State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

L. Scott Baird
Executive Director

DIVISION OF WASTE MANAGEMENT
AND RADIATION CONTROL

Ty L. Howard
Director

September 23, 2020

Kristen Lamb, Owner - Manager
Western Water Solutions, Sand Pass
Exploration and Production Waste Landfill
3214 North University Avenue, Suite 133
Provo, UT 84604

RE: Western Water Solutions – Sand Pass Exploration and Production Waste Landfill Permit

Dear Ms. Lamb:

The Division of Waste Management and Radiation Control (Division) has completed its review of the application to permit the Exploration and Production Waste Landfill (WWS), located, just east of State Road 87, at 20355 West 3400 South, in Duchesne County, Utah.

Enclosed with this letter is the approved Permit #2002 and applicable attachments from portions of the Application. The Permit approval and expiration dates are listed on the cover page of the permit. WWS shall also ensure that all local approvals and permits are received prior to landfill construction.

The Statement of Basis for this permit (DSHW-2020-011622) containing the Division's history evaluating the permit application, public comment period and transmittal of the permit is also attached.

Please notify our office when work begins on the landfill so the Division can conduct periodic inspections to ensure compliance with the Permit. After completion of construction and submission of as-built documentation, the Division will conduct an inspection to ensure the landfill has been constructed in compliance with construction design criteria prior to acceptance of solid waste.

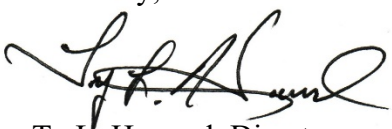
During construction and operation of the landfill representatives of the Division and the Tri-County Health Department will conduct periodic inspections of the landfill to assess compliance with the Permit and the Solid Waste Management Rules.

(Over)

195 North 1950 West • Salt Lake City, UT
Mailing Address: P.O. Box 144880 • Salt Lake City, UT 84114-4880
Telephone (801) 536-0200 • Fax (801) 536-0222 • T.D.D. (801) 536-4284
www.deq.utah.gov

If you have any questions, please call Doug Taylor at (801) 536-0240.

Sincerely,



Ty L. Howard, Director
Division of Waste Management and Radiation Control

Enclosures Statement of Basis (DSHW-2020-011622)
Permit (DSHW-2019-010502)
Attachment #1 - Landfill Design and Construction (DSHW-2019-010808)
Attachment #2 – Operations Plan (DSHW-2019-010806)
Attachment #3 - Ground Water Monitoring (DSHW-2019-010804)
Attachment#4 - Closure and Post-Closure Plans (DSHW-2019-010802)

TLH/DT/ar

c: Jordan Mathis, Health Officer, Tri-County Health Department
Darrin Brown, EHD, Tri-County Health Department
Nathan Hall, P.E., DEQ District Engineer
Jon Peaden, GEOSTRATA

Statement of Basis
for the Western Water Solutions – Sand Pass
Exploration and Production Waste Landfill Permit

1. INTRODUCTION

This Statement of Basis provides the rationale of the Director of the Division of Waste Management and Radiation Control (the Division) for issuing the Western Water Solutions - Sand Pass Exploration and Production Waste Landfill Permit. The Director's staff conducted this evaluation to ensure compliance with the applicable Solid Waste Rules. Doug Taylor wrote this Statement of Basis.

2. FACILITY BACKGROUND

a. Facility Location and History

The facility location is approximately 10 miles south of Roosevelt and 3.5 miles southeast of Myton, on 10000 South, in Section 10, Township 4, Range 1 West of the Uintah Special Base Meridian, Duchesne County, Utah. See Figure 1.

b. Regulatory History

This is a new landfill facility, so there is no regulatory history for the Facility.

3. EVALUATION OF THE PERMIT APPLICATION

a. The permit application (DSHW-2019-003529) for the Facility was received in March 13, 2019 and the evaluation of the permit application was begun. A permit application deficiencies letter was sent to the Facility on August 5, 2019 asking for clarification and for additional information. (DSHW-2020-008102). The Facility responded to the Division's deficiencies letter on October 21, 2019 addressing all the information asked for by the Division (DHSW-2019-013682). The Division deemed the permit application to be complete on November 21, 2019 (DSHW-2019-015042).

b. After the Permit application was submitted, amendments to the Utah Solid and Hazardous Waste Act affected the definition of "solid waste," removing certain exemptions for oil and gas exploration wastes. As a result, the Western Water Solutions - Sand Pass Exploration and Production Waste Landfill may not be classified as a Class IIIb facility, because this permit classification is limited to non-commercial facilities. This Landfill will be issued an Oil and Gas Exploration and Production Waste Landfill Permit with an undefined classification at this time. Future rulemaking may further specify a classification or additional requirements for oil and gas exploration and production waste landfills. In such a case, it may be necessary to amend this Permit in the future to address changes made by the Waste Management and Radiation Control Board. A June 1, 2020 letter (DSHW-2020-007717) from the Director communicated these issues to the permittee.

c. The required 30-day public comment period was initiated on July 15, 2020 (2020-008855). As a courtesy, the Division forwarded a copy of the draft permit to the Facility on July 15, 2020 (2020-009668).

4. JUSTIFICATION FOR ISSUING THE PERMIT

a. The Director's staff has evaluated the permit application as required by Section 19-6-108 of the Solid and Hazardous Waste Act and R315-301 through 320 of the Solid and Hazardous Waste Rules.

5. PUBLIC PARTICIPATION

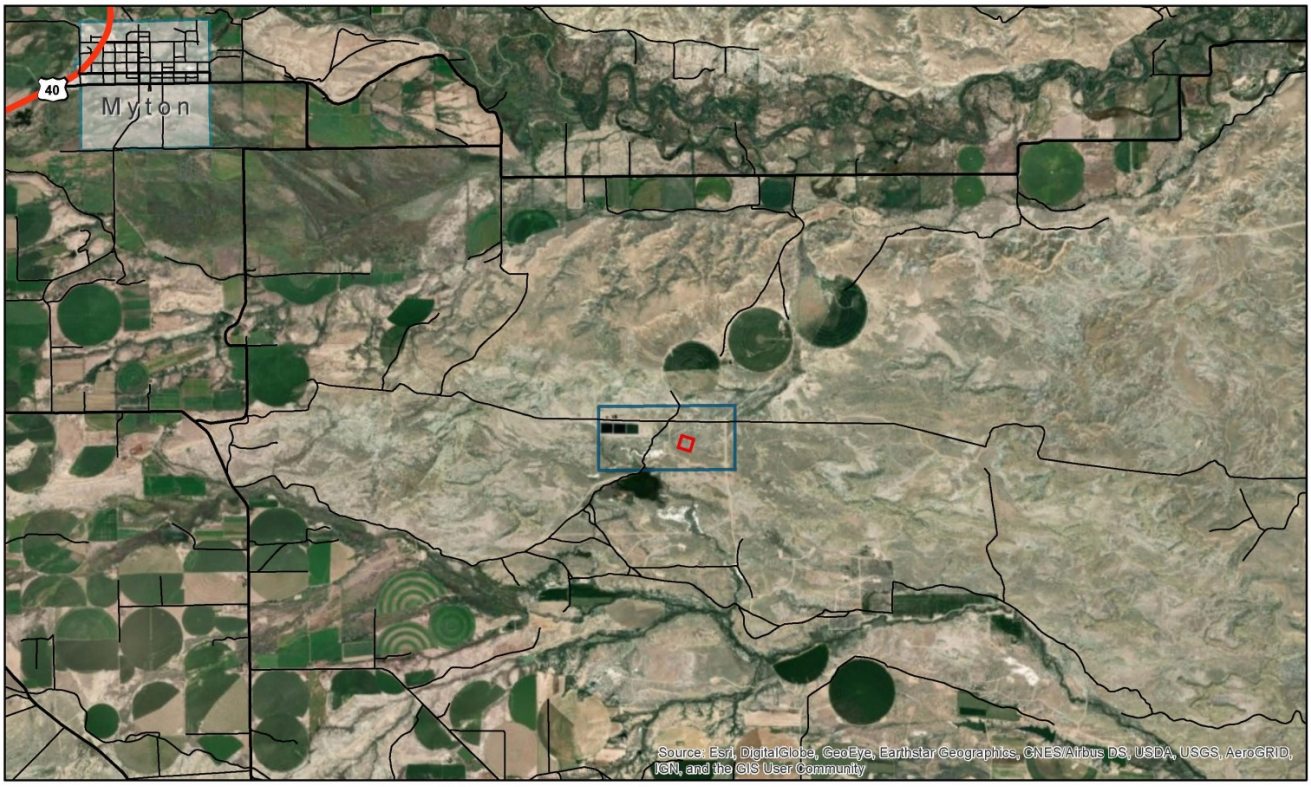
a. As required by Utah Administrative Code R315-311-3, the Director provided an initial 30-day public comment period on the draft permit began July 15, 2020 and ended on August 14, 2020.

b. There were no comments.

6. CONCLUSION

The Director has determined that the applicant has met all required items in the permit application.

Figure 1
Facility Location



0 0.5 1 2 3 4 Miles

1:60,000

N

GeoStrata
Copyright GeoStrata, 2019

Legend

Cell

Landfill Cell

Property Boundary

Landfill Permit
Western Water Solutions
Duchesne County, Utah
Project Number: 705-011

Site Vicinity Map

Plate A-1

DIVISION OF WASTE MANAGEMENT AND RADIATION CONTROL SOLID WASTE LANDFILL PERMIT

Western Water Solutions Sand Pass Oil and Gas Exploration and Production Waste Landfill

Pursuant to *Utah Solid and Hazardous Waste Act*, Title 19, Chapter 6, Part 1, Utah Code Annotated (Utah Code Ann.) (the Act) and the *Utah Solid Waste Permitting and Management Rules*, Utah Administrative Code R315-301 through 320 adopted thereunder, a Permit is issued to

Western Water Solutions as owner and operator (Permittee),

to own, construct, and operate the Landfill located in the NW ¼ of the SE 1/4 of Section 10 Township 4 South, Range 1 West, Salt Lake Base and Meridian, Duchesne County, Utah as shown in the Permit Application that was determined complete.

The Permittee is subject to the requirements of R315-301 through 320 of the Utah Administrative Code and the requirements set forth herein.

All references to R315-301 through 320 of the Utah Administrative Code are to regulations that are in effect on the date that this permit becomes effective.

This Permit shall become effective September 23, 2020.

This Permit shall expire at midnight September 22, 2030.

Closure Cost Revision Date: September 23, 2025.

Signed this 23rd day of September 2020

Ty L. Howard Director
Utah Division of Waste Management and Radiation Control

FACILITY OWNER/OPERATOR INFORMATION

LANDFILL NAME:	Western Water Solutions Oil and Gas Exploration and Production Waste Landfill
OWNER NAME:	Western Water Solutions, LLC
OWNER ADDRESS:	3214 North University Avenue, STE 133 Provo, Utah 84604
OWNER PHONE NO.:	801-518-9790
OPERATOR NAME:	Western Water Solutions, LLC
OPERATOR ADDRESS:	3214 North University Avenue, STE 133 Provo, Utah 84604
OPERATOR PHONE NO.:	801-518-9790
TYPE OF PERMIT:	Oil and Gas Exploration and Production (E&P) Waste Landfill
PERMIT NUMBER:	2002
LOCATION:	Landfill located in the NW ¼ of the SE 1/4 of Section 10 Township 4 South, Range 1 West, Salt Lake Base and Meridian, Duchesne County, Utah Lat. 40^0 09' 18.89"; Long. 109^0 59' 45.32".

The term, “Permit,” as used in this document is defined in R315-301-2(55) of the Utah Administrative Code. Director as used throughout this permit refers to the Director of the Division of Waste Management and Radiation Control

The Permit application for the Landfill was deemed complete on the date shown on the signature page of this Permit.

This Permit consists of the signature page, Facility Owner/Operator Information section, sections I through V, and all attachments to this Permit.

The facility as described in this Permit consists of an Oil and Gas Exploration and Production (E&P) Waste Landfill.

Compliance with this Permit does not constitute a defense to actions brought under any other local, state, or federal laws. This Permit does not exempt the Permittee from obtaining any other local, state or federal permits or approvals required for the facility operation.

The issuance of this Permit does not convey any property rights, other than the rights inherent in this Permit, in either real or personal property, or any exclusive privileges other than those inherent in this Permit. Nor does this Permit authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations, including zoning ordinances.

The provisions of this Permit are severable. If any provision of this Permit is held invalid for any reason, the remaining provisions shall remain in full force and effect. If the application of any provision of this Permit to any circumstance is held invalid, its application to other circumstances shall not be affected.

By this Permit, the Permittee is subject to the following conditions.

PERMIT REQUIREMENTS

I. GENERAL COMPLIANCE RESPONSIBILITIES

I.A. General Operation

I.A.1. The Permittee shall operate the landfill in accordance with the requirements of this permit. For the purpose of this permit, requirements pertaining to Class IIIb landfills found in R315-304 of the Utah Administrative Code that are in effect as of the date of this permit, shall apply regardless of any apparent or stated exemptions in the Utah Administrative Code. Any permit noncompliance or noncompliance with any applicable portions of Utah Code Ann. § 19-6-101 through 126 and applicable portions of R315-301 through 320 of the Utah Administrative Code constitutes a violation of the Permit or applicable statute or rule and is grounds for appropriate enforcement action, permit revocation or modification.

I.B. Acceptable Waste

I.B.1. This Permit is for disposal of nonhazardous industrial waste, as defined in R315-301-2(35) of the Utah Administrative Code, generated by the oil and gas industry as described in the Permit Application.

I.C. Prohibited Waste

I.C.1. Hazardous waste as defined by R315-260 and R315-261 of the Utah Administrative Code;

I.C.2. PCB's as defined by R315-301-2(53) of the Utah Administrative Code, except PCB's specified by R315-315-7(2)(a) and (c) of the Utah Administrative Code;

I.C.3. Household waste;

I.C.4. Municipal waste;

I.C.5. Commercial waste; and

I.C.6. Regulated asbestos-containing material.

I.C.7. Any prohibited waste received and accepted for disposal at the facility shall constitute a violation of this Permit, of Utah Code Ann. § 19-6-101 through 126 and of R315-301 through 320 of the Utah Administrative Code.

I.D. Inspections and Inspection Access

I.D.1. The Permittee shall allow the Director or an authorized representative, or representatives from the Tri-County Health Department, to enter at reasonable times and:

I.D.1.a Inspect the landfill or other premises, practices or operations regulated or required under the terms and conditions of this Permit or R315-301 through 320 of the Utah Administrative Code;

I.D.1.a.(i) Have access to and copy any records required to be kept under the terms and conditions of this Permit or R315-301 through 320 of the Utah Administrative Code;

I.D.1.a.(ii) Inspect any loads of waste, treatment facilities or processes, pollution management facilities or processes, or control facilities or processes required under this Permit or regulated under R315-301 through 320 of the Utah Administrative Code; and

I.D.1.a.(iii) Create a record of any inspection by photographic, video, electronic, or any other reasonable means.

I.E. Noncompliance

I.E.1. If monitoring, inspection, or testing indicates that any permit condition or any applicable rule under R315-301 through 320 of the Utah Administrative Code may be or is being violated, the Permittee shall promptly make corrections to the operation or other activities to bring the facility into compliance with all permit conditions or rules.

I.E.2. In the event of noncompliance with any permit condition or violation of an applicable rule, the Permittee shall promptly take any action reasonably necessary to correct the noncompliance or violation and mitigate any risk to the human health or the environment. Actions may include eliminating the activity causing the noncompliance or violation and containment of any waste or contamination using barriers or access restrictions, placing of warning signs, or permanently closing areas of the facility.

I.E.3. The Permittee shall:

I.E.3.a Document the noncompliance or violation in the daily operating record, on the day the event occurred or the day it was discovered;

I.E.3.b Notify the Director of the Utah Division of Waste Management and Radiation Control by telephone within 24 hours, or the next business day following documentation of the event; and

I.E.3.c Give written notice of the noncompliance or violation and measures taken to protect human health and the environment within seven days after Director Notification.

I.E.4. Within thirty days after the documentation of the event, the Permittee shall submit to the Director a written report describing the nature and extent of the noncompliance or violation and the remedial measures taken or to be taken to protect human health and the environment and to eliminate the noncompliance or violation. Upon receipt and review of the assessment report, the Director may order the Permittee to perform appropriate remedial measures including development of a site remediation plan for approval by the Director.

I.E.5. In an enforcement action, the Permittee may not claim as a defense that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with R315-301 through 320 of the Utah Administrative Code and this Permit.

I.F. Revocation

I.F.1. This Permit is subject to revocation if the Permittee fails to comply with any condition of the Permit. The Director will notify the Permittee in writing prior to any proposed revocation action and such action shall be subject to all applicable hearing procedures established under R305-7 of the Utah Administrative Code and the Utah Administrative Procedures Act.

I.G. Attachment Incorporation

I.G.1. Attachments to this Permit are enforceable conditions of this Permit, as are documents incorporated by reference into the attachments. Language in this Permit supersedes any conflicting language in the attachments or documents incorporated into the attachments.

II. DESIGN AND CONSTRUCTION

II.A. Design and Construction

II.A.1. The landfill shall be constructed according to the design outlined in Attachment #1 and in the area designated in Attachment #1, including landfill cells, fences, gates, and berms prior to acceptance of waste.

II.A.2. The Permittee shall notify the Director upon completion of construction of any landfill cells or run-on and run-off diversion systems. No landfill cells or run-on and run-off diversion system may be used until construction is approved by the Director and this permit modified.

II.A.3. The Permittee shall notify the Director of the completion of construction of any final cover system and shall provide all necessary documentation and shall apply for approval of the construction from the Director and modification of this permit.

II.A.4. If ground water is encountered during excavation of the landfill, the Director shall be notified immediately, and an alternative construction design developed and submitted for approval.

All engineering drawings submitted to the Director shall be stamped by a professional engineer with a current registration in Utah.

II.B. Run-On Control

II.B.1. The Permittee shall construct drainage channels and diversions as specified in Attachment # 1 and shall maintain them at all times to effectively prevent runoff from the surrounding area from entering the landfill.

III. LANDFILL OPERATION

III.A. Operations Plan

III.A.1. The Permittee shall keep the Operations Plan included in Attachment #2 on site at the landfill or at the location designated in section III-H of this Permit. The Permittee shall

operate the landfill in accordance with the operations plan. If necessary, the Permittee may modify the Operations Plan, provided that the modification meets all of the requirements of R315-301 through 320 of the Utah Administrative Code, is as protective of human health and the environment as the Operations Plan approved as part of this Permit, and is approved by the Director as a permit modification under R315-311-2(1) of the Utah Administrative Code. The Permittee shall note any modification to the Operations Plan in the daily operating record.

III.B. Security

III.B.1. The Permittee shall operate the Landfill so that unauthorized entry to the facility is restricted. The Permittee shall:

III.B.1.a Lock all facility gates and other access routes during the time the landfill is closed.

III.B.1.b Have at least a person employed by the Permittee at the landfill during all hours that the landfill is open.

III.B.1.c Construct all fencing and any other access controls as shown in Attachment #1 to prevent access by persons or livestock by other routes.

III.C. Training

III.C.1. The Permittee shall provide training for on-site personnel in landfill operation, including waste load inspection, hazardous waste identification, and personal safety and protection.

III.D. Burning of Waste

III.D.1. Intentional burning of solid waste is prohibited and is a violation of R315-303-4(2)(b) of the Utah Administrative Code.

III.D.2. The Permittee shall extinguish all accidental fires as soon as reasonably possible.

III.E. Cover

III.E.1. The Permittee shall cover the waste or apply moisture as necessary to control fugitive dust. The Permittee shall record in the daily operating record and the operator shall certify, at the end of each day of operation when waste, cover and moisture are placed; the amount and type of cover placed and the area receiving cover.

III.F. Waste Inspections

III.F.1. The Permittee shall inspect all loads that the Permittee suspect may contain a waste not permitted for disposal at the landfill.

III.F.1.a The Permittee shall visually inspect incoming waste loads to verify that no wastes other than those allowed by this permit are disposed in the landfill. The Permittee shall conduct a complete waste inspection at a minimum frequency of 1 % of incoming

loads, but no less than one complete inspection per day. The Permittee shall select the loads to be inspected on a random basis.

III.F.1.b The Permittee shall inspect all loads that the Permittee suspect may contain a waste not permitted for disposal at the landfill.

III.F.1.c The Permittee shall conduct complete random inspections as follows:

III.F.1.d The Permittee shall conduct the random waste inspection at the working face or an area designated by the Permittee.

III.F.1.e The Permittee shall direct that loads subjected to complete inspection be unloaded at the designated area;

III.F.1.f Loads shall be spread by equipment or by hand tools;

III.F.1.g Personnel trained in hazardous waste recognition and recognition of other unacceptable waste shall conduct a visual inspection of the waste; and

III.F.1.h The personnel conducting the inspection shall record the results of the inspection on a waste inspection form as found in Attachment #3. The Permittee shall place the form in the daily operating record at the end of the operating day.

III.F.1.i The Permittee or the waste transporter shall properly dispose of any waste found that is not acceptable at the facility at an approved disposal site for the waste type and handle the waste according to the rules covering the waste type.

III.G. Self Inspections

III.G.1. The Permittee shall inspect the facility to prevent malfunctions and deterioration, operator errors, and discharges that may cause or lead to the release of wastes or contaminated materials to the environment or create a threat to human health or the environment. The Permittee shall complete these general inspections no less than quarterly and shall cover the following areas: Waste placement, compaction, cover; fences and access controls; roads; run-on/run-off controls; ground water monitoring wells; final and intermediate cover; litter controls; and records. The Permittee shall place a record of the inspections in the daily operating record on the day of the inspection. The Permittee shall correct the problems identified in the inspections in a timely manner and document the corrective actions in the daily operating record.

III.H. Recordkeeping

III.H.1. The Permittee shall maintain and keep on file at the facility, a daily operating record and other general records of landfill operation as required by R315-302-2(3) of the Utah Administrative Code. The landfill operator, or other designated personnel, shall date and sign the daily operating record at the end of each operating day. Each record to be kept shall contain the signature of the appropriate operator or personnel and the date signed. The Daily operating record shall consist of the following two types of documents:

III.H.1.a Records related to the daily landfill operation or periodic events including:

III.H.1.a.(i) The number of loads of waste and the weights or estimates of weights or volume of waste received each day of operation and recorded at the end of each operating day;

III.H.1.a.(ii) Major deviations from the approved plan of operation recorded at the end of the operating day the deviation occurred;

III.H.1.a.(iii) Results of monitoring required by this Permit recorded in the daily operating record on the day of the event or the day the information is received;

III.H.1.a.(iv) Records of all inspections conducted by the Permittee, results of the inspections, and corrective actions taken shall be recorded in the record on the day of the event.

III.H.1.b Records of a general nature including:

III.H.1.b.(i) A copy of this Permit, including all attachments;

III.H.1.b.(ii) Results of inspections conducted by representatives of the Director of the Division of Waste Management and Radiation Control, and of representatives of the local Health Department, when forwarded to the Permittee;

III.H.1.b.(iii) Closure and Post-closure care plans; and

III.H.1.b.(iv) Records of employee training.

III.I. Reporting

III.I.1. The Permittee shall prepare and submit to the Director an Annual Report as required by R315-302-2(4) of the Utah Administrative Code. The Annual Report shall include: the period covered by the report, the annual quantity of waste received, an annual update of the financial assurance mechanism and all training programs completed.

III.J. Roads

III.J.1. The Permittee shall improve and maintain All access roads within the landfill boundary that are used for transporting waste to the landfill for disposal shall be improved and maintained as necessary to assure safe and reliable all-weather access to the disposal area.

III.K. Ground Water Monitoring

III.K.1. The Permittee shall monitor the ground water underlying the landfill in accordance with the Ground Water Monitoring Plan and the Ground Water Monitoring Quality Assurance/Quality Control Plan contained in Attachment # 3. The Permittee shall note in the daily operating record any modification to the Ground Water Monitoring Plan and the Ground Water Monitoring Quality Assurance/Quality Control Plan. A plan change that the Director finds to be less protective of human health or the environment

than the approved plan is a major modification and is subject to the requirements of R315-311 of the Utah Administrative Code.

IV. CLOSURE REQUIREMENTS

IV.A. Closure

IV.A.1. Final cover of the landfill shall be as shown in Attachment #4. The final cover shall meet, at a minimum, the standard design for closure as specified in R315-305-5(5)(b) of the Utah Administrative Code.

IV.A.2. This Permittee has demonstrated through geologic, hydrogeologic, climatic, waste stream, cover material properties, infiltration factors, and other factors that the landfill will not contaminate ground water and is approved for the alternative cover design as outlined in the Permit Application. Upon finding by the Director of any contamination of ground water resulting from the landfill, the Director may revoke this alternative cover design approval and the Director may require placement of a cover meeting the requirements of R315-303-3(4)(a) of the Utah Administrative Code or other remedial action as required by the Director.

IV.B. Title Recording

IV.B.1. The Permittee shall meet the requirements of R315-302-2(6) of the Utah Administrative Code by recording a notice with the Duchesne County Recorder as part of the record of title that the property has been used as a landfill. The notice shall include waste disposal locations and types of waste disposed. The Permittee shall provide the Director the notice as recorded.

IV.C. Post-Closure Care

IV.C.1. The Permittee shall perform post-closure care at the closed landfill in accordance with the Post-Closure Care Plan contained in the Permit Application. Post-closure care shall continue until all waste disposal sites at the landfill have stabilized and the finding of R315-302-3(7)(c) of the Utah Administrative Code is made.

IV.D. Financial Assurance

IV.D.1. The Permittee shall establish and fund the approved mechanism, as described in the Permit Application, prior to receipt of waste. The Permittee shall adequately fund and maintain the financial assurance mechanism(s) to provide for the cost of closure at any stage or phase or anytime during the life of the landfill or the permit life, whichever is shorter. The Permittee shall keep the approved financial assurance mechanism in effect and active until closure and post-closure care activities are completed and the Director has released the facility from all post-closure care requirements.

IV.D.2. The Permittee shall notify the Director of the establishment of the approved financial assurance mechanism and shall receive acknowledgment from the Director that the established mechanism complies with the approved method prior to the acceptance of waste.

IV.E. Financial Assurance Annual Update

IV.E.1. The Permittee shall submit an annual revision of closure and post-closure costs for inflation and financial assurance funding as required by R315-309-2(2) of the Utah Administrative Code, to the Director as part of the annual report.

IV.E.2. Closure Cost and Post-Closure Cost Revision

IV.E.3. The Permittee shall submit a complete revision of the closure and post-closure cost estimates by the Closure Cost Revision Date listed on the signature page of this Permit and any time the facility is expanded, any time a new cell is constructed, or any time a cell is expanded.

V. ADMINISTRATIVE REQUIREMENTS

V.A. Permit Modification

V.A.1. Modifications to this Permit may be made upon application by the Permittee or by the Director following the procedures specified in R315-311-2 of the Utah Administrative Code. The Permittee shall be given written notice of any permit modification initiated by the Director.

V.A.2. Permit Transfer

V.A.2.a This Permit may be transferred to a new Permittee or new Permittees by complying with the permit transfer provisions specified in R315-310-11 of the Utah Administrative Code.

V.B. Expansion

V.B.1. This Permit is for the operation of an Oil and Gas Exploration and Production (E&P) Waste Landfill according to the design and Operation Plan described and explained in the Permit Application. Any expansion of the current footprint designated in the description contained in the Permit Application, but within the property boundaries designated in the Permit Application, shall require submittal of plans and specifications to the Director. The plans and specifications shall be approved by the Director prior to construction.

V.B.2. Any expansion of the landfill facility beyond the property boundaries designated in the description contained in the Permit Application shall require submittal of a new Permit Application in accordance with the requirements of R315-310 of the Utah Administrative Code.

V.B.3. Any addition to the list of acceptable waste in Section I-B shall require submittal of all necessary information to the Director and the approval of the Director.

V.C. Expiration

V.C.1. If the Permittee desires to continue operating this landfill after the expiration date of this Permit, the Permittee shall submit an application for permit renewal at least six months prior to the expiration date, as shown on the signature (cover) page of this

Permit. If the Permittee timely submits a permit renewal application and the permit renewal is not complete by the expiration date, this Permit shall continue in force until renewal is completed or denied.

V.D. Status Notification

V.D.1. Eighteen months from the date of this Permit, the Permittee shall notify the Director in writing of the status of the construction of this facility unless construction is complete and operation has commenced. If construction has not begun within 18 months the Permittee shall submit adequate justification to the Director as to the reasons that construction has not commenced. If no submission is made or the submission is judged inadequate by the Director, this Permit shall be revoked.

V.E. Construction Approval and Request to Operate

V.E.1. The Permittee shall meet each of the following conditions prior to receipt of waste:

V.E.1.a The Permittee shall notify the Director that all the requirements of this Permit have been met and all required facilities, structures and accounts are in place.

V.E.1.b The Permittee shall submit to the Director, for approval, documentation that all local zoning requirements and local government approvals have been obtained for operation of this landfill prior to construction of any portion of the landfill; including offices, fences, and gates.

V.E.1.c The Permittee shall demonstrate that the lowest level of the landfill liner is greater than 5 feet from the historic high ground water elevation. The Permittee shall submit documentation of this demonstration for approval by the Director.

V.E.1.d The Permittee shall obtain from the Director written approval, prior to receipt of waste that all information required by this section has been submitted and the information meets the requirements of this Permit and R315-301 through 320 of the Utah Administrative Code.

Attachment 1
Landfill Design and Construction

2.0 ENGINEERING REPORT

2.1 CELL DESIGN

The Proposed Class III E&P Landfill would consist of four landfill cells that will be constructed sequentially, over time. When a landfill cell is approximately 75-percent full and additional storage is anticipated, construction of the next, adjoining cell will be initiated upon approval from DWMRC. Construction location of the Proposed Class III E&P Landfill in an undisturbed area within WWS owned property. The State permitted evaporation ponds are located the west and northwest of the proposed landfill cells and a State permitted E&P landfarm is located to the south of the proposed landfill cells. The permit drawings show the proposed location in relation to the remaining site and surrounding land features.

Appendix D

Proposed Landfill Location

CONSTRUCTION VOLUMES

Excavated Earth	51,582 CY
Constructed Berm (10ft)	31,115 CY
Final Cover 18" Clay	16,486 CY
Final Cover 6" Soil	5,497 CY
6" Protective Soil	4,942 CY
6" Leachate Sand	5,255 CY
60ml HDPE Liner	335,000 SF
GCL (10^-12)	335,000 SF
6" Grading Sand	5,490 CY

FILL/ WASTE VOLUMES

Landill floor to top of 10 ft berm	108,837 CY
Stacked waste to 25 ft	198,895 CY
Total waste material	307,732 CY

CONTENTS

REV	DATE	BY	DESCRIPTION
A	11/9/18	BER	FOR PERMITTING USE ONLY

GeoStrata
BLUFFDALE, UTAH

LOCATION: WWS Sand Pass Landfill	B–0
PROJECT: WWS Landfill Permit Application	
TITLE: Cover Page	NO

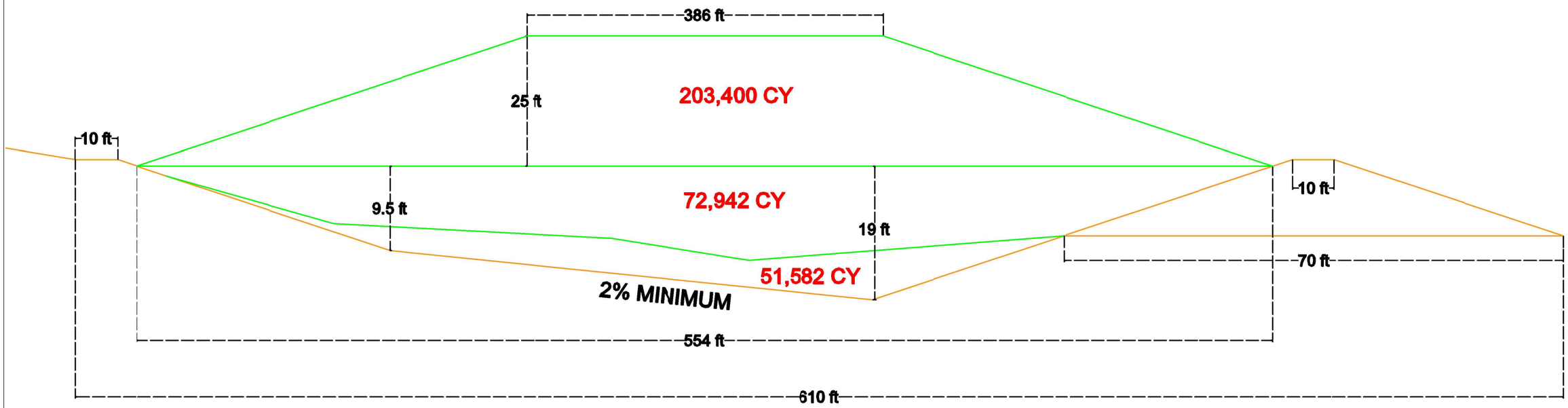
REV	DATE	BY	DESCRIPTION
A	11/9/18	BER	FOR PERMITTING USE ONLY

GeoStrata
BLUFFDALE, UTAH

LOCATION: WWS Sand Pass Landfill	B–1
PROJECT: WWS Landfill Permit Application	
TITLE: 3D Plan	NO

A'

A



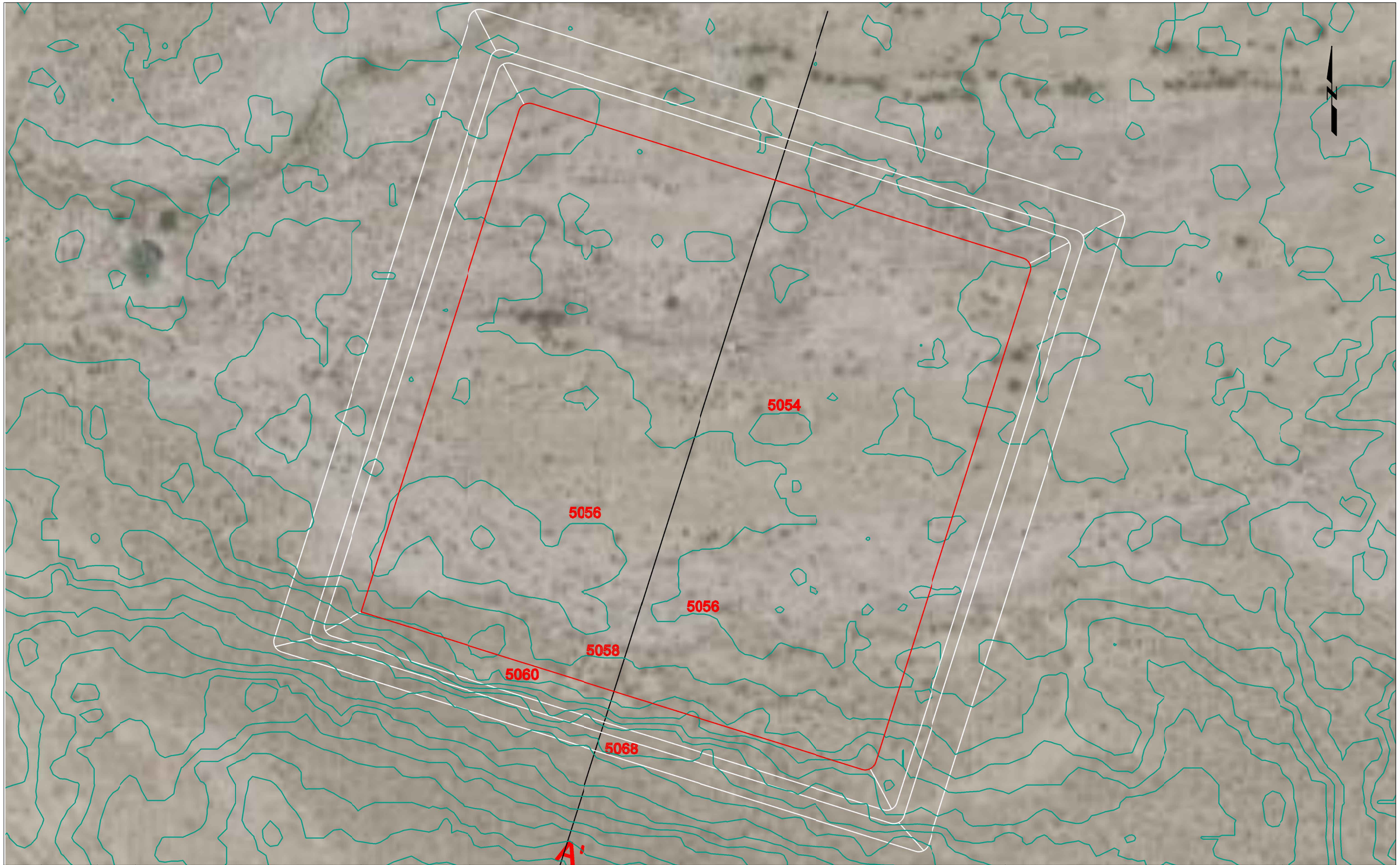
REV	DATE	BY	DESCRIPTION
A	11/9/18	BER	FOR PERMITTING USE ONLY

GeoStrata
BLUFFDALE, UTAH

LOCATION	WWS Sand Pass Landfill
PROJECT	WWS Landfill Permit Application
TITLE	Cross Section A

B–2

NO



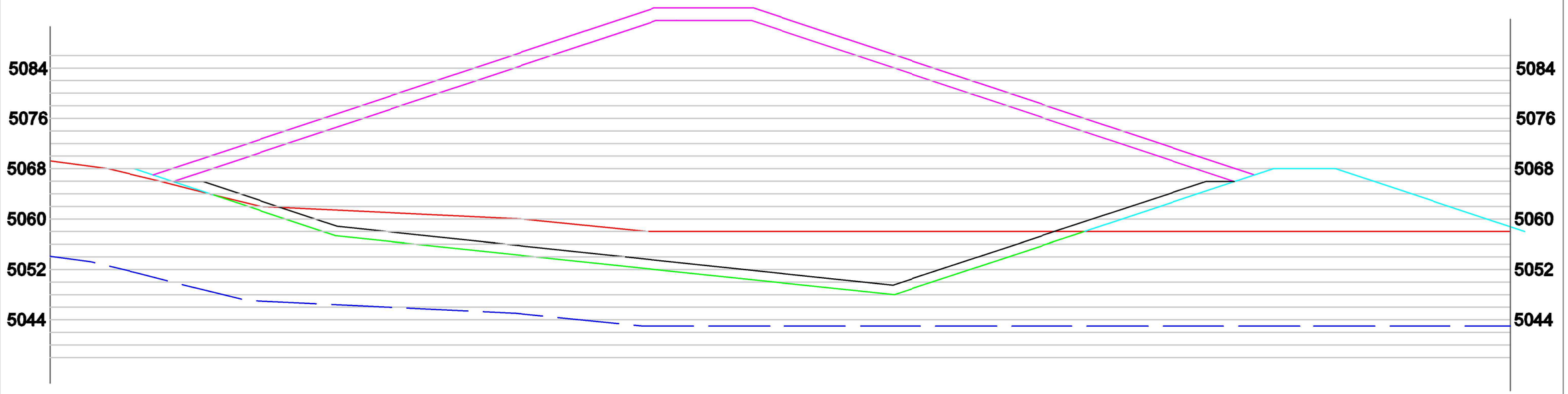
REV	DATE	BY	DESCRIPTION
A	11/9/18	BER	FOR PERMITTING USE ONLY

GeoStrata
BLUFFDALE, UTAH

LOCATION: WWS Sand Pass Landfill	B–3
PROJECT: WWS Landfill Permit Application	
TITLE: Plan & Elevation	NO

A'

A



Berm

Undisturbed Ground Surface

Bottom of Excavated Landfill

Top of Liner and Protective Soil

Completed Landfill Cap

Ground Water

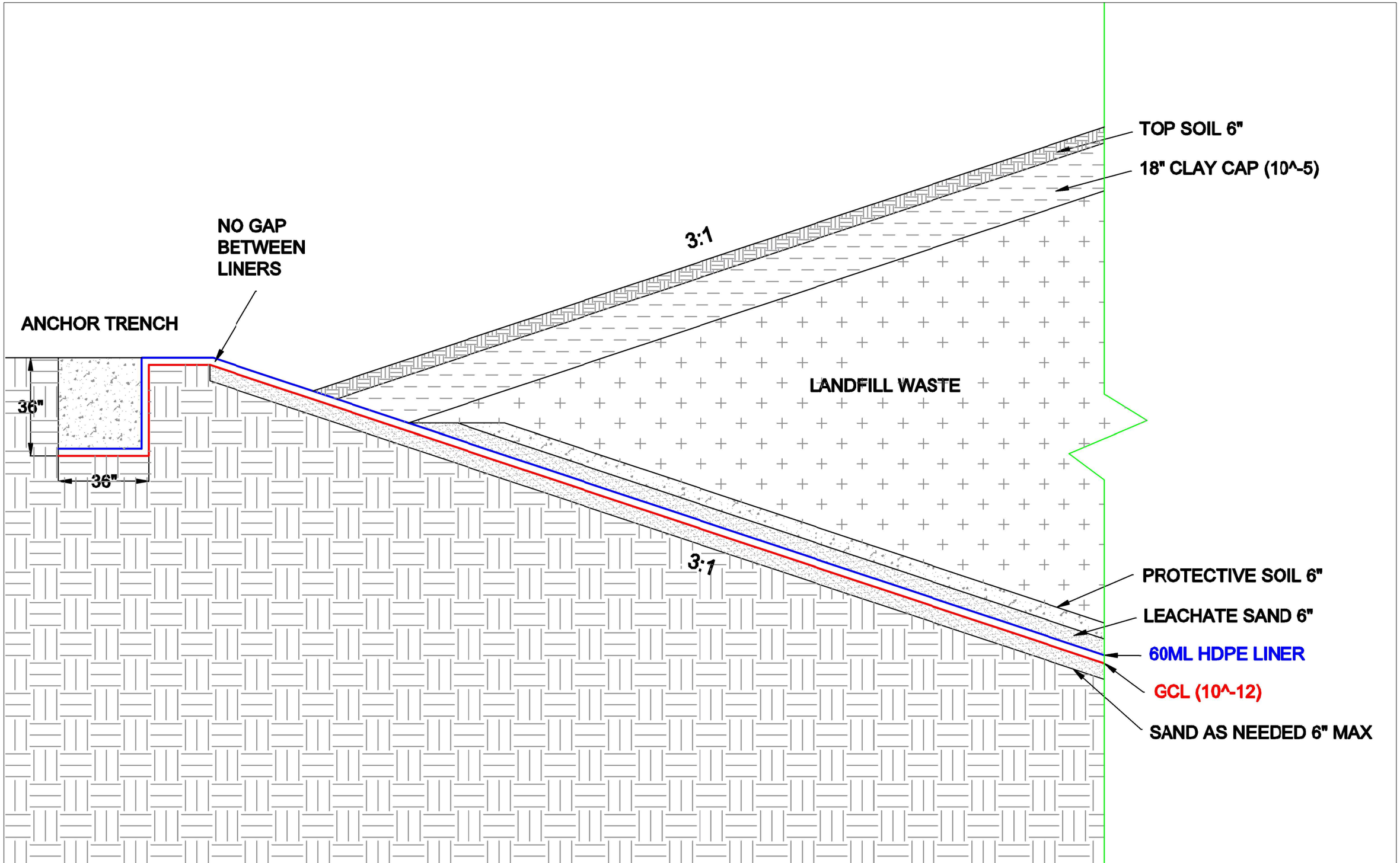
REV	DATE	BY	DESCRIPTION
A	11/9/18	BER	FOR PERMITTING USE ONLY

GeoStrata
BLUFFDALE, UTAH

LOCATION	WWS Sand Pass Landfill
PROJECT	WWS Landfill Permit Application
TITLE	Cross Section B

B–4

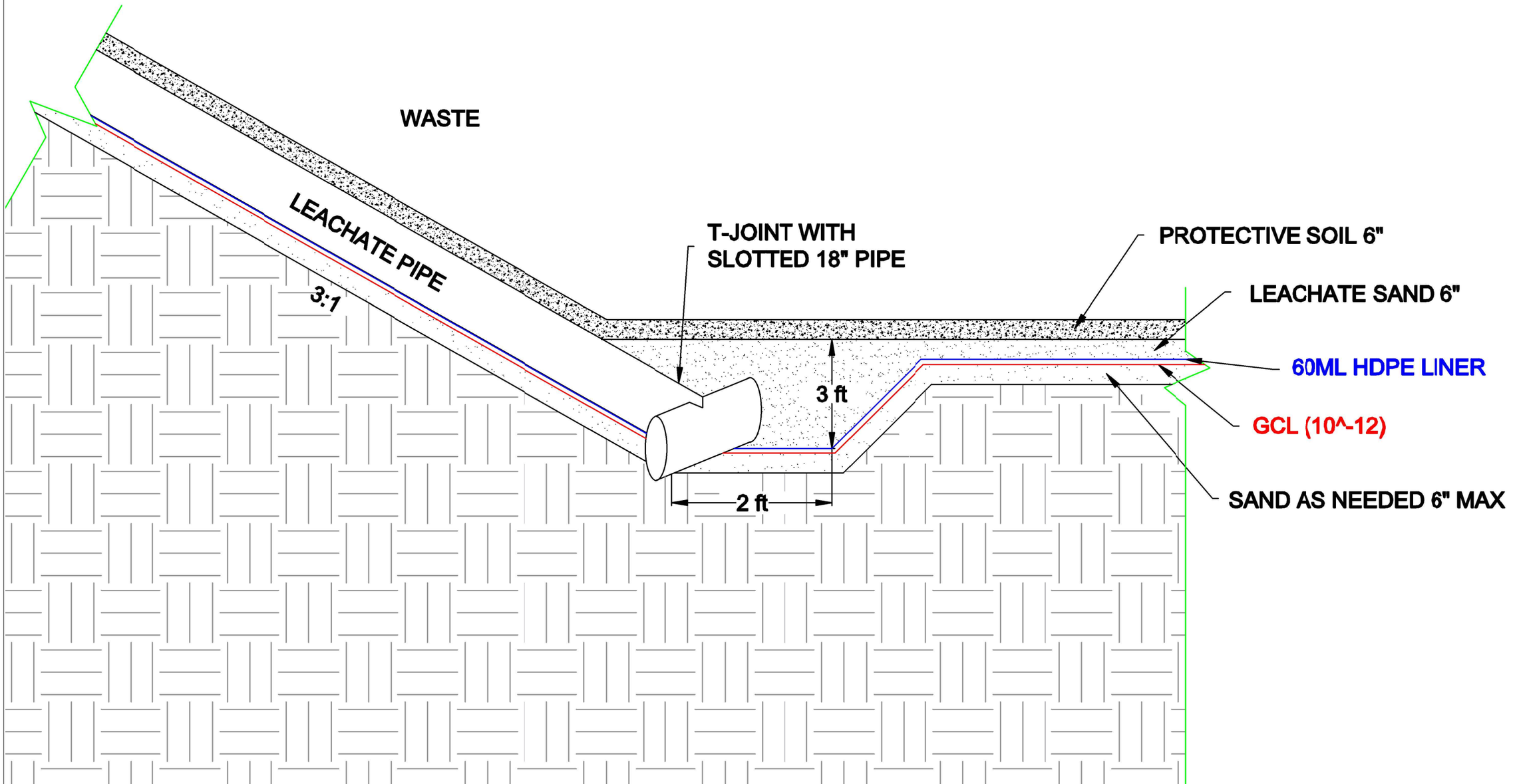
NO



REV	DATE	BY	DESCRIPTION
A	11/9/18	BER	FOR PERMITTING USE ONLY

GeoStrata
BLUFFDALE, UTAH

LOCATION: WWS Sand Pass Landfill	B–5
PROJECT: WWS Landfill Permit Application	
TITLE: Berm Detail	NO



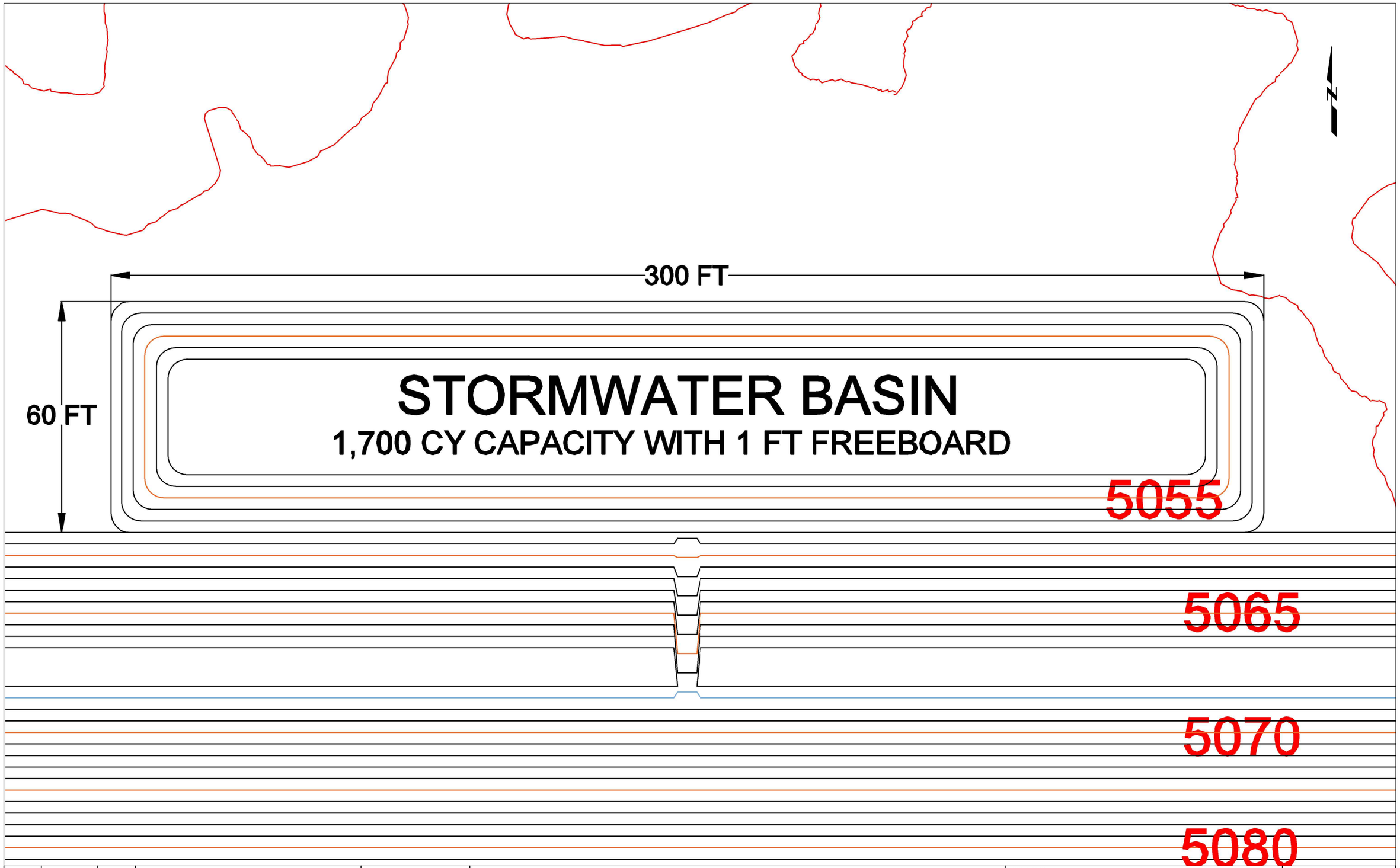
REV	DATE	BY	DESCRIPTION
A	11/9/18	BER	FOR PERMITTING USE ONLY

GeoStrata
BLUFFDALE, UTAH

LOCATION	WWS Sand Pass Landfill
PROJECT	WWS Landfill Permit Application
TITLE	Leachate Detail

B–6

NO

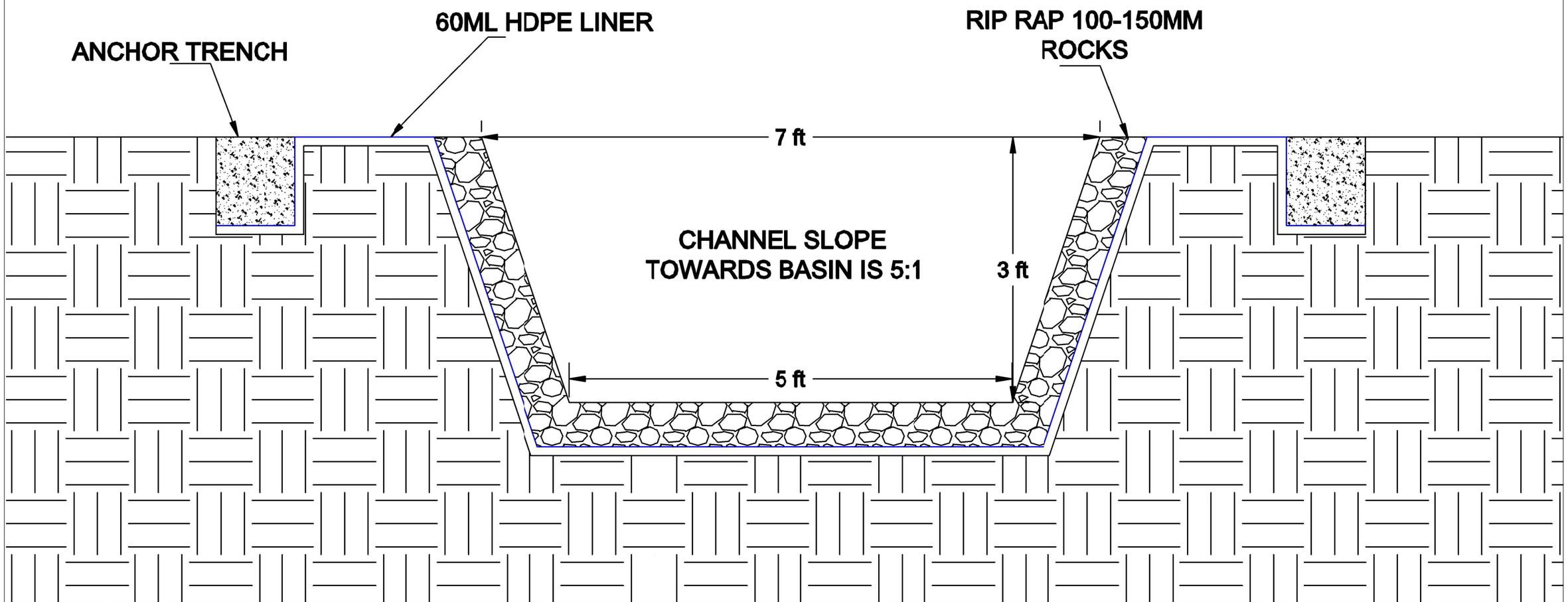


REV	DATE	BY	DESCRIPTION
A	11/9/18	BER	FOR PERMITTING USE ONLY

GeoStrata
BLUFFDALE, UTAH

LOCATION: WWS Sand Pass Landfill	B–7
PROJECT: WWS Landfill Permit Application	
TITLE: Storm Basin Detail	NO

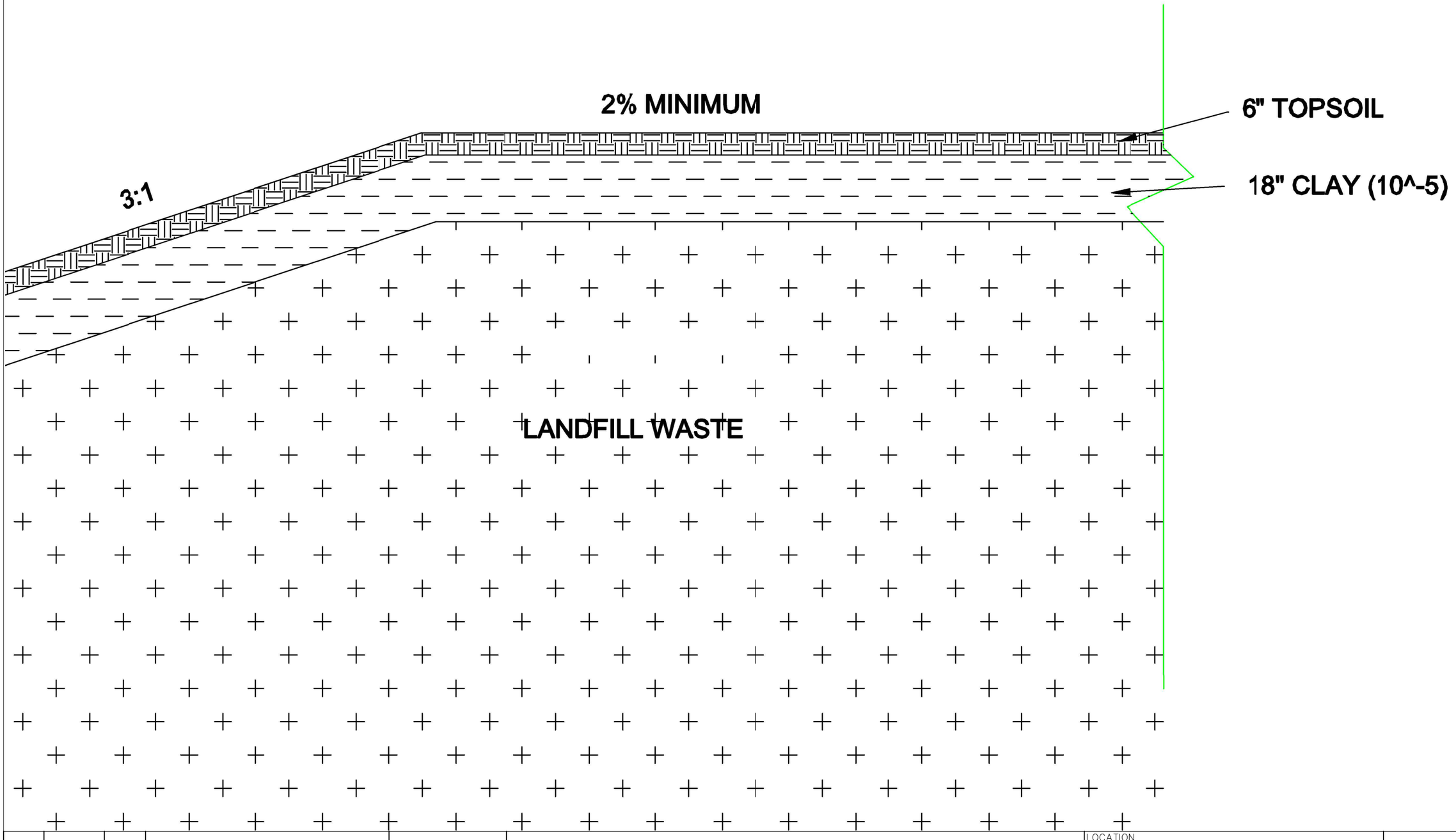
RUNOFF DURING A 24HR 25YR STORM FOR SITE AREA IS APPROXIMATELY 1,700 CY, FLOWING AT A RATE OF APPROXIMATELY 135 CFS. THE DESIGNED CHANNEL CAN WITHSTAND 373 CFS.



REV	DATE	BY	DESCRIPTION
A	11/9/18	BER	FOR PERMITTING USE ONLY

GeoStrata
BLUFFDALE, UTAH

LOCATION: WWS Sand Pass Landfill	B–8
PROJECT: WWS Landfill Permit Application	
TITLE: Storm Drain Detail	NO



REV	DATE	BY	DESCRIPTION
A	11/9/18	BER	FOR PERMITTING USE ONLY

GeoStrata
BLUFFDALE, UTAH

LOCATION: WWS Sand Pass Landfill	B–9
PROJECT: WWS Landfill Permit Application	
TITLE: Final Cover Detail	NO

Natural Topography is a 2ft interval

25 100 200 feet

100 FT

570 FT

STAGING AREA

5065

5060

5050

5048

5050

5055

5056

5054

5058

5060

5062

5064

5066

5068

5070

5074

REV	DATE	BY	DESCRIPTION
A	11/9/18	BER	FOR PERMITTING USE ONLY

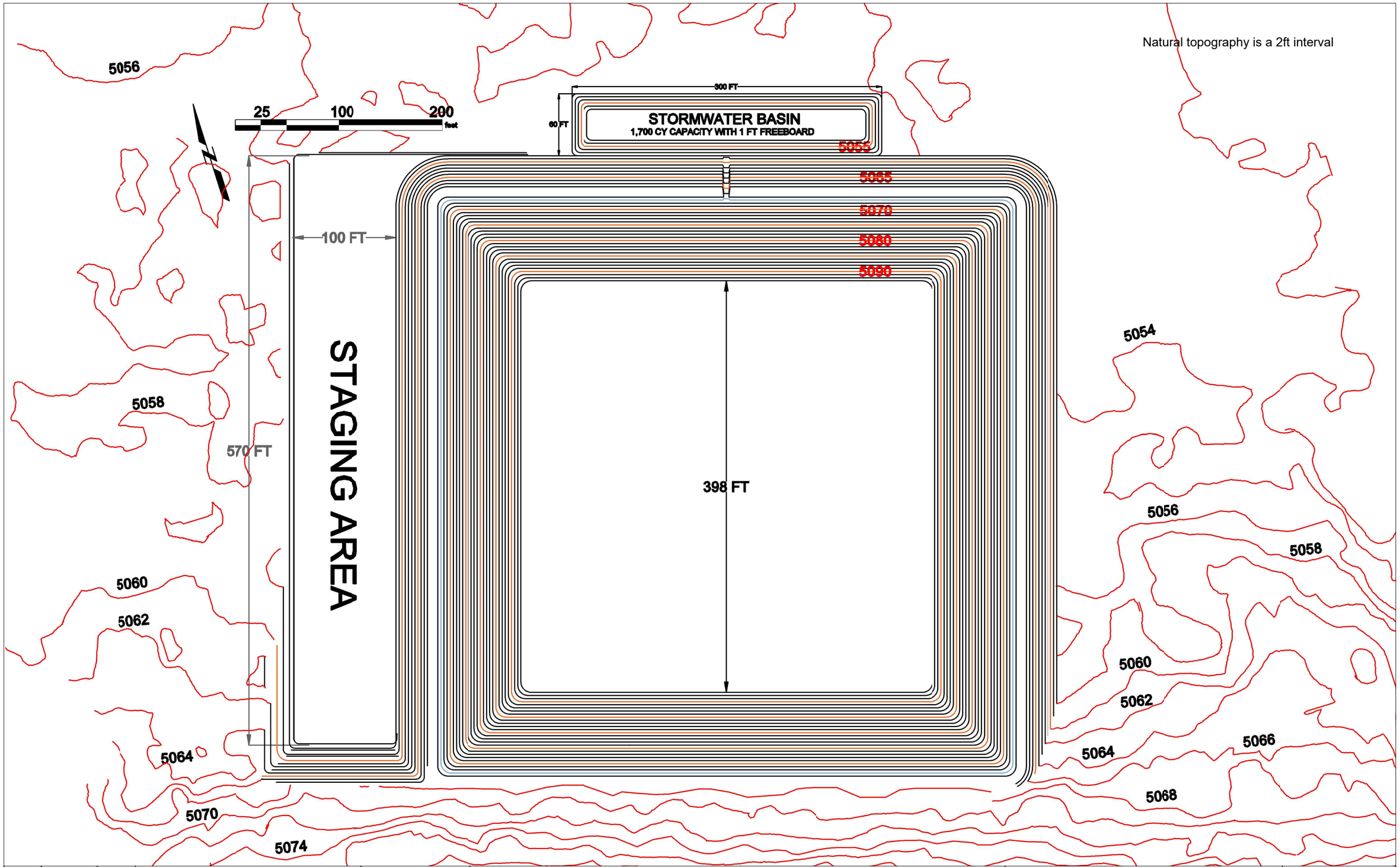
GeoStrata
BLUFFDALE, UTAH

LOCATION	WWS Sand Pass Landfill
PROJECT	WWS Landfill Permit Application
TITLE	Excavated Topo

B–10a

NO

Natural topography is a 2ft interval



REV	DATE	BY	DESCRIPTION
A	11/9/18	BER	FOR PERMITTING USE ONLY

GeoStrata
BLUFFDALE, UTAH

LOCATION: WWS Sand Pass Landfill	B–10b
PROJECT: WWS Landfill Permit Application	
TITLE: Completed Topo	NO

Attachment 2
Operations Plan

3.0 OPERATIONS PLAN

3.1 SCHEDULE OF CONSTRUCTION

As previously described, the proposed landfill will be located near the existing waste water disposal facility on a section of undeveloped land. The landfill will be constructed in phases with the construction of multiple cells that will merge into a single large landfill cell. As a landfill waste cell is filled to capacity, an adjacent cell will be constructed to accommodate more waste. Design of the phased landfill cells will include control of storm water and leachate for the entire landfill. As WWS nears the completion of a landfill cell, WWS will work with DWMRC to modify their permit prior to the construction of an additional landfill phase.

Each landfill cell will be constructed with two liners to isolate the landfill from the surrounding soils. An upper liner will be constructed with 60 mil HDPE geosynthetic liner. The lower liner will consist of Geosynthetic Clay liner (GCL). Permit design drawings and specification are provided in Appendix D.

The landfill will also include an access ramp into the cell located at the west side of the cell. To the west, adjacent to the landfill cell will be a waste staging area where waste delivered to the site will be inspected and treated to meet DWMRC standards if necessary, prior to disposal. Waste that requires treatment will be processed in a waste temporary holding area that will be constructed with an impermeable surface to protect ground water from possible waste contamination. Details of the waste staging area are provided in the permitting drawings

At the beginning of landfill operations WWS anticipates that approximately 5 truckloads of E&P waste will be transported to the facility per day. Each truck load will have a volume of approximately 10 cubic yards. WWS anticipates that some waste accepted to the landfill will consist of drilling mud and drilling fluid that will require additional processing to allow these types of waste to be accepted for disposal. Currently WWS is considering using several different techniques to meet the states requirement of waste to stabilize liquid waste and pass the paint filter test. One of the techniques WWS plans to utilize includes but is not limited to a pugmill mixer or a mixing basin where waste will be combined with sawdust, fly ash, native soils and/or other components to stabilize fluids. Waste acceptance procedures and quality control of waste being disposed in the landfill are outlined in sections 3.2.1 and 3.2.2 of this report.

When the final process is defined, the design life of the land will be more accurately estimated. At this preliminary phase the life duration is estimated using the assumptions that intake waste will be approximately 50 cubic yard per day, and assuming that half of the waste arriving at the landfill will be suitable for direct placement into the land fill and the remaining waste will require additional processing, drying or mixing prior to placement in the landfill. Waste that will be mixed with additional material will need to reach a moisture content that corresponds with passing the paint filter test. It is assumed that mixing of native soils with waste at a ratio of approximately 1.5:1 will reach a waste moisture content that will pass the paint filter test. For example, every 1 ton of waste there will be approximately 1.5 tons of native soils added to reach a moisture content that will pass the paint filter test. Calculations used to estimate the mixing ratio are provided in appendix E as plate E-1 and E-2. As the landfill waste acceptance and mixing processes are changed and/or modified throughout the life of the landfill, adjustments to the design life of the landfill will be made.

Based on waste mixing assumptions described above and assuming waste throughput of 50 cubic yards per day and a 10% growth rate over the life of the landfill, the projected life of the landfill is approximately 10 years. However, the projected life may increase or decrease based on the conditions of the market, type of processing and mixing methods required to meet DWMRC standards. A copy of the spreadsheet used to calculate this estimated life is included in Appendix E. All the assumptions presented in the previous paragraphs were used in the spreadsheet calculations.

3.2 DESCRIPTION OF WASTE HANDLING PROCEDURES

The following section describe the general procedures that will be followed under this permit application for accepting, disposing, recording and excluding landfill waste at the Sand Pass Landfill.

3.2.1 General Procedures

All waste will be hauled to the proposed landfill using commercial and/or independently owned trucks. All trucks will enter at the main gate and check in with the landfill office. Every truck load of waste will be inspected for liquid content prior to disposal and a paint filter test will be performed on each load of waste. Waste that is free of liquids and passes the paint filter test will be directed to the landfill for placement. Waste that contain liquids and fail to pass the paint filter test will be placed in a temporary storage area for

further processing. The temporary storage area will be constructed to ensure that the waste will be isolated from the underlying soils. The liner material for the storage area will be composed of either concrete, clay, or an HDPE liner. The temporary storage area will be part of the staging area located to the west of the proposed landfill.

Additional paint filter tests will be conducted on every 15 cubic yards of waste that requires processing prior to being disposed into the landfill. Waste that fail the second paint filter test will remain in the temporary storage area and will be reprocessed by mixing with other materials. Paint filter test procedures are attached to this application in appendix E. After passing the paint filter test waste will be removed from the temporary storage area and then placed in the landfill using heavy equipment or a conveyor system. All Waste will then be placed in a uniform layer in the landfill as described in section 3.2.3 Waste Disposal. All waste found to meet the requirements for disposal and accepted to the site will be disposed in the landfill. There are no plans to implement a recycling program since most anticipated waste materials are soils and drill cuttings.

3.2.2 Waste Shipment Records

The landfill operations manager will maintain and store waste shipment records as part of the daily records of disposal activities. Each truck load of E&P waste delivered to the WWS facility will have a waste shipment ticket completed. The waste shipment ticket will be completed by the truck driver and then verified by the landfill operating staff. An example of the waste shipment ticket is included in Appendix E. The waste shipment ticket will include the following data for record keeping:

- Date and time of arrival
- Load ID number
- Quantity in cubic yards and estimated tons based on unit weight
- Type of waste
- Origin and generator of waste
- Name of trucking company and truck number
- Truck drivers name and signature

3.2.3 Waste Disposal

Waste that is approved for disposal will be transported into the landfill cell by means of either direct placement from delivery truck, heavy equipment or a conveyor system.

Waste deposited in the landfill will be placed in approximately 1ft. thick lifts. Lifts will be distributed by use of heavy equipment and then compacted. Waste will be compacted to reach a firm and unyielding surface to maximize landfill capacity.

Waste deposited in the landfill will not come in direct contact with the HDPE liner. A protective 6-inch layer of soil material will be used as a buffer between waste and the sand for the leachate collection system. Below the 6-inch layer of protective soil, 6-inches of bank run sand will be placed as part of the leachate collection system to make a total of 12-inches of soil between the waste and the HDPE liner. The 6-inches of protective soil and 6-inches of sand will be placed on all surfaces of the HDPE liner. Details of the protective soil layer are included in the permitting drawings located in Appendix D. All equipment moving in or on the landfill will not have contact with the liner and will remain on the protective fill layer or the access ramp. Waste will also be placed in such a way as to protect the liner from puncturing during the compaction process.

3.2.4 Plans for Excluding Waste

WWS will maintain a comprehensive waste screening process when working with waste generators. Non-hazardous industrial waste including E&P waste and RCRA exempt waste will be accepted at the proposed landfill as allowed under a Class IIIb landfill or as directed by DWMRC. Non-E&P waste and waste that is not RCRA exempt will not be accepted at the Sand Pass landfill. To ensure that waste meets this requirement, all potential waste generators that wish to dispose waste at the WWS facility must first provide a waste certification letter. This letter is part of the assessment which will determine the acceptability of the generated waste that is to be disposed of under this permit application.

When requested by WWS generators will provide representative samples of each type of waste for paint filter testing. Generators will be required to provide a waste characterization letter for each type of waste certifying that the waste meets the requirements of disposal in a Class IIIb Landfill. Generators will be required to certify the waste from each of the various sources. Generators will also be required to inform WWS when waste composition changes and then resubmit a waste characterization form with samples.

Wastes that contain PCBs will not be accepted in to the proposed landfill. In addition, WWS does not anticipate any type of waste will be accepted at the landfill that would be considered a disease vector.

3.3 WASTE FACILITY INSPECTION AND MONITORING

WWS personnel will monitor the facility daily and conduct weekly inspect of the facility. The weekly inspection will be conducted to limit operator errors, to avoid facility malfunctions, deterioration, and to circumvent facility discharges that may cause or lead to a threat to human health and/or the environment. Daily and weekly facility inspections will be recorded using inspection logs. An example of these inspection logs is provided in this permit application in Appendix E.

3.3.1 Fugitive Dust Control

As required in Utah Administrative Code R315-302-2(2)(g) WWS has prepared a plan for controlling fugitive dust as part of this permit application. Daily WWS fugitive dust emissions will be monitored, with controls to be put in place as deemed necessary by the landfill operations manager.

During the construction and operational phases of the landfill, sources of dust within the landfill cell will be identified by the landfill operations manager. These sources of dust will be controlled by watering and proper placement of waste in the landfill. WWS will have staff on site that are certified in monitoring opacity and will periodically check the facility for dust control issues. When opacity of the dust exceeds 10% watering controls will be put into place.

The landfill operations manager will also monitor dust on all haul roads on WWS property. Haul roads leading from the main gate to the landfill cell are all unpaved. Proper maintenance of haul roads, speed limit controls and watering when dust opacity exceeds 10% will aid in reducing fugitive dust emissions. In addition, the Sand Pass facility is regulated by the Division of Air Quality for PM emissions. The facility is waiting for a final approval order for the facility that will have recommended control practices for reducing PM emissions for the entire facility.

3.3.2 Plan for Litter Control

WWS does not anticipate accepting waste materials that will cause a wind-blown litter problem. WWS will complete a daily inspection of the landfill and surrounding area and identify any potential waste material that may escape the facility.

3.3.3 Contingency Plan for Fire or Explosion

In the event of a fire or explosion at the WWS facility, the landfill operations manager will be notified. The landfill operations manager will then contact local emergency authorities to initiate emergency response. A list of the local emergency responders is provided in Appendix E of this permit application.

3.3.4 Alternative Waste Handling Plan

In the event of a landfill closure due to an emergency or repairs, WWS will arrange to have the waste transported to the Duchesne County Landfill located at 20550 West and 2000 South as needed.

3.3.5 General Training Plan

As required in R315-302-2(2), every permitted landfill must have a detailed training program. WWS currently has a training program that educates their employees on how to handle E&P waste and how to operate the existing components of the waste facility. Prior to working in the landfill portion of the WWS facility, all employees are required to complete the training program as out lined here-in. This training program will consist of three parts including health and safety training, E&P waste handling, and landfill operations specific training. The training of each employee will be supervised and conducted by the WWS operations manager.

Health and Safety Training:

Prior to completing the WWS health and safety training portion of the education program, each employee will complete a 10-hour safety course provided by OSHA. In addition to the safety training provided by OSHA, WWS will educate the employees on the following safety procedures:

- Facility safety controls
- Emergency procedures and equipment
- Contingency plan procedures
- Fire prevention and control
- Spill prevention and control
- Proper safety equipment and personal protection equipment

- Waste loading and unloading procedures
- Waste disposal equipment handling procedures and safety
- H_2S safety training
- Chemical Hazards

E&P Waste Handling Training:

The WWS operations manager will instruct all employees on proper handling of E&P waste based on current government regulations. This training will cover RCRA exempt E&P, produced water and crude oil. This portion of the training will educate the employees with the following items:

- Overview of E&P waste production and disposal
- Identification of E&P waste types
- Review of regulations relating to E&P waste
- Prohibited waste
- Proper handling and disposal of each waste type
- Proper recordkeeping of accepted waste

Landfill Operations Specific Training

Employees that will be involved in any portion of the Landfill operations will receive landfill specific training. Each employee will also receive hands-on training from the operations manager specific to the employee's assigned duties. This portion of the training will cover the following items:

- Overview of landfill design, construction and components
- Waste identification and characterization
- Documentation of accepted waste
- Landfill hazards and safety
- On-site waste transportation
- Waste loading and unloading procedures
- Waste sampling procedures
- Waste inspection, processing and testing procedures
- Recordkeeping
- Landfill inspection and general maintenance
- Emergency procedures and contingency plan
- Proper transportation and placement of waste in landfill
- Spill prevention and containment

All personnel that will be working on the landfill will be required to participate in weekly safety meetings and morning tailgate safety meetings held at the WWS facility. All employees are required to read and review the landfill permit on a semiannually basis. Annual refresher training of the above-mentioned training program will be conducted for all employees involved with the permitted landfill. Any new information relevant to the permitted landfill will also be covered in the annual refresher training. New employees that are assigned to work associated with the landfill will receive training during the first month of employment and will be trained by a supervisor that has completed the required training. Records of this training will be kept in the WWS database.

3.4 RECORD KEEPING

During the operation of the landfill, the operator and staff will maintain records of landfill activities as required by the division (315-302-2-(3). These records will be stored electronically in the WWS database at their facility.

3.4.1 Daily Permanent Record

The landfill manager will record the following data daily and maintain the data in a permanent file:

- Waste shipment records as described in section 3.2.2
- The estimated weight in tons and volume in cubic yards of E&P waste received for the day
- The estimated weight in tons and volume in cubic yards of E&P waste that required treatment prior to disposal in the landfill cell
- The estimated weight in tons and volume in cubic yards of material added to treat the waste and the total weight and volume of treated waste
- Number of trucks visiting the Landfill
- Type of E&P waste received
- Paint filter test results
- Deviations from the UDSHW approve Operations Plan
- Staff training records
- Status of groundwater, leachate and gas monitoring as may be necessary
- A written report of daily activities at the landfill site

3.4.2 Other Records

The landfill manager will also include the following data in the permanent records:

- Design documentation of the placement or recirculation of leachate or gas condensate into the landfill
- Closure and post closure care plans and activities
- Cost estimates and financial assurance documentation
- Safety training and landfill specific training for all employees associated with the landfill

Attachment 3
Groundwater Monitoring

2.2.5 Ground Water

Two monitor wells have been installed near the Proposed Class III E&P Landfill. The location map for these monitor wells is in Appendix A, Plate A-2. P-1 is the up-gradient well and P-2 is the down-gradient monitoring well. Water levels have been measured, with the most recent measurement occurring on March 1, 2019. Ground water elevation data are included in table 2.2.5.a.

Table 2.2.5. a

			3/1/2019
Well Number	Well Surface Elevation (ft)	Well Bottom Elevation (ft)	Water Elevation (ft)
P-1	5058	4999	5043
P-2	5054	5038	5039

The monitor well logs and completion details for each of the monitoring wells are in Appendix B, Plate B-5 through B-6. Water elevation data collected in March 2019 was used to determine the direction of ground water flow at the subject site. Groundwater generally flows to the east towards the Green River. A cross section of the proposed landfill also identifies the elevation of the potentiometric surface of the groundwater (Appendix D, Page B-4).

Based on our finding of groundwater at the WWS facility, groundwater is measured as being greater than 5 feet below the lowest portion of the Proposed Class III E&P Landfill. A cross-section of the Proposed Class III E&P Landfill identifies bedrock, soils and inferred elevations of ground water under the WWS facility (Appendix D, Page B-4). The data used to create these cross sections was obtained using the geologic map (Appendix A, Plate A-3), subsurface exploration data (section 2.3.1) and ground water data provided in the table above.

2.2.6 Surface Water

The Reservoir on Pleasant Valley Draw is located on the extreme south-central portion of the WWS owned Property, approximately 1,500 feet southwest of the Proposed Class III E&P Landfill. There are numerous ephemeral drainages that are identified near the facility. A map locating these drainages is provided in Appendix A as plate A-4. No landfill related activities will impact these drainages. The mapped ephemeral drainage that is near the northwest corner of the Landfill cell was not observed during the on-site visits.

2.2.7 Groundwater and Surface Water Monitoring Plan

Groundwater was encountered at the subject site in wells P-1 South and P-2 North. The groundwater resides in alluvial aquifers overlying bedrock and permeable sandstone beds within the bedrock. WWS may utilize P-1 and P-2 for supplementary ground water level monitoring because these wells were not constructed with the intent for monitoring groundwater quality. Additional wells will be constructed and utilized as up gradient monitoring and down gradient monitoring of ground water quality. The proposed locations of these wells are indicated on Plate A-2 of Appendix A. WWS will use the proposed wills to sample groundwater semiannually. Water will be analyzed for the following analytes as required in R315-308-4:

- Heavy Metals including Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc

- Inorganic Constituents including Ammonia, Carbonate/Bicarbonate, Calcium, Chemical Oxygen Demand (COD), Chloride, Iron, Magnesium, Manganese, Nitrate, pH, Potassium, Sodium, Sulfate, Total Dissolved Solids (TDS), Total Organic Carbon (TOC)

- Gasoline Range Organics (Method SW-846 8260C)

As required in R315-308-2(8) WWS will use a statistical method for determining whether a significant change has occurred as compared to background. To establish a background range of groundwater constituents, at least eight rounds of sampling will be completed over the course of 12 months after the completion of the landfill construction. Based on the sampling results for each constituent the 95% upper confidence interval will be calculated and will assume homoscedasticity. During operations of the landfill, semiannual samples will be collected, and results of each constituent will be compared using a parametric analysis of variance. If concentrations of a constituent are greater than the 95% confidence

interval, it will be considered and outlier and will be further evaluated to determine if it is a normal fluctuation in the groundwater or if it is a result of possible leachate or other contaminated water from the water disposal facility. A report of the data and outliers will be provided to the division which will determine an appropriate response to this data.

- Natural Moisture and Unit Weight of Soils
- Grain Size Distribution Analysis (ASTM D422)

Legend

- Monitoring Well
- Test Pit
- Proposed Monitoring Well
- Future Landfill Phases
- Landfill Cell
- Property Boundary

0 140 280 560 840 1,120 Feet

1:4,000

N

GeoStrata

Landfill Permit
Western Water Solutions
Duchesne County, Utah
Project Number: 705-011

Landfill Site Map

Plate A-2

Attachment 4
Closure and Post-closure

3.0 CLOSURE PLAN

3.1 CLOSURE SCHEDULE

The Proposed Class III E&P Landfill will be closed in a single operation that includes the final grading of the waste material and the placement of the final cover. The expected duration of the land fill operation is approximately 10 years at a 10% growth rate. Sixty days prior to the expected final receipt of waste, WWS will notify the division of their intent to begin closure operations. WWS will begin its closure operations after the final receipt of waste is obtained. It is anticipated that the closure operation will take place over an anticipated duration of 90 to 120 days. During this period the landfill will be graded, covered and surveyed. As-built plans will be generated for reference for the final inspection by the division.

3.2 DESIGN OF FINAL COVER

The final cover will consist of two soil layers. The lower layer will consist of a compacted clay soil liner which will be overlain by an upper layer of soil that will be seeded with native grasses. The construction of the lower layer portion of the final cover will be an Alternative Design that will achieve equivalent requirements as the Standard Design as prescribed in R315-303-3(4)(c)(i). The upper layer will follow the Standard Design requirements as explained in R315-303-3(4)(a)(ii). Cover soils will be constructed from soils that are available on site. All testing and calculations are based on samples of the native soils at the site.

In the alternative final cover design the waste will be covered with a minimum of 6 inches of clay that will have a permeability of at most $1x10^{-6}$ cm/second. The Utah regulation R315-303-3(4)(c)(i) requires that the alternative final cover of a soil liner must achieve and equivalent reduction in infiltration as achieved by the standard design. Standard design calls for at least 18 inches of compacted soil, or equivalent, with a permeability of 1×10^{-5} cm/sec or less, or equivalent. The proposed soils used for the final cover are far less permeable than this requirement. The proposed lower layer will use 6 inches of clay soils that have a permeability of no greater than 1×10^{-7} cm/s. Preliminary testing show that the soils have a permeability of less than 1×10^{-8} cm/s. Based on engineering calculations 6 inches of soils with a permeability no more than $1x10^{-7}$ cm/sec is equivalent to 18 inches of soils that are permeable up to $1x10^{-5}$ cm/second. These calculations are included as part of our mathematical model that can

be found in Appendix D of this permit application and explained in the following paragraph.

As part of the requirements of an alternative final cover design, expected performance of the alternative cover has been documents by use of a mathematical model as required in R315-303-3(4)(d). Line item 3 of the model includes a hydraulic conductivity test that was performed on a sample of cover soils obtained from the Sand Pass facility. The lab test was performed in accordance with ASTM D5084 method C that resulted in a lab measurement of 4.31×10^{-6} cm/second. This result exceeds minimum requirement of $1x10^{-5}$ cm/second of the standard design. The mathematic model also includes other lab tests on the soil that demonstrate that the soil is non-dispersive (line 1). Lines 5 through 15 include the model that demonstrates the performance of the soils used for the alternative cover. This model includes in line Item 5 the climatic conditions including the normal precipitation and wettest 5 years on record as required in R315-303-3(4)(d)(i) and (ii). Using this data, we then calculated the annual soil erosion rate was based on the Revised Universal Soil Loss Equation that is commonly used by the EPA and NRCS. Using this equation, we are able to show that the proposed cover design would lose annually 0.05 inches of soil over the entire cap (line 14). Applying a factor of safety of 10, the unattended and unrepaired cover would lose 6 inches of soil after 10 years. It is our engineering opinion that this alternative design is equivalent to the Standard Design.

In addition, R315-303-3(4)(a)(ii) also requires that a second layer of soil is to be use for reducing erosion consisting of at least 6 inches of soil capable of sustaining vegetative growth placed over the compacted soil cover and seeded with grass, other shallow rooted vegetation, or other native vegetation. In our proposed design follows the standard design requirements in that the compacted clay liner soils will be covered with a second soil layer that will be a minimum of 6 inches of soil as prescribed in R315-303-3(4)(a)(ii). This soil layer will be capable of sustaining vegetative growth and will be seeded with native shallow root vegetation or native vegetation to minimize erosion of the final cover. It is our understanding that locally available topsoil suitable for vegetative growth may be readily available to be utilized at the time of closure. These soils may be tested for organic content, permeability and cohesion prior to use as final cover soil.

The final cover for each cell will be graded to no steeper than a 3:1 slope around the outer perimeter of the landfill cell. The top elevation of the landfill cap will be rectangular and will have a slope of no less than 2%. To control the run-off of storm water and minimize erosion of the final cover material, it is intended that the final cover soils be seeded with native grasses and use other erosion controls as needed. The final cover may be reseeded as needed during the post closure phase of the landfill. The final cover plans of each landfill cell are included in Appendix D of this permit application.

3.3 CAPACITY OF LANDFILL

The estimated capacity of the Proposed Class III E&P Landfill, up to the final cover, is 307,000 cubic yards. With an estimated dry density of 97.2 lb./cu-ft. based on the assumption of half the waste being mixed with additional material, the landfill will have an estimated total of 403,000 tons of waste at the time of closure. A table with the projected life of at 0, 2, 3, 5, and 10 percent growth rate for the landfill is provided in Appendix E, Plate E-1. The growth rate is defined as the number of trucks delivered to the site on an average daily basis. With an increase in the growth rate, the life of the landfill will be reduced.

3.4 FINAL INSPECTION

After the completion of the final cover, the final inspection of the landfill will be conducted by officials from DWMRC. WWS will notify the division of the anticipated date of completion and arrange for scheduling the inspection.

4.0 POST CLOSURE CARE

Immediately after the completion of construction for the final cover of the landfill, the post closure care plan will be implemented. As required in R315-302-3(5) the post closure care activities will take place for 30 years or as long as the Director determines is necessary for the facility or unit to become stabilized and to protect human health and the environment. A licensed engineer with the state of Utah will direct the post-closure care of the facility and will provide WWS with recommendations to properly maintain the landfill site and prevent any release of harmful substances. The engineer will also provide the division with documentation if he determines that the site is safe to reduce or discontinue site monitoring prior to the end of the 30-year period.

4.1 POST CLOSURE CARE PLANS

During the post closure period the following activities will take place:

Site Monitoring: Portions of the WWS facility are operated 24 hours a day 7 day a week. WWS personnel will be onsite every day to monitor activities at the facility and restrict access to the landfill. Access to the landfill will be restricted with fencing and locked gates at the roadway entrance. Signs will be posted advising of the potential dangers associated with the landfill. Only authorized personnel of WWS will have access to the landfill site.

On a quarterly basis the landfill cover will be inspected to check for rutting and depressions that could result in rapid erosion. If rutting or depressions in the cover are identified they will be repaired by grading and seeding the surface. Slopes of the final cover will also be inspected and maintained. WWS will insure that a 2% slope will be maintained on the top of the cover and a 3:1 slope will be maintained around the perimeter of the landfill.

Run-off water from the final cover will be directed into the existing drainages to the south and east of the landfill. WWS will on a Quarterly basis inspect the run-off collection system and ensure that they are properly diverting water into the existing storm water drainages. Repairs will be made as needed.

Surface and Ground Water Monitoring: Samples will be collected of groundwater from the monitoring wells on site. No samples of surface waters will be collected

because there are no observed streams, springs or other surface waters at the site of the proposed landfill. All sampling will be completed by a Utah certified groundwater sampler. Sampling will take place every six months during the closure and post-closure care period. The water will be field tested for pH, water temperature, and water conductivity. Samples will also be collected for lab analysis, testing for heavy metals and organic constituents will be conducted as required in R315-308-4. The results of the water sample testing will be recorded and statistically analyzed for significant changes in concentrations of constituents utilizing a parametric analysis of variance (ANOVA). If significant changes are detected, then WWS will follow the guidelines in R315-308-2(13).

4.2 RECORD OF TITLE, LAND USE, ZONING

The Duchesne County Recorder will be notified during the closure period of the completion of the disposal site. The county recorder will be provided with documentation and plats of the location of the disposal site. Notification of the closure, and location of the land fill will also be sent to the county recorder and zoning changes will be made if necessary. Documentation of the history of the landfill will permanently appended to the title of record and land use restrictions will be put in place.

4.3 POST CLOSURE CONTACTS

The point of contact during the post closure care period for this facility is Reece Jensen. His contact information is provided below:

Reece Jensen

Western Water Solutions

1145 S. 800 E Suite 259

Orem, Utah 84097

801-518-9790

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Appendix H

Task	Description	Unit Cost	No. Units Landfill #1	Unit Type	Total Cost	Details
Engineering	QCA (Laboratory/field Testing)	$ 8,994.25	1	Estimate	$ 8,994.25	15% of construction Cost, inludes design, lab testing and field engineering support
	Construction Surveying	$ 1,500.00	1	Estimate	$ 1,500.00	Aerial drone imaging and processing
	As built survey	$ 2,000.00	1	Estimate	$ 2,000.00	GeoStrata As built survey and CAD drawing
	Letter of notification of closure	$ 1,500.00	1	Estimate	$ 1,500.00	Letter to DWMRC and County
Construction Cost	Topsoil Material	$ -	5497	Cu Yd	$ -	Topsoil is available on site
	Top Soil Testing	$ 250.00	1	Estimate	$ 250.00	Soil sampling and testing to ensure top soil is adequate
	Topsoil Graded	$ 0.16	26444	Sq Yd	$ 4,231.04	RS Means
	Trucking Topsoil	$ 1.00	5497	Cu Yd	$ 5,497.00	Top Soil is available on site
	Clay Liner Soils and Hauling	$ 2.89	5495	Cu yd	$ 15,880.55	Use of clay soils available on site Haul 0.5 Mile RS Means
	Clay Soils Compacted	$ 0.80	5495	Cu Yd	$ 4,396.00	RS Means
	Clay Soils Testing	$ 500.00	1	Estimate	$ 500.00	Soil sampling and testing to ensure Clay liner is adequate
	Hydro Seeding with mulch and fertilizer	$ 62.00	238	1000 Sq ft	$ 14,756.00	RS Means
	Mobilization /Demobilization	$ 3,000.00	3	Each	$ 9,000.00	$1500 per mobilization per piece of quipment
Contingency	10% of constuction cost	$ 5,451.06	1	Each	$ 5,451.06	GeoStrata Estimate
TOTAL COST:					**$ 73,955.90**	

Engineers opinion of probable Costs

Closure Cost Summary

Western Water Solutions
Landfill Permit Application
Project Number: 705-011

Plate H-1

Task	Description	Unit Cost	No. Units	Unit Type	Total Cost	Total units 30 yrs.	Total cost 30 yrs.	Details/Source
Inspections	Quarterly 1st 2 years; Semiannually for 28 years	$ 25.00	4	hours	100.00	64	$ 6,400.00	4 inspections/year for the first 2 years and then 2 inspections/year for 28 years
Report	Quarterly 1st 2 years; Semiannually for 28 years	$ 25.00	2	hours	50.00	64	$ 3,200.00	4 reports/year for the first 2 years and then 2 reports/year for 28 years
TOTAL for 30 yrs							$ 9,600.00	

Groundwater Monitoring	Groundwater Sampling labor	$ 85.00	6	hour	510.00	13	$ 6,630.00	Annual monitoring for first 5 years, biennial for next 10 years, then monitoring evey 5th year for final 15 years. Sampling from 2 monitoring wells for 13 rounds of sampling
	GRO	$ 130.00	2	sample	260.00	13	$ 3,380.00	
	Heavy Metals	$ 178.00	2	sample	356.00	13	$ 4,628.00	
	Inorganic Constituents/other	$ 234.00	2	sample	468.00	13	$ 6,084.00	
	Groundwater sampling report	$ 1,200.00	1	report	1200.00	13	$ 15,600.00	
	Transport to lab	$ 100.00	1	vehicle	100.00	13	$ 1,300.00	
TOTAL for 30 yrs							$ 37,622.00	

Maintenance	Re-grading top Soil	$ 0.16	26444.444	Sq Yd	4231.11	1	$ 2,432.01	Assumes 100% of topsoil of final cover of both cells will have to be replaced over 30 years
	Soil replacement	$ 1.00	4661	Cu Yd	4661.00	1	$ 4,661.00	
	Reseeding	$ 62.00	238	1000 Sq Ft	14756.00	1	$ 14,756.00	Assumes 1 total reseeding of final cover over 30 years
TOTAL for 30 yrs							$ 21,849.01	

TOTAL for all tasks 30 yrs							$ 69,071.01	

Contingency	10% of total cost for all tasks						$ 6,907.10	

TOTAL POST CLOSURE COST							**$ 75,978.11**	

Engineers opinion of probable Costs

Post-Closure Care Cost Summary

Western Water Solutions
Landfill Permit Application
Project Number: 705-011

Plate H-2