for through the Director as required in Title 39, Health and Safety; Chapter 74, Idaho Solid Waste Facilities Act. 39-7421, Research, Development and Demonstration Permits.

The NRC has a leachate collection and management system that will be operated during the post closure period. The leachate system operations during the post closure period will be the same as those presented in the operations plan for system operations during Landfill operations.

The leachate system includes the leachate pump station that pumps leachate from the lined landfill sump to the leachate evaporation lined pond where leachate is evaporated. The leachate pump station includes redundant backup pumps to provide continued pumping when a pump needs to be serviced. The pump station includes a control system that operates the pumps. The pumps can be manually operated when the controls require servicing. The pump station includes a connection to operate the pump station on a portable generator if a sustained power outage occurred. The pump station is designed to operate unattended, requiring only periodic inspection on a weekly basis.

Operation maintenance includes the following:

- Inspect leachate pumps for proper operations.
- Employ a mechanical services contractor to repair/replace valves, misc. piping components, remove/replace any non-operating pump.
- Employ an electrical services contractor to repair/replace any electrical or instrumentation component in need of service.
- Employ an electrical contractor to provide a portable electrical generator to power the pump station if needed.
- Inspect the pipeline using the pump pressure to provide static pressure record to look for a pressure drop that may indicate a pipeline leak. On a quarterly basis, isolate and pressurize the pipeline using the pump pressure to provide a pressurized static test that may indicate a leak. If a leak is indicated, employ a mechanical services contractor to identify the leak location and repair/replace the pipe.
- Inspect leachate evaporation pond, re-grade pond protective gravel surface to correct eroded spots, record leachate pond level monthly, and annually evaluate total leachate volume pumped and leachate pond level to ensure that pond capacity is sufficient to handle leachate generation.
- Record field inspections, repairs, and data and file in the Operating Record.

Data logs (Exhibits 23, 24, and 25) will be used to collect and analyze data, and will be included in the Operating Record.

EXHIBIT 23

LEACHATE OPERATING LOG Weekly Inspections

Weekly Inspections. (Week 1 thru 52) Initial next to the week number.

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52				

EXHIBIT 24

LEACHATE OPERATING LOG Monthly Inspections

Month/ Year	Inspector	Rainfall	Pond Depth #1	Pond Depth #2	PSI Constant	Total Pumped

Total pumped for the year._____

EXHIBIT 25

LEACHATE OPERATING LOG Quarterly Inspections Pressurized Static Test

Date of pressure test	Test performed by.	Pass / Fail / Comments

3.10 Liquid Waste Disposal Prohibitions

3.10.1 Applicable Regulations

Title 39, Health and Safety; Chapter 74, Idaho Solid Waste Facilities Act. 39-7412. Standards for Operation.

Owners or operators of all MSWLF units shall:

(8) Prohibit the disposal of noncontainerized liquids or sludges containing free liquids in MSWLF units except as provided in 40 CFR 258.28;

Title 40: Protection of Environment; Part 258—Criteria for Municipal Solid Waste Landfills, Subpart C— Operating Criteria. § 258.28 Liquids restrictions.

- (a) Bulk or noncontainerized liquid waste may not be placed in MSWLF units unless:
 - (1) The waste is household waste other than septic waste;
 - (2) The waste is leachate or gas condensate derived from the MSWLF unit and the MSWLF unit, whether it is a new or existing MSWLF, or lateral expansion, is designed with a composite liner and leachate collection system as described in §258.40(a)(2) of this part. The owner or operator must place the demonstration in the operating record and notify the State Director that it has been placed in the operating record; or
 - (3) The MSWLF unit is a Project XL MSWLF and meets the applicable requirements of §258.41. The owner or operator must place documentation of the landfill design in the operating record and notify the State Director that it has been placed in the operating record.
- (b) Containers holding liquid waste may not be placed in a MSWLF unit unless:
 - (1) The container is a small container similar in size to that normally found in household waste;
 - (2) The container is designed to hold liquids for use other than storage; or
 - (3) The waste is household waste.
- (c) For purposes of this section:
 - (1) Liquid waste means any waste material that is determined to contain "free liquids" as defined by Method 9095B (Paint Filter Liquids Test), included in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (EPA Publication SW–846) which is incorporated by reference. A suffix of "B" in the method number indicates revision two (the method has been revised twice). Method 9095B is dated November 2004. This incorporation by reference was approved by the Director of the Federal Register pursuant to 5 U.S.C. 552(a) and 1 CFR part 51. This material is incorporated as it exists on the date of approval and a notice of any change in this material will be published in the Federal Register. A copy may be inspected at the Library, U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., NW. (3403T), Washington, DC 20460, *libraryhq@epa.gov;* or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html*.
 - (2) Gas condensate means the liquid generated as a result of gas recovery process(es) at the MSWLF unit

3.10.2 How Ada County Landfill Fulfills Requirements

Disposal of bulk or non-containerized liquid wastes in the Landfill is prohibited except when the waste is household waste other than septic system waste.

Containers holding liquid waste are not placed in the Landfill unless: 1) the container is a small container similar in size to that normally found in household waste; or 2) the waste is a household waste (40 CFR 258.28). The restriction of bulk or non-containerized liquids is intended to control liquids that may become a source of leachate generation. Recyclable oil and paint are diverted to the Household Hazardous Material Facility.

Liquid waste refers to any waste material containing free liquids as defined by SW-846 Method 9095A-Paint Filter Liquids Test. The paint filter test requires placement of a 100-milliliter sample of waste in a conical, specified paint filter. The waste is classified as a liquid if any liquid passes through the filter during a 5-minute period. The apparatus for performing the paint filter test is illustrated in the referenced test method.

A common waste stream that may contain a significant percentage of liquid is sludge. Sludge is a mixture of water and solids that has been concentrated from and produced during operations such as: water and wastewater treatment; municipal services such as storm drain maintenance; or commercial or industrial operations. Non-hazardous sludge (except domestic sewage sludge) will be accepted for disposal if the waste passes the paint filter test.

3.11 Operating and Record Keeping Procedures

3.11.1 Applicable Regulations

Title 39, Health and Safety; Chapter 74, Idaho Solid Waste Facilities Act. 39-7412. Standards for Operation.

Owners or operators of all MSWLF units shall:

- (9) Establish an operating and recordkeeping procedure as provided in 40 CFR 258.29; and
- (10) Comply with operating procedures established by the board for implementation by the districts which are intended to assure operations which protect the public health and maintain the integrity of the landfill design.

Title 40: Protection of Environment; Part 258—Criteria for Municipal Solid Waste Landfills, Subpart C— Operating Criteria. 258.29 Recordkeeping requirements.

- (a) The owner or operator of a MSWLF unit must record and retain near the facility in an operating record or in an alternative location approved by the Director of an approved State the following information as it becomes available:
 - (1) Any location restriction demonstration required under subpart B of this part;
 - (2) Inspection records, training procedures, and notification procedures required in §258.20 of this part;
 - (3) Gas monitoring results from monitoring and any remediation plans required by §258.23 of this part;
 - (4) Any MSWLF unit design documentation for placement of leachate or gas condensate in a MSWLF unit as required under §258.28(a)(2) of this part;
 - (5) Any demonstration, certification, finding, monitoring, testing, or analytical data required by subpart E of this part;
 - (6) Closure and post-closure care plans and any monitoring, testing, or analytical data as required by §§258.60 and 258.61 of this part; and
 - (7) Any cost estimates and financial assurance documentation required by subpart G of this part.
 - (8) Any information demonstrating compliance with small community exemption as required by §258.1(f)(2).
- (b) The owner/operator must notify the State Director when the documents from paragraph (a) of this section have been placed or added to the operating record, and all information contained in the operating record must be furnished upon request to the State Director or be made available at all reasonable times for inspection by the State Director.
- (c) The Director of an approved State can set alternative schedules for recordkeeping and notification requirements as specified in paragraphs (a) and (b) of this section, except for the notification requirements in §258.10(b) and §258.55(g)(1)(iii).
- (d) The Director of an approved state program may receive electronic documents only if the state program includes the requirements of 40 CFR Part 3 (Electronic reporting).

3.11.2 How Ada County Landfill Fulfills Requirements

3.11.2.1 Introduction

A facility Operating Record comprised of notebooks and files is kept at the Landfill's main office, and is updated daily with pertinent information as required under Idaho statute and federal regulations. In accordance with the regulations, the Operating Record (files and notebooks) includes the following:

- Applicable location restriction demonstrations
- Inspection records, training procedures, and notification procedures associated with hazardous waste screening

- Gas monitoring results and any remediation plans
- Documentation for placement of any leachate or gas condensate (not applicable for this Landfill)
- Demonstration, certification, finding, monitoring, testing, or analytical data as required by groundwater monitoring (40 CFR 258 Subpart E)
- Closure and post-closure plans and financial assurance with any associated monitoring, testing, or analytical data
- Cost estimates and financial assurance documentation required by 40 CFR 258 Subpart G
- Small community exemption (not applicable for this Landfill)
- Compliance data regarding operating procedures established by the board and implemented by the Health Districts
- Daily weather monitoring data
- Total annual Landfill tonnage

A more detailed description of these records is provided below.

3.11.2.2 Location Restriction Demonstrations

Demonstrations are required for the applicable location restrictions under 40 CFR Subpart B and Idaho Administrative Code 39-7407. Location restrictions for MSW landfills include location criteria related to airports, floodplains, unstable areas, wetlands, residential, and similar facilities and areas. The Landfill complies with all location criteria, and DEQ approved the Site Certification Application.

3.11.2.3 Inspection Records, Training Procedures, and Notification Procedures

Inspection records, training records, and notification procedures are described in this plan and included in the Operating Record.

3.11.2.4 Gas Monitoring Results and Any Remediation Plans

In accordance with the Methane Monitoring and Control Program, detected methane gas levels are documented in the Operating Record. If mitigating steps need to be taken, the plan will be followed and response actions will be included in the Operating Record. To date, no mitigation measures have been required for compliance with 40 CFR §258.23.

3.11.2.5 Demonstration, Certification, Monitoring, Testing, or Analytical Finding Required by the Groundwater Criteria

The Landfill maintains complete groundwater documentation in the Operating Record. Documents associated with the following regulatory criteria applicable to the Landfill's groundwater program are included:

• Documentation of design, installation, development, and decommissioning of any monitoring wells, piezometers, and other measurement, sampling, and analytical devices

- Certification by a qualified groundwater scientist of the number, spacing, and depths of the monitoring systems
- Documentation of sampling and analysis programs and statistical procedures
- Notice of finding a statistically significant increase over background for one or more of the constituents listed in 40 CFR Part 258 at any monitoring well at the waste management unit boundary or the relevant point of compliance
- Certification by a qualified groundwater scientist that an error in sampling, analysis, statistical evaluation, or natural variation in groundwater caused an increase (false positive) of Appendix I constituents, or that a source other than the Landfill unit caused the contamination (if appropriate)
- A notice identifying any Appendix II constituents that have been detected in groundwater and their concentrations
- A notice identifying the Appendix II constituents that have exceeded the groundwater protection standard
- A certification by a qualified groundwater scientist that a source other than the Landfill caused the contamination or an error in sampling, analysis, statistical evaluation, or natural groundwater variation caused the statistically significant increase (false positive) in Appendix II constituents (if applicable)
- The remedies selected to remediate groundwater contamination
- Certification of remediation completion

3.11.2.6 Closure and Post-Closure Plans and any Monitoring, Testing, or Analytical Data Associated with these Plans

The Landfill's Operating Record includes a copy of the Closure Plan and Post-Closure plan. When applicable, the Operating Record will be amended to include the following:

- Notice of intent to close the facility
- Monitoring, testing, or analytical data associated with closure and post-closure information generated from groundwater and landfill gas monitoring
- Copy of the notation on the deed to the Landfill property, as required following closure
- Certification and verification that closure and post-closure activities have been completed in accordance with their respective plans

3.11.2.7 Estimates and Financial Assurance Documentation Required

The Operating Record includes the following estimates and financial assurance documentation:

- Cost estimate for hiring a third party to conduct closure
- Justification for the reduction of the closure cost estimate and the amount of financial assurance (if appropriate)
- Cost estimate for hiring a third party to conduct post-closure care

- Justification for the reduction of the post-closure cost estimate and financial assurance (if appropriate)
- Cost estimate for the cost of a third party to conduct corrective action
- A copy of the financial assurance instrument (trust agreement, surety bond, insurance policy, or guarantee)

The Landfill will notify the Director of DEQ when any of the information described above is added to the Operating Record. All information in the Operating Record will be furnished to the Director of DEQ upon request, or made available at all reasonable times for the Director's inspection.

3.11.2.8 Operating by Procedures Established by the Board and Health Districts

This Landfill operates by procedures established by the DEQ for implementation by the Health Districts. The procedures are intended to ensure that operations protect the public health and maintain the integrity of the Landfill's design. Copies of such procedures are included in the Operating Record.

3.12 Daily Weather Monitoring and Annual Landfill Tonnage

3.12.1 Applicable Regulations

Title 39, Health and Safety; Chapter 74, Idaho Solid Waste Facilities Act. 39-7412. Standards for Operation.

Owners or operators of all MSWLF units shall:

- (11) MSWLF units that dispose of greater than twenty (20) tons per day of municipal solid waste based on an annual average shall:
 - (a) Monitor daily climatic conditions. Monitoring shall include precipitation including snow, evaporation, evaporative water temperature, air temperature, wind speed and direction; and
 - (b) Weigh all incoming waste or provide an equivalent method of measuring waste tonnage capable of estimating total annual solid waste tonnage.

3.12.2 How Ada County Landfill Fulfills Requirements

3.12.2.1 Weather Monitoring Data

To monitor daily climatic conditions, a Davis Instruments "Weather Monitor II" is installed at the Landfill office. The weather information is downloaded via a "Weatherlink" system to a computer in the office. Data is saved on the hard disk of the computer until the storage capacity of the drive is reached and thereafter is saved on portable media for 5 years.

The weather monitoring system measures temperature, wind direction, wind speed, barometric pressure, dew point, high and low humidity, and precipitation. Evaporation data is available from regional sources.

3.12.2.2 Total Annual Landfill Tonnage

The Landfill prepares an estimate of the total annual solid waste tonnage in accordance with Idaho regulations. The annual tonnage estimate is filed in the Operating Record. Waste tonnage is calculated by weighing each vehicle as it enters and leaves the landfill, and then subtracting the empty vehicle weight from the loaded vehicle weight to determine the waste tonnage.

3.13 Asbestos Receiving and Disposal Procedures

3.13.1 Applicable Regulations

See the excerpts from EPA's document "REPORTING AND RECORD KEEPING REQUIREMENTS FOR WASTE DISPOSAL, Field Guide" below. Accessed at http://www.epa.gov/region4/air/asbestos/waste.htm

Reporting and Record Keeping Requirements for Waste Disposal Field Guide

This is a guide to help you comply with the new reporting and record keeping requirements of the asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP). The specific responsibilities of waste generators, transporters and waste disposal site operators are addressed, as well as detailed explanations of how to complete the new forms accurately and efficiently. This field guide is organized into four main sections as follows:

Waste Shipment Record Reporting Requirements Record keeping Requirements Source Reporting Requirements for Disposal Site Operators

I. WASTE SHIPMENT RECORD

After (the effective date of this rule), all shipments of asbestos-containing waste material must be accompanied by a Waste Shipment Record (WSR) similar to the sample shown in Figure 1. When it is signed by the generator, the transporter and the waste disposal site operator, the WSR documents the movement and ultimate disposition of asbestos waste. The WSR consists of three parts and requires three signatures, those of the generator, the transporter and the disposal site operator.

B. Transporter

The transporter who delivers the waste shipment to the waste disposal site should surrender the WSR to the disposal site operator. It is recommended that you keep a copy of the WSR signed by the disposal site operator for your files as a matter of good business practice.

C. Waste Disposal Site Operator

Waste disposal site operators are not expected to open bags or other containers to verify that the material is asbestos: if a WSR accompanies the shipment, that is sufficient verification. You must complete Items 12 and 13 of the WSR according to the instructions in Figure 1 and send a copy of the WSR according to the name and address listed in Item 2 of the WSR. The disposal site operator should check to see that the numbers of containers reported in WSR Item 6 and the quantities reported in WSR Item 7 appear to be correct. Any discrepancy should be noted in Item 12.

If the WSR indicates a truckload of asbestos waste, ask the driver if he knows the truck's cargo capacity. If he cannot tell you the capacity, estimate it by multiplying the length by the width by the height of the cargo compartment (all in feet) and divide by 27 cubic feet to obtain cubic yards. If you know the capacity of a truck-say 20 cubic yards--and you judge it to be half-full, estimate the load as 10 cubic yards.

Item 12 is also used to note improperly enclosed or uncovered waste.

II. REPORTING REQUIREMENTS

The revised NESHAP now includes reporting requirements for generators and waste disposal site operators. Generators are required to submit exception reports if they do not receive a copy of the WSR signed by the disposal site owner or operator within 45 days of the date the shipment was accepted by the first transporter. Disposal site operators must file reports of discrepancies between the quantities of waste indicated on the WSR and the quantities actually received, as well as reports of improperly enclosed or uncovered waste.

A. Exception Report

If you as a generator of a shipment of asbestos waste do not receive a copy of the WSR signed by the disposal site operator within 35 days after you turned the waste over to the first transporter, you must take steps to locate the waste shipment.

First, contact the transporter and verify the fact that the waste was delivered to the waste disposal site specified in Item 3 of the WSR. If the transporter has not delivered the shipment, determine the reason for the delay, and when it will be delivered. If the transporter has delivered the waste to the specified waste disposal site, inquire if a copy of the WSR signed by the disposal site operator can be made available to you. (The transporter is not required to obtain or keep a copy signed by the disposal site operator: however, some may do so as a matter of good business practice.) Next contact the disposal site operator and determine why you have not received a copy of the WSR signed by him. Request that the disposal site operator send a signed copy of the WSR to you immediately.

If you have not received a signed WSR from the disposal site operator within 45 days after you turned the waste over to the initial transporter, you must submit a written exception report to the responsible NESHAP program agency (see Appendix A for a list of agencies and their jurisdictions). The report should include a copy of the WSR in question as well as a cover letter that explains what you have done to locate the shipment, and the results of your search.

B. Discrepancy Report

As a waste disposal site operator, you will be checking the WSR that accompanies each asbestos waste shipment that arrives at your site to make sure that the information on the WSR accurately describes the waste shipment. If you see that there is a discrepancy between the number of containers shown on the WSR and the number that you count in the truck you should note this in Item 12 of the WSR and contact the generator to determine if there is a reasonable explanation for the discrepancy. If you are able to reconcile the apparent discrepancy, make a note of it on the WSR and forward it to the generator as you would normally do.

If you are unable to resolve the discrepancy within 15 days of accepting the waste, you must send a written discrepancy report immediately to the responsible agency in whose jurisdiction the generator of the waste is located. The discrepancy report should describe the discrepancy in question and the steps you have taken to obtain an explanation for it, such as how and when you attempted to reach the generator. A copy of the shipment's WSR must accompany the discrepancy report.

C. Report of Improperly Enclosed or Uncovered Waste

Disposal site operators will check asbestos waste shipments arriving at their sites and are expected to look for significant amounts of improperly enclosed or uncovered waste before the material is disposed of. If significant amounts of improperly enclosed or uncovered waste are discovered in a shipment (see discussion under WSR), note it in Item 12 of the WSR and send, by the following working day, a written report of the problem to the specific agency responsible for administering the NESHAP program for the jurisdiction where the job site is located (identified on the WSR). If the disposal site is located in a different jurisdiction than the job site, you should also send a copy of the WSR to the agency responsible for the disposal site. The written report should describe the improperly enclosed or uncovered waste in sufficient detail that the responsible agency can determine the urgency of the situation and what action to take. A copy of the WSR must be submitted along with the written report.

III. RECORD KEEPING REQUIREMENTS

New requirements for record keeping are set for waste generators and waste disposal sites. Generators must keep copies of all WSR's for at least 2 years. In addition to keeping WSR's for at least 2 years, active waste disposal sites must also keep records of the asbestos-containing waste material located within the site.

B. Active Waste Disposal Site Operator

You, the waste disposal site operator, are required to keep copies of WSR's that you have received for at least 2 years. The WSR's should be kept in chronological order in a secure, water-tight file. You are expected, further, to provide copies of WSR's upon request of the responsible agency and to make the WSR file available for inspection during normal business hours.

Another new requirement is that you now must maintain up-to-date records that indicate the location, depth and area, and quantity of asbestos containing waste material within the disposal site on a map or diagram of the disposal area.

You have the option of either restricting the asbestos waste to specified areas within the disposal site or depositing it throughout the site. In making this decision you should consider the future use of the property after the disposal site has been closed. By restricting the area where asbestos waste is deposited you will be able to preserve more of the property for future use. However, if you choose to deposit asbestos waste throughout the site, the responsible agency would consider that the entire disposal area contains asbestos.

When you open a new trench (or area) for asbestos waste disposal, place stakes in the ground at the corners of the trench. Take precautions to see that the stakes are kept where they are originally positioned and are not broken during the time that the trench is being filled. When you have filled the trench, call in a land surveyor. The surveyor will use the stakes to determine the location of the asbestos deposit within the disposal site. Ask the surveyor to prepare a map or diagram of the disposal site that shows the location(s) and surface dimensions of the asbestos deposit.

Before beginning to fill a new trench with asbestos waste, measure the maximum depth of the trench, record it, and save it to put on the map provided by the surveyor. Use the data provided in Item 7 of the WSR's to obtain the quantity of asbestos-containing waste material. Add up the cubic yards (cubic meters) of waste indicated on the WSR's for all of the asbestos waste shipments that are deposited in the trench up until the time that it is full and is closed. Also, put the total quantity of asbestos-waste deposited at the site on the map provided by the surveyor. The map should be kept current until the time that the waste disposal site is closed. At closure, you must submit a copy of records of asbestos waste disposal locations and quantities to the agency responsible for administering the NESHAP program in your area. The surveyor's map or diagram of the disposal site with the location and surface dimensions of the asbestos deposit(s), maximum depth of the deposit(s) and asbestos waste quantities fulfills this requirement and should be submitted to the Administrator.

See Figure 2 for an example of a map.

Within 60 days of closing your waste disposal site you must record on the deed to the waste disposal site the following information:

The land has been used for the disposal of asbestos-containing waste material,

The survey plot and record of the location and quantity of asbestos containing waste disposed of within the disposal site have been filed with (name of responsible agency).

The site is subject to 40 CFR 61 Subpart M.

In some states, a Notation of Deed form can be used to add this information to a deed, while in others it may be easier to prepare a new deed than it is to annotate an existing deed. You should contact the Register of Deeds at the county seat of the county in which your disposal site is located to learn the rules that cover deeds and for instructions on how to proceed.

IV. SOURCE REPORTING REQUIREMENTS FOR DISPOSAL SITE OPERATORS

Another new requirement is that, within 90 days of the effective date of this rule, you are required to report certain information about your asbestos waste disposal operations to the responsible asbestos NESHAP program agency (see Appendix A for a list of agencies). Section 61.153 of the asbestos NESHAP requires that you report the following information:

A brief description of the waste disposal site, which would include such information as the location and size of the disposal facility.

A description of the method or methods that will be used to comply with the asbestos NESHAP, or a description of alternative methods that will be used. Methods to be used, such as covering asbestos waste daily with 6 inches of non-asbestos cover or the use of dust suppressants should be reported. Other information that might be reported includes procedures to prevent public access to the asbestos waste disposal area, such as the use of warning signs and fencing. You must report this information using the format in Appendix A of Part 61 of Title 40 of the Code of Federal Regulations (40 CFR).

In addition to the information listed above, you as the waste disposal site operator, must also report the following information required by the source reporting requirements of Section 61.10 of Subpart, Part 61 of 40 CFR.

Name and address of the owner or operator.

The location of the source.

The type of hazardous pollutants emitted by the stationary source.

A brief description of the nature, size, design, and method of operation of the stationary source including the operating design capacity of the source. Identify each point of emission for asbestos.

The average weight per month of asbestos being processed by the source over the last 12 months preceding the date of the report.

If there is a change in any of the information listed above, you must report the changes to the appropriate agency within 30 days after they occur.

3.13.2 How Ada County Landfill Fulfills Requirements

The following is the Asbestos Receiving and Disposal Procedure for the Ada County Solid Waste Management. This procedure applies to all asbestos containing waste entering the Landfill.

3.13.2.1 Receiving

Asbestos wastes will be inspected to verify they have been properly containerized as follows:

- Asbestos waste must be double bagged (each bag a minimum of 6-mil thick).
- Bags must be permanently marked with an appropriate warning label approved by OSHA or EPA.
- Asbestos containing materials that cannot be placed in bags must be wrapped in transparent, double 6-mil-thick plastic. All seams must be sealed to prevent fiber release. OSHA or EPA warning labels must be permanently attached to inner plastic wrap.
- Waste Shipment Records (WSR) must accompany the asbestos waste.

3.13.2.2 Disposal

Asbestos wastes will be disposed of as follows:

- Properly containerized asbestos waste can be accepted from 8:30 a.m. to 3:00 p.m. Monday through Friday at the Landfill.
- Contractor/hauler must give the Ada County Solid Waste Management Department (208-853-1297) at least 1 business day notice prior to arrival at the Landfill.
- Containerized asbestos waste loads arriving prior to scheduled disposal time may be required to wait until scheduled time before disposal is permitted.
- Containerized asbestos waste loads arriving after scheduled disposal time may be refused entry into the Landfill.
- Ada County Solid Waste Management Department personnel will inspect containerized asbestos waste before and during off-loading. Improper or damaged containerization may result in the load being rejected for disposal.
- The contractor/hauler will stack or place containerized asbestos waste as directed by the landfill personnel in the asbestos disposal cell.
- Contractor/hauler will provide necessary manpower and equipment at the time of delivery to stack or place containerized waste.
- Wastes containing asbestos that are being generated/removed from outside of Ada County are not acceptable for disposal at the Landfill site.
- Ada County personnel will complete the Asbestos Waste Shipment Record for each load (see Exhibit 8 in Section 3.1.2.2).

3.13.2.3 Reporting and Record Keeping

3.13.2.3.1 Discrepancy Report

The Waste Shipment Record (WSR) will be checked to ensure that the information accurately describes the waste shipment. If there is a discrepancy between the number of containers shown on the WSR and the number counted in the truck, the discrepancy will be noted in the WSR and the generator contacted to determine if there is a reasonable explanation for the discrepancy. If the apparent discrepancy cannot be reconciled, the apparent discrepancy will be noted on the WSR and forwarded to the generator, as normally practiced.

If the apparent discrepancy cannot be resolved within 15 days of accepting the waste, written discrepancy report will be sent immediately to the responsible agency in whose jurisdiction the generator of the waste is located. The discrepancy report will describe the discrepancy in question and the steps Ada County has taken to obtain an explanation for it, such as how and when Ada County attempted to reach the generator. A copy of the shipment's WSR will accompany the discrepancy report.

3.13.2.3.2 Report of Improperly Enclosed or Uncovered Waste

Each asbestos waste shipment arriving will be inspected to determine if a significant amount of improperly enclosed or uncovered waste is present. If significant amounts of improperly enclosed or uncovered waste are discovered in a shipment, it will be noted in the WSR. Also, by the following working day, the WSR will be sent to the specific agency responsible for administering the NESHAP program for the jurisdiction where the job site is located (identified on the WSR) with a written report of the problem. If the disposal site is located in a different jurisdiction than the job site, a copy of the WSR will also be sent to the agency responsible for the disposal site. The written report will describe the improperly enclosed or uncovered waste in sufficient detail that the responsible agency can determine the urgency of the situation and what action to take. A copy of the WSR will be submitted along with the written report.

3.13.2.3.3 WSR Records

Ada County keeps Waste Shipment Records in the Operating Record for at least 2 years.

3.13.2.3.4 Asbestos waste disposal Location

Asbestos waste is disposed throughout the MSW Landfill footprint in the Hidden Hollow Cell. The MSW Landfill footprint is considered the limits of the asbestos disposal site.

3.13.2.3.5 Closure Documentation

Within 60 days of closing Ada County's MSW Landfill cells (HHC or NRC) Ada County will record on the deed to the Landfill cell site the following information:

- The land that has been used for the disposal of asbestos-containing waste material
- The survey plot and record of the Landfill footprint and quantity of asbestos containing waste disposed of within the site will be filed on the deed. A copy will be submitted to CDHD.
3.13.2.3.6 Previously Submitted Source Reporting Requirements for Disposal Site Operators Ada County has previously submitted the required information about Ada County's asbestos waste disposal operations to the responsible asbestos NESHAP program agency, as required by the rule. The information reported included the following:

- A brief description of the waste disposal site, including such information as the location and size of the disposal facility
- A description of the methods used to comply with the asbestos NESHAP, such as covering asbestos waste daily with 6 inches of non-asbestos cover
- Procedures to prevent public access to the asbestos waste disposal area
- The information required by the source reporting requirements of Section 61.10 of Subpart, Part 61 of 40 CFR

3.14 Petroleum Contaminated Soil Program

3.14.1 Applicable Regulations

Title 40: Protection of Environment; Part 261—Identification and Listing of Hazardous Waste; 261.24, Toxicity Characteristic; and 261.4 Exclusions

Petroleum contaminated soil (PCS) may result from cleanup of a leaking petroleum storage tank or from cleanup of accidental releases. Soil contaminated with petroleum may contain constituents significant enough to be classified as a hazardous waste under criteria of 40 CFR 261.24. To avoid classifying media and debris contaminated by accidental leaks or releases, the EPA has approved an exemption from RCRA hazardous waste requirements under 40 CFR 261.4(b)(10). This section states, in part:

- (b) Solid wastes which are not hazardous wastes. The following solid wastes are not hazardous wastes:
 - (10) Petroleum contaminated media and debris that fail the test for Toxicity Characteristics of Section 261.4 (Hazardous Waste Codes D018 through D043 only) and are subject to the corrective action under part 280 of this chapter.

3.14.2 How Ada County Landfill Fulfills Requirements

3.14.2.1 Landfill Acceptance Policy

On a case-by-case basis, the Landfill will accept petroleum-contaminated soil (PCS) from cleanups or other events if the PCS qualifies as a non-hazardous waste under the exemption provided in 40 CFR 261.4(b)(10). Laboratory test results proving this qualification must be submitted to the Ada County Solid Waste Management Department for approval prior to waste acceptance. Ada County's PCS Acceptance Procedure, provided below, is subject to change without notice and the Landfill reserves the right to require additional testing prior to disposal of PCS or to rejecting any PCS waste that the Landfill determines may potentially pose an unreasonable risk or environmental concern to Landfill operations.

3.14.2.2 Acceptance Procedure

The acceptance procedure for PCS is as follows:

- Before PCS is delivered to the Landfill, prior written notification must be given to the Solid Waste Management Department. Notification shall include test results from a State of Idaho-approved laboratory, location of the PCS, and quantity of material. No out-of-county PCS will be accepted by the Landfill.
- Unacceptable PCS will not be accepted, and owners/transporters will be referred to DEQ for further guidance. Unacceptable PCS conditions include, but are not limited to the following:
 - PCS that contains any RCRA-listed hazardous material that is not exempted by 40 CFR 261.4
 - PCS that poses a health and/or safety risk to personnel at the Landfill
 - PCS that contains "free product" or is in a slurry form (see Liquid Waste Disposal)

- All samples must be analyzed in a State of Idaho-approved laboratory using test methods approved by EPA and DEQ including, but not limited to: benzene, toluene, ethylbenzene, and total xylenes (BTEX); and, toxicity characteristic leaching procedure (TCLP)-metals, volatiles; and pesticides. Sample methods shall be in accordance with EPA procedures and are subject to review and approval by the Landfill. The amount of sampling required will be determined on a case-by-case basis by the Ada County Solid Waste Management Department. The burden of proof that PCS material is acceptable for final disposal falls to the generator of the waste material as prescribed by EPA regulations.
- Samples for testing shall be collected by a qualified professional in the field of sampling, testing, removal, handling, and characterization of PCS. Depending on the situation and factors surrounding the generation of the PCS, the Landfill may require certification of an Idaho-registered Professional Geologist (P.G.), a Professional Engineer (P.E.), or other professional with the proper qualifications.
- PCS that does not meet the criteria for a hazardous waste as stated in 40 CFR 261.24, and is in conformance with items 1 through 4 above, may be accepted for final disposal at the Landfill.

This program refers only to PCS. Under no circumstances will this program be adapted to other hazardous substances.

3.15 Household Hazardous Wastes and Special Wastes Recycling Activities

3.15.1 Introduction

Ada County, in cooperation with the cities in the county, offers a Household Hazardous Materials Facility Program. The Program is restricted to Ada County households, and limits waste quantities to household exempt waste as defined in CFR 40 261.4 b(1) or Conditionally Exempt Small Quantity Generators as defined in 40 CFR Part 261.5. Materials are processed through the Hazardous Materials Facility for recycle or disposal at appropriate hazardous waste disposal facilities. The Ada County Landfill facilities are used to process and handle the city-sponsored household hazardous waste collection events held in Boise, Eagle, Garden City, Kuna, Meridian, and Star. In fiscal year 2013, over 27,000 households participated in the program. During the year, approximately 1,168,675 pounds of household waste and 2,098,532 pounds of electronic waste were processed through this program.

Landfill operations also include numerous diversions and recycling programs to reduce landfilling, promote recycling, and eliminate potentially hazardous substances from being landfilled. Wastes handled in these programs include waste oil, batteries, refrigeration units, cathode ray tubes (CRTs – television and computer monitors), paints, fluorescent lights, tires, and wood wastes.

3.15.2 Special Wastes and Recycling Activities

A number of special and recyclable wastes are received and handled at the Landfill. These wastes include the following:

- Tires
- Wood products
- Asbestos
- Motor oil
- Automobile batteries
- Paint
- Household quantities of paint, pesticides, cleansers, and other household hazardous material
- Electronics
- Other recyclable wastes

Methods for handling these wastes are discussed in the following text.

3.15.2.1 Tires

Tires are accepted at the Landfill where they are separated and temporarily stored. Up to four tires per vehicle load per day, not to exceed a 20-inch-diameter rim, are accepted at the Landfill. The tires must be passenger car, light truck, utility trailer tires, or other personal vehicle or ATV type tires. Commercial vehicle tires including truck, tractor, or heavy equipment tires are not accepted. The accepted tires are shipped to a private facility for recycling – they are not disposed of in the Landfill. Whole tires containing steel rims are stored and sent to a private facility that removes the rims and recycles the rims and tires. The Landfill does not accept waste tires from commercial customers.

3.15.2.2 Wood Products

Ada County encourages Landfill users to recycle wood waste. A separate wood recycling area is available to Landfill customers. Wood products are taken to the wood recycling area and unloaded on a temporary stockpile. A private contractor then chips the wood waste and the wood chips are sold and transported offsite for use.

3.15.2.3 Asbestos

Asbestos is accepted at the Landfill for disposal. Asbestos wastes are managed and disposed in accordance with state and federal regulations. Ada County's asbestos management and disposal procedures are provided at the end of this chapter. Asbestos is disposed of in a designated area (Hidden Hollow Cell) within the Landfill. See Section 3.13, Asbestos Receiving and Disposal Procedure, for details.

3.15.2.4 Motor Oil

Motor oil from residential customers is accepted for recycling at the Landfill. Oil quantities are limited to 5 gallons per vehicle per visit. The oil is transferred to a temporary 500-gallon bulk storage vessel. A private contractor pumps the oil from the temporary storage vessel into a tanker truck and removes the oil from the Landfill. The private contractor recycles or re-refines the oil.

3.15.2.5 Automobile Batteries

Automobile batteries are accepted for recycling at the Landfill. Accepted batteries are temporarily stored onsite in a designated area. A private contractor removes the batteries for reclamation and recycling.

3.15.2.6 Paint

Containerized paint from residential customers is accepted at the Landfill. The County's hazardous material contractor processes the paint containers through the Hazardous Materials Facility. The contractor manages all material received at the Hazardous Materials Facility. Collected materials are either recycled and reclaimed or are packaged, manifested, and shipped out for recycling, destruction, or disposal at appropriately licensed facilities.

3.15.2.7 Electronics Waste

Currently, Ada County's E-waste program accepts all household and small business electronic devices, appliances, tools, etc. E-waste collected at the landfill and through the Household Hazardous Materials Collection Program is shipped away from the landfill for de-manufacturing. After the E-waste is dismantled to the various components, the components are sold on the recyclables market.

3.15.2.8 Other Recyclable Wastes

Ada County continually explores recycling options at the Landfill. Recycling options are dependent on market conditions, fiscal operating requirements, statutes and rules of law, and development of new technologies.

Appendix 1 Ada County Landfill Waste Filling Plans



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NOTES:



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1. TO GET THE MOST BENEFIT FROM THE ALTERNATE DAILY COVER PROGRAM, THERE SHALL BE MAINTAINED ON SITE AN ADEQUATE AMOUNT OF TARP-O-MATIC TARPS TO COMPLETELY COVER FIVE DAYS WORTH OF COMPACTED WASTE. ON THE SIXTH DAY THE TARPS ARE REMOVED AND ALL WASTE IS COVERED WITH COVER SOIL. COVER SOIL. 2. IDEALLY, COVER SOIL WOULD ONLY NEED TO BE APPLIED TO THE TOP DECK OF ANY FILL AREA, AND NOT TO AN INTERMEDIATE DECK ELEVATION BELOW THE 20-FOOT LIFT HEIGHT. THEREFORE, THE SIZE OF THE DAILY AND WEEKLY FOOTPRINT MUST BE CONTINUALLY DETERMINED AND ADJUSTED BASED ON THE PREVIOUS DAILY OR WEEKLY VOLUMES PLACED. THE VOLUMES MUST BE MEASURED EITHER BY THE REQUIRED GPS COMPACTION TRACKING AND FILL TRACKING EQUIPMENT AND SOFTWARE. OR SURVEYED. THE INTENT IS TO GET THE MOST BENEFIT FROM THE ALTERNATE DAILY COVER PROGRAM BY LIMTING THE AMOUNT OF COVER SOIL REQUIRED AND STILL MEET THE REQUIREMENT THAT ALL WASTE IS COVERED WITH SOIL ONCE A WEEK.





Appendix 2 Ada County Landfill Standard Details





NOTES:

- 1. SLOPE OF TRENCH SIDEWALLS TO BE DETERMINED BY CONTRACTOR TO FIT METHOD OF CONSTRUCTION AS WELL AS JURISTICTIONAL SAFETY REQUIREMENTS.
- PROVIDE A MINIMUM OF 2-FEET OF ROAD SURFACING AGGREGATE COVER DIRECTLY OVER THE HORIZONTAL COLLECTOR PIPE AT DESIGNATED HEAVY EQUIPMENT CROSSING AREAS. AGGREGATE SHALL BE REMOVED PRIOR TO PLACEMENT OF SEQUENTIAL WASTE FILL, PLACEMENT OF SEQUENTIAL WASTE FILL LIFTS DIRECTLY ABOVE THE PIPE SHOULD REACH A MINIMUM OF 3-FEET OF WASTE FILL BEFORE COMPACTING.
- 3. CONSTRUCT 50-FOOT LENGTHS OF 6" DIA PERFORATED HDPE PIPE (SDR 11) AND CENTER IN 10-FOOT PIECES OF 10" DIA PERFORATED HDPE PIPE (SDR 11) SLIP JOINT. WRAP JOINT ENDS WITH GEOTEXTILE TO PREVENT DRAIN GRAVEL FROM ENTERING ANNULAR SPACE BETWEEN PIPES.
- 4. IN SOLID WALL PIPE AREA AT ENDS OF HORIZONTAL COLLECTOR TRENCH, TRANSITION FROM USING DRAIN GRAVEL IN THE PIPE ZONE TO USING FINE SILTY SOIL MATERIAL. WRAP THE EXTERIOR ENDS OF THE GRAVEL ENVELOPE WITH SEPARATION GEOTEXTILE. SEE HORIZONTAL GAS COLLECTOR PROFILE FOR SOLID WALL PIPE AREA DELINEATION WITH RESPECT TO THE CREST OF LIFT DECK.

DRAIN GRAVEL SPECIFICATION

DRAIN GRAVEL SHALL BE CLEAN
WASHED, UNCRUSHED, NATURA
RIVER BED AGGREGATED
SCREENED AS SHOWN:

Screen/Sieve Size	Percent Passing
2-1/2"	100%
2"	90-100%
1-1/2"	65-75%
1"	15-25%
3/4"	Less than 8%
No. 4	Less than 4%

ROAD SURFACING SPECIFICATION

ROAD MIX MEETING THE REQUIREMENTS OF THE ITD STANDARD SPECIFICATION SECTION 703.04, AGGREGATE FOR UNTREATED BASE, TREATED BASE, AND ROAD MIX, 2-INCH GRADATION.

NONWOVEN SEPARATION GEOTEXTILE SPECIFICATION

A. PERVIOUS SHEET OF POLYESTER, POLYPROPYLENE, OR POLYETHYLENE FABRICATED INTO STABLE NETWORK OF FIBERS THAT RETAIN THEIR RELATIVE POSITION WITH RESPECT TO EACH OTHER. NONWOVEN GEOTEXTILE SHALL BE COMPOSED OF CONTINUOUS OF DISCONTINUOUS (STAPLE) FIBERS HELD TOGETHER THROUGH NEEDLE-PUNCHING, SPUN-BONDING, THERMAL-BONDING, OR RESIN-BONDING. 5

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- B. GEOTEXTILE EDGES: SELVAGED OR OTHERWISE FINISHED TO PREVENT OUTER MATERIAL FROM PULLING AWAY FROM GEOTEXTILE.
- C. UNSEAMED SHEET WIDTH: MINIMUM 12 FEET.
- D. NOMINAL WEIGHT PER SQUARE YARD, PER ASTM D5261: 10 OUNCE.
- E. PHYSICAL PROPERTIES:

GEOTEXTILE						
PROPERTY	REQUIREMENT	TEST METHOD				
WATER PERMITTIVITY	0.5 SEC. ⁻¹ , MINARV	ASTM D4491 (FALLING HEAD)				
APPARENT OPENING SIZE (AOS)	NO. 70 U.S. STANDARD SIEVE SIZE	ASTM D4751				
GRAB TENSILE STRENGTH, MACHINE DIRECTION	200 LB/IN, MINARV	ASTM D4632				
GRAB ELONGATION, MACHINE DIRECTION	50 PERCENT, MAXARV	ASTM D4632				
TRAPEZOID TEAR STRENGTH	90 LB, MINARV	ASTM D4533				

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HHC TYPICAL GAS EXTRACTION WELL VAULT AND SUB-LATERAL





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Ada County Landfill

Closure Plan

Prepared for Ada County Landfill Ada County, Idaho

February 2017

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1.0 Purpose

This plan provides information regarding closure of the Ada County Landfill. This closure plan was developed for Ada County for closure of the Hidden Hollow Cell and North Ravine Cell in accordance with state regulations (Idaho 39-7415) and federal regulations (40 CFR 258.60). These regulations are presented below.

Applicable Regulations

Title 39, Health and Safety; Chapter 74, Idaho Solid Waste Facilities Act. 39-7415. Standards for Closure.

- (1) Applicability. These standards apply to all MSWLF units that receive wastes on or after October 9, 1993, except as provided by 40 CFR 258. MSWLF units that accept waste after October 9, 1991, but cease to accept waste prior to October 9, 1993, shall at a minimum comply with subsections (2)(a) and (3) of this section in addition to the "sanitary landfill closure guidance" criteria as adopted by the health district.
- (2) Cover designs. Owners or operators of MSWLF units shall install one (1) of the following final cover systems:
 - (a) A cover as provided under 40 CFR 258.60(a); or
 - (b) The cover material must be fine-grained with intrinsic permeability no greater than 1 X 10-3 cm/sec and a minimum thickness of twenty-four (24) inches; and
 - (i) have capillary holding capacity greater than the projected maximum accumulated volume of water as determined by utilization of accepted water balance methodology based on local or regional twenty-five (25) year climatic records;
 - (ii) annual precipitation is less than twenty-five (25) inches with net evaporative losses greater than thirty (30) inches annually;
 - (iii) the top six (6) inches of the cover shall be capable of sustaining shallow rooted native plant growth; and
 - (iv) this design shall demonstrate consideration of site specific factors as provided in 40 CFR 258.60(b) or:
 - (c) As provided in 40 CFR 258.60(b).
- (3) The final grade of slopes shall be greater than two per cent (2%) unless otherwise supported by the post closure plan and uses approved by the health district, and the grade of side slopes not more than thirty-three percent (33%).
- (4) Closure plan preparation, placement in operating record, notice of intent to close, time requirements for commencement and completion of closure activities, certification, deed notation and removal of deed notation shall be conducted as provided in 40 CFR 258.60(c) through (j), inclusive. The deed notation and removal of deed notation shall comply with the uniform environmental covenants act, chapter 30, title 55, Idaho Code.

Title 40: Protection of Environment; Part 258—Criteria for Municipal Solid Waste Landfills, Subpart C— Operating Criteria. § 258.60 Closure criteria

- (a) Owners or operators of all MSWLF units must install a final cover system that is designed to minimize infiltration and erosion. The final cover system must be designed and constructed to:
 - (1) Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than 1×10⁻⁵ cm/sec, whichever is less, and
 - (2) Minimize infiltration through the closed MSWLF by the use of an infiltration layer that contains a minimum 18-inches of earthen material, and
 - (3) Minimize erosion of the final cover by the use of an erosion layer that contains a minimum 6-inches of earthen material that is capable of sustaining native plant growth.
- (b) The Director of an approved State may approve an alternative final cover design that includes:
 - An infiltration layer that achieves an equivalent reduction in infiltration as the infiltration layer specified in paragraphs (a)(1) and (a)(2) of this section, and

- (2) An erosion layer that provides equivalent protection from wind and water erosion as the erosion layer specified in paragraph (a)(3) of this section.
- (3) The Director of an approved State may establish alternative requirements for the infiltration barrier in a paragraph (b)(1) of this section, after public review and comment, for any owners or operators of MSWLFs that dispose of 20 tons of municipal solid waste per day or less, based on an annual average. Any alternative requirements established under this paragraph must:
 - (i) Consider the unique characteristics of small communities;
 - (ii) Take into account climatic and hydrogeologic conditions; and
 - (iii) Be protective of human health and the environment.
- (c) The owner or operator must prepare a written closure plan that describes the steps necessary to close all MSWLF units at any point during their active life in accordance with the cover design requirements in §258.60(a) or (b), as applicable. The closure plan, at a minimum, must include the following information:
 - (1) A description of the final cover, designed in accordance with §258.60(a) and the methods and procedures to be used to install the cover;
 - (2) An estimate of the largest area of the MSWLF unit ever requiring a final cover as required under §258.60(a) at any time during the active life;
 - (3) An estimate of the maximum inventory of wastes ever on-site over the active life of the landfill facility; and
 - (4) A schedule for completing all activities necessary to satisfy the closure criteria in §258.60.
- (d) The owner or operator must notify the State Director that a closure plan has been prepared and placed in the operating record no later than the effective date of this part, or by the initial receipt of waste, whichever is later.
- (e) Prior to beginning closure of each MSWLF unit as specified in §258.60(f), an owner or operator must notify the State Director that a notice of the intent to close the unit has been placed in the operating record.
- (f) The owner or operator must begin closure activities of each MSWLF unit no later than 30 days after the date on which the MSWLF unit receives the known final receipt of wastes or, if the MSWLF unit has remaining capacity and there is a reasonable likelihood that the MSWLF unit will receive additional wastes, no later than one year after the most recent receipt of wastes. Extensions beyond the one-year deadline for beginning closure may be granted by the Director of an approved State if the owner or operator demonstrates that the MSWLF unit has the capacity to receive additional wastes and the owner or operator has taken and will continue to take all steps necessary to prevent threats to human health and the environmental from the unclosed MSWLF unit.
- (g) The owner or operator of all MSWLF units must complete closure activities of each MSWLF unit in accordance with the closure plan within 180 days following the beginning of closure as specified in paragraph (f) of this section. Extensions of the closure period may be granted by the Director of an approved State if the owner or operator demonstrates that closure will, of necessity, take longer than 180 days and he has taken and will continue to take all steps to prevent threats to human health and the environment from the unclosed MSWLF unit.
- (h) Following closure of each MSWLF unit, the owner or operator must notify the State Director that a certification, signed by an independent registered professional engineer or approved by Director of an approved State, verifying that closure has been completed in accordance with the closure plan, has been placed in the operating record.
 - (i)(1) Following closure of all MSWLF units, the owner or operator must record a notation on the deed to the landfill facility property, or some other instrument that is normally examined during title search, and notify the State Director that the notation has been recorded and a copy has been placed in the operating record.
 - (2) The notation on the deed must in perpetuity notify any potential purchaser of the property that:
 - (i) The land has been used as a landfill facility; and
 - (ii) Its use is restricted under §258.61(c)(3).
- (j) The owner or operator may request permission from the Director of an approved State to remove the notation from the deed if all wastes are removed from the facility.

This plan will be reviewed and revised periodically in response to changes that occur in the federal, state, or county regulatory framework; technological innovations; or changes in the County's solid waste management plan. All closure plan records will be placed in Ada County's Landfill Operating Record. The closure plan presentation has been organized into the plan for the HHC and the plan for the NRC. Many of the plan elements for closure are common to both cells, and are repeated where appropriate in the plan presentations for each.

The elements of the plan include the following:

- Purpose
- Hidden Hollow Cell Closure Plan
- North Ravine Cell Closure Plan
- Closure Records
- Schedule of Closure Activities
- Closure Certification

2.1. Background

The Ada County Landfill is located west of North Seamans Gulch Road in northwest Boise, Idaho. It is the sole operating Landfill in the county for municipal solid waste (MSW) disposal. Ada County owns the Landfill with operations management being provided by Ada County's Solid Waste Management Department personnel under the direction of Ada County's Operations Department. County-owned property surrounding the Landfill includes approximately 2,700 acres (see Exhibit 2A, *Master Site Plan*, in the *Operation Plan*). The Hidden Hollow Cell (HHC) encompasses an area of approximately 110 acres. The HHC has a maximum capacity of approximately 16,000,000 cubic yards of fill volume at completion. The closure plan for the North Ravine Cell is presented in the next section.

The previously approved closure plan was submitted in 2000. This 2007 plan for the HHC includes updates since the 2000 plan.

The previously approved cover plan for the HHC is described in the *Evapotranspiration Cover Predesign Report Ada County Hidden Hollow Sanitary Landfill*, CH2M HILL, September 2001, and *Ada County Hidden Hollow Sanitary Landfill Closure Phase 1 Design and Specification Documents*, CH2M HILL, July 31, 2002. The final cover plan incorporates an alternative evapotranspiration (ET) cover specifically designed for arid landfills. An ET cover utilizes the water-holding capacity of the soil to retain precipitation. The precipitation is then removed through evaporation from the soil and transpiration from the vegetative cover. The design utilizes soils with appropriate properties and sufficient depth, combined with native vegetative plant cover, to provide a system conforming to the alternate final cover design criteria cited in federal regulations. A summary of the ET cover design is presented in this Closure Plan.

As discussed in the Operations Plan, the landfill gas collection system approach has been modified to include both horizontal collectors and extraction wells, whereas the Phase 1 HHC closure used gas extraction wells and surface collectors. For the Phase 1 project, gas extraction wells were installed where the depth of filled waste was sufficient for well installation, typically 30 to 40 feet. Surface collectors were installed along the east Landfill periphery where previously filled waste thickness was the thinnest. The horizontal collectors are a requirement resulting from a change in the air permit regulatory status of the Ada County Landfill. The installation of horizontal collectors began in fall 2005, and will continue to be installed until the Landfill is filled to final grade. Supplemental vertical extraction wells will be added as needed to complete the landfill gas control system.

2.2 Closure Plan

The closure plan presented below presents the components of the ET cover and other closure plan elements for the HHC.

2.2.1 Cover Plan

The ET cover uses silty sand soil excavated from the soil barrow area approximately 1,500 feet southwest of the HHC. Soil at this site has the proper water-retention characteristics and soil properties to construct an ET cover in accordance with regulatory requirements. The cover provides sufficient soil depth to absorb precipitation and significantly limit infiltration into the Landfill and supports a vigorous growth of native arid vegetation to prevent erosion and minimize long-term maintenance. The horizontal extent of the final HHC cover is approximately 108 acres, as shown in Exhibit 26, *Final Landfill Cover Grading Plans*. The cover is being constructed in phases as the Landfill is filled. Approximately 46 acres of the HHC were completed to final grade and had the final cover and gas collection system constructed in Phase 1 that was completed in spring 2004. The remaining HHC area will be filled to the final elevation and closed in phases. The final soil cover design for future phases will be in accordance with the previously approved design.

2.2.2 Typical Cross Section

Each layer of the cover cross section is described below. The descriptions of the layers begin at the bottom and progress up to the surface.

The first layer of the cover cross section is the leveling course. The leveling course provides a uniform graded surface for placement of the soil cover. The leveling course consists of medium to coarse sandy soils excavated from the Landfill operations soil borrow areas. The leveling course includes 12 to 24 inches of interim cover soils previously applied plus additional soils as needed to prepare the surface for placement of the silty sand ET soil.

The second layer of the cover is the ET soil. This layer is spread and graded to achieve a uniform thickness. Placement is carefully controlled to prevent over compaction; compaction criteria is no more than 85 percent of the maximum relative dry density. The 85 percent compaction criterion is recommended to provide for vegetation root growth. The final design depth of the compacted cover soil is 4.5 feet. The 4.5-foot depth is based on the evaluation of cover soil characteristics and precipitation/evapotranspiration data to comply with regulatory requirements. The design evaluation is presented in the Design Criteria section of the *Predesign Report*.

The third layer is a 3-inch thick surface mix comprised of the following:

- Topsoil previously stripped and stockpiled from cover soil excavation areas
- Organic-rich leaf compost available from the Landfill's leaf mulching program
- Coarse sand to minimize surface erosion of the newly seeded surface

These surface mix components are mixed then spread on the ET soils. The Phase 1 project utilized this surface soil mix with excellent results.



2.2.3 Vegetative Cover

The closure plan includes a vigorous vegetative cover of arid native plants that will prevent erosion and provide for transpiration of soil moisture. The seed mixture is sprayed on in a hydro-mulch solution. Based on the construction schedule and weather conditions after seeding, supplemental irrigation water may be applied during the initial few years to establish a viable stand of vegetation. The Phase 1 project included a drip irrigation system to supply supplemental water. This system was used initially, but has been used infrequently since then. The seeding specification includes seed mix and application rates for arid soil re-vegetation and includes the same types of seeds supplied by local seed companies to the U.S. Bureau of Land Management (BLM) to reseed the foothills. A mulch and tackifier is included for temporary erosion protection. Typical seed mixtures recommended by BLM for the Boise area vary each year according to what seeds are available. BLM recommends a seeding rate of approximately 10 to 20 pounds per acre, depending on seed type and the mix. The following are native seed species used locally for re-vegetation. The exact seed mix used will vary from year to year depending on availability of seed species harvested commercially.

EXHIBIT 27

Ada County Landfill Revegetation

Common Name (Scientific Name)	Pounds of Pure Live Seed per Acre
Sandberg's bluegrass (Poa secunda)	2.0
Needle and thread (Stipa comata/Hesperostipa comata)	2.5
Bottlebrush squirreltail (Sitanion hystrix/Elymus elymoides)	3.0
Red threeawn (Aristida longiseta/Aristida purpurea longiseta)	4.0
Bluebunch wheatgrass (Agropyron spicatum/Pseudoroegneria spicata ssp. spicata)	2.5
Indian ricegrass (Oryzopsis hymenoides/Achnatherum hymenoides)	3.0
Big sagebrush (Artemisia tridentata)	0.5
Bitterbrush (Purshia tridentata)	3.0
Gray rabbitbrush (Chrysothamnus nauseosus)	0.3
Western yarrow (Achillea millefolium)	0.5
Arrowleaf balsamroot (Balsamorhiza sagittata)	0.5
Woollypod milkvetch (Astragalus purshii)	2.0
Velvet lupine (Lupinus leucophyllus)	1.0
Pale evening primrose (Oenothera pallida)	0.4
Strict buckwheat (Eriogonum strictum)	0.3
False dandelion (Crepis acuminata)	0.5

2.2.4 Storm Water Control

Storm water run-on and runoff controls are shown in Exhibit 21, *Master Drainage Plan* in the *Operation Plan*. A concrete storm water collection channel parallels the east side of the HHC. The channel runs from the northern perimeter, along the east perimeter, and to the southern perimeter. Storm water from the HHC is collected in the channel and conveyed to the HHC storm water holding/infiltration pond. This channel prevents run-on to the Landfill and controls runoff from the landfill. The access road along the cell's west perimeter that runs up the ridgeline forms the west perimeter of the cell. The road/ridge serves as the barrier controlling storm water run-on and runoff. Storm water run-on to the HHC is prevented by the ridgeline. HHC runoff to the east of the road/ridge line flows to the east and is controlled by the storm water channel. Pond water is lost through evaporation and infiltration. The construction of the ET cover significantly reduces runoff from the Landfill compared to pre-cover conditions because the ET cover is designed to retain precipitation. The HHC storm water pond has a 20-acre-foot capacity, sufficient to handle a 2 inches of runoff, exceeding the expected runoff of a 100-year storm event.

2.2.5 Final Cell Surface Grading Plan

The projected final cell surface grading plan is presented in Exhibit 26, *Final Landfill Cover Grading Plans*. The Phase 1 closure project included approximately 46 acres. The final grading included berm roads located along the gas extraction well alignments. The berm roads provide access to the extraction wells, routing of gas collection piping, and maintenance access to the Landfill surface. The berms also provide interim storm water runoff control, routing storm water from the Landfill face to the perimeter storm water control channel. The berm roads form surface water collection channels at the inside toe of the access berm road and sloping cell face. Current settled final surface slopes range from about 4:1 to 5:1 (horizontal to vertical).

Ada County is currently filling the remaining airspace with unsettled side slopes of approximately 3:1 to 10:1 to maximize remaining cell footprint capacity. The final cell grading plan for this area of the cell includes loop access roads spaced on approximately 150-foot centers between the previous Phase 1 project and the completed Landfill top elevation. These loop access roads will serve the same function as the existing berm access roads. They will also provide the haul access routes to place final cover soils on the side slopes. The final loop access road will be designed around the perimeter of the Landfill's top 10 percent graded area.

2.2.6 Gas Collection and Control System

The landfill gas collection and control system is presented in Exhibit 13, *Landfill Gas Collection Master Plan* in the *Operation Plan*. The purpose of the landfill gas system is to comply with air permitting requirements. The current landfill gas collection and control system is being constructed as the landfill is being filled. Horizontal collectors are being installed as landfill lifts are completed. Vertical landfill gas extraction wells will be located on the access roads at selected locations to supplement the horizontal collectors. No significant gas collection facilities are envisioned to be included when the final cover soil is applied since a majority of the gas collection system is being installed during filling.

2.2.7 Implementation

Ada County staff and contractors, supported by Ada County's engineering consultant, currently are designing/installing the landfill gas collection system, access roads, and storm water control systems that are integrated into the filling of the remaining HHC airspace. Ada County plans to contract for the work to place the final cover soil.

Construction that is bid to outside contractors will include standard design plans and specifications. Specifications will include a Quality Assurance/Quality Control plan that will provide the procedures and methods to be followed during construction to ensure that the final cover systems are constructed in accordance with the plans and specifications.

2.3 Closure Records

Ada County's Landfill records will be updated to include all closure plan documentation to reflect and record that closure was completed in accordance with this plan.

2.4 Schedule of Closure Activities

Final design and construction of the 46 acre HHC Phase 1 Closure Project, was completed in spring 2004 and the ±30 acre Phase 2 Closure Project was completed in November 2014. Currently the ±30 acre Phase 3 Closure Project is planned for construction during 2018. Landfill gas collection systems, access roads, and storm water systems are currently being installed as the Landfill fills. The schedule for adding the final cover on the remaining portion of the landfill will depend on the sequencing and transitioning of all filling into the NRC.

The August 4, 2016 annual aerial survey and capacity analysis indicated approximately 129,000 cubic yards of remaining capacity. Ada County anticipates that filling at the HHC will continue at a much-reduced rate. Currently, during good weather seasons the HHC is used exclusively for self hauler (general public) loads so that separation of small vehicles and large commercial vehicles can be maintained. Ada County will begin closure activities no later than 30 days after the date on which the HHC receives the final load of waste, and will complete closure activities for the HHC in accordance with the closure plan within 180 days following the beginning of closure. Ada County will apply for an extension of the closure period if Ada County determines that the final closure construction will take longer than 180 days.

2.6 Closure Certification

Following closure of the HHC, Ada County will notify the DEQ and the Central District Health Department (CDHD) that a certification, signed by an independent registered professional engineer or approved by DEQ and CDHD, verifying that closure has been completed in accordance with the closure plan, has been placed in the Operating Record.

Following closure of the HHC and the NRC, Ada County will record a notation on the deed to the Landfill facility property, or some other instrument that is normally examined during title search, and notify the DEQ/CDHD that the notation has been recorded and a copy has been placed in the Operating Record. The notation on the deed will in perpetuity notify any potential purchaser of the property that the land has been used as a landfill, and that its use is restricted under §258.61(c)(3).

3.1 Background

The HHC is the first of two cells at the Ada County Landfill. The NRC is the second cell. Construction of the NRC was begun in 2006 and the cell will be completed in phases until it is closed. At Completion, the NRC will cover an area of 260 acres and have a capacity of 70,000,000 cubic yard. This capacity may last to approximately 2100.

The plan for the NRC has previously been presented in the *Site Certification Report, Predesign Plan, Final Design Report,* and numerous air permit document submittals. Many elements of the NRC closure plan are contained in these previously submitted documents. The Stage 1 NRC project was completed and approval for MSW disposal in the first quarter 2007. It included the first 20 acres of lined cell plus the infrastructure components necessary for operating the lined cell. In the last quarter of 2009, Stage 2 was completed, adding 35 acres of lined cell. Most of the elements included in the NRC closure plan are the same or substantially the same as those for the HHC. However, because the NRC is a lined cell, some elements are specific to this cell. Currently the Stage 3 expansion project which will add ±30 acres of landfill liner is in design and is anticipated to begin construction in 2018.

The final cover for the NRC will be of the same design as was used for the HHC Phase 1 closure using an evapotranspiration (ET) cover of vegetated silty topsoil. This cover is an alternative cover specifically designed for arid landfills. An ET cover utilizes the water-holding capacity of the soil to retain precipitation. The precipitation is then removed through evaporation from the soil and transpiration from the vegetative cover. The design utilizes soils with appropriate properties and sufficient depth, combined with native vegetative plant cover, to provide a system conforming to the alternate final cover design criteria cited in federal regulations. The *Evapotranspiration Cover Predesign Report Ada County Hidden Hollow Sanitary Landfill*, CH2M HILL, September 2001, is included in the Operating Record. A summary of the ET cover design is presented in this Closure Plan.

3.2 Closure Plan

The closure plan presented below presents the components of the ET cover and other closure plan elements for the NRC.

3.2.1 Cover Plan

The cover design presented below summarizes the key components of the ET cover for the NRC Cell. The design is supported by the data, testing, and design criteria details developed and discussed in the Site Certification Report and Section 2.7 Final ET Cover System of the *Predesign Report*.

The ET cover uses topsoil excavated from the NRC construction area (approximately 350 acres) for the ET cover. The NRC site topsoil averages approximately 4 feet thick. The top 4 feet of topsoil is being stripped and stockpiled for future use as ET cover soils and for

topsoil to reclaim other Landfill disturbed areas. The NRC ET cover is expected to be comprised of 4 to 4.5 feet thick cover of stockpiled topsoil. The final design thickness will be verified based on additional testing of the stockpiled topsoil prior to placement. Topsoil at this site has the proper water-retention characteristics and soil properties to construct an ET cover in accordance with regulatory requirements as documented in the *Site Characterization Report*. This ET cover provides sufficient soil depth to absorb precipitation and significantly limit infiltration into the Landfill and supports a vigorous growth of native arid vegetation to prevent erosion and minimize long-term maintenance. The horizontal extent of the final Landfill cover is approximately 260 acres, as shown in Exhibit 2A, *Master Site Plan* in the *Operation Plan*. The cover will be constructed in phases as the Landfill is filled to its final elevation. Fill projections indicate it may be 50 years before any portion of the NRC is filled to its final elevation and would be ready to receive the final ET cover.

3.2.1.1 Typical Cross Section

Each layer of the cover cross section is described below. The descriptions of the layers begin at the bottom and progress up to the surface.

The first layer of the cover cross section is the leveling course. The leveling course provides a uniform graded surface for placement of the ET soil cover. The leveling course consists of medium to coarse sandy soils excavated from the Landfill operations soil borrow areas. The leveling course includes 12 to 24 inches of interim cover soils previously applied plus additional soils as needed to prepare the surface for placement of the ET topsoil.

The second layer of the cover is the ET soil. This layer is spread and graded to achieve a uniform thickness. Placement is carefully controlled to prevent over compaction, compaction criteria is no more than 85 percent of the maximum relative dry density. The 85 percent compaction criterion is recommended to provide for vegetation root growth. The final design depth of the compacted cover soil will be approximately 4 feet. The 4-foot depth is based on the evaluation of topsoil characteristics and precipitation/evapotranspiration data to comply with regulatory requirements. The design evaluation is presented in the *Site Characterization* and *Predesign Reports*.

The third layer is a 3- to 6-inch-thick surface mix comprised of the following;

- Organic-rich leaf compost available from the landfill's leaf mulching program
- Coarse sand added to minimize surface erosion of the newly seeded surface.

These surface mix components are mixed, then spread on the ET soils, and finally disked into the previously placed topsoil. The HHC Phase 1 Closure project included a similar top mix with excellent results.

3.2.1.2 Vegetative Cover

The closure plan includes a vigorous vegetative cover of arid native plants that will prevent erosion and provide for transpiration of soil moisture. The seed mixture is sprayed on in a hydro-mulch solution. Based on the construction schedule and weather conditions after seeding, supplemental irrigation water may be applied. The NRC project includes non-Landfill graded areas that will be re-vegetated using essentially the same cover soil and vegetation design as that used for the Landfill final cover. The plan is to establish vegetation on these areas by natural precipitation. Vegetation growth will be monitored to evaluate if supplemental irrigation is necessary. The seeding specification includes seed mix and application rates for arid soil re-vegetation and includes the same types of seeds supplied by local seed companies to the U.S. Bureau of Land Management (BLM) to reseed the foothills. Hydro-seeding is used to apply the seed. A mulch and tackifier is included for temporary erosion protection. Typical seed mixtures recommended by BLM for the Boise area varies each year according to what seeds are available. BLM recommends a seeding rate of approximately 10 to 20 pounds per acre, depending on seed type and mix availability. Exhibit 27 (see section 2.2.3) presents the native seed species used locally for foothills revegetation. The exact seed mix used will vary from year to year depending on availability of seed species harvested commercially.

3.2.2 Storm Water Control

Storm water runoff facilities will be constructed in conjunction with development of NRC stages. Storm water run-on to the Landfill will be prevented because the design of the Landfill perimeter is constructed above the perimeter of adjoining surfaces or includes diversion ditches where it is not. Storm water runoff is controlled by berm access roads constructed on the Landfill's finished grades (similar to the HHC berm access roads) that convey storm water to the Landfill perimeter and beyond the Landfill perimeter access road. Storm water-holding/infiltration areas are located around the Landfill's perimeter to remove storm water by evaporation/infiltration. These storm water management facilities, constructed during the operational life of the Landfill, will be used for the post-closure period. No significant additional storm water facilities are anticipated to be required at closure.

3.2.3 Final Cell Surface Grading Plan

The projected final cell surface-grading plan is presented in Exhibit 26, *Final Landfill Cover Grading Plan*. The final surface grading includes berm roads located on the final Landfill surface. The berm roads provide maintenance access to the Landfill surface and storm water runoff control. The berms create a storm water channel to route storm water from the Landfill face to the perimeter. The berm roads also provide for future extraction wells and routing of gas collection piping if extraction wells are found to be needed during the post-closure period. The final Landfill surface slopes are 5:1, tapering to 5 percent slopes over the very top.

3.2.4 Gas Collection and Control System

The landfill gas collection and control system is presented in Exhibit 13. *Landfill Gas Collection System Master Plan* in the *Operation Plan*. The purpose of the landfill gas system is to comply with air permitting requirements. The landfill gas collection and control system will be constructed as the Cell is being filled. Horizontal collectors will be installed as Landfill lifts are completed. In the future, vertical landfill gas extraction wells, located on the access roads, can be installed if need at selected locations to supplement the horizontal collectors. No significant landfill gas collection facilities are envisioned to be included when the final cover soil is applied because the majority of the landfill gas collection system is being installed during filling.

Ada County staff and Ada County's Landfill operations contractor, supported by Ada County's Engineering consultant, plan to design and install the gas collection system, access roads, and storm water control systems that are integrated into the filling of the NRC. Ada County plans to contract for the work to place the final cover soil.

Construction that is bid to outside contractors will include standard design plans and specifications. Specifications will include a QA/QC plan that will provide the procedures and methods to be followed during construction to ensure that the final cover systems are constructed in accordance with the plans and specifications.

4.0 Closure Records

Ada County's Landfill records will be updated to include all Closure Plan documentation to reflect and record that closure was completed in accordance with this plan.

Final design and construction of the NRC closure cover will depend on rate of airspace utilization generated by waste disposal from Ada County. Waste projections indicate it may be 50 years before the NRC is filled to the 100-foot berm elevation, and another 50 years before the NRC is filled to final elevation. Sometime into the future, in the range of 50 plus years, sufficient area of the NRC will be filled to its final finished elevation and be ready to receive the final cover. Final closure of the entire NRC is estimated to be around the year 2100 time period. Landfill gas collection systems, access roads, and storm water systems are currently being installed as the Landfill fills. The schedule for adding the final cover will depend on several factors, including timing of various Landfill projects, budgeting, and sequencing and filling the NRC stages. Ada County will complete closure activities for the NRC cell in accordance with the closure plan within 180 days following the beginning of final closure, no later than 30 days after the date on which the NRC cell receives the final receipt of wastes. Ada County will apply for an extension of the closure period if Ada County determines that the final closure construction will take longer than 180 days.

Following closure of the NRC, Ada County will notify the DEQ/CDHD that a certification, signed by an independent registered professional engineer or approved by DEQ/CDHD, verifying that closure has been completed in accordance with the closure plan, has been placed in the Operating Record.

Following closure of both the HHC and NRC, Ada County will record a notation on the deed to the Landfill facility property, or some other instrument that is normally examined during title search, and notify the DEQ/CDHD that the notation has been recorded and a copy has been placed in the Operating Record. The notation on the deed will in perpetuity notify any potential purchaser of the property that the land has been used as a landfill, and its use is restricted under §258.61(c)(3).

Ada County Landfill

Post-Closure Plan

Prepared for Ada County Landfill Ada County, Idaho

February 2017

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1.0 Purpose

The post-closure care period begins with completion of all Hidden Hollow Cell (HHC) closure activities and will be followed by the post-closure care following completion of the North Ravine Cell (NRC) closure activities. Post-closure care requirements, specified in Idaho Code 39-7416 and federal regulations at 40 CFR 258.61, require the owner or operator of all municipal solid waste landfill (MSWLF) units to prepare a written post-closure plan. Idaho Code references the federal standards for post-closure care without modification. This post-closure plan is written to comply with these regulations.

The requirements for post-closure care are presented below.

Applicable Regulations

Title 39, Health and Safety; Chapter 74, Idaho Solid Waste Facilities Act. 39-7416. Standards for Post Closure Care.

- Applicability. Post closure maintenance standards apply to all MSWLF units that receive wastes on or after October 9, 1993, except as provided by 40 CFR 258.1.
- 2) Post closure care shall be conducted as provided under 40 CFR 258.61.

Title 40: Protection of Environment; Part 258—Criteria for Municipal Solid Waste Landfills, Subpart C— Operating Criteria. § 258.61 Post-closure care requirements.

- (a) Following closure of each MSWLF unit, the owner or operator must conduct post-closure care. Post-closure care must be conducted for 30 years, except as provided under paragraph (b) of this section, and consist of at least the following:
 - (1) Maintaining the integrity and effectiveness of any final cover, including making repairs to the cover as necessary to correct the effects of settlement, subsidence, erosion, or other events, and preventing runon and run-off from eroding or otherwise damaging the final cover;
 - (2) Maintaining and operating the leachate collection system in accordance with the requirements in §258.40, if applicable. The Director of an approved State may allow the owner or operator to stop managing leachate if the owner or operator demonstrates that leachate no longer poses a threat to human health and the environment;
 - (3) Monitoring the ground water in accordance with the requirements of subpart E of this part and maintaining the ground-water monitoring system, if applicable; and
 - (4) Maintaining and operating the gas monitoring system in accordance with the requirements of §258.23.
- (b) The length of the post-closure care period may be:
 - (1) Decreased by the Director of an approved State if the owner or operator demonstrates that the reduced period is sufficient to protect human health and the environment and this demonstration is approved by the Director of an approved State; or
 - (2) Increased by the Director of an approved State if the Director of an approved State determines that the lengthened period is necessary to protect human health and the environment.
- (c) The owner or operator of all MSWLF units must prepare a written post-closure plan that includes, at a minimum, the following information:
 - A description of the monitoring and maintenance activities required in §258.61(a) for each MSWLF unit, and the frequency at which these activities will be performed;
 - (2) Name, address, and telephone number of the person or office to contact about the facility during the post-closure period; and

- (3) A description of the planned uses of the property during the post-closure period. Post-closure use of the property shall not disturb the integrity of the final cover, liner(s), or any other components of the containment system, or the function of the monitoring systems unless necessary to comply with the requirements in this part 258. The Director of an approved State may approve any other disturbance if the owner or operator demonstrates that disturbance of the final cover, liner or other component of the containment system, including any removal of waste, will not increase the potential threat to human health or the environment.
- (d) The owner or operator must notify the State Director that a post-closure plan has been prepared and placed in the operating record no later than the effective date of this part, October 9, 1993, or by the initial receipt of waste, whichever is later.
- (e) Following completion of the post-closure care period for each MSWLF unit, the owner or operator must notify the State Director that a certification, signed by an independent registered professional engineer or approved by the Director of an approved State, verifying that post-closure care has been completed in accordance with the post-closure plan, has been placed in the operating record.

To comply with these regulations, this post-closure plan is divided into the following sections:

- Schedule
- Site Security
- Inspection, Monitoring and Operations and Maintenance
 - Infrastructure
 - Landfill evapotranspiration soil cover
 - Methane gas detection
 - Groundwater detection and assessment
 - Groundwater remediation
 - Landfill gas collection system
 - Leachate management
- Decommissioning Operations
- Final Land Use
- Post-Closure Certification

2.0 Schedule

Post-closure activities will continue for 30 years after closure.

The Ada County Operations Director (see Exhibit 3 in the *Operations Plan*) will be the primary contact for information regarding Ada County Landfill post-closure care and maintenance activities.

The length of the post-closure care period can be reduced by the Director of the Department of Environmental Quality (DEQ) if the owner or operator demonstrates that no adverse impact to human health and the environment would result. Conversely, the post-closure care period can be increased if the Director of the DEQ determines that the lengthened period is necessary to protect human health and the environment.

The estimated start of post-closure care is 2019 for the HHC and 2100 for the NRC. This estimate is based on current fill rates and estimated future rates of fill. The actual date may vary depending on variables that will affect fill rates, including countywide waste disposal volume and new landfill management technologies. Ada County annually reviews and updates Landfill fill rates, remaining Landfill capacity, and estimated future fill rates. The analysis is included in the Operating Record, and provides the basis for preparing the annual update of closure and post-closure cost estimates for financial assurance documentation that is also included in the Operating Record.

Access to the Ada County Landfill will be controlled to prevent damage to the final cover, groundwater and gas monitoring wells, landfill gas systems, and other post-closure facilities. A four-strand barbed wire perimeter fence encloses the Ada County Landfill property. Within this fence is additional fencing at strategic locations for added security. Permanent metal no trespassing signs are located in prominent areas around the perimeter property fence line and at each locked gate. Permanent metal no trespassing signs are also posted on interior fence locked gates. The security fences and signs will be maintained throughout the post-closure period. The existing security measures have proven adequate to date, and the public does not access the site. If future security requirements change because of a problem with trespassers, Ada County will enhance security with additional signs, strengthened fences/gates, and/or security patrols to mitigate the security problem. The post-closure plans, and associated cost impacts, if any, will be revised accordingly.

Security facilities will be maintained as follows:

- Site security fencing, signs, and gates at access points available to the public (along Seamans Gulch Road and along Goose Creek Lane) will be inspected weekly and repaired as needed.
- Site security fencing, signs, and gates along the Landfill property perimeter fencing adjacent to private property with no/limited public access will be inspected annually and repaired as needed.

4.0 Inspection, Monitoring, and Operation and Maintenance

4.1 Infrastructure

Infrastructure includes access roads, security fencing (see Section 3.0), storm water systems (ditches, channels, ponds), power supply, and other miscellaneous systems that comprise the Landfill infrastructure.

Routine post-closure operations and maintenance includes a weekly inspection to maintain systems in good operating condition.

Infrastructure operations and maintenance includes the following:

- Inspect access roads and maintain road grade for access.
- Inspect storm water channels, ditches, ponds fill/grade erosion, remove obstructions. Maintain channels and ponds.
- Inspect power and water supplies. Repair as needed and notify utility owners of the need to make repairs

4.2 Landfill Evapotranspiration Soil Cover

The HHLF and NRC Landfill final covers are designed to be low-maintenance evapotranspiration covers planted with native vegetation. This design was successfully demonstrated during the Phase 1 closure of the HHC. Maintenance of the cover includes an annual inspection and cover maintenance scheduled in the spring. Spots of erosion will be re-graded and filled. Invasive weeds will be spot sprayed. In the fall, bare spots will be reseeded with a native seed mix.

4.3 Methane Gas Detection

The procedures for methane gas detection monitoring that are presented in the *Operation Plan*, Section 3.4, are the same as those to be followed in the post-closure period.

4.4 Groundwater Detection and Assessment

The procedures for groundwater monitoring that are presented in the *Operation Plan*, Section 3.5, are the same as those to be followed in the post-closure period.

4.5 Groundwater Remediation

The procedures for groundwater remediation that are presented in the *Operation Plan*, Section 3.5, are the same as those to be followed in the post-closure period.

4.6 Landfill Gas Collection System

The Ada County landfill gas collection system includes a landfill gas extraction system for the HHC, landfill gas extraction system for the NRC, and a common hydrogen sulfide scrubber, flares, and electrical generation system to destroy extracted landfill gas.

The landfill gas collection and control system is monitored, operated, and maintained in accordance with the Ada County Landfill State of Idaho Air Permit. Permit provisions apply from Landfill operations through the closure/Post-closure period, until emissions reduce to the level below permit requirements. The detailed air permit requirements, operations, monitoring, and reporting are detailed in the air permit documentation included in the Operating Record. A brief summary of the monitoring and operations are presented below.

4.6.1 Monitoring

The Ada County Landfill air permit includes routine monitoring of the landfill gas system. The same monitoring provisions apply from operations through the closure/post-closure period. A summary of the routine monitoring and reporting is as follows:

- Monthly monitoring and adjustment of gas extraction wells, surface collectors, and horizontal collectors
- Quarterly monitoring of Landfill surface emissions
- Semiannual compliance reports submitted to DEQ
- Annual NMOC emissions Report submitted to DEQ

4.6.2 Operations and Maintenance

The Ada County Landfill air permit includes routine operations and maintenance provisions for the landfill gas system. The same operations and maintenance provisions apply from operations through the closure/post-closure period. A summary of the routine operations and maintenance is presented in the following text.

Routine daily landfill gas collection and control system operations include observing system operations and performing system adjustments to ensure the system is operating properly. Online system monitoring data is available via remote PC to perform the daily evaluation.

- Daily monitor flare system operations via remote PC system monitoring, switch to the backup flare if there appears to be operational issues with the on-line flare, or inspect the flare system for further evaluation.
- Weekly inspect hydrogen sulfide scrubber and flare systems, evaluate system functions, and identify potential maintenance needs. Inspection of components includes vacuum blowers, condensate system, flare, instrumentation and controls, and piping and valves. Perform comparatively simple maintenance and service as needed. Schedule contractors for maintenance that is more involved and service tasks.
- Monthly inspect the gas collection sampling and control valve vaults (gas extraction wells, surface collectors, and horizontal collectors) during the monitoring event. Perform routine maintenance and service as needed, such as replacement of the manual control valves, tightening flexible hose clamp connections if loose, cutting down vertical well casings that are becoming extended as the Landfill settles, etc.
• Employ mechanical and electrical/instrumentation service contractors to repair or replace system components as needed.

4.7 Leachate Management

The HHC does not have a bottom liner system or a leachate collection system. Therefore, no leachate management or system operational requirements are necessary during the post-closure period.

The NRC has a leachate collection and management system that will be operated during the post-closure period. The leachate system operations during the post-closure period will be the same as those presented in the operations plan for system operations during Landfill operations.

The leachate system includes the leachate pump station that pumps leachate from the lined landfill sump to the leachate evaporation lined pond where leachate is evaporated. The leachate pump station includes redundant backup pumps to provide continued pumping when a pump needs to be serviced. The pump station includes a control system that operates the pumps. The pumps can be manually operated when the controls require servicing. The pump station includes a connection to operate the pump station on a portable generator if a sustained power outage occurred. The pump station is designed to operate unattended, requiring only weekly inspection.

Operation and maintenance includes the following:

- Inspect leachate pumps for proper operation
- Employ a mechanical services contractor to repair or replace valves, miscellaneous piping components, and remove or replace any non-operating pumps.
- Employ an electrical services contractor to repair or replace any electrical or instrumentation component in need of service.
- Employ an electrical contractor to provide a portable electrical generator to power the pump station if needed.
- Inspect the pipeline static pressure record to look for a pressure drop that may indicate a pipeline leak. Quarterly, isolate and pressurize the pipeline using the pump pressure to provide a pressurized static test that may indicate a leak. If a leak is indicated, employ a mechanical services contractor to identify the leak location and repair/replace the pipe.
- Inspect leachate evaporation pond, re-grade pond protective gravel surface to correct eroded spots, record leachate pond level monthly, and annually evaluate total leachate volume pumped and leachate pond level to ensure that pond capacity is sufficient to handle leachate generation.
- Record field inspections, repairs, and data and file in the Operating Record.

4.8 Inspection, Operations, and Maintenance Summary

Inspections, operations, and maintenance of Landfill closure systems are summarized below. The Landfill closure systems are being specifically planned, designed, and constructed to minimize the inspection frequency and the amount of expected operations/maintenance. Designs and construction will be based on providing robust systems that will provide long-term operations with low maintenance. Inspection and maintenance summary is presented in Exhibit 28.

EXHIBIT 28

Inspection, Operations, and Maintenance of Ada County Closure Systems

		Inspection					
Frequency	Areas for Inspection, Operation, and Maintenance	Inspection, Operation, and Maintenance Required					
	Security Systems						
Monthly	Locked gates, signs, and adjacent fence at roadway/public access points to Landfill	Immediately repair damaged fencing, gates, and signs					
Annually	Landfill property perimeter/interior fencing, signs, access road locked gates	Annually repair fences, gates, and signs					
	Facil	ities Infrastructure					
Weekly	Access Roads	Re-grade access roads to maintain access					
	Storm water channels, ditches, ponds	Clean, re-grade, and repair storm water control system facilities that would impact the effectiveness of the control system to prevent run-on or control runoff					
	Utility Services (power, water)	Inspect power and water utilities, notify utility supplier if maintenance is needed					
	ET Ve	egetated Soil Cover					
Quarterly	Erosion spots	Re-grade/fill soil					
	Evasive weeds	Spot spray in the spring					
	Bare spots	Annually (fall) dress up with native seed mix seed and mulch					
	Groundwater ar	nd Methane Monitoring Wells					
Semiannual	Monitoring well function and well integrity	Repair well heads to provide for planned monitoring to ensure wells are secured					
		Employ well service contractor to repair/replace sample pumps					
		Employ well service contractor to repair/replace monitoring wells					

EXHIBIT 28

Inspection, Op	erations, and	Maintenance of	of Ada C	ounty Cl	losure Sy	stems

Groundwater Remediation System							
Weekly	Stripper building facilities	Maintain systems to ensure the proper function of the stripper system and extraction wells					
		Employ mechanical and electrical/instrumentation service contractors to repair/ replace stripper building system components as needed.					
Annual	Extraction Pumps and stripper	Employ well service contractor to pull the pumps; inspect pumps for corrosion, loose wiring, etc.; clean the wells by surging and hypochlorite tablet addition to control bio-fowling, repair/replace pumps and components as needed, clean stripper tray					
	Gas Collec	tion and Control System					
Daily	Monitor hydrogen sulfide scrubber and flare system operations via remote PC system	Switch to the backup flare if there appear to be operational issues with the online flare, or inspect the flare system for further evaluation.					
Weekly	Inspect systems	Evaluate system functions and identify potential maintenance needs, perform simple maintenance and service as needed, schedule contractors for maintenance that is more involved and service tasks.					
Monthly	Gas collection control valve vaults	Perform maintenance and service as needed, repair/ replace manual control valves, tightening flexible hose clamp connections, cutting down vertical well casings					
	Le	eachate System					
Daily	Monitor leachate pump system operations via remote PC system	Inspect facilities if operations are abnormal					
Weekly	Inspect pump station	Repair/replace simple problems check pipeline static pressure leak indication, record leachate levels. Employ contractors service/repair mechanical and electrical/instrumentation components or provide backup generator					
Quarterly	Leachate Pond and Pipeline	Static pressure test leachate pipeline for leaks Re-grade eroded pond gravel surface, record pond level					
	De	ecommissioning					
At end of Closure	Wells	Abandon Wells					
At end of Closure	Gas Wells and Horizontal collectors	Cap piping					

4.9 Monitoring Summary

Monitoring of landfill closure systems are summarized in Exhibit 29.

EXHIBIT 29

Monitoring of Ada County Closure Systems

Inspection Frequency	Monitoring Required						
Management							
Annual Monitoring, Inspection, Maintenance, operations management	Management and supervision of Monitoring, Inspection, Maintenance, and operations tasks and personnel						
Groundwater and Me	ethane Monitoring Wells						
Semiannual Ground Water Detection monitoring Quarterly Methane Monitoring	Sampling, analysis, reporting of the ground water monitoring well network						
	Sampling, analysis, reporting of the methane monitoring well network						
Groundwater R	emediation System						
Semiannual Remediation system monitoring	Sampling, analysis, reporting of the groundwater extraction and monitoring wells and stripper discharge network. Employ mechanical and electrical/instrumentation service contractors to repair/ replace stripper building system components as needed.						
Landfill Gas Col	lection and Control						
Monthly Gas collection System	Monitor each gas collection well, surface collector, and horizontal collector monitoring location, adjust flows as needed.						
Quarterly Landfill Surface Emissions	Monitor quarterly Landfill source emissions monitoring on a 100-foot grid basis						
Annual NMOC Monitoring	Sample the gas collection header for total NMOC determination						
Semiannual reporting	Prepare semiannual air emissions compliance reports						
Leacha	te System						
Annual Data Analysis	Analyze leachate system data to ensure adequate system capacity						

5.0 Decommissioning Operations

At the conclusion of the post-closure period, several facilities will remain that will require decommissioning to protect the environment from future potential risks. Groundwater monitoring and extraction wells, and soil vapor wells (methane monitoring wells, soil vapor monitoring wells, and soil vapor extraction wells) pose a risk to the environment from potential surface water inflow. Landfill gas extraction wells and horizontal collectors pose a potential risk from exposure to residual landfill gas. The decommissioning plan presented below includes the actions to protect the environment from potential risks.

The plan includes abandonment of all groundwater, methane, and soil vapor wells in place, in accordance with the appropriate regulations and supervised by a registered hydrogeologist. The well network currently consists of approximately 60 wells within the Landfill property boundary. The number of wells at any time may vary depending on future Landfill projects.

The landfill gas extraction wells and horizontal collectors will be closed by capping the well ends and collector ends at least 3 feet below grade and covering with soil.

Following completion of all post-closure plans, a certification of closure will be prepared by a registered engineer and hydrogeologist certifying that closure is complete in accordance with the approved plans.

The Ada County Landfill HHC and NRC areas will be fenced and not actively used after closure. The HHC cover, with native vegetation, will blend into the natural setting. Perimeter fencing and signs will remain to prevent public access to the area and to prevent disruption of the final cover. Groundwater monitoring, landfill gas monitoring, and landfill gas extraction facilities will be decommissioned at the end of the post-closure monitoring period to prevent potential risk to the environment.

Ada County has no current land use plans for the buffer land surrounding the Landfill. The post-closure plan will be modified if Ada County changes the status of the surrounding buffer land.

7.0 Post-Closure Certification

Following completion of the post-closure care period, an independent registered professional engineer will certify that post-closure care has been completed in accordance with this post-closure plan. Ada County will notify the Central District Health Department and DEQ that the certification has been placed in the Operating Record of the facility.

In accordance with 40 CFR 258 Subpart G *Financial Assurance Criteria*, the updated current cost estimate for the Ada County Landfill, including the HHC and NRC, for closure, post closure, and corrective action is presented in Exhibit 30 (see following pages). This estimate has been placed in Ada County's Operating Record. Following the cost estimate is the current financial assurance documentation. The financial assurance documentation will be placed in the Operating Record and updated annually by September 30.

Ada County Landfill Closure and Post-Closure Information, FY 2016

PREPARED FOR:	Sarah Lund / Ada County Auditor's Office	OFESSION
PREPARED BY:	Jeff Osterman, P.E./CH2M HILL Craig Caldwell, P.E./CH2M HILL	82
COPIES:	Scott Williams, Director/Ada County Operations Ted Hutchinson, Deputy Director/Ada County Solid Waste Management	SIATE O
DATE:	September 30, 2016	



The Ada County Landfill includes the Hidden Hollow Cell (HHC) and the North Ravine Cell (NRC). The HHC has been in continuous operation since the early 1970s. The HHC is an unlined monolithic cell situated at the head of a natural ravine. The NRC is a modern lined landfill that will be constructed in stages, with new liner installed prior to filling each stage.

The HHC provides approximately 108 acres of landfill area. NRC Stages 1 (20 acres) & 2 (34 acres) provide the first approximately 54 acres of landfill disposal area of the planned 260 acres of total NRC lined cell at completion. In fiscal year (FY) 2007, Stage 1 the new NRC became operational. In FY 2010 Stage 2 construction was completed, but was not yet operational. In FY 2011 operations began in NRC Stage 2. The closure and post- closure information provided herein covers both the HHC and NRC.

Memo Organization

A summary of closure and post-closure costs for the Ada County Landfill (combined HHC and NRC) are presented in table format.

The HHC summary tables are presented first, followed by the NRC summary tables. The HHC information format is different because the HHC has been partially closed, and includes the partial closure project costs spent to date. The NRC has not been partially closed and so it has no partial closure costs.

The detailed HHC and NRC closure and post-closure cost estimate data sheets are attached.

Gas Collection System Status

With the addition of the NRC, all Ada County Landfill operations are now covered by a single air permit. The air permit regulations are an extension of the general regulations that the entire landfill operates under. Because the landfill gas (LFG) system and other landfill emissions are subject to regulation, closure and post-closure costs associated with the LFG system are now included in the closure/post-closure costs for the landfill. The ongoing

expansion of the gas collection system is required by the landfill's operational permit and these ongoing costs are included in normal operating costs of the landfill.

During fiscal year 2010, new federal greenhouse gas regulations were implemented. These regulations require monitoring and reporting greenhouse gas emissions from the Ada County Landfill and increased the post closure costs.

Answers to Ada County Auditor's Questions

LFG Collection System:

• What procedures have taken place as of September 30, 2016 for the gas collection system?

HHC: During FY 2016 there were no new gas collection wells added to the cell. As of September 30, 2016 the HHC *operational* gas collection system consisted of 195 deep wells, 18 surface collectors, 21 perimeter wells, and 49 horizontal collectors. There are 4 *non-operational* horizontal collectors that do not have sufficient waste placed above them to allow them to be activated. Without waste fill above them, the wells would pull more than the allowed 5% oxygen into the collection system.

NRC: During FY 2016 no new wells were completely installed, but work on several horizontal wells was advanced. None of these new wells have been activated. As of September 30, 2016 the NRC *operational* gas collection system consisted of eight horizontal gas collectors. There are nine partially or fully installed horizontal collectors that are *not activated* due to lack of waste cover or incomplete installation.

Control System: During FY 2015 (last year) a new landfill gas hydrogen sulfide scrubber system was put into operation. The scrubber is required to meet national emissions standards. The post closure costs for both cells now reflect an increase to account for ongoing operations and maintenance of the scrubber system during the 30-year post closure time period. A large part of the costs associated with operating the scrubber depend on the amount of hydrogen sulfide in the gas and the gas flow rate. The costs will be recalculated when needed to reflect current gas composition and flow rate. No cost maintenance changes were made in FY 2016.

• What procedures will take place in the future for the gas collection system? Horizontal gas collectors, vertical wells, surface collectors (as needed), and other components for the HHC and NRC will continue to be installed as waste is filled in the landfill cells during and after FY 2016. Currently there are new perimeter soil gas extraction wells being installed at the HHC. They are planned to be activated in early FY 2017. Air permitting monitoring and compliance reporting will be ongoing.

Groundwater Corrective Action:

• Are there any corrective action costs for the Ada County Landfill for groundwater restoration?

The corrective actions that were mandated by the Consent Agreement between Ada County and DEQ have previously been implemented, and these costs have previously been incurred. The NRC and HHC operate under a common groundwater plan that includes standard landfill groundwater system operations, maintenance, and monitoring as part of the standard landfill groundwater permit program. Both groundwater monitoring and remediation system monitoring are integrated into the standard permit program. The standard permit program allows for remediation system adjustments and modifications in response to changes in conditions in accordance with standard procedures.

Currently Idaho DEQ is directing that additional efforts be made to characterize and then remediate suspected new migration of groundwater contamination that is attributed to landfill gas vapor, and possibly leachate, from the unlined HHC. Groundwater contamination was detected east of Seaman's Gulch Road, potentially increasing the work needed to mitigate the issues. There is insufficient current data to prepare preliminary engineering solutions to develop a more detailed closure/post closure cost estimate. It is likely to take several years of groundwater monitoring and investigative soil vapor control system testing before the data will be available to develop more definitive estimates. The engineer's recommendation is to include this budget amount, based on best engineering judgment, to account for the potential closure/post closer costs associated with HHC soil vapor migration and potential expansion of the groundwater extraction system. Since 2008, \$7M has been added to the Closure/Post Closure Cost Summary as a contingency amount to cover the cost of these unknown corrective actions. No additional contingency costs have been added in FY 2016.

HHC Closure and Post-Closure Summary for FY 2016

Table 1 summarizes general information for the HHC as of September 30, 2016.

TABLE 1

HHC Remaining Cost and Duration Summary

	Item	Detail
1.	Remaining Closure and Post-Closure costs estimated in Sept 30, 2016 dollars (Closure costs <mark>—\$3,976,251</mark> ; Post-Closure costs <mark>—\$11,552,881</mark> ; Landfill Gas Migration Controls— <mark>\$7,000,000;</mark>)	\$22,529,132
2.	Post-Closure monitoring duration	30 years
3.	Percentage of landfill capacity used to date	99.2%
4.	Estimated earliest landfill closure date	2018

Table 2 presents closure and post-closure cost information and net remaining liability for FY 2016 (accrued liability minus incurred closure and post-closure costs) and HHC closure/post-closure cost for DEQ financial assurance.

TABLE 2

Ada County Solid Waste Landfill HHC Closure and Post-Closure Financial Plan Information—End of Fiscal Year 2016
Description
Cost

Description	0031
Summary of Closure and Post-Closure Costs for DEQ Financial Assurance	
Total remaining closure cost	<mark>\$3,976,251</mark>
Total remaining post-closure cost	\$11,522,881
Total remaining landfill gas soil migration Controls	\$7,000,000
HHC closure/post-closure cost for DEQ financial assurance	\$22,529,132
HHC Closure/Post-Closure Cost Net Remaining Liability	
Total cumulative incurred closure costs through FY 2016	\$10,755,207
Total incurred and remaining closure and post-closure costs	\$33,284,338
Percent of landfill capacity, volume basis, used through FY 2016	<mark>99.2%</mark>
Accrued liability volume basis	<mark>\$33,018,064</mark>
Net remaining liability for FY 2016	
(accrued liability minus incurred closure and post-closure costs)	\$22,262,857

Table 3 presents a summary of past and future HHC closure costs.

TABLE 3

Summary of HHC Closure Costs

Closure Cost Element	Cost
2003 Phase 1 Closure expenditures	\$5,036,759
2004 Phase 1 Closure expenditures	\$3,262,146
2005 expenditures (none)	SO
2006 expenditures (financial plan basis)	\$328,800
2007 expenditures (financial plan basis)	\$276,000
2008-2013 expenditures (none - all costs included in routine landfill O&M starting FY 2008)	<mark>\$0</mark>
2014 Phase 2 Closure expenditures	\$1,160,793
2015 Phase 2 Closure expenditures	\$690,709
2016 expenditures (none)	SO
Subtotal (closure costs through FY 2016)	\$10,755,207
Future closure costs (as of Sept 30, 2016)	\$3,976,251
Future Gas Migration closure costs (as of Sept 30, 2016)	\$7,000,000
Total closure costs past and future	\$21,731,457

NRC Closure and Post-Closure Summary for FY 2016

The NRC began landfill operations in FY 2007. The NRC will be built out in stages as landfill capacity is needed. NRC Stage 1 became operational in FY 2007, and Stage 2 became operational in FY 2011. NRC Stages 1&2 included approximately the first 54 acres of lined cell area of the planned 260 acres of total NRC lined cell at completion. Attached are the cost estimate detailed data sheets. Table 4 presents a summary of the Closure/Post-Closure costs for the NRC.

TABLE	4
	•

NRC Closure/Post-Closure Cost Summary	
Post-closure monitoring duration	30 years
Estimated landfill closure date ¹	Year 2107
Description	Cost
Closure costs as of Sept 30, 2016 (260 acre landfill)	\$18,980,690
Post-closure costs as of Sept 30, 2016 (260 acre landfill)	<mark>\$14,057,161</mark>
Total closure/post-closure costs (260 acre landfill)	<mark>\$33,037,851</mark>
Percentage of landfill capacity used as of Sept 30, 2016 (% volume basis)	<mark>4.38%</mark>
Ada County net remaining Financial Liability closure/post- closure costs as a percentage of capacity (% volume basis)	<mark>\$1,447,058</mark>
Ada County net remaining Financial Liability closure/post- closure costs as a percentage of capacity (% volume basis)	<mark>\$1,447,058</mark>
Ada County net remaining Financial Liability closure/post- closure costs as a percentage of capacity (% volume basis) Percentage of landfill area used as of Sept 30, 2016	\$1,447,058 17.27%
Ada County net remaining Financial Liability closure/post- closure costs as a percentage of capacity (% volume basis) Percentage of landfill area used as of Sept 30, 2016 Closure costs as of Sept 30, 2016 (44.9 acre landfill, 17.27% of 260 acres)	\$1,447,058 17.27% \$3,277,819
Ada County net remaining Financial Liability closure/post- closure costs as a percentage of capacity (% volume basis) Percentage of landfill area used as of Sept 30, 2016 Closure costs as of Sept 30, 2016 (44.9 acre landfill, 17.27% of 260 acres) Post-closure costs as of Sept 30, 2016 (44.9 acre landfill, 17.27% of 260 acres) See detailed data sheets.	\$1,447,058 17.27% \$3,277,819 \$11,197,049

¹ Date is too far in the future to estimate reliably. This date is based on a projected initial landfill life of 100 years.

HHC and NRC Financial Liability and DEQ Financial Assurance Summary for FY 2016

Table 5 Summarizes the Ada County Landfill net remaining financial liability and the DEQ financial assurance cost estimates.

TABLE 5 Summary			
Combined Closure and Post- Closure Coasts	ннс	NRC	Total Ada County Landfill
Ada County Net Remaining Financial Liability	\$22,262,857	<mark>\$1,447,058</mark>	<mark>\$23,709,915</mark>
Ada County Financial Assurance Documentation for DEQ	\$22,529,132	\$14,474,868	<mark>\$37,004,000</mark>

Post Closure Cost Estimate												
System or Activity												
Inspection Frequency												
											% NRC Costs Prorated	
											Acreage Built-out, FY	NRC - DEQ Financial
	Inspection/Operation/Maintenance	Labor and Equipment	Annual Unite	Cost Bor Unit	Annual cost	30 vears cost	HHC % of Total		NRC % of Total	NRC Cost	2016 IS 44.9 acres-	to Landfill Acres Built
	inspection/operation/maintenance	Summary	Annual Units	Cost Per Offic	Annual Cost	SU years COST		HHC COSt	NICC /0 OF FOLD	NIC COSt	17.27 % 01 200 total acres	to Lanutin Acres Buil
General Facilities and Site Inspections and												
Maintenance												
Security Systems	Inspection looked getes signs and ediscent	Boutine 3 percep grow/truck 1	10	1093	\$10.729	\$224.940	500/	£400.000	500/	¢100.000	17.27%	¢400.0
Wohuny	fence at roadway/public access points to landfill/	day per month average	12	\$094	\$10,728	\$321,640	50%	\$160,920	50%	\$160,920	100%	\$160,9
	O&M- repair damaged fencing, gates, and signs	s										
Annually	In an exting the dfill area anti- a size star (interior	Beutine O econo econtrale O	0	C004	¢4 700	6 50.040	500/		500/	\$ 20,000	100%	1 00 0
Annuaiy	Inspection- landfill property perimeter/interior fencing signs access road locked gates/ O&M-	Routine- 2 person crew/truck, 2 days per year average	2	\$894	\$1,788	\$53,640	50%	\$26,820	50%	\$26,820	100%	\$26,8
	repair fences, gates, and signs	days per year average										
Facilities Infrastructure												
Weekly	Inspection- access roads; storm water	Routine- 2 person	52	\$1,127	\$58,604	\$1,758,120	50%	\$879,060	50%	\$879,060	100%	\$879,0
	channels, ditches, ponds; utility services (power, water)/ O&M - re-grade access roads to maintain	crew/truck/backhoe, 1 day per week average										
	clean/re-grade/repair storm water control system	, moon average										
	facilities that would impact the effectiveness of											
	the control system to prevent run-on or control											
	runoff access; notify utility supplier if											
ET Vegetated Soil Cover												
Quarterly	Inspection- erosion spots; evasive weeds; bare	Routine- 2 person	20	\$1,127	\$22,540	\$676,200	30%	\$202,860	70%	\$473,340	17.27%	\$81,7
	spots/ O&M- re-grade/fill soil; spot spray weeds	crew/truck/backhoe, 5 days per										
	in the spring; annually (fall) dress up with native	quarter average										
Monitoring Wells and Groundwater Remediation												
System												
Groundwater and Methane Monitoring Wells												
Semi-annual	Inspection- monitoring well function and well	Routine- 2 person crew/truck, 1	2	\$894	\$1,788	\$53,640	30%	\$16.092	70%	\$37.548	100%	\$37.5
	integrity/ O&M- repair well heads to provide for	day per semi-annual period										
	planned monitoring to ensure wells are secured;	average										
	employ well service contractor to repair/replace sample pumps: employ well service contractor to											
	repair/replace monitoring wells	- -										
		A	0	\$1.070	* • - • •	\$110,000						
		service company rig plus labor	2	\$1,872	\$3,744	\$112,320	30%	\$33,696	70%	\$78,624	100%	\$78,6
		for 2 days annual average, plus										
		allowance for one monitoring										
		well replacement every										
		Major Maintenance -			\$2 500	\$75.000	30%	\$22 500	70%	\$52.500	100%	\$52.5
		Annual materials allowance			\$2,000		0070	\$L1,000	10/0	\$02,000	100,0	\$0 <u>2</u> ,0
Groundwater Remediation System												
Weekly	Inspection- Stripper building facilities/ O&M-	Routine- 2 person crew/truck, 1	52	\$894	\$46,488	\$1,394,640	100%	\$1,394,640	0%	\$0		
	maintain systems to ensure the proper function	day per week average										
	employ mechanical and											
	electrical/instrumentation service contractors to											
	repair/ replace stripper building system											
	components as needed.	Major Maintenance –	1	\$1.407	\$1.407	\$42.210	100%	\$42 210	0%	\$0		
		Mechanical/electrical contract				,		÷ 12,210	- / •	Ψ		
		service company rig plus labor										
Annual	Inspection- extraction Pumps and stripper/	tor 2 days annual average. Major Maintenance - Well	4	\$1 872	\$7 488	\$224 640	100%	\$224 640	0%	¢r		
, and a	O&M- employ well service contractor to pull the	service company rig plus labor		\$1,072	¢1,400	φ 22 4,040	10070	ψεε+,040	070	φι		
	pumps; inspect pumps for corrosion, loose	for 4 days annual average, plus										
	wiring, etc; clean the wells by surging and	allowance for one monitoring										
	fowling, repair/replace pumps and components	every 10 years										
	as needed, clean stripper tray											
		Major Maintenance -			\$2,500	\$75,000	100%	\$75,000	0%	\$0		
		Annual materials and well										
		replacement allowance		1			I				1	

Post Closure Cost Estimate (Continued)												
System or Activity												
Inspection Frequency												
											% NRC Costs Prorated	
											Acreage Built-out, FY	NRC - DEQ Financial
	Inspection/Operation/Maintenance	Labor and Equipment	Annual Units	Cost Per Unit	Annual cost	30 years cost	HHC % of Total	HHC Cost	NPC % of Total	NRC Cost	2016 IS 44.9 acres-	to Landfill Acres Built
	inspection/operation/maintenance	Summary	Ainuai Onits	COSt P Er Offit	Annual Cost	So years cost		Tine cost		NKC COSt		to Landini Acres Built
Mechanical Systems Inspections, Operations, and Maintenance												
Gas Collection and Control System												
Daily	Inspection- monitor flare system operations via	Routine- 1 person, 1 hour	250	\$120	\$30,000	\$900,000	50%	\$450,000	50%	\$450,000	100%	\$450,000
	remote PC system/ O&M - switch to the backup	office time per day average										
	with the on-line flare, or inspect the flare system											
	for further evaluation.											
Weekly	Inspection- flare system/ O&M- evaluate	Routine- 2 person crew/truck,	130	\$894	\$116,220	\$3,486,600	50%	\$1,743,300	50%	\$1,743,300	100%	\$1,743,300
	system functions and identify potential	2.5 days per week average										
	maintenance and service as needed, schedule											
	contractors for more involved maintenance and											
	service tasks.	Major Maintonanaa	7	\$1.407	¢0.940	\$205.470	500/	\$4.47.70F	50%	¢4.47.705	400%	¢4.47.705
		Mechanical/electrical contract	7	\$1,407	\$9,849	\$295,470	50%	\$147,735	50%	\$147,735	100%	\$147,735
		service company rig plus labor										
		for 7 days annual average.			A / A B A	6 001010						
Monthly	Inspection- gas collection control valve valits/	Routine- 2 person crew/truck, 1	12	\$894	\$10,728	\$321,840	50%	\$160,920	50%	\$160,920	100%	\$160,920
	needed, repair/ replace manual control valves,	day per monar average										
	tightening flexible hose clamp connections,											
	cutting down vertical well casings	Maine Maintenance			\$25.000	\$750.000	500/	A 075 000	500/	* 075 000	1000/	\$075 000
		Major Maintenance -			\$25,000	\$750,000	50%	\$375,000	50%	\$375,000	100%	\$375,000
Annually	H2S Scrubber Maintenance - consumable	Routine- annual period for	1	\$94,250	\$94,250	\$2,827,492	84%	\$2 370 034	16%	\$457.458	100%	\$457 458
	media, labor, misc expeses for repairs, etc.	estimate, daily inspection		** .,	••••,=••	+=,+=-,,+==	0470	φ2,010,004	1070	Q407,400	10070	φτοι,του
		required										
Leachate System												
Daily	Inspection- Monitor leachate pump system	Routine- 1 person, 1 hour	250	\$120	\$30,000	\$900,000	0%	\$0	100%	\$900,000	100%	\$900,000
	operations via remote PC system/ O&M- inspect facilities if operations are apportable	t office time per day average										
Weekly	Inspection- pump station/ O&M- repair simple	Routine- 2 person crew/truck, 1	52	\$894	\$46,488	\$1,394,640	0%	\$0	100%	\$1.394.640	100%	\$1,394,640
,	problems; check pipe line static pressure leak	day per week average						• -				
	indication; record leachate levels; employ											
	contractors service/repair mechanical and electrical/instrumentation components or provide	e .										
	backup generator											
		Major Maintenance –	5	\$1,407	\$7,035	\$211,050	0%	\$0	100%	\$211,050	100%	\$211,050
		iviecnanical/electrical contract service company rig plus labor										
		for 5 days annual average.										
Quarterly	Inspect- leachate Pond and Pipeline/ O&M-	Routine- 2 person crew/truck, 1	4	\$894	\$3,576	\$107,280	0%	\$0	100%	\$107,280	100%	\$107,280
	static pressure test leachate pipeline for leaks; re	e day per quarter average										
	level											
		Major Maintenance -			\$5,000	\$150,000	0%	\$0	100%	\$150,000	100%	\$150,000
		Annual materials allowance										
Decommissioning		Overfreed Overfree Wild'	20	A		A=0					1000/	
At end of Closure	Groundwater Wells- Abandon Wells	service company rig plus labor	30	\$1,872	\$56,160	\$56,160	30%	\$16,848	70%	\$39,312	100%	\$39,312
		for 30 days										
At end of Closure	Gas Wells and Horizontal collectors- Cap piping	Contract Service- General	20	\$1,250	\$25,000	\$25,000	30%	\$7,500	70%	\$17,500	17.27%	\$3,022
		contractor rig/backhoe plus										
		10001 101 20 0033.						1		1		

Post Closure Cost Estimate (Continued) System or Activity ction Frequency Labor and Equipment Inspection/Operation/Main Summary Annual Units Cost Per Unit Annual cost 30 years cost HHC % of Total HHC Cost NRC % of Tota Regulatory Monitoring, Sampling, Reporting, and rofessional staff Management Annual Monitoring, Inspection, Maintenance, operations lanagement- 75 days per yea \$1,16 \$87,00 \$2,610,00 lanagement and supervision of Monitoring, 75 30% \$783,000 70% nspection, Maintenance, and operations tasks nagement staff average management nd personnel Groundwater and Methane Monitoring Wells Semi-annual Ground Water Detection monitoring \$7,15 Sampling, analysis, reporting of the 18 ground \$894 \$214,56 30% \$64,368 70% Groundwater Field- 2 person crew/truck, 4 days per semivater monitoring well network Innual event Innual event Iethane Field- 2 person Quarterly Methane Monitoring \$3,57 \$107,28 Sampling, analysis, reporting of the XX methane \$89 30% \$32,184 70% onitoring well network crew/truck, 1 day per quarterly crewitruck, 1 day per quarteriy event **Reporting**- professional staff 20 days annual average data analysis and reporting **Analytical**- annual lab cost 20 \$120 \$72,00 \$2,40 50% \$36,000 50% \$20,00 \$600,00 \$180,000 30% 70% Groundwater Remediation System oundwater Field- 2 person \$894 \$5.36 \$160.92 100% \$160,920 0% Sampling, analysis, reporting of the 15 crew/truck, 3 days per semigroundwater extraction and monitoring nnual event wells and stripper discharge network; employ mechanical and electrical/instrumentation service contractors to repair/ replace stripper building system components as needed. **Reporting-** professional staff 10 days annual average data 10 \$120 \$1,200 \$36,000 100% \$36,000 0% analysis and reporting Analytical- annual lab cost \$6,00 \$180,00 100% \$180,000 0% Landfill Gas Collection and Control \$75,09 \$2,252,88 \$89 Monthly Gas collection System Monitor each gas collection well, surface Routine- 2 person crew/truck, days per month average 84 30% \$675.864 70% llector, and horizontal collector monitoring location, adjust flows as needed. Perform routi naintenance on gas collection and control ystems, including the flares and blowers. Annual Greenhouse Gas Reporting Sampling and Data Management \$5,36 \$160,92 Routine- 2 person crew/truck. \$48,276 \$89 30% 70% Routine- 2 person crew/truck, days per annual period Reporting- professional staff days annual average data analysis and reporting Routine- 2 person crew/truck, Prepare annual Greenhouse Gas Report 12 \$960 \$11,520 \$345,60 30% \$103,680 70% Quarterly Landfill Surface Emissions Monitor quarterly landfill surface emissions 74 \$89 \$66,15 \$1,984,68 30% \$595,404 70% 18.5 days per quarter average nonitoring on a 100 ft grid basis (20 acres/day) Annual NMOC Monitoring Sample the gas collection header for total \$26,820 50% \$13,410 50% Routine- 2 person crew/truck, \$89 \$89 day per annual period Analytical- annual lab cost NMOC dete nination \$12,00 50% 50% \$6.000 Semi-annual reporting Prepare semi-annual air emissions compliance Reporting- professional staff 20 days annual average data 20 \$96 \$19.20 \$576.00 50% \$288,000 50% ports lysis and reporting Leachate System \$1,920 Reporting- professional staff 2 days annual average data \$96 \$57,60 0% 100% Annual Data Analysis Analyze leachate system data to ensure \$0 equate system capacity alysis and reporting Totals \$932,123 \$25,610,042 \$11.552

al	NRC Cost	% NRC Costs Prorated Acreage Built-out, FY 2016 is 44.9 acres- 17.27% of 260 total acres	NRC - DEQ Financial Assurance Cost- Prorated to Landfill Acres Built
	\$1,827,000	100%	\$1,827,000
	\$150,192	100%	\$150,192
	\$75,096	100%	\$75,096
	\$36,000	100%	\$36,000
	\$420,000	100%	\$420,000
	\$0		
	\$0		
	\$0		
	\$1,577,016	17.27%	\$272,339
	\$112,644	100%	\$112,644
	\$241,920	100%	\$241,920
	\$1,389,276	17.27%	\$239,917
	\$13,410	100%	\$13,410
	\$6,000 \$288,000	<u>100%</u> 100%	\$6,000 \$288,000
	\$57,600	100%	\$57,600
	\$14,057,161		\$11,197,049

Resource Unit Cost Resource Unit Cost								
Resource	(hourly)	(daily)						
2 person crew/truck- \$/day (county staff)		\$894						
2 person crew/backhoe/grader/etc- \$/day (county staff)		\$1,127						
Mechanical/electrical service contractor- \$/day (contractor)		\$1,407						
Well service contractor/service rig- \$/day (contractor)		\$1,872						
Office - professional \$/hr; \$/day (contractor)	\$120	\$960						
Office-Manager \$/hr; \$/day (contractor)	\$145	\$1,160						

The basic crew unit cost assumes county staff and includes labor, misc. materials and equipment. The contractor resources include labor, misc. materials and equipment, office overhead, and profit typically expected in the performance of the post closure and closure inspection, operations, and maintenance tasks by a 3rd party contractor. These unit costs will be reviewed annually and revised as needed to reflect changes in costs and the estimated level of effort for the work based on the most current information regarding the scope, technical requirements, regulatory requirements, revisions to the Landfills closure/post-closure plans, etc, that may impact the cost basis.

Closure Cost Estimate September 30, 2016		ннс	Cell	NRC (260 acres)		
Item	Unit Cost	Unit	Quantity	Subtotal	Quantity	Subtotal
Landfill Gas Collection System						
Horizontal LFG collectors- Installed as landfill is filled,						
costs are a part of landfill operations						
Supplemental Gas Extraction Wells Installed Post						
Closure						
Vertical extraction wells	\$56.30	lineal foot	10,460	\$588,898	12000	\$675,600
Piping, well heads, misc.	\$10,000.00	each	50	\$500,000	36	\$360,000
Subtotal LFG wells				\$1,088,898		\$1,035,600
Subtotal LFG System				\$1,088,898		\$1,035,600
Closure Cover System			21.69	Acros Pomaining	260	Acros Pomoining
Cover poil (HHC 4.5 ft thick: NDC 4.ft Thick)	¢ 4 75	oubio vord	31.00	Acres Remaining	1 677 967	Acres Remaining
Topsoil Layor ($HHC = 0.25$ ft)	\$4.75 \$4.20	cubic yard	12 779	\$1,092,405	1,077,007	\$7,909,007
Erosion Layer ($HHC = 0.25$ ft)	\$4.20 \$4.60	cubic yard	12,770	\$53,000 \$57,400		
Hydromulch Seeding	\$3 726 00		31.69	\$118.040	260	\$968 760
Subtotal	ψ3,720.00	acie	51.00	\$1.321.690	200	\$8 938 627
Misc construction	58 29%	of subtotal	1	\$770 413	58 29%	\$5,210,325
Subtotal Cover System	00.2070	or oubtotal		\$2.092.102	00.2070	\$14,148,952
Subtotal Construction				\$3,181,000		\$15,184,552
Engineering and Permitting	25%	of construction	1	\$795,250	25%	\$3,796,138
Total Closure Cost Estimate				\$3,976,251		\$18,980,690

September 30, 2016				1
ltem	Post Closure cost	Closure Cost	Total	
Cost For Ada County Financial Plan Total Costs- 30 year				
HHC Landfill Gas Soil Migration		\$7,000,000		The \$5,000,000 FY 2008 allocation for future controls to mitigate landfill soil gas migration issues was increased by \$2,000,000 for FY 2009 to address potential lan- migration related groundwater issues detected east of Seamans Gulch Road. Little new information has been developed in FY 2016, so this contingency amount is r for 2016.
HHC Total	\$11,552,881	\$10,976,251	\$22,529,132	Cost for calculating Einancial Liability % of HHC Landfill Vol Cap filled and for DEO Einancial Assurance
NRC Total	\$14,057,161	\$18,980,690	\$33.037.851	Cost for calculating Financial Liability % of NRC Landing Volceptined and been been manual resonance
Landfill Total	\$25,610,042	\$29,956,941	\$55,566,983	
Cost for DEQ Financial Assurance	+	+	+,,	
Total Costs Prorated				
HHC Total	\$11,552,881	\$10,976,251	\$22,529,132	Use this cost for Ada County HHC DEQ Financial Assurance
NRC Total Acres	· · · ; · · · · · · · · · · · · · · · ·	260	Acres	
Acres Operational		44.90	Acres	
Percent of Total NRC acres Operational		17.27%		
Closure cost		\$3,277,819		
NRC Total	\$11,197,049	\$3,277,819	\$14,474,868	Use this cost for Ada County NRC DEQ Financial Assurance
Landfill Total DEQ Fianacial Assurance			\$37,004,000	Use this cost for Ada County Total DEQ Financial Assurance
Notes:				
1) HHC Soil Vapor Control, a \$5,000,000 amount w	as added in FY 2008 for the HHC soil vapo	r migration issue. For 2009	this amount was increased	
to \$7,000,000 because landfill gas related groundwa	ater contamination was detected east of Sea	mans Gulch Road, potentia	al increasing the work need	
to mitigate the issues. There is insufficient current	data to prepare preliminary engineering so	lutions to develop a more o	letailed closure/post	
closure cost estimate. It is likely to take years of inv	estigative soil vapor control system testing	before the data will be ava	ilable to develop a more	
definitive estimate. The engineer's recommendation	n is to include this budget amount, based or	n best engineering judgmer	it, to account for the	
potential closure/post closer costs associated with	HHC soil vapor migration.	8 . 8) 8	,	
2) The above closure/ post closure estimates are for /post closure costs in their financial plans. It is reco (D138) to account for future costs due to inflation, 100% factor (Ada County should evaluate its risks purposes.	r the DEQ financial assurance purposes. Ac ommended Ada County include an addition scope uncertainties, unknowns, and costs b and plan accordingly) should be applied t	ta County should be account n percentage of the Landfil peyond the 30 yr DEQ post o establish the amount for t	nting for the full closure l current Total Costs closure period. At least a financial planning	

Ada County Landfill (HHC&NRC) Accrued Financial Liability as % Cell Volume Basis

HHC End of FY 2016			Hidden Hollow Cell 2016 Percent of	Total Volume Used Calculation
	••••			
I otal Remaining Closure and Post Closure Costs	\$22,529,132			
			HHC remaining volume	
Previous Expenditures Closure and Post Closure Costs	\$40,755,007		estimated as of Sept 30,	
	\$10,755,207		2018	129,000 Cubic Yards
Total HHC Cell Closure and Post Closure Costs	\$33.284.338		HHC total	16.000.000 Cubic Yards
	00.20%	(rounded)	9(upod	00.10%
	99.20%	(rounded)	% used	99.19%
HHC Accrued liability volume basis	\$22.019.064		round to	00.2% round %
	\$33,010,004		Tound to	33.2 /0 100110 /8
		Current year HHC Ada		
HHC Net remaining liability for EV 2016 (accrued liability		County Financial Plan		
minus incurred closure and post-closure costs)	\$22,262,857	Liability		
	·;;			
NRC End of FY 2016				
NRC Design Capacity (Cubic Yards)	70,000,000	Cubic Yards		
Filled Capacity September 30, 2016 (Cubic Yards)	3,063,380	Cubic Yards		
NRC % Filled	4.38%	(rounded)	4.3762575%	round to 4.38%
NRC Total Closure/Post Closure	\$33,037,851			
NRC Financial Liability Closure/Post Closure Costs		Current year NRC Ada		
as a percentage of landfill capacity	\$4,447,050	County Financial Plan		
	\$1,447,058	Liability		
		Auditors' report Financial		
Total Ada County Landfill (HHC&NRC) Accrued Financial Liability FY 2016	\$23,709,915	Liability Value		

gas changed			

HHC Historical Closure Cost Summary

Closure Cost	Cost End FY 2005	Costs End FY 2006	Costs End FY 2007	Costs End FY 2008	Costs End FY 2009	Costs End FY 2010	Costs End FY 2011	Costs End FY 2012	Costs End FY 2013	Costs End FY 2014	Costs End FY 2015	Costs End FY 2016
Phase 1 46 Acre Cost:												
2003 Expenditures (Phase 1 -46 acres):	\$5,036,759	\$5,036,759	\$5,036,759	\$5,036,759	\$5,036,759	\$5,036,759	\$5,036,759	\$5,036,759	\$5,036,759	\$5,036,759	\$5,036,759	\$5,036,759
2004 Expenditures (Completion of Phase 1)	\$3,262,146	\$3,262,146	\$3,262,146	\$3,262,146	\$3,262,146	\$3,262,146	\$3,262,146	\$3,262,146	\$3,262,146	\$3,262,146	\$3,262,146	\$3,262,146
2005 Expenditures (None)	\$0											
2006 Expenditures		\$328,800	\$328,800	\$328,800	\$328,800	\$328,800	\$328,800	\$328,800	\$328,800	\$328,800	\$328,800	\$328,800
2007 Expenditures			\$276,000	\$276,000	\$276,000	\$276,000	\$276,000	\$276,000	\$276,000	\$276,000	\$276,000	\$276,000
2008-2013 Expenditures				\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2014 Expenditures										\$1,160,793	\$1,160,793	\$1,160,793
2015 Expenditures											\$690,709	\$690,709
2016 Expenditures												\$0
Subtotal Closure Costs Through Current FY	\$8,298,905	\$8,627,705	\$8,903,705	\$8,903,705	\$8,903,705	\$8,903,705	\$8,903,705	\$8,903,705	\$8,903,705	\$10,064,498	\$10,755,207	\$10,755,207
Future Closure (Remaining 32 Acres)	\$6,201,000	\$6,141,000	\$5,542,292	\$12,091,188	\$14,091,188	\$14,091,188	\$14,091,188	\$11,299,038	\$11,299,038	\$10,900,685	\$10,961,868	\$10,976,251
Total Closure Costs Past and Future Costs	\$14,499,905	\$14,768,705	\$14,445,997	\$20,994,893	\$22,994,893	\$22,994,893	\$22,994,893	\$20,202,743	\$20,202,743	\$20,965,183	\$21,717,075	\$21,731,457
Total Post Closure Costs	\$6,244,540	\$6,716,042	\$7,038,750	\$8,805,525	\$8,805,525	\$8,953,755	\$8,953,755	\$8,953,755	\$9,182,847	\$9,182,847	\$11,573,280	\$11,552,881
Total HHC Closure/Post Closure Past&Future	\$20,744,445	\$21,484,747	\$21,484,747	\$29,800,418	\$31,800,418	\$31,948,648	\$31,948,648	\$29,156,498	\$29,385,590	\$30,148,030	\$33,290,355	\$33,284,338