

CLASS IV_a LANDFILL APPLICATION

**FOR THE PROPOSED:
GREEN RIVER LANDFILL**

EMERY COUNTY, UTAH

PREPARED ON BEHALF OF:

CITY OF GREEN RIVER
460 EAST MAIN STREET
GREEN RIVER, UTAH 84525

PREPARED BY:

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JUNE 2022

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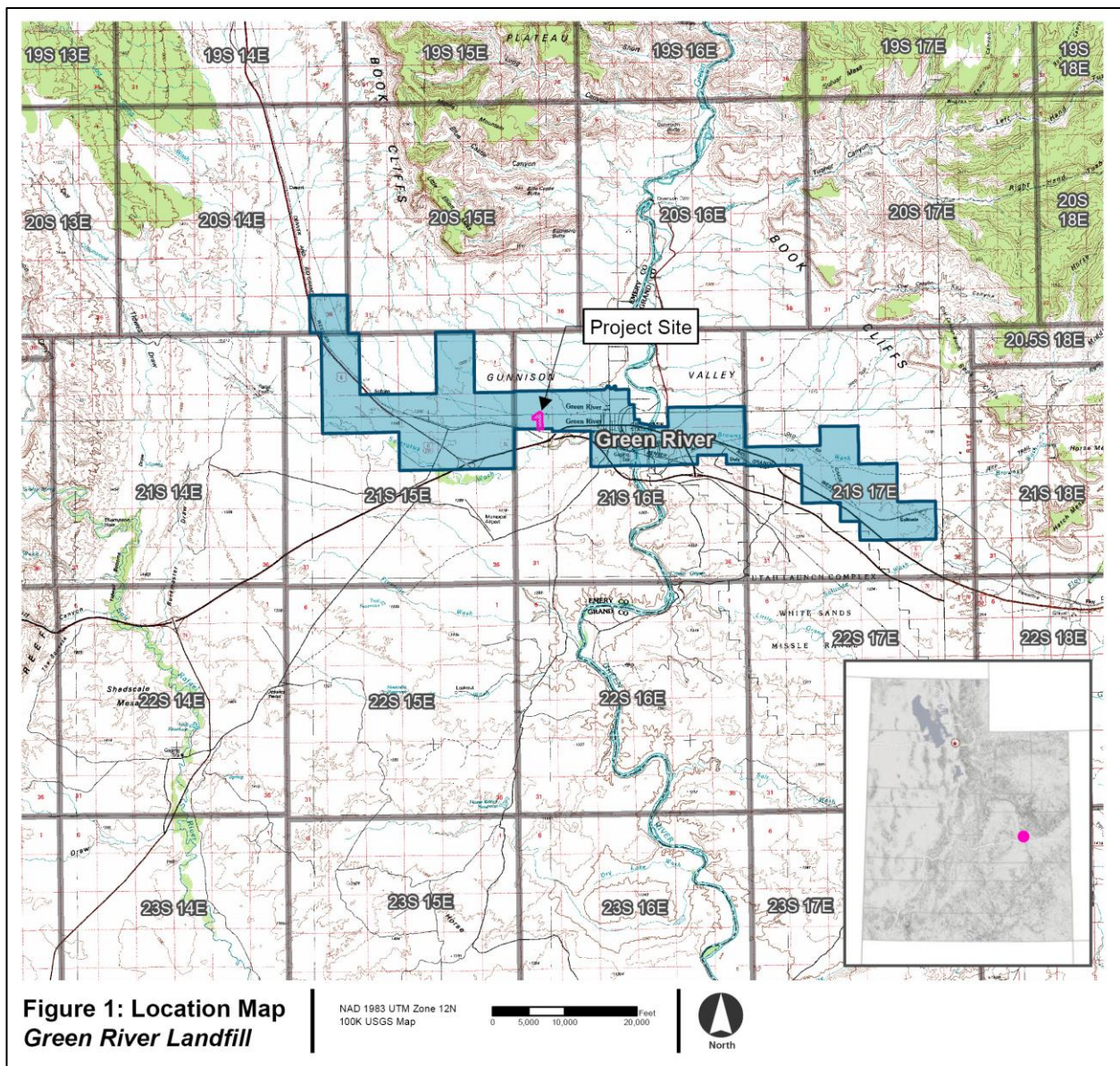
1.0 GENERAL DATA

1.1 NAME OF FACILITY

Green River Landfill

1.2 SITE LOCATION

The proposed landfill is located on the west side of Green River City, north of I-70 in the southeast quarter of Section 7, Township 21 South, Range 16 East, Salt Lake Base and Meridian (S.L.B.&M.), Green River, Emery County, Utah (see Figure 1). Approximate latitude of the proposed project is 38° 59' 50" and longitude is 100° 11' 48".



1.3 FACILITY OWNER

City of Green River (City)

1.4 FACILITY OPERATOR

City of Green River

1.5 CONTACT PERSON

Conae Black
460 East Main Street
P.O. Box 620
Green River, Utah 84525
435-564-3448

1.6 TYPE OF FACILITY

Class IVa Landfill

1.7 PROPERTY OWNERSHIP

City of Green River

1.8 CERTIFICATION OF SUBMITTED INFORMATION

The certification of the submitted information is included below:

CERTIFICATION OF SUBMITTED INFORMATION

_____, _____
(Name of Official) (Title)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: _____, Date _____

SUBSCRIBED AND SWORN to before this _____ day of _____, 20____.

My commission expires on the _____ day of _____, 20____.

Notary Public in and for

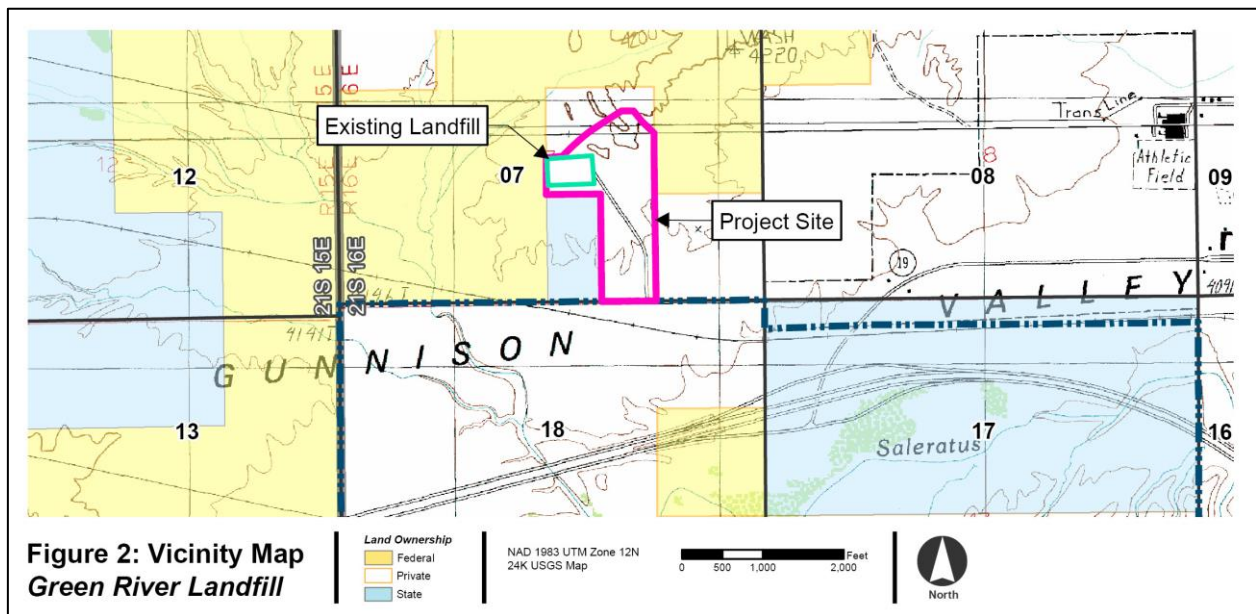
(SEAL) _____ County, Utah.

2.0 INTRODUCTION

2.1 GENERAL DESCRIPTION OF THE FACILITY

The proposed Green River Landfill is located on lands owned by the City of Green River (City). See Appendix A for Proof of Ownership. Currently, the City manages a small, existing landfill to the north of the proposed Class IVa landfill (Figure 2).

The existing landfill is being used by the City to dispose of soil and other fill materials resulting from City projects, including excavated soils. At present, no other permissions are being granted for dumping; although, the site is occasionally being used for unauthorized disposal of yard waste (clippings and other course, woody plant materials).



2.2 LANDFILL STANDARDS

This landfill is being proposed to operate under the standards of a Class IVa landfill as discussed in Utah Administration Code (UAC) R315-305-4. According to this Code, the City of Green River will:

1. Meet location standards (R315-302-1[2];
2. Obtain a permit (R 315-310);
3. Design the landfill to prevent the run-on of all surface waters from a 25-year storm into the landfill and to collect and treat the run-off of surface waters from a 25-year storm from the active area of the landfill (R315-305-4[3a,b]);
4. Monitor the ground water beneath the landfill (R315-308) (see Section 2.4.6);
5. Construct a sign at the facility entrance (R315-303-3[7d]);
6. Keep applicable records (R315-302-2[3]); and
7. Make the required recording with the Emery County recorder (R. 315-302-2[6]).

2.3 LOCATION STANDARDS

2.3.1 LAND USE COMPATIBILITY

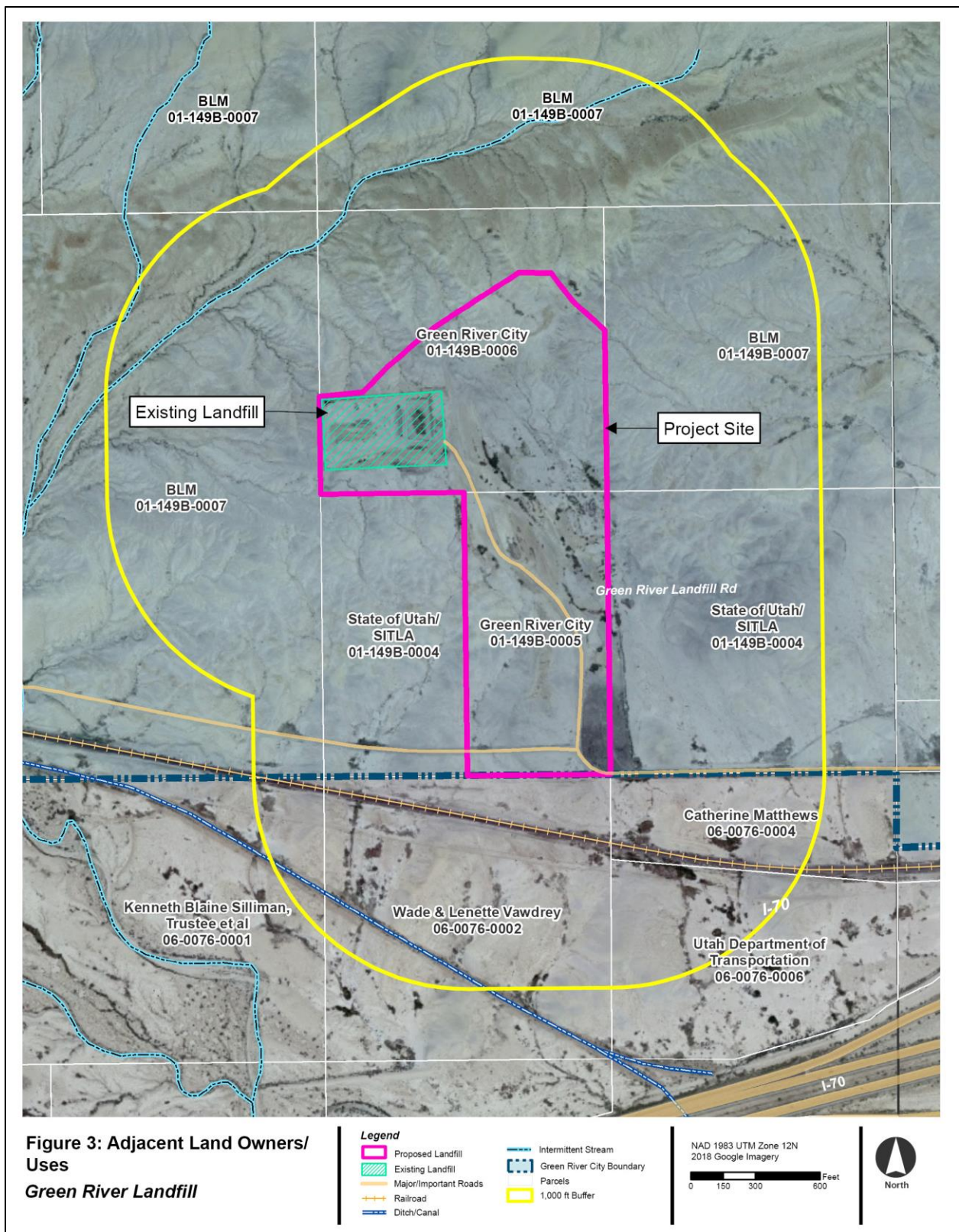
The proposed landfill is located a little over one mile west of the residential areas of the City of Green River, Utah. There are no National, State, Emery County or City parks, monuments, or recreation areas; designated wilderness or wilderness study areas; wild and scenic river areas; or streams, lake, or reservoirs within 1,000 feet of the proposed facility (R315-302-1[2]). The closest airport, the Green River Municipal Airport, is 2.7 miles away (see Figures 3 and 4).

Names and addresses of all property owners within 1,000 feet of the facility boundary are as follows (see Figure 3 and Table 1):

Table 1. Parcel data of adjacent property owners.

PARCEL ID	OWNER	ADDRESS
01-149B-0004	State of Utah/SITLA	Emery County Courthouse Castle Dale, UT 84513
01-149B-0004	State of Utah/SITLA	Emery County Courthouse Castle Dale, UT 84513
01-149B-0007	Bureau of Land Management	United States of America Emery County Courthouse Castle Dale, UT 84513
01-149B-0007	Bureau of Land Management	United States of America Emery County Courthouse Castle Dale, UT 84513
06-0076-0001	Kenneth Blaine Silliman, Trustee et al.	PO Box 480 Green River, UT 84525-0480
06-0076-0002	Wade & Lenette Vawdrey	2299 Cayuse St Twin Falls, ID 83301-5685
06-0076-0004	Catherine Matthews	2 Terracima Irvine, CA 92620-2587
06-0076-0006	Utah Department of Transportation	Roadway Design, 4 th Floor 4501 South 2799 West Salt Lake City, UT 84119

A notice of intent to apply for a permit has been sent to all property owners listed above. A copy of the letter sent is provided in Appendix B.



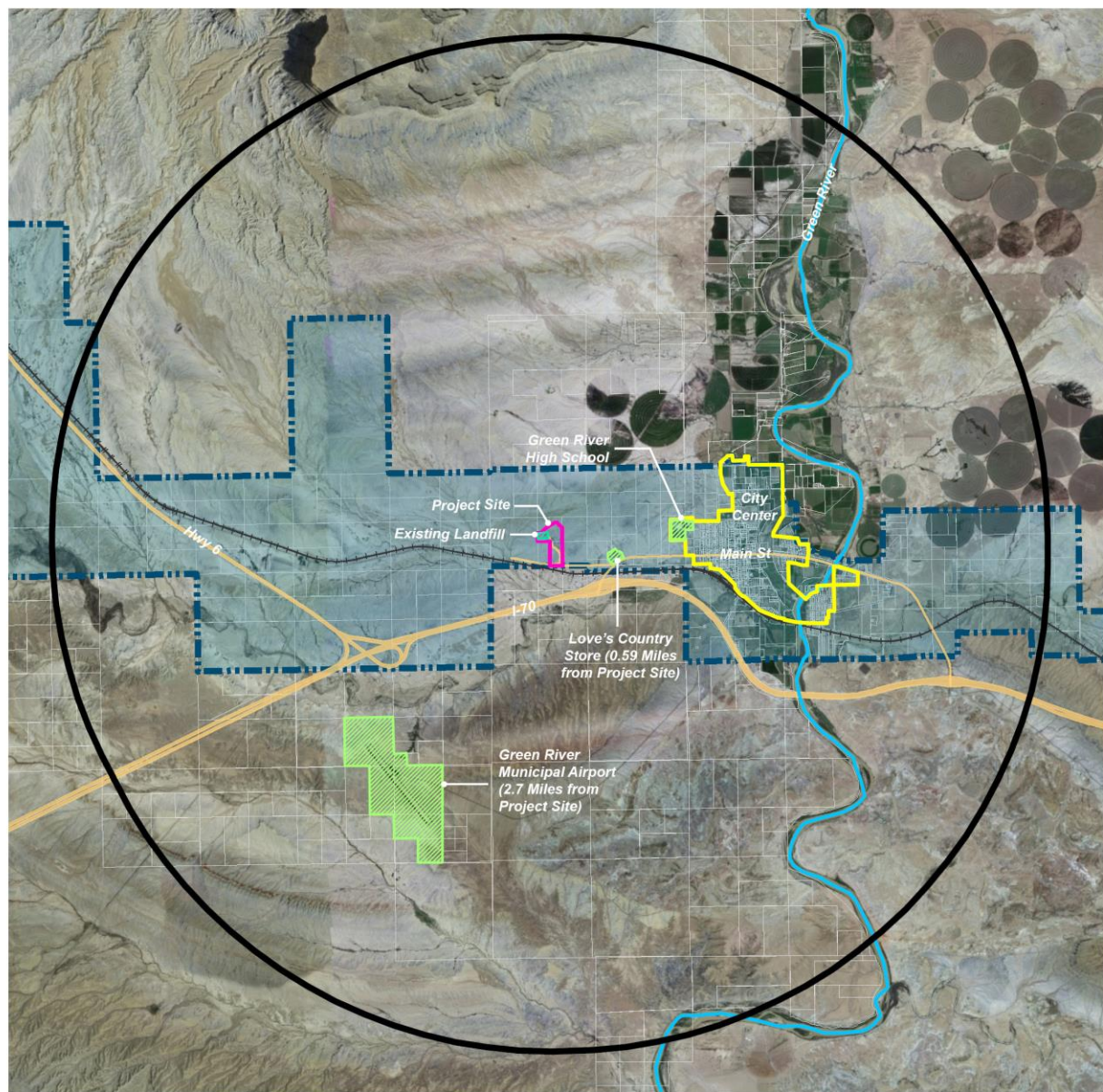


Figure 4: Land Use Compatibility
Green River Landfill

Legend

- Proposed Landfill
- Existing Landfill
- Residential Area
- Highlighted Places
- Major/Important Roads

- Railroad
- Green River
- Green River City Boundary
- Parcels
- 5-mile Buffer

NAD 1983 UTM Zone 12N
2018 Google Imagery

0 2,000 4,000 8,000 Feet



2.4 ECOLOGICALLY OR SCIENTIFICALLY SIGNIFICANT AREAS OR FEDERALLY LISTED SPECIES

The proposed landfill footprint and 1,000 buffer were assessed for the potential to support species listed as Threatened, Endangered, Proposed, or Candidate (TEPC) by the U.S. Fish and Wildlife Service (USFWS). This task was accomplished by conducting a database search of the USFWS Information, Planning, and Conservation System (IPaC) (USFWS 2021a) and the Utah Natural Heritage Program (UNHP) (UNHP 2021), and field surveys pertaining to biological resources. The following information is based on the results of these searches.

Threatened, Endangered, Proposed Candidate — Botanical Resources: The proposed landfill site is in the USFWS current range for the *Pediocactus despainii* (San Rafael Cactus), an endangered plant species (USFWS 2015, USFWS 2021). *P. despainii* is known to occur on fine textured soils derived limestone substrate of the Carmel Formation, Sinbad member of the Moenkopi Formation, and shale barrens of the Brushy Basin member of the Mancos, Morrison, Carmel, and Dakota geologic formations (Heil 1984; Kass 1990, Clark 1999, Welsh et al. 2018). The proposed landfill and 1,000-foot buffer intersect the Blue Gate Shale Member of Mancos Shale Formation which has potential to support *P. despainii* (see Section 2.4.3 Geology). Although habitat with potential to support this species is present, no occurrences have been reported to the Utah Natural Heritage Program (UNHP) (UNHP 2021). In addition, a botanical survey was conducted during April 2022. At this time, no *P. despainii* individuals were documented within the proposed project disturbance footprint, nor within the 1,000-foot buffer. See Appendix C for detailed results related to the botanical survey.

Threatened, Endangered, Proposed Candidate — Wildlife Resources: No TEPC wildlife species have the potential to occur within the project area. No habitats suitable to TEPC wildlife species were documented within the project footprint or the associated survey buffer. The potential for TEPC wildlife species to occur within the project area is low. See Appendix C for details pertaining to TEPC wildlife species.

The UNHP reports a western yellow-billed cuckoo occurrence within two miles of the project area. This occurrence is likely associated with the Green River, which is outside the wildlife survey buffer. No western yellow-billed cuckoo habitat was identified within the project area.

Nesting Raptors, Including Burrowing Owls: No previously documented raptor nests have been reported within the project area. No new raptor nests were located during the April 2022 survey (during the regional nesting season). Migratory bird foraging and nesting habitats were observed throughout the one-half mile buffer of the project area. The proposed landfill project area is mostly disturbed and is not considered suitable migratory bird habitat. See Appendix C for details pertaining to nesting raptors, burrowing owl, and other migratory bird species.

2.4.1 GEOLOGY

The proposed landfill site is in the northern portion of the Paradox Basin within the Canyonlands Section of the Colorado Plateau on a layer of Mancos shale that is approximately 1,000 feet thick (Bingham Environmental 1999). There are no known

significant geologic features, faults, or unstable areas within the boundaries of the proposed landfill. The proposed landfill site and surrounding area are primarily within the Blue Gate Shale Member of the Mancos Shale Formation. Soils derived from alluvium stream deposits area are found in the southern portion of the site. (UTGS 2004, UTGS 2015) (see Figure 5).

The proposed landfill location includes four soil types:

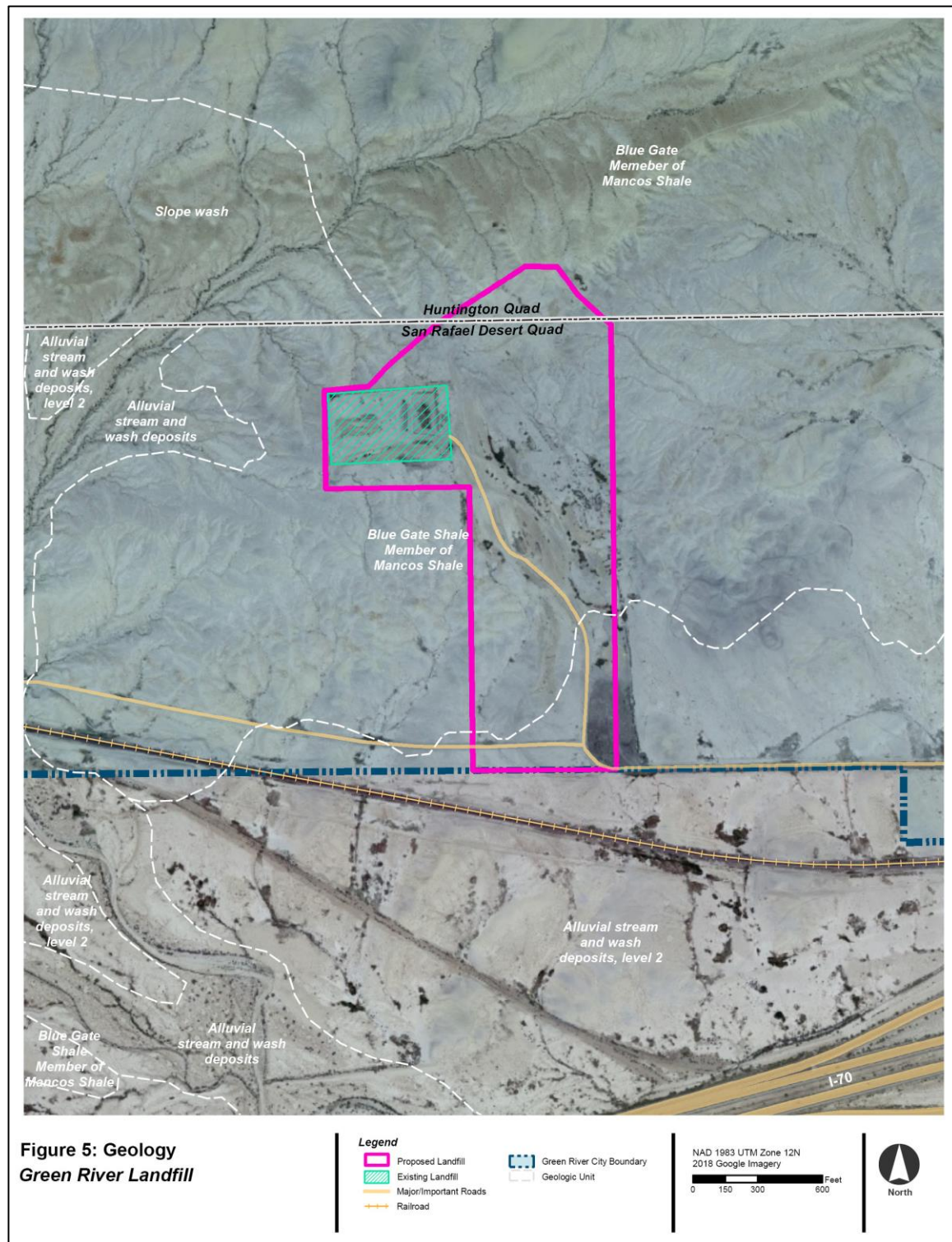
- Chipeta-Badland complex, 3 to 45 percent slopes,
- Chipeta-Persayo-Killpack complex, 3 to 20 percent slopes,
- Hanksville-Chipeta complex, 1 to 12 percent slopes, and
- Persayo-Casmos-Badland complex, 3 to 30 percent slopes (USGS 2022).

Characteristics of the soils associated with the mapped complexes are detailed in Table 2, below. In addition, a soils map is available in Appendix D.

Table 2. Soil types and characteristics.

SOIL TYPE	SOIL CHARACTERISTICS*	
Chipeta	• Silty clay loam • Paralithic bedrock at 17 to 27 inches • Well drained; high runoff	• Very low water holding capacity • Water table more than 80 inches
Badland	• Eroded remnants, ridges, and hills • Shale and siltstone parent material	• Drainage class not assigned • Depth to water table not assigned
Persayo	• Loam / clay loam • Paralithic bedrock at 12 to 22 inches • Well drained; high runoff	• Very low water holding capacity • Water table more than 80 inches
Killpack	• Silty clay loam • Paralithic bedrock at 26 to 36 inches • Well drained; high runoff	• Low water holding capacity • Water table more than 80 inches
Hanksville	• Silty clay loam / silty clay • Paralithic bedrock at 26 to 37 inches • Well drained; medium runoff	• Very low water holding capacity • Water table more than 80 inches
Casmos	• Channery loam / clay loam • Paralithic bedrock at 9 to 13 inches • Well drained; high runoff	• Very low water holding capacity • Water table more than 80 inches

*Source: USGS 2020



2.4.2 SURFACE WATER

The proposed landfill is not located within a watershed used for municipal drinking water. The City's drinking water source is the Green River which is located over 2.5 miles away from the site. There are no connecting ephemeral or perennial drainages directly emptying into the Green River that intercept the landfill site footprint. The northern-most boundary of the landfill extent follows a low ridge. The area to the north of the landfill, behind the ridge, a larger ephemeral drainage is connected to the Saleratus Wash, which is a well-defined ephemeral feature that discharges directly into the Green River. Hydrology from storm events or other seasonal accumulations is directed to these ephemeral drainages, away from the landfill location. More specifically, any run-off hydrology intercepted by Saleratus Wash does not pass through the proposed landfill.

There are no "blue-line" aquatic features within the proposed footprint of the landfill (USFWS 2022).

The project area has not been mapped by FEMA. The nearest FEMA-mapped floodplain is associated with the Green River, 2.39 miles east (FEMA 1986). The footprint of the proposed landfill is situated on a slight incline that slopes towards the south.

Average annual precipitation for the area is 6.45 inches (WRCC 2021).

2.4.3 WETLANDS

There are no wetland habitats located within the boundaries of the proposed landfill, nor would landfill operations affect any wetland habitats or associated aquatic wildlife species (USFWS 2021b).

2.4.4 GROUND WATER

According to the *Green River Permit Application Class II Landfill Report* (Bingham Environmental, 1999), a report completed but not officially submitted the State for approval to collect waste., the nearest groundwater to the site is in an aquifer approximately 1,000 feet below the natural ground surface. The Bingham Environmental 1999 report details that "the groundwater is hydraulically isolated from the landfill cell by a thick layer of Mancos shale."

As part of the Bingham Environmental (1999) site study, data were collected from three (3) test pits that were excavated within the vicinity of the new proposed landfill location. Test pits revealed that the "shale layer may be fractured within the top layers." That said, geologic data indicates that the Mancos shale at lower levels is nonfractured and has low permeability.

2.4.5 HISTORIC PRESERVATION SURVEY

The Class III cultural resource survey conducted for the Class IVa landfill resulted in the documentation of one newly identified archaeological site (42EM5590). Site 42EM5590 was recommended as ineligible for listing to the National Register of Historic Places (NRHP). The cultural resource report was submitted to Matt Sullivan, Environmental Specialist with the Solid Waste Program (SWP) as well as the DWMRC, via email on October 22, 2021.

Pursuant to Section 106 of the National Historic Preservation Act (36 CFR 800), the SWP initiated consultation with the Utah State Historic Preservation Office (USHPO). A letter of concurrence with a determination of ***No Historic Properties Affected*** was issued (Case Number 22-0763); this response was sent to the Division of Waste Management and Radiation Control (DWMRC) (USHPO 2022).

3.0 PLAN OF OPERATION

The Green River Landfill will be operated by the City, primarily for use by the City or other parties as approved by the owner. The proposed landfill will not be open to the public; collection of materials will occur by appointment only. It is anticipated that appointments will be available during the typical work week, Monday through Friday.

Anticipated daily volumes will vary. For lifespan calculations and purposes, it been assumed that the landfill will accept 10 cubic yards of waste per day. Any fees collected by the landfill will be used to pay for operation of the facility and not for profit.

As a Class IVa landfill, this facility will accept:

- Yard wastes.
- Construction wastes.
- Demolition wastes.
- Untreated wood, including pallets and crates.
- Dead animals.
- Asphalt from roads and other surfaces.
- Whole tires when less than four tires are received in each load.
- Tires with rim diameters greater than 24.5 inches.
- Shredded tires or tire-derived materials when the requirements of the Utah Administrative Rules R315-320 are met.

No hazardous material of any kind or household waste will be collected at the proposed landfill.

3.1 SCHEDULE OF CONSTRUCTION

The landfill will be constructed by excavating the two disposal areas approximately 5 feet below the natural grade (see Sheets 1 and 2, Appendix E). The bottom of each cell will be graded at approximately 2 percent slope. Waste disposal in Cell 1 will continue until the area is filled from 5 to 15 feet above the ground surface and 10 to 20 feet above the ground surface for Cell 2. These heights include a 2-foot soil cap that will cover the cell once collection has finished.

The access road has been designed based on accepted safety and engineering standards and will be regularly inspected to maintain standards (see Section 3.2.4). A chain-link fence will be installed around the perimeter of the facility with signage denoting restricted access.

Construction will begin within 30 days following the issuance of a permit by the DWMRC. Initial construction will include the construction of Cell 1 the access road, facility fencing, gate, and signage. Cell 2 is estimated to be constructed within 20 years once Cell 1 has reached its capacity.

3.2 ON-SITE WASTE HANDLING PROCEDURES

3.2.1 DISPOSAL CELL DEVELOPMENT

Received waste will be placed in disposal cells and heavy equipment will be used to consolidate and compact waste. Waste will be distributed systematically to maximize the waste capacity of each cell. Cell 1 will initially be filled, followed by Cell 2.

3.2.2 RECORDING WEIGHTS OR VOLUMES OF WASTE RECEIVED

Waste will be received only by appointment; there are no standard hours of operation planned at this time. The operator will record load counts daily when applicable due to appointments being filled. The quantity, type of waste, and maximum volume of each delivery will be recorded in a Daily Operating Record (see Appendix F for an example) There will not be a scale onsite to record tare weight.

The operator will also include an Inspection Log and record of any deviations, along with a reason for those deviations, in the Daily Operating Record. The Daily Operating Record will be kept on file at the landfill site or at the City office.

3.2.3 PLAN FOR LITTER CONTROL AND COLLECTION

Incoming waste will be deposited downwind as much as possible so any loose litter will blow back into the working collection area. Prompt compaction and use of cover soil will also be used to reduce debris and other litter from transferring (e.g., blowing) to the adjacent and broader landscape. The perimeter fence will also help to contain litter. Landfill attendants will regularly monitor the fence and surrounding area for litter to keep the area clean and under the control of the City to reduce the potential of unauthorized dumping.

3.2.4 SCHEDULE OF INSPECTIONS AND MONITORING

The schedule for inspections and monitoring of the landfill facilities to ensure proper operation and maintenance is included below:

INSPECTION/MONITORING ACTIVITY	FREQUENCY
Access road and gate	As needed during operation
Fence inspection/maintenance	Quarterly
Gas monitoring	Quarterly
Cover inspection during operation	Daily
Landfill equipment maintenance	Per manufacturer's recommendations

The owner/operator will keep an Inspection Log or summary, in the Daily Operating Record (see Appendix F for an example) that includes the date and time of the inspection, notations of any observations made, dates of any corrective actions or repairs and the handwritten printed name and signature of the inspector. Logs are to be kept for at least three years from the date of inspection and shall be easily available to the Director of the DWMRC upon request.

3.2.5 FUGITIVE DUST GENERATED FROM ROADS, CONSTRUCTION, GENERAL OPERATIONS AND COVERING THE WASTE

As needed, the landfill operator will contract with a water truck for dust abatement on the access road(s) and waste cover to reduce fugitive dust.

3.2.6 RECEIPT OF PROHIBITED HAZARDOUS OR PCB CONTAINING WASTE

Collection of materials will occur by appointment only. A visual inspection for prohibited materials will occur at each collection.

3.2.7 CONTROLLING DISEASE VECTORS

As Class IVa landfills do not accept food or household waste, it is not anticipated that insect, rodent, and/or bird populations will be problematic. The ongoing covering of waste will also minimize problematic pests from proliferating because of landfill deposits. Landfill operators will hire professional exterminators to control pests if additional measures are required.

3.3 CONTINGENCY PLANS FOR FIRE OR EXPLOSION

3.3.1 FIRE

To avoid fire hazard, all waste will be covered with soil daily. Small fires that do occur are to be extinguished using on-site fire extinguishers and/or water tanks. The landfill operator may utilize site equipment to try to limit the spread of a fire. Equipment can be used to segregate the burning materials and smother fire using soil. If it is determined that the fire is not controllable with on-site tools, all personnel are to move to a safe location until the fire is extinguished and/or the Green River Fire Department is alerted. The telephone number and location of the nearest fire department shall be prominently displayed in the site office and in all site vehicles. Semi-annual fire drills will also be conducted.

3.3.2 EXPLOSION

Explosions are not anticipated due to the dry nature of the waste materials and the dry climate of this region. The landfill manager is responsible for monitoring methane gas levels on a quarterly basis using a methane detection meter capable of measuring methane at levels below the Lower Explosive Limit (LEL). Gas monitoring will consist of testing methane levels at the facility boundary and in all facility structures. If explosive gases are detected above the LEL at any time or above 25 percent of the LEL inside any facility structures, emergency evacuation will be required, and the corrective measures will be implemented.

Additionally, the landfill operator will:

- Within 24 hours, or the next business day, notify the Director of the DWMRC.
- Within 7 days, record in the Operating Record the explosive levels detected, and a description of steps take to protect human health.
- Within 60 days, implement a remediation plan for the explosive gas release that has been approved by the Director of the DWMRC. Once implemented, a copy of the plan will be placed in the operating record and the Director of the DWMRC will be notified.

3.4 PLAN FOR ALTERNATIVE WASTE HANDLING

If the Green River Landfill is unable to accept waste due to an emergency, waste can be hauled and placed in the Emery County Landfill in Castle Dale, Utah approximately 90 miles from the site.

3.5 PLANNED RECYCLING PROGRAMS

The City does not currently plan to offer recycling at this site.

3.6 GENERAL TRAINING PLAN FOR SITE OPERATIONS

All employees will be required to read the landfill application and permit prior to working at the landfill. Employees will be trained in the operation and maintenance of the facility and maintain the facility according to health and safety guidelines.

At minimum, one (1) employee will be trained and certified under the Manager of Landfill Operations (MOLO), a program accredited by the Solid Waste Association of North America. Landfill operators will receive on-the-job training from certified staff and annual refresher courses.

A use specific training plan will be developed by the operator.

4.0 FACILITY TECHNICAL INFORMATION

4.1 FACILITY MAPS/DRAWINGS

A topographic map drawn to show existing site contours in relation to the proposed location of two waste disposal cells can be found in Appendix E, Sheets 1. Sheets 2 and 3 (Appendix E), illustrate contours related to the boundaries of the landfill units (Cells 1 and 2), both finished grade and sub grade. All materials excavated as part of the construction of Cells 1 and 2 will be stockpiled onsite and used later to cap waste disposal areas.

No ground water monitoring well locations or gas monitoring points are planned as part of this facility. and the borrow and fill areas (R315-310-4(2)(a)(i)).

A current U.S. Geological Survey topographic map, 7-1/2-minute series can be found in Section 1.2 (Figure 1), which shows the waste facility boundary; the property boundary; surface drainage channels; any existing utilities and structures within one-fourth mile of the site, and the direction of the prevailing winds (R315-310-4(2)(a)(ii)).

4.2 GEOHYDROLOGICAL ASSESSMENT

4.2.1 LOCAL AND REGIONAL GEOLOGY

- There are no faults, unstable slopes, or subsidence areas on site
- Evaluations of bedrock and soil types completed by Bingham Environmental (1999) study ascertained from three test pits that were excavated that the “shale layer may be fractured within the top layers.” However, geologic data indicates that the Mancos shale at lower levels is nonfractured and has low permeability.

4.2.2 LOCAL HYDROLOGY

DEPTH TO GROUND WATER

As discussed in Section 2.4.6, the nearest groundwater to the site is in an aquifer approximately 1,000 feet below the natural ground surface and is isolated from the landfill cells by a thick layer of Mancos shale.

PRIVATE/PUBLIC WELLS

There are no private or public wells on-site or within 2,000 feet of the facility boundary.

SURFACE WATERS

There are no surface waters on-site.

WATER RIGHTS

There are no water rights held relating to surface water. Further, there are no ground water rights within 2,000 feet of the facility boundary.

4.2.3 CALCULATION OF SITE WATER BALANCE

All surface water run-off incurred during storm events within the bounds of the landfill footprint will be captured and diverted to one of two collection ponds. Any off-site runoff will be directed around the facility boundaries (see Sheets 2 and 3, Appendix E). The natural drainage patterns within proximity to the proposed landfill are primarily directed to the north. Average annual precipitation for the area is 6.45 inches (WRCC 2021).

4.3 ENGINEERING REPORT, PLANS, SPECIFICATIONS AND CALCULATIONS

4.3.1 CELL DESIGN AND DEVELOPMENT

- *Describe fill methods and final cover design (include elevation of final cover and refer to plans/drawings):* Waste will be covered systematically, placing 6-inches of cover material at the end of each dump session.
- *Describe fill methods and final cover design (include elevation of final cover and refer to plans/drawings. Identify borrow sources for daily and final cover):* Borrow sources will be obtained from the excavation of cells that are excavated below natural grade. All borrow sources will be native soils from the site. At the end of the life of the landfill, the site will be capped with a minimum of 2-feet of native soils. See Sheet 3, Appendix E.

- *Describe anticipated facility life and the basis for calculating the facility's life (R315-310-4(2)(c)(ii))*: The anticipated lifespan of the facility is 50-years. The capacity of the landfill has been calculated assuming the facility accepts 10-yards of waste per day.

4.3.2 RUN-ON AND RUN-OFF SYSTEMS

- *Describe design and location of run-on and run-off control systems*: The landfill will be graded so surface run-off will be directed towards the ponds. See Sheets 2 and 3 in Appendix E for pond layout and design details.
- *Explain how the system prevents the run-on of all surface waters resulting from a maximum flow of a 25-year storm into the active area of the landfill*: Pond capacity is designed to hold water from a 25-year storm event lasting for a duration of up to 24-hours. See Hydrograph in Appendix G.
- *Explain how the system collects and treats the run-off of surface waters and other liquids resulting from a 25-year storm from the active area of the landfill*: Ponds will hold water, which will eventually evaporate. Ponds will not be lined so it is expected that some of the water held will seep into the ground. Water held onsite will not be treated.
- *Describe a final leachate collection, treatment, and disposal (or describe how one is not needed?)*: There are no waterways adjacent to the landfill location. Water collected during storm events will either seep into the ground or evaporate. Further, no hazardous materials will be received at this landfill.

5.0 CLOSURE AND POST-CLOSURE PLAN

5.1 FINAL COVER AND GRADING

Once collection is completed, and the facility is no longer accepting waste, a final cover will be applied in two layers, according to State Code R315-303-3(4). The first layer will consist of 18 inches of compact soil placed in lifts with surface slopes of a minimum of 2-percent. This layer is to not be more permeable than the natural soils of the area. To minimize erosion, a final six-inch soil layer will be added and seeded with grass or other shallow rooted, native vegetation.

5.2 VOLUME CAPACITY

The total volume capacity of the proposed landfill was calculated to be approximately 342,000 cubic yards or 400,000 tons. It is estimated that the density of the waste will be approximately 2,300 pounds per cubic yard.

5.3 CLOSURE SCHEDULE

It is anticipated that the Cell 1 will reach capacity within 20 years and that the life of the facility will be 50 years. The City will notify the DWMRC 60 days prior of closing any section of the landfill. Implementing the closure plan will begin within 30 days of the final collection of waste. Closure plans will be completed within 180 days of the last collection.

5.4 FINAL INSPECTION

The City will complete and submit certification of closure to the DWMRC within 90 days of completing closure. Certification of closure includes the as-built drawings signed by a professional engineer registered in the state of Utah, certification by the owner, and a professional engineer in the state of Utah that the facility has been closed in accordance with the approved closure plan.

5.5 POST-CLOSURE PLAN

5.5.1 CLOSURE PROCEDURE

No later than 60 days after the certification of closure, the City of Green River will submit plats and a statement that the site was used as a disposal facility to the County Recorder to be recorded as part of the record of title and submit proof of the title filing to the Director of the DWMRC.

5.5.2 MAINTENANCE

The following maintenance activities will occur on an on-going basis once the landfill has been closed:

INSPECTION/MONITORING ACTIVITY	FREQUENCY
Gas monitoring & site inspection	Quarterly*
Ground water monitoring	Semi-annual
Surface water monitoring	If required by the Director of the Utah Division of Waste Management and Radiation Control
Cover and run-on/run-off systems maintenance	As needed

**For 30 years or until the Director of the Utah Division of Waste Management and Radiation Control determines that the facility has stabilized and no longer needs monitoring and/or post-closure activities are no longer necessary.*

5.5.3 POST-CLOSURE CONTACT

City of Green River
460 East Main Street
P.O. Box 620
Green River, Utah 84525
435-564-3448

6.0 FINANCIAL ASSURANCE PLAN

Anticipated costs for the construction, annual operation, equipment, ancillary structures, fencing and road(s) are detailed in Table 3.

City budgeted \$8,000 per year for 50-years to cover anticipated closure costs totaling approximately \$400,000. The cost of construction and estimate for annual operation equipment, ancillary structures, fencing and road(s). This amount has been based on the requirements to close and the site and maintain the landfill post-closure. Tables 3 and 4 provide a summary of those estimated costs.

Table 3. Estimated Closure Costs.

TASK/SERVICE	QUANTITY	UNIT	UNIT COST	TASK COST
Subgrade Excavation	132,378	C.Y.	\$1	\$132,378
Final Grading of Cover Material	45,000	C.Y.	\$2	\$90,000
Seeding, and mulching the Final Cover	15	Acre	\$300	\$4,500
Chain Link Fence	6,340	L.F.	\$21	\$133,140
Subtotal				\$360,018
Technical & Professional Services		L.S.	\$20,000	\$20,000
Contingency		L.S.	\$15,000	\$15,000
Total				\$395,018

Table 4. Estimated Post-Closure Costs.

TASKS/SERVICE	QUANTITY	UNIT	UNIT COST	TASK COST
Post-Closure Inspections	30	Hours	\$55	\$1,650
General Maintenance	10	Hours	\$150	\$1,500
General Services	1	L.S.	\$2,000	\$2,000
Contingency	1	L.S.	\$2,000	\$2,000
Total				\$7,150

7.0 REFERENCES

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- Utah Natural Heritage Program [UNHP]. 2021. Utah Natural Heritage Program, Utah Division of Wildlife Resources, Utah Department of Natural Resources, Letter describing the search for TEPC, and species of concern located within two miles of the project area.

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8.0 APPENDICES

APPENDIX A
PROOF OF OWNERSHIP/DEED DOCUMENTS

In All to Whom These Presents Shall Come, Greeting:

WHEREAS, CITY OF GREEN RIVER

GREEN RIVER

of the County of EMERY

State of UTAH heretofore purchased from the State of Utah, the lands hereinafter described, pursuant to the laws of said State in such case made and provided,

AND WHEREAS, the said CITY OF GREEN RIVER

has paid for said lands, pursuant to the conditions of said sale, and the laws of the State duly enacted in relation thereto, the sum of Four Hundred and no/100 (\$400.00) Dollars, and all legal interest thereon accrued, as fully appears by the certificate of the proper officer, now on file in the office of the Secretary of State of the State of Utah;

NOW THEREFORE, I CALVIN L. RAMPTON, Governor, in consideration of the premises, and by virtue of the power and authority vested in me by the laws of the State of Utah, in such case made and provided, do issue this PATENT, in the name and by the authority of the State of Utah, hereby granting and confirming unto the said

CITY OF GREEN RIVER

and to its successors heirs and assigns forever, the following piece or parcel of land, situate in the County of Emery State aforesaid,

to-wit: East Half of the Southwest Quarter of the Southeast Quarter (E $\frac{1}{2}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$) of Section Seven (7) of Section Seven (7) in Township Twenty-one (21) South, Range Sixteen (16) East of the Salt Lake Meridian.

(Reserving to the State of Utah, all coal and other minerals, in the above lands, and to it, or persons authorized by it, the right to prospect for, mine and remove coal and other minerals from the same, upon compliance with the conditions and subject to the law

Rights of way for canals, ditches, tunnels, telephone and power lines reserved by authority of the United States are hereby reserved. U. S. Act, Aug. 30th, 1890 (26 Stat. 391); 46-2-3 Utah Code Annotated 1943.

forever, the following piece or parcel of land, situate in the County of Emery State aforesaid,

to-wit: East Half of the Southwest Quarter of the Southeast Quarter (E1/2SW1/4SE1/4) of Section Seven (7) of

Section Seven (7) in Township Twenty-one (21) South, Range Sixteen (16) East of the Salt Lake Meridian.

(Reserving to the State of Utah, all coal and other minerals, in the above lands, and to it, or persons authorized by it, the right to prospect for, mine and remove coal and other minerals from the same, upon compliance with the conditions and subject to the limitations of Title 65, Chapter 1, Utah Code Annotated 1953, and amendments thereto.

Rights of way for roads, ditches, tunnels, telephone and transmission lines constructed by authority of the United States are hereby reserved. U. S. Act, Aug. 30th, 1890 (26 Stat. 391); 86-2-3 Utah Code Annotated 1943.

301678
STATE OF UTAH
COUNTY OF EMERY SS
FILED AND RECORDED FOR
Green River City
DEC 8 9 45 AM '82
IN BOOK 33
PAGE 763-764
Harold H. Hargrave
COUNTY RECORDER

containing Twenty and no/100 (20.00) acres according to the said certificate.

TO HAVE AND TO HOLD the above described and granted premises unto the said CITY OF GREEN RIVER

and to its successors

here and assigns forever, subject to any easement or right of way of the public, to use all such highways as may have been established according to law, over the same or any part thereof, and subject also to all rights of way for ditches, tunnels, and telephone and transmission lines that may have been constructed by authority of the United States.

IN TESTIMONY WHEREOF, I have hereunto set my hand and caused the great seal of the State of Utah to be hereunto affixed.

Done at Green River this 10th day of May in the year of our Lord, one thousand nine hundred and Sixty-six, and of the independence of the United States of America the one hundred and 89th and in the 70th year of the State of Utah.



containing Twenty and no/100 (20.00) acres according to the said certificate.

TO HAVE AND TO HOLD the above described and granted premises unto the said CITY OF GREEN RIVER

and to its successors heirs and assigns forever, subject to any easement or right of way of the public, to use all such highways as may have been established according to law, over the same or any part thereof, and subject also to all rights of way for ditches, tunnels, and telephone and transmission lines that may have been constructed by authority of the United States.

IN TESTIMONY WHEREOF, I have hereunto set my hand and caused the great seal of the State of Utah to be hereunto affixed.

Done at this 10th day of May in the year of our Lord, one thousand nine hundred and Sixty-six, and of the independence of the United States of America the one hundred and 89th, and in the 70th year of the State of Utah.

By the Governor:

George L. Miller
Secretary of State

Earl R. Rupp
Executive Secretary, State Land Board



Recorded May 18 1966 Book 36 Page 200

Certificate of Sale No. 24043

APPROVED AS TO FORM:

PHIL L. HANSEN
ATTORNEY GENERAL

By Earl R. Rupp

PAID IN FULL MAR 18 1966

R. Rupp
CASHIER

The United States of America

To all to whom these presents shall come, Greeting:

Serial: U-66950

608

WHEREAS,

City of Green River

is entitled to a land patent pursuant to Section 203 of the Act of October 21, 1976, 90 Stat. 2750; 43 U.S.C. 1713, for the following described land:

Salt Lake Meridian, Utah

T. 21 S., R. 16 E.,
Sec. 7, NW $\frac{1}{4}$ SE $\frac{1}{4}$.

Containing 40.00 acres

NOW KNOW YE, that there is, therefore, granted by the UNITED STATES, unto the above named claimant the land above described: TO HAVE AND TO HOLD the said land with all rights, privileges, immunities, and appurtenances, of whatsoever nature, thereunto belonging, unto the said claimant, its successors and assigns, forever;

EXCEPTING AND RESERVING TO THE UNITED STATES:

1. A right-of-way thereon for ditches and canals constructed by the authority of the United States. Act of August 30, 1890, (26 Stat. 391; 43 U.S.C. 945 (1970)).
2. All minerals in the land described above, with the right to prospect for, mine, and remove the same under applicable law and such regulations as the Secretary may prescribe.
3. A 10 foot wide right-of-way, Serial No. U-66134, for a stock fence granted under the Act of October 21, 1976; 90 Stat. 2776; 43 U.S.C. 1761.

327551
STATE OF UTAH
COUNTY OF EMERY SS
FILED AND RECORDED FOR
City of Green River
90 DEC 5 AM 10 12
IN BOOK 185
PAGE 608-609
COUNTY RECORDER

43-91-0006

Patent Number _____

609

SUBJECT TO:

1. A right-of-way, Serial No. U-21372, for a powerline granted under the Act of October 21, 1976; 90 Stat. 2776; 43 U.S.C. 1761.



IN TESTIMONY WHEREOF, the undersigned authorized officer of the Bureau of Land Management, in accordance with the provisions of the Act of June 17, 1948 (62 Stat. 476), has, in the name of the United States, caused these letters to be made Patent, and the Seal of the Bureau to be hereunto affixed.

GIVEN under my hand, in Salt Lake City, Utah
the Twenty-Seventh day of November
in the year of our Lord one thousand nine hundred and
Ninety and of the Independence of the
United States the two hundred and Fifteenth

By J. C. Robbins
Chief, Branch of Lands and Minerals
Operations

Patent Number 43-91-0006

APPENDIX B

LETTER OF INTENT



February 25, 2022

State of Utah/SITLA
Emery County Courthouse
Castle Dale, UT 84513

To Whom It May Concern:

You are listed on the Emery County Tax Rolls as the responsible party of Parcel 01-149B-0004. In accordance with provisions of the State of Utah Department of Environmental Quality, I hereby notify you that the City of Green River is applying for a Class IV landfill on Parcel 01-149B-0006 which is immediately abutting your property. The acceptable wastes at a Class IV Landfill (R315-301-2(17)) are:

- Yard wastes
- Construction wastes
- Demolition wastes
- Untreated wood, including pallets and crates
- Dead animals
- Asphalt from roads and other surfaces
- Whole tires when less than four tires are received in each load
- Tires with rim diameters greater than 24.5 inches
- Shredded tires or tire-derived material when the requirements of the Utah Administrative Rules R315-320 are met.

If you have any questions, please call me at 435-564-3448 ext. 2 or email at cblack@greenriverutah.com

Respectfully,

Conae Black
Green River City Administrator/Recorder

APPENDIX C

BIOLOGICAL REPORT

BIOLOGICAL REPORT

FOR THE PROPOSED:
GREEN RIVER LANDFILL

EMERY COUNTY, UTAH

PREPARED FOR:
CITY OF GREEN RIVER
460 EAST MAIN STREET
GREEN RIVER, UTAH 84525

PREPARED BY:
WESTERN-ENVIRO RESOURCES, INC.
856 N 500 E
SPRINGVILLE, UTAH 84663



APRIL 2022

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1.0 EXECUTIVE SUMMARY

Proposed Project:	Green River Landfill	
Client:	City of Green River 460 East Main Street, Green River, Utah 84525	
Consultant/Contractor:	Johansen and Tuttle Engineering, Inc. 90 South 100 East Castle Dale, UT 84513	WESTERN-ENVIRO Resources, Inc. Springville, UT 84663
Land Status/ Managing Agencies:	Private Property —City of Green River	
Date(s) of Surveys:	Plant survey conducted April 13, 2022 Wildlife resources survey conducted April 19, 2022	
Description of Project Location:	Section 7 in Township 21 South, Range 16 East, Salt Lake Base and Meridian (U.S.B.&M.), Emery County, Utah	
Project Manager:	Merrial Johansen, PE, Project Manager	
Survey Crew Lead(s):	Bridget Atkin, MS, MLA, Plant Ecologist Glen Gantz, MS, Certified Wildlife Biologist	
Summary – Botanical and Wildlife Field Survey Results:		
Acreage Surveyed for Plant Resources:	268.23 acres	
Target Plant Species:	Plant species listed by the U.S. Fish and Wildlife Service (USFWS) as Threatened, Endangered, Proposed, and Candidate (TEPC); survey focused specifically on <i>Pediocactus despainii</i> .	
Number of Target Plant Species Observed:	None (0)	
Target Plant Species Habitat Documented:	Marginally suitable <i>P. despainii</i> habitat observed within the 1,000-foot buffer plant survey buffer.	
Target Wildlife Species:	Wildlife species listed by the USFWS as TEPC and migratory birds, including raptors.	
Acreage Surveyed for Wildlife Resources:	937.93 acres	
Target Wildlife Species or Resources Documented:	• No habitat suitable to any TEPC wildlife species. • No previously documented raptor nests within the one-half-mile buffer. • Suitable foraging and nesting habitat for raptors present.	
Wildlife Resources for Consideration:	No pre-construction avian surveys are recommended at this time due to lack of suitable nesting habitats and current level of disturbance within the proposed project footprint.	

2.0 INTRODUCTION AND BACKGROUND

The City of Green River (Green River/Client) retained WESTERN-ENVIRO Resources, Inc. (WESTERN-ENVIRO), in coordination with Johansen and Tuttle Engineering, Inc., to conduct field surveys and prepare a biological report related to the proposed Green River Landfill (project) (Map 1, Appendix A).

Surveys focused on characterizing and mapping habitats respective to Federally listed plant and wildlife species and identifying the presence of listed target species within corresponding habitats, if applicable. Work specifically involved the following tasks:

- Identifying potential habitats for Federally listed TEPC species, as per the USFWS requirements (USFWS 2022a).
- Determining if Federally listed TEPC species have been identified within the project area and its immediate surroundings. This task was accomplished by referencing the Utah Natural Heritage Program (UNHP) (UNHP 2022).
- Conducting field assessments for TEPC species within the proposed impact area and in respective resource survey buffers.

This report details findings related to TEPC plant and wildlife species within the proposed project right-of-way (ROW) and survey buffers. Field assessments and reporting pertain to associated buffers for plant survey (1,000 feet) and wildlife assessment (one-half mile) (project area) (Map 2, Appendix A).

This report is intended to provide the Client guidance during permitting and construction activities associated with the proposed project.

2.1 PROJECT LOCATION AND DESCRIPTION

The proposed project area is in Green River approximately 1.92 miles west of the city center in Emery County, Utah, Section 7, Township 21 South, Range 16 East, S.L.B.&M. (Map 1, Appendix A). The project is situated roughly 0.3 miles north of Interstate 70 between Battleship Butte to the north and the Green River to the east. The proposed project includes the development of a new landfill (Map 2, Appendix A).

The proposed landfill is located directly adjacent to an existing landfill has been used by the City of Green River to dispose of soil and other fill materials that are being excavated. At present, no other permissions are being granted for dumping, although the site is occasionally being used by the public for unauthorized disposal of green waste. Much of the proposed project footprint has previously been subject to ground disturbance activity. The proposed project area totals 44.18 acres and is located entirely on private property owned by the City of Green River.

3.0 RESOURCE SURVEY METHODOLOGY

3.1 BOTANICAL SURVEY

The project area was first evaluated for potential TEPC plant species, specifically targeting *P. despainii*. If habitat appropriate to any of the listed TEPC plant species was not present, the area was classified as negative. If an area contained habitat that could potentially support any of the listed species, it was surveyed using methodology that would provide 100-percent coverage for detecting corresponding species within suitable habitat (USFWS 2011).

A habitat suitability rating (e.g., suitable, or not suitable) for respective Emery County-listed TEPC plant species (i.e., target plant species) was assigned. Vegetation associations, geology, hydrology, and substrate qualities were considered indicators of habitat suitability, in accordance with documented and personal knowledge of known habitat parameters specific to target plant species.

Data recorded during 2022 botanical survey was collected using the ESRI® data collection software, Field Maps® supported by hand-held Trimble® R1 GNSS receivers. In addition, field notes and photos were taken of the project area to record general site characteristics. Botanical survey and reporting were completed by Bridget Atkin and Kari Coy; vitae found in Appendix B.

3.2 WILDLIFE SURVEY

The project area was surveyed for Federally listed wildlife species and migratory birds, ensuring that the entire area was thoroughly reviewed for wildlife resources. A one-half mile survey buffer was established around the proposed project impact footprint and surveys were conducted within this buffer zone. Areas that could be directly impacted by construction and occupancy of the proposed project footprint were also surveyed.

The project area was surveyed for raptor nests using roads for access (where possible) and on foot. All potential nesting habitats within the raptor buffer were examined for nests using a spotting scope and binoculars, focusing on suitable nesting habitats. Each raptor nest encountered was spatially documented; species, activity, condition, substrate, and in situ habitat were recorded.

Within this region, the commencement of nesting seasons for the majority of locally nesting raptor species, begins during January and continues through August. Surveys were conducted during April, within the regional nesting and breeding season.

In addition to raptor nests, habitat suitable to any of the TEPC wildlife species known to occur in Emery County (USFWS 2022b, UNHP 2021) were noted and discussion specific to each are included within the results section of this report.

Wildlife surveys were conducted by Glen Gantz, his vita can also be found in Appendix B.

4.0 EXISTING CONDITIONS

4.1 GENERAL DESCRIPTION OF PROJECT AREA

The project is situated in the central region of Gunnison Valley, approximately 2.5 miles northwest of the Green River. The project area and surrounding region are characterized by undulating topography formed by clay loam hillslopes intersected by deep drainages which have eroded the soft substate (Figure 4-1). A larger ephemeral drainage is located north of the proposed landfill and is connected to the Saleratus Wash which discharges into the Green River (Figure 4-2). Most of the proposed landfill location is disturbed and includes an access road, large piles of fill material and green waste; soil berms, large cylinder tanks, and perimeter fencing around the existing landfill. In addition to access to the landfill, the road and surrounding area appears to be used as a route to access nearby ATV trails.

Habitats within the project area are generally characterized by sparse mixed desert shrublands dominated by shadscale saltbush (*Atriplex confertifolia*), Gardner's saltbush (*Atriplex gardneri*), Mormon tea (*Ephedra viridis*), small-leaf globemallow (*Sphaeralcea parvifolia*), bud sagebrush (*Picrothamnus desertorum*), and Indian ricegrass (*Achnatherum hymenoides*) (Figure 4-1). The drainages support rubber rabbitbrush (*Ericameria nauseosa*), and siltbush (*Zuckia brandegeei*). Table 4-1 includes a detailed list of plant species observed within the plant survey area.

Table 4-1. Plant species documented within the project area.

BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME
Grass and grass-like species			
<i>Achnatherum hymenoides</i>	Indian ricegrass	<i>Pleuraphis jamesii</i>	James' galleta
<i>Bromus tectorum</i>	Cheatgrass	<i>Sporobolus airoides</i>	Alkali sacaton
<i>Eremopyrum triticeum</i>	Annual wheatgrass		
Forbs			
<i>Ceratocephala testiculata</i>	Bur buttercup	<i>Machaeranthera canescens</i>	Hoary tansyaster
<i>Cymopterus bulbosus</i>	Bulbous springparsley	<i>Oenothera caespitosa</i>	Tufted evening primrose
<i>Encelia nutans</i>	Nodding sunray	<i>Salsola tragus</i>	Russian thistle
<i>Eriogonum inflatum</i>	Desert trumpet	<i>Sphaeralcea parvifolia</i>	Small-leaf globemallow
<i>Halogeton glomeratus</i>	Saltlover		
Shrubs and sub-shrubs			
<i>Atriplex confertifolia</i>	Shadscale saltbush	<i>Ericameria nauseosa</i>	Rubber rabbitbrush
<i>Atriplex corrugata</i>	Matt saltbush	<i>Picrothamnus desertorum</i>	Bud sagebrush
<i>Atriplex gardneri</i>	Gardner's saltbush	<i>Zuckia brandegeei</i>	Siltbush
Cactus			
<i>Opuntia polyacantha</i>	Plains pricklypear		

Figure 4-1. The project area is characterized by sparse cover of mixed desert shrublands. Dominant plant species include *Atriplex confertifolia*, *Atriplex gardneri*, *Ephedra viridis*, and *Achnatherum hymenoides*. Photo oriented northerly.



Figure 4-2. Erodible clay loam substrate is intersected by ephemeral drainages. View of large drainage north of the proposed landfill footprint. Photo oriented westerly.



4.2 GEOLOGY

The proposed landfill site and surrounding area are primarily within the Bluegate Shale Member of the Mancos Shale Formation. Soils derived from alluvium stream deposits area are found in the southern portion of the site (UTGS 2004, UTGS 2015).

5.0 EVALUATED SPECIES INFORMATION

5.1 FEDERALLY LISTED TEPC SPECIES - WILDLIFE AND BOTANICAL

Species listed by the USFWS as TEPC that are in the known range of Emery County, Utah were reviewed to determine potential to occur within the proposed project area. To further narrow the list, WESTERN-ENVIRO conducted an online search of the USFWS Information, Planning, and Conservation System (IPaC) database (USFWS 2022b). Based upon data presented in the IPaC, *Pediocactus despainii* (Despain's pincushion cactus), a Federally listed TEPC plant species was identified as having potential to occur within this region. In addition, Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*) was noted to occur within 2 miles of the project. See Table 5-2 for more details pertaining to the potential for respective TEPC species to occur within the project area.

5.2 MIGRATORY BIRDS, INCLUDING RAPTORS

Habitats suitable to migratory birds, including raptors, are present within one-half mile of the project area. This area is likely used as foraging habitat for migratory birds, including raptors. Migratory birds are discussed in this report as they are protected under the Migratory Bird Treaty Act. Pursuant to migratory birds, the USFWS, Region 6 issued Migratory Bird Management Strategies (USFWS 2019). These strategies can be found in Appendix C and outline migratory bird conservation actions to reduce the risks of a *take* during the nesting season.

Table 5-2. Status and potential of TEPC plant, terrestrial wildlife, and aquatic wildlife species to occur within the project area.

SPECIES	STATUS	POTENTIAL TO OCCUR IN PROJECT AREA
Flowering Plants		
<i>Cycladenia humilis</i> var. <i>jonesii</i> (Jones cycladenia)	Threatened	NO POTENTIAL TO OCCUR: • <i>C. humilis</i> var. <i>jonesii</i> is restricted to the canyon-lands of the Colorado Plateau in Emery, Grand, Garfield and Kane counties. This species occurs in arid landscapes in desert scrub and juniper plant communities at elevations from 4,300 to 6,000 feet (Tilley et al. 2010). This species grows in gypsiferous, saline soils of the Cutler, Summerville, and Chinle formations. • The project area does not contain habitat(s) suitable to this species, nor was it observed during field survey. This species has no potential to occur and will not be discussed further.

Table continued on the following page.

Table 5-2, continued. Status and potential of TEPC plant, terrestrial wildlife, and aquatic wildlife species to occur within the project area.

SPECIES	STATUS	POTENTIAL TO OCCUR IN PROJECT AREA
<i>Flowering Plants, continued</i>		
<i>Pediocactus despainii</i> (Despain's pincushion cactus)	Endangered	MAY OCCUR: - Habitat suitable to <i>P. despainii</i> is characterized by open pinyon-juniper and salt desert shrub communities on limestone gravels and on shales, clays, and silty substrates of the Mancos, Morrison, Carmel, and Moenkopi Formations. <i>P. despainii</i> occurs at elevations ranging from 5,746 ft to 6,405 ft (Welsh et al. 2018). - The project area is within the know geographic range of <i>P. despainii</i> and includes geologies suitable to support this species. This species has potential to occur within the project area and will be discussed further.
<i>Pediocactus winkleri</i> (Winkler's pincushion cactus)	Threatened	NO POTENTIAL TO OCCUR: <i>P. winkleri</i> occurs in salt desert shrub communities on the Dakota, Curtis, and associated Strata. This species occupies elevational ranges between 4,400 and 5,000 feet (Welsh et al. 2018). - The project area does not contain habitat suitable to this species, nor was it observed during field survey. This species has no potential to occur and will not be discussed further.
<i>Schoenocrambe barnebyi</i> (Barneby reed-mustard)	Endangered	NO POTENTIAL TO OCCUR: <i>S. barnebyi</i> occurs in vegetation communities characterized by shadscale (<i>Atriplex</i>), <i>Eriogonum</i> ssp., and <i>Ephedra</i> on the Chinle Formation at elevations ranging from 5,353 ft to 6,233 ft (Welsh et al. 2018). - The project area does not contain habitat suitable to this species, nor was it observed during the field survey. This species has no potential to occur and will not be discussed further.
<i>Sclerocactus wrightiae</i> (Wright Fishhook cactus)	Endangered	NO POTENTIAL TO OCCUR: <i>S. wrightiae</i> occurs in salt desert and shrub-grass to juniper communities at 5,100 to 5,900 feet elevation. This species is specific to geology of the Mancos Shale (Bluegate, Tununk, Emery, and Feron members), Dakota, Morrison, Summerville, and Entrada formations (Welsh et al. 2018). - The project area intercepts geology of the Bluegate Member of the Mancos Shale Formation which is known to support populations of <i>S. wrightiae</i>. However, this species occurs south of the project area, nearer to Emery and Ferron, Utah. This species has no potential to occur and will not be discussed further.
<i>Spiranthes diluvialis</i> (Ute lady's tresses)	Threatened	NO POTENTIAL TO OCCUR: <i>S. diluvialis</i> grows in wet meadows and on the banks of perennial streams and rivers. Sites were evaluated in accordance with known <i>S. diluvialis</i> habitat parameters outlined in "Ute lady's-tresses Field Survey Guidelines" (USFWS 2007), Range-wide Status Review of <i>S. diluvialis</i> (Fertig et al. 2005), and personal knowledge of the area and species requirements. - Although the project is within the known distribution of the species, no suitable <i>S. diluvialis</i> habitat was documented. This species has no potential to occur and will not be discussed further.

Table continued on the following page.

Table 5-2, continued. Status and potential of TEPC plant, terrestrial wildlife, and aquatic wildlife species to occur within the project area.

SPECIES	STATUS	POTENTIAL TO OCCUR IN PROJECT AREA
Aquatic Wildlife Species		
<i>Xyrauchen texanus</i> (Razorback sucker)	Endangered	NO POTENTIAL TO OCCUR: - Razorback sucker is endemic to the Colorado River Basin, including Emery County, Utah. The species requires riverine habitats for spawning and move into flooded areas in early spring. Spawning occurs over rocky runs and gravel bars (USFWS 1998). - The project area does not intersect any perennial water bodies with the potential to support this species. This species will not be discussed further.
<i>Gilia elegans</i> (Bonytail chub)	Endangered	NO POTENTIAL TO OCCUR: - Bonytail chub is adapted to mainstream rivers and has been documented in pools, eddies, and reservoirs in a variety of habitats. This species is endemic to the Colorado River Basin, including Emery County, Utah (DOI 1994) - The project area does not intersect any perennial water bodies with the potential to support this species. This species will not be discussed further.
<i>Gilia cypha</i> (Humpback chub)	Endangered	NO POTENTIAL TO OCCUR: - Humpback chub is endemic to the Colorado River Basin, including Emery County, Utah. Humpback chub are found in river canyons where they use a variety of habitats including pools, riffles, and eddies. Further, humpback chub has been associated with boulder-strewn canyons, travertine dams, pools, backwaters, gravel pits, flooded bottoms, flooded mouths of tributary streams, slow runs, sandy riffles, and others (Minckley et al. 1991). - The project area does not intersect any perennial water bodies with the potential to support this species. This species will not be discussed further.
<i>Ptychocheilus lucius</i> (Colorado pikeminnow)	Endangered	NO POTENTIAL TO OCCUR: - Colorado pikeminnow habitat includes large rivers of the Colorado River Basin with warm, swift waters, and seasonally variable flows. Adult fishes are migratory and inhabit pools and eddies just outside of the main current. Young Colorado pikeminnow have been observed in backwater areas (DOI 1994). - The project area does not intersect any perennial water bodies with the potential to support this species. This species will not be discussed further.
Terrestrial Wildlife - Birds		
<i>Strix occidentalis lucida</i> (Mexican spotted owl)	Threatened	NO POTENTIAL TO OCCUR: - Occurring in both rocky-canyon and forested habitats, Mexican spotted owl is documented in Utah and is known to nest and roost in steep, rocky-canyon habitats that include prominent vertical cliffs, neighboring tributary canyons, and a variety of riparian and desert scrub/shrub vegetation communities. Foraging habitats include riparian areas, pinyon-juniper woodlands, cliff areas, and mixed-conifer and ponderosa pine forests (USFWS 2012). - The project area is within the known range of Mexican spotted owl; however, no suitable habitat was documented within one-half mile of project area, nor was it observed during field surveys. This species will not be discussed further.

Table continued on the following page.

Table 5-2, continued. Status and potential of TEPC plant, terrestrial wildlife, and aquatic wildlife species to occur within the project area.

SPECIES	STATUS	POTENTIAL TO OCCUR IN PROJECT AREA
Terrestrial Wildlife – Birds, continued		
<i>Empidonax traillii extimus</i> (Southwestern willow flycatcher)	Endangered	NO POTENTIAL TO OCCUR: • Southwestern willow flycatcher breeds in relatively dense riparian trees and shrub communities associated with rivers, swamps, and other wetland habitats. In most documented occurrences, dense vegetation occurs within the first 10-13 feet above the ground. • No habitats suitable to the southwestern willow flycatcher was documented within one-half mile of the project area. This species will not be discussed further.
<i>Coccyzus americanus occidentalis</i> (Western yellow-billed cuckoo)	Threatened	NO POTENTIAL TO OCCUR: • Western yellow-billed cuckoo is known or believed to occur in the western U.S., Canada, and Mexico. Habitat preference includes forested stream sides dominated by cottonwood and willow species composed of dense, low, shrubby vegetation (Halterman et al. 2015). Individuals use and nest in areas characterized by cottonwood galleries and an understory of <i>Elaeagnus angustifolia</i> with occasional inclusions of <i>Tamarix</i> ssp. (Howe 1986). • No suitable habitat for western yellow-billed cuckoo documented within one-half mile of the project area. This species will not be discussed further.
Terrestrial Wildlife - Insects		
<i>Danaus plexippus</i> (Monarch butterfly)	Candidate	NO POTENTIAL TO OCCUR: • Due to declining population numbers, the monarch butterfly was proposed as a Candidate for listing under the Endangered Species Act in December 2020 (USFWS 2020). Monarch butterflies are globally distributed with two distinct population occurring across North America--the western and eastern populations. The western population's 3,000-mile migration intersects Utah, including Emery County. This species occupies open grasslands with wildflowers for foraging and milkweed, the exclusive hosts of monarch butterfly larva (USFWS 2020). • The project area does not include habitat suitable to monarch butterfly. Plant communities that include milkweed species as a component are not present. Vegetative cover, specifically flowering forbs, are sparse within the project area. This species will not be discussed further.

6.0 SURVEY RESULTS

6.1 TEPC PLANT SPECIES

Based on the characteristics of the project area and the habitat requirements of the plant species outlined in Table 5-2, habitat with potential to support *P. despainii* was observed during the April 2022 botanical survey. All other TEPC plant species will not be discussed as they have no potential to occur within the plant survey area.

***Pediocactus despainii*:** The plant survey area, which includes both the proposed disturbance footprint and 1,000-foot buffer, was assessed to determine if habitat suitable to *P. despainii* was present. Surveys were completed during April, within the USFWS identified survey period (USFWS 2011).

The northern, eastern, and western portions of the plant survey area are located on Bluegate Shale Member of the Mancos Shale Formation. *P. despainii* populations have been documented to occur within this geology, in addition to other members of the Mancos Shale Formation (USFWS 2015). The geology characterizing the project area is consistent with known *P. despainii* populations.

The project area is characterized by sparsely vegetated mixed desert shrubland. While *P. despainii* has been documented within mixed desert shrublands, this species has been notably observed in association with pinyon-juniper woodlands (Welsh et al. 2018). Furthermore, the project area is located at ~4,100 feet in elevation while *P. despainii* is reported to occur between the elevational range of 4,760 – 6,820 feet (USFWS 2015). No *P. despainii* occurrences had been reported by the UNHP within the project area or surrounding region (UNHP 2022). During the botanical survey, the habitats that exhibited low to moderate suitability were surveyed using methodology that would facilitate detection of this low-profile species.

While the project area is within the known geographic range of this species and supportive geologies are present, general conditions were not optimal to *P. despainii*. No individuals were observed.

6.2 TEPC AND BLM SENSITIVE WILDLIFE SPECIES

Federally Listed TEPC Wildlife Species: As identified in Table 5-2, no TEPC wildlife species have the potential to occur within the project area. No habitats suitable to TEPC wildlife species were documented within the project footprint or the associated survey buffer. The potential for TEPC wildlife species to occur within the project area is low.

The UNHP reports a western yellow-billed cuckoo occurrence within two miles of the project area. This occurrence is likely associated with the Green River, which is outside the wildlife survey buffer. No western yellow-billed cuckoo habitat was identified within the project area.

Nesting Raptors, Including Burrowing Owls: No previously documented raptor nests have been reported within the project area. No new raptor nests were located during the April 2022 survey (during the regional nesting season). Migratory bird foraging and nesting habitats were observed throughout the one-half mile buffer of the project area. The proposed landfill project area is mostly disturbed and is not considered suitable migratory bird habitat.

7.0 REFERENCES

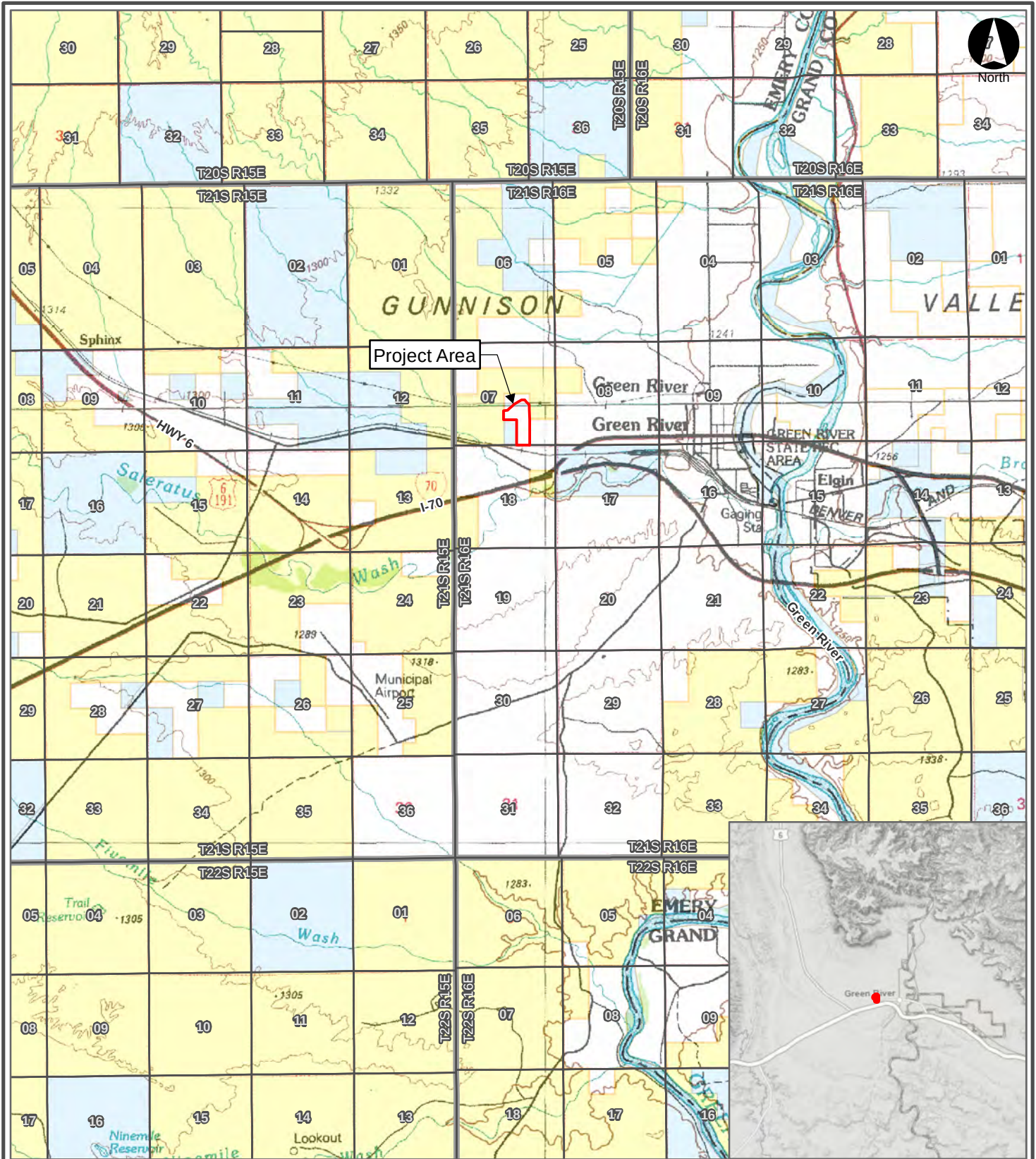
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8.0 APPENDICES

APPENDIX A

MAPS



Green River Landfill

LOCATION: SECTION 7 in T.21S, R.16E., S.L.B. & M.
EMERY COUNTY, UTAH

LEGEND

Project Area (44.18 Ac)

Federal Private State

WESTERN-ENVIRO
RESOURCES

Project
Location

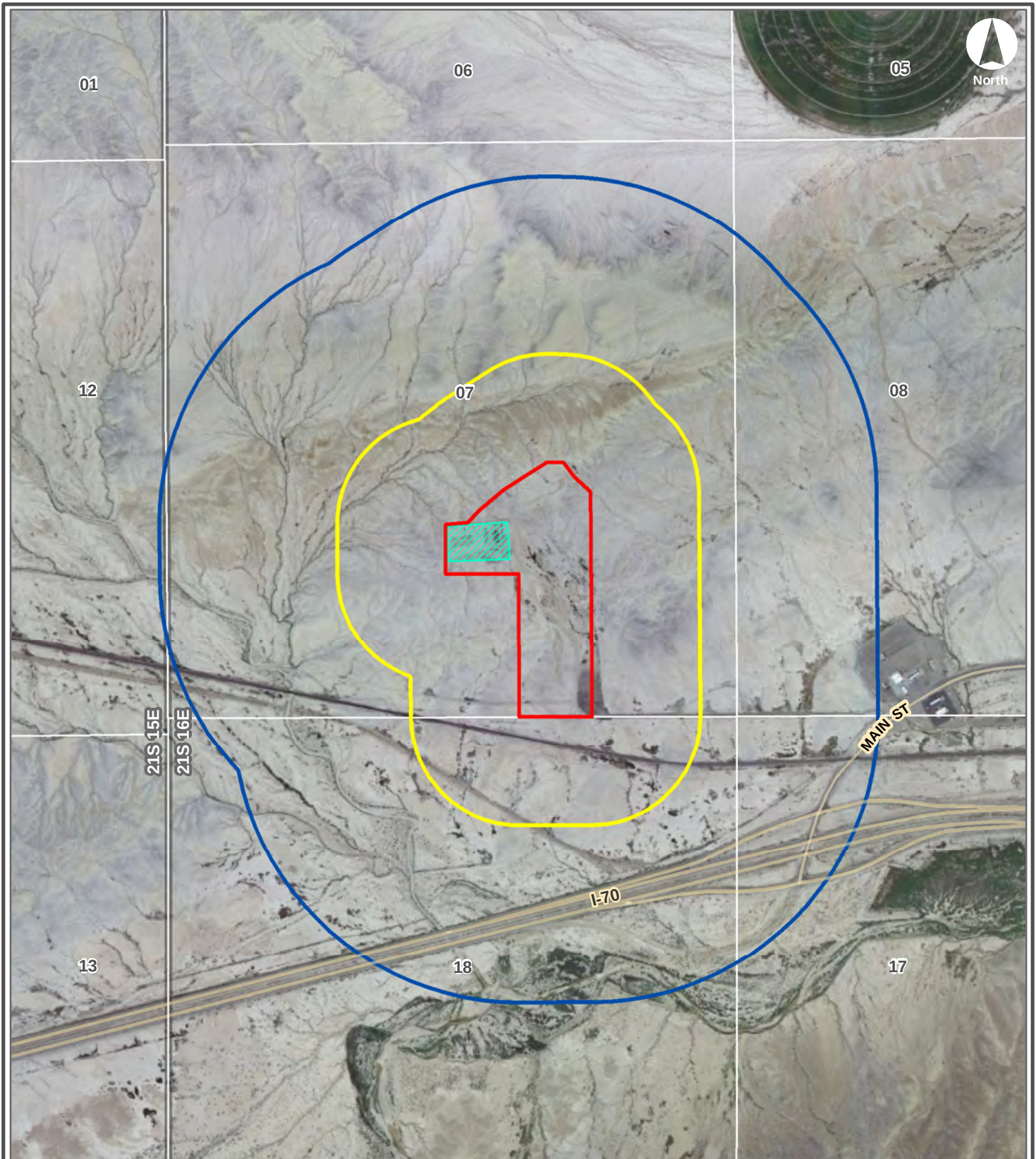
0 1,400 2,800 4,200 5,600 7,000
Feet

VERSION:	NA
SURVEYED:	NA

USGS
100k
Topo

APR 19, 2022
SCALE: 1" = 7,000'
AUTHOR: JH

MAP
1



WESTERN-ENVIRO
RESOURCES

Survey
Areas

0 250 500 750 1,000 1,250 Feet

VERSION:	NA
SURVEYED:	NA

LEGEND

- Project Area (44.18 Ac)
- Former Landfill
- Plant Survey Area/1,000 ft Buffer (268.23 Ac)
- Wildlife Survey Area/Half Mile Buffer (937.93 Ac)

Green River Landfill

LOCATION: SECTION 7 in T.21S, R.16E., S.L.B. & M.
EMERY COUNTY, UTAH

2018
Google
Imagery

APR 19, 2022
SCALE: 1" = 1,250'
AUTHOR: JH

MAP
2

APPENDIX B

QUALIFICATIONS

BRIDGET ATKIN – PLANT ECOLOGIST and ENVIRONMENTAL PLANNER – Ms. Atkin has 17 years of plant and environmental planning experience in the Intermountain West. She is experienced in the preparation and application of NEPA documents from scoping to project construction and compliance. She has managed projects involving the Clean Water Act, Section 404 Wetlands and was primary coordinator with Federal and State agencies. She is experienced with surveying and monitoring TEPC species, water-related planning, and permitting processes. She has managed hundreds of projects focusing on monitoring and mapping flora resources throughout the Intermountain West and has conducted natural resource surveys, inventories, and plant identification. Ms. Atkin holds a B.S. degree in horticulture, a M.S. degree in Plant Science, and has an M.L.A. from the Landscape Architecture and Environmental Planning department, all from Utah State University (USU).

KARI COY – PLANT TAXONOMIST and ENVIRONMENTAL PLANNER – Ms. Coy has 13 years of environmental planning and natural resources experience and is an expert in plant biology, TEPC species, wetland resources and NEPA analysis. She has knowledge and experience in environmental permitting including Section 404 Individual and Nationwide permits, Section 401 Water Quality Certificates, and PGP 10 Stream Alteration Permits. Ms. Coy has conducted extensive rare plant clearance surveys for transportation, oil and gas, restoration, biological inventory, and various development projects. She has coordinated with Federal, State, Local, and Tribal organizations on environmental projects and has experience in the NEPA process as both a subject matter expert and project manager for CatEx, EA and EIS documents. Ms. Coy holds a B.S. in Botany from Weber State University, a NEPA Certificate from the Utah State University (USU) and a M.S. in Natural Resources from USU.

GLEN GANTZ – CERTIFIED WILDLIFE BIOLOGIST and COMMERCIAL PILOT – Mr. Gantz has 30 years of experience conducting ground based and low-level aerial surveys. He is certified by The Wildlife Society as a Wildlife Biologist in addition, he is a commercial pilot. Aerial surveys include aerial telemetry in mountainous areas. Training and certifications include Mexican Spotted Owl Surveys, Utah Prairie Dog Surveys, Southwest Willow Flycatcher surveys, Raptor Surveys and Monitoring, and Migratory Bird Surveys. Mr. Gantz holds a B.S. in Wildlife Science from Pennsylvania State University, University Park Pennsylvania and an M.S. in Wildlife Ecology from Utah State University, Logan Utah. In recent years, Mr. Gantz has conducted wildlife analysis on nearly 400 well sites and associated infrastructure proposed for oil and gas development, including 1600 miles of proposed pipelines, roads, and power lines, and two large seismic projects in Utah, Wyoming, and Nevada. Specifically, during the past 5 years, Mr. Gantz has surveyed over 200,000 acres. A high concentration of work has been within the Uinta Basin of Utah. During this time, he has mapped more than 800 raptor nests and 32,000-acres of white-tailed prairie dog towns and associated burrowing owl habitat.

APPENDIX C
USFWS MIGRATORY BIRD CONSERVATION ACTIONS

Migratory Bird Conservation Actions for Projects to Reduce the Risk of Take during the Nesting Season*

U.S. Fish and Wildlife Service (USFWS) Region 6, Migratory Bird Management

June 2014

Goal: Avoid take of migratory birds and/or minimize the loss, destruction, or degradation of migratory bird habitat while completing the proposed project or action. Under the Migratory Bird Treaty Act (MBTA) take is defined as “pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture or collect” a migratory bird (50 CFR § 10.12). **

1. Determine if the proposed project or action will involve below- and/or above-ground construction or habitat-altering activities, because recommended practices and timing of surveys could differ accordingly.
2. If the proposed project or action includes a reasonable likelihood that take of migratory birds will occur, then complete the project or those actions expected to take migratory birds outside of their nesting season to the greatest extent possible. Examples of actions that may take migratory birds include, clearing or cutting of vegetation, burning vegetation, driving or parking equipment on vegetation that may harbor nesting birds, etc. The primary nesting season for migratory birds varies greatly among species and geographic locations, but generally extends from early April to mid-July. However, the maximum time period for the migratory bird nesting season can extend from early January through late August. Due to this variability, project proponents should consult with the USFWS for specific nesting seasons of birds in your project or action area. As early as possible please consult the USFWS in the planning stages of your project for other input on conservation measures to avoid and minimize the take of migratory birds.
3. Complete all project activities that could result in migratory bird take outside the maximum migratory bird nesting season (early January through late August) to the greatest extent possible. If this is not possible, then avoid any habitat alteration, removal, or destruction during the primary nesting season for migratory birds (early April to mid-July).
4. If a proposed project or action includes the potential for take of migratory birds and/or the loss or degradation of migratory bird habitat, and work cannot occur outside the migratory bird nesting season (either the maximum or primary nesting season), project proponents should provide USFWS with an explanation for why work has to occur during the migratory bird nesting season. Further, in these cases, project proponents also should demonstrate that all efforts to complete work outside the migratory bird nesting season were attempted, and that the reasons work needs to be completed during the nesting season were beyond the proponent’s control.

5. Where project work must occur during the migratory bird nesting season, project proponents should utilize a qualified biologist to survey those portions of the project area during the nesting season (but prior to the project or action occurring) to determine if migratory birds are present and nesting in those areas. These bird surveys should occur no more than 7-10 days prior to when work actually begins on the project site. In addition to conducting surveys during the nesting season, entities may also benefit from conducting surveys during the previous nesting season. Such surveys will serve to inform the likely presence of nesting migratory birds in the proposed project or work area. While individual migratory birds will not necessarily return to nest at the exact site as in previous years, a survey in the nesting season the year before the project or action allows the company to become familiar with bird species and numbers present in the project area well before the nesting season in the year of proposed action. Migratory bird surveys also should be completed during the best timeframe for detecting the presence of nesting migratory birds, using accepted bird survey protocols. USFWS Offices can be contacted for recommendations on appropriate survey guidance. Project proponents should also be aware that results of migratory bird surveys are subject to spatial and temporal variability.
6. If no migratory birds are found nesting in proposed project or action areas immediately prior to the time when construction and associated activities are to occur, then proceed with your project activity as planned.
7. If migratory birds are present and nesting in the proposed project or action area, contact your nearest USFWS Ecological Services Field Office and/or USFWS Regional Migratory Bird Management Office for guidance on appropriate next steps to avoid and minimize impacts to (and take of) migratory birds associated with the proposed project or action. Although bald and golden eagles are protected under MBTA they are also covered under BGEPA. Please consult USFWS if there are eagles or eagle nests in or near your proposed project area ***.

* Note: these recommended conservation measures assume that there are no Endangered or Threatened migratory bird species present in the project/action area, or any other Endangered or Threatened animal or plant species, or any designated critical habitat for Endangered or Threatened species present in this area. If Endangered or Threatened species or designated critical habitat are present, or they could potentially be present, and the project/action may affect these species or designated critical habitat for them, then consult with your nearest USFWS Ecological Services Office before proceeding with any project/action.

** The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, and transportation, (among other actions) of migratory birds, their eggs, parts, and nests, except when specifically permitted by regulations. While the MBTA has no provision for allowing unauthorized take, the USFWS realizes that some birds may be killed during construction or through other project activities, even if all known reasonable and effective measures to protect birds are used. The USFWS Office of Law Enforcement carries out its mission to protect migratory birds through investigations and enforcement, as well as by fostering relationships

with individuals, companies, and industries that have taken effective steps to avoid take of migratory birds and by encouraging others to implement measures to avoid take of migratory birds. It is not possible to absolve individuals, companies, or agencies from liability even if they implement bird mortality avoidance, or other similar protective measures. However, the Office of Law Enforcement focuses its resources on investigating and undertaking enforcement actions against individuals and companies that take migratory birds without identifying and implementing all reasonable, prudent, and effective measures to avoid that take. Companies are encouraged to work closely with USFWS biologists to identify available protective measures when developing project plans and/or avian protection plans, and to implement those measures prior to/during construction or similar activities.

*** Also note that Bald and Golden Eagles receive additional protection under the Bald and Golden Eagle Protection Act (BGEPA). BGEPA prohibits the take, possession, sale, purchase, barter, offer to sell, purchase, or barter, transport, export or import, of any Bald or Golden Eagle, alive or dead, including any part, nest, or egg, unless allowed by permit. BGEPA also defines take to include “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb,” 16 U.S.C. 668c, and includes criminal and civil penalties for violating the statute. Further, activities that would disturb Bald or Golden Eagles are prohibited under BGEPA. “Disturb” means to agitate or bother a Bald or Golden Eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an Eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior. If a proposed project or action would occur in areas where nesting, feeding, or roosting eagles occur, then project proponents may need to take additional conservation measures to achieve compliance with BGEPA. New regulations (50 CFR § 22.26 and § 22.27) allow the take of bald and golden eagles and their nests, respectively, to protect interests in a particular locality provided that the USFWS finds that such take is compatible with the goal of maintaining stable or increasing eagle breeding populations. However, consultation with the USFWS Migratory Bird, Ecological Services, and Law Enforcement programs will be required before a permit may be issued.

APPENDIX D

SOILS MAP

APPENDIX E

DESIGN / SITE PLAN



SCALE: 1"=300'

LEGEND:

EXISTING MAJOR CONTOURS	
EXISTING MINOR CONTOURS	
EXISTING DRAINAGE	
DESIGN MAJOR CONTOURS	
DESIGN MINOR CONTOURS	
PARCEL BOUNDARY	
PROJECT LIMITS	
CHAIN LINK FENCE	

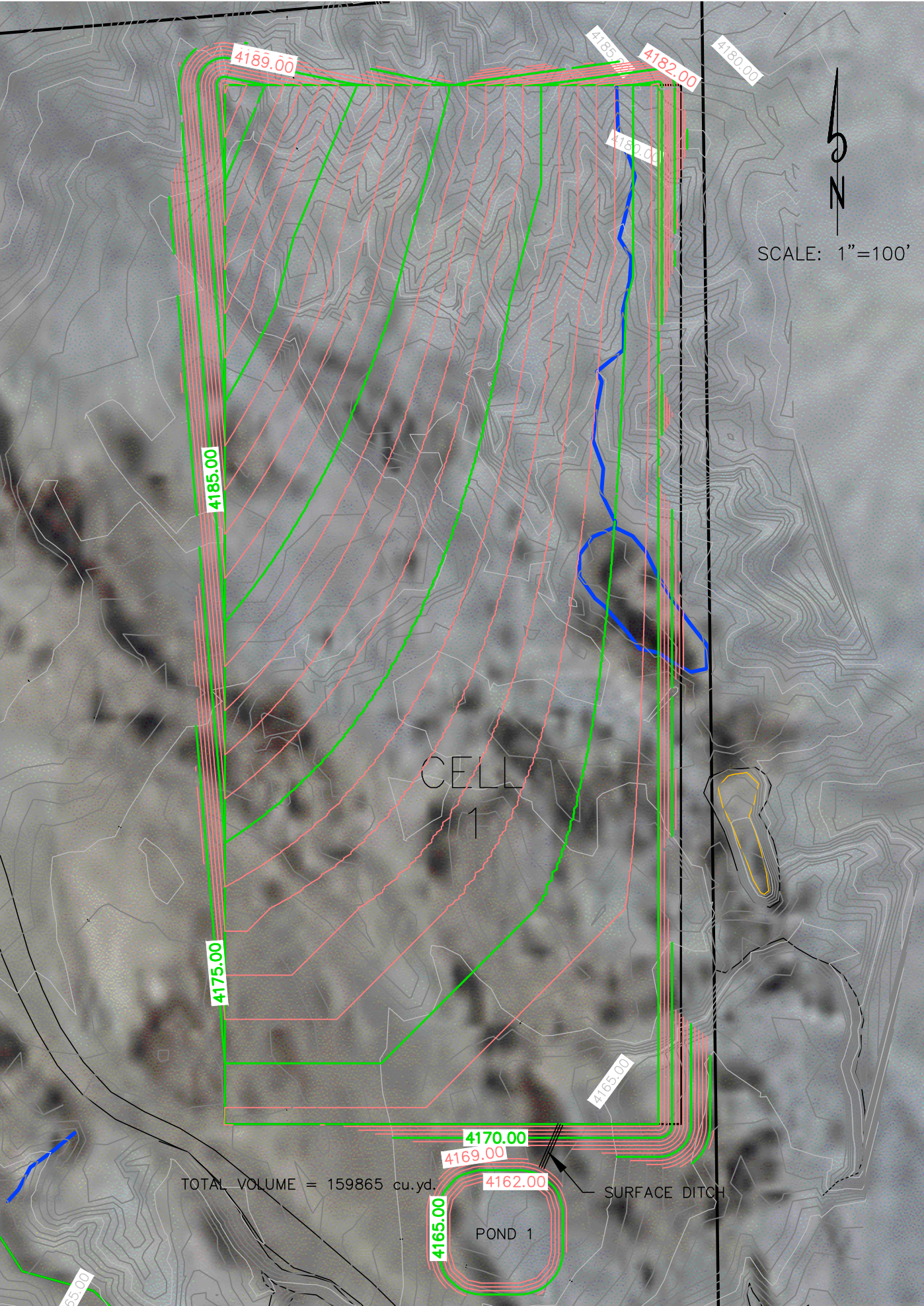
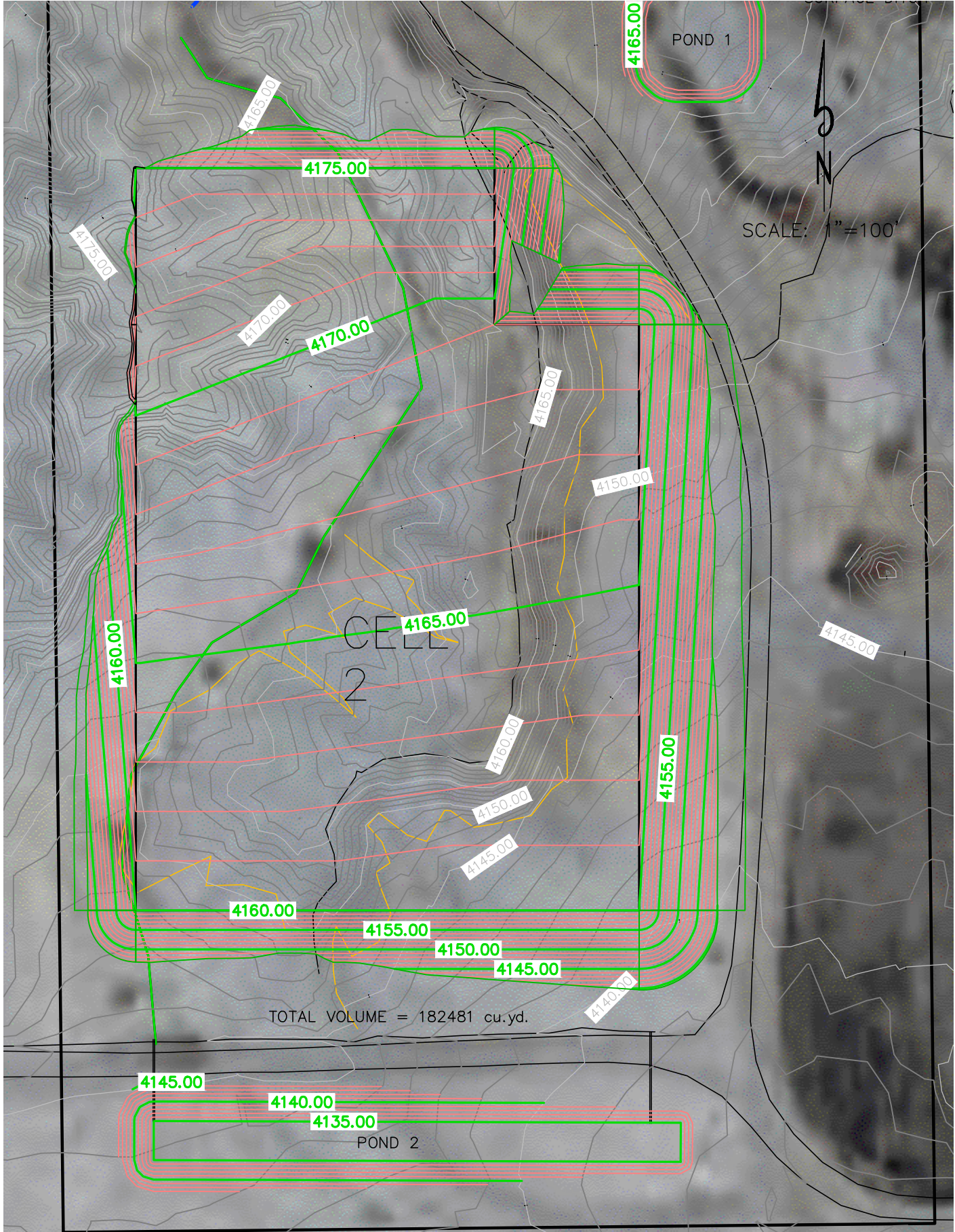
PROPERTY DESCRIPTION:

T. 21 S., R. 16 E., SEC. 7 NW $\frac{1}{4}$ SE $\frac{1}{4}$
CONTAINING 40.00 Ac.

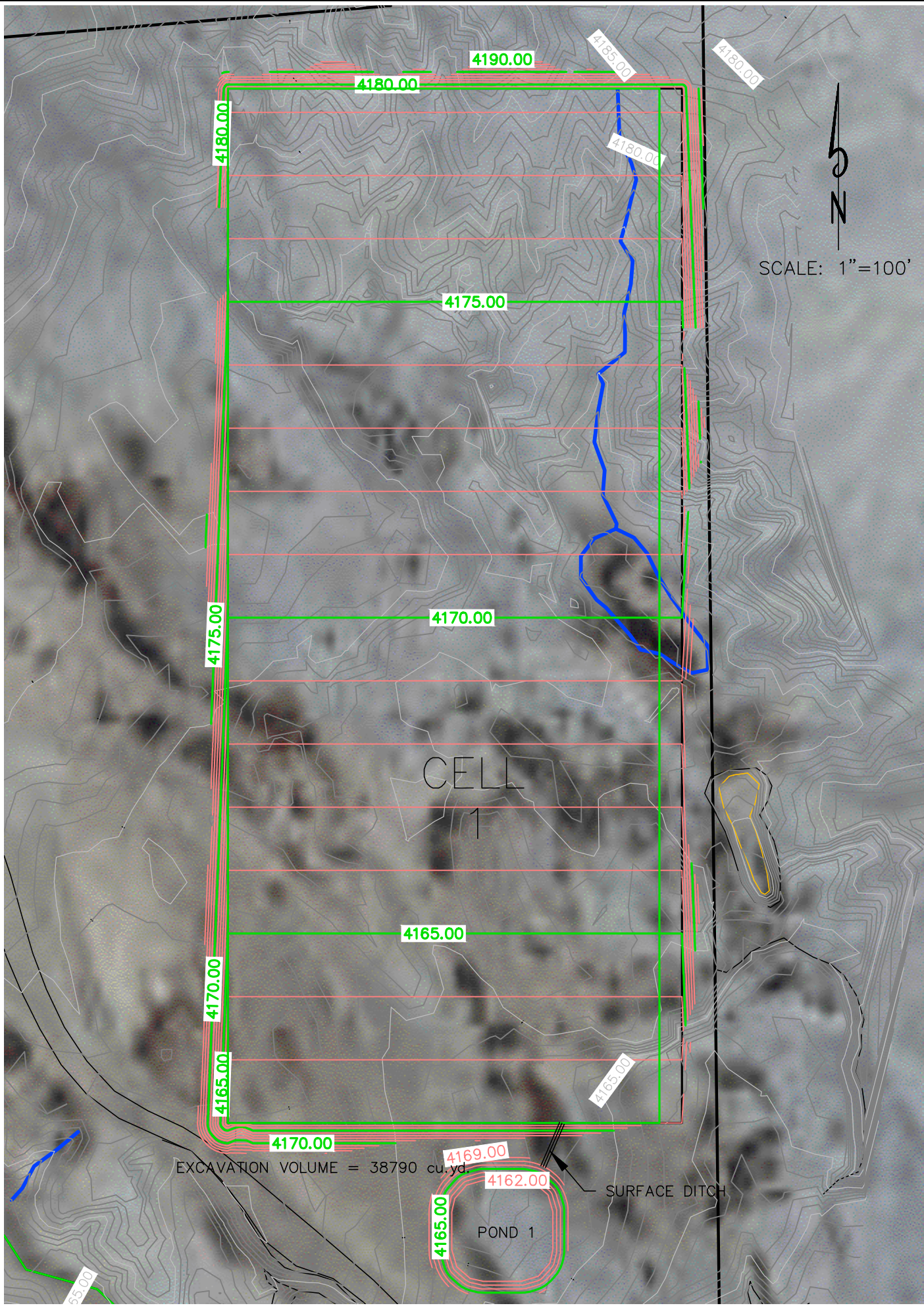
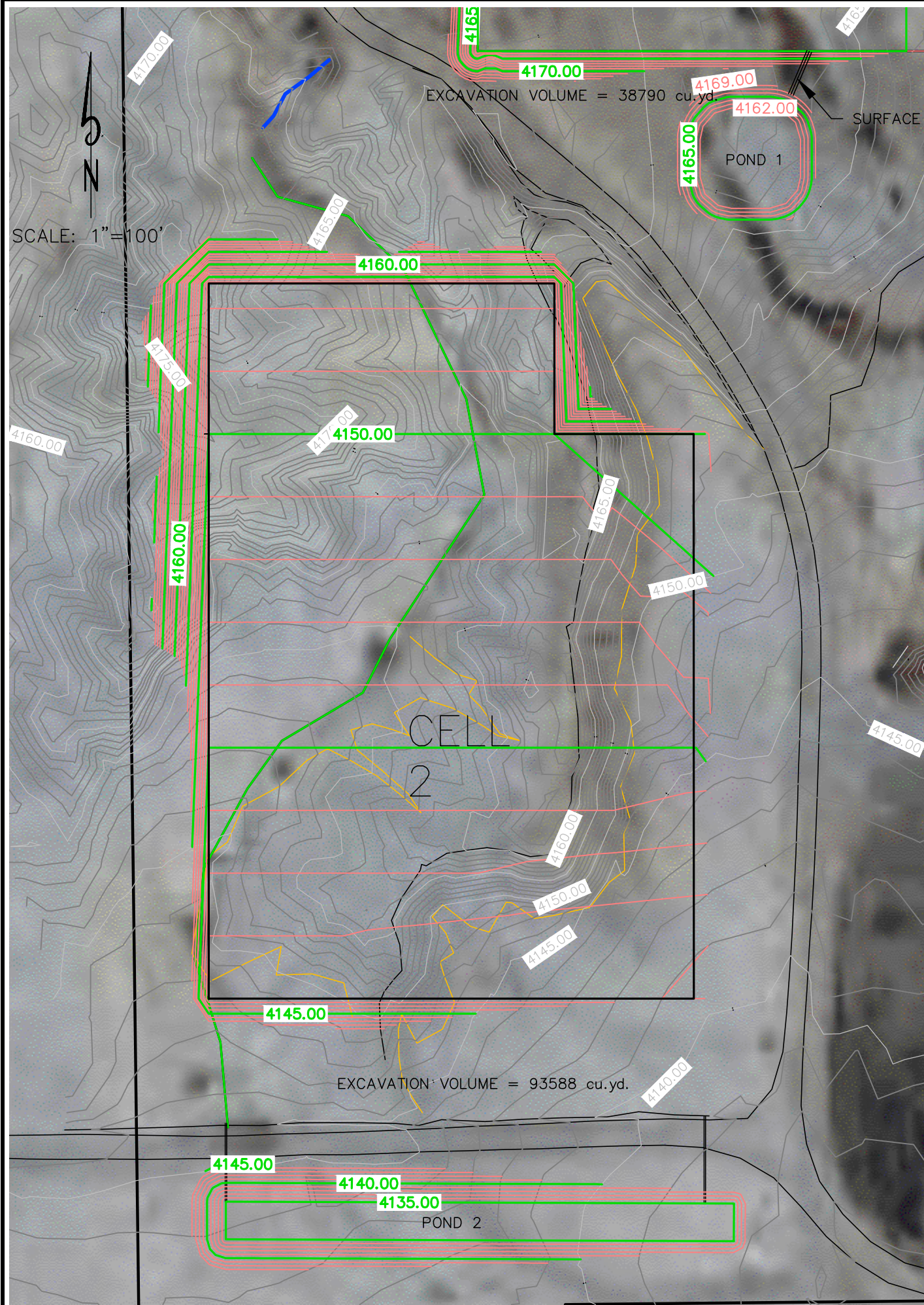
ALSO: EAST HALF OF THE SOUTHWEST
QUARTER OF THE SOUTHEAST QUARTER
(E $\frac{1}{2}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$) OF SECTION SEVEN (7) IN
TOWNSHIP TWENTY-ONE (21) SOUTH,
RANGE SIXTEEN (16) EAST OF THE
SALT LAKE MERIDIAN



PROPERTY DESCRIPTION EXISTING CONTOURS		LAND FILL PROJECT 2021				 P.O. Box 487, Castle Dale, UT 84513 (435) 381-2523 Fax (435) 381-2522, e-mail jt@etv.net
		DESIGNED	MJ	CHECKED	MJ	
		DRAWN	DMF	CHECKED	JU	
		SURVEYED	LDO	CHECKED	BHT	
SHEET NO. 1	PROJECT No.				T:\Projects- 2020\Green River Land fill	



 P.O. Box 487, Castle Dale, UT 84513 (435) 381-2523 Fax (435) 381-2522, e-mail j@etv.net	LAND FILL PROJECT 2021					CELL 1 and CELL 2 FINISHED GRADE	SHEET NO. 2
	DESIGNED	MJ	CHECKED	MJ			
	DRAWN	DMF	CHECKED	JJ			
	SURVEYED	LDO	CHECKED	BHT			
PROJECT No.				T:\Projects- 2020\Green River Land fill			



CELL 1 and CELL 2 SUB GRADE	LAND FILL PROJECT 2021				phansen & tittle ENGINEERING INC. P.O. Box 487, Castle Dale, UT 84513 (435) 381-2523 Fax (435) 381-2522 e-mail jt@etv.net			
	DESIGNED	MJ	CHECKED	MJ	SURVEYED	LD	CHECKED	BHT
	DRAWN	DNF	CHECKED	JJ	PROJECT NO.			
SHEET NO. 3				T:\Projects- 2020\Green River Card III				

APPENDIX F
DAILY OPERATING RECORD AND INSPECTION LOG

Daily Operating Log

Date: _____

Operator: _____

Load No.	General Description of Load	Estimated Weight of Load
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Quarterly Inspection Record

Date: _____

Time: _____

Inspection to include (but not limited to):

- | | |
|---------------------------------------|--------------------------|
| • Storm Water Run-on/Run-off Controls | • Litter Condition |
| • Access Road Condition | • Monitor Well Condition |
| • Litter Control Fence | • Gate Condition |

Observations:

Repairs or Corrective Actions:

Inspector Signature: _____

APPENDIX G

HYDROGRAPH

Hydrograph Report

1

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

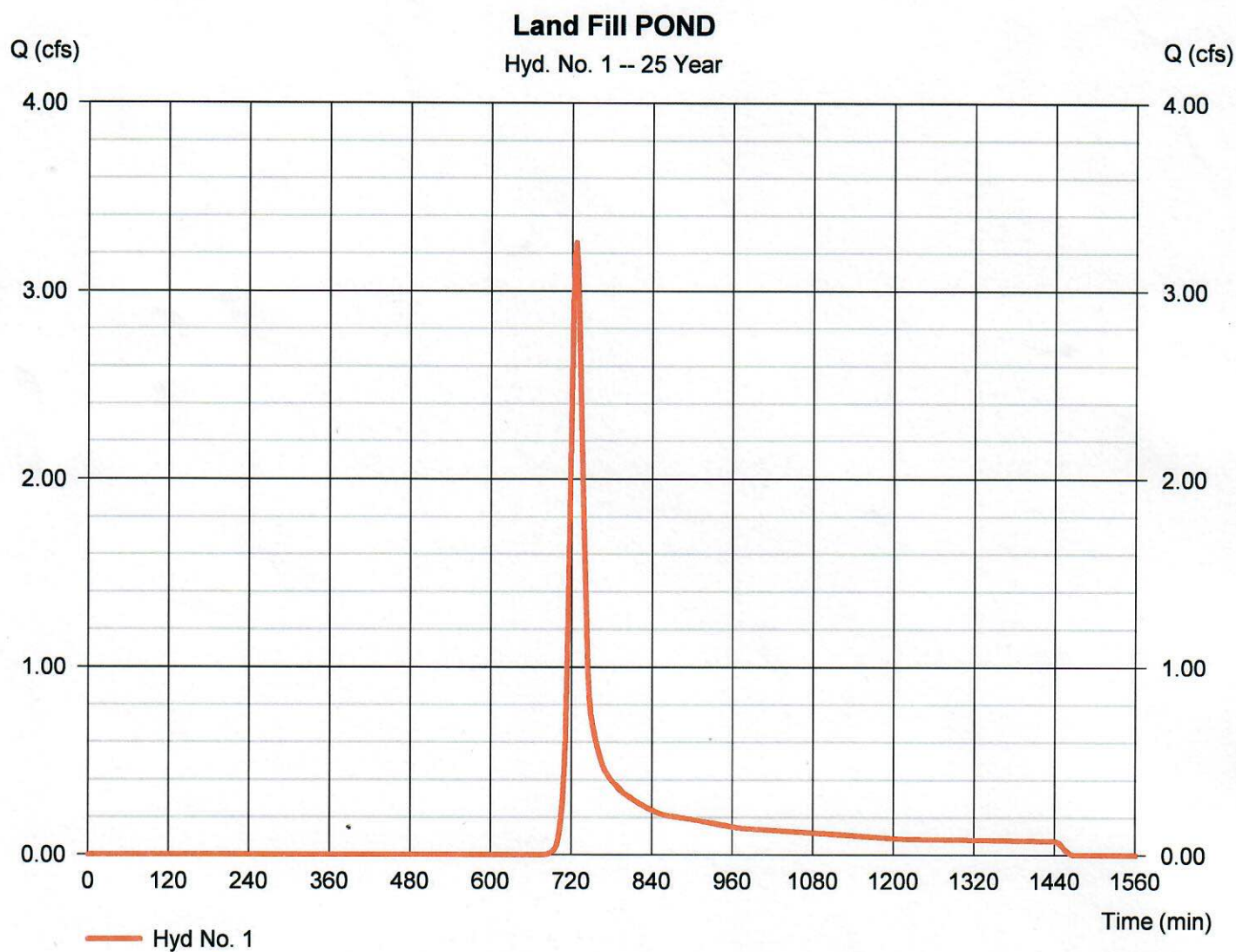
Wednesday, 02 / 23 / 2022

Hyd. No. 1

Land Fill POND

Hydrograph type = SCS Runoff
Storm frequency = 25 yrs
Time interval = 2 min
Drainage area = 6.300 ac
Basin Slope = 2.3 %
Tc method = LAG
Total precip. = 1.74 in
Storm duration = 24 hrs

Peak discharge = 3.259 cfs
Time to peak = 726 min
Hyd. volume = 11,071 cuft
Curve number = 82
Hydraulic length = 940 ft
Time of conc. (Tc) = 18.66 min
Distribution = Type II
Shape factor = 484



Hydrograph Report

2

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

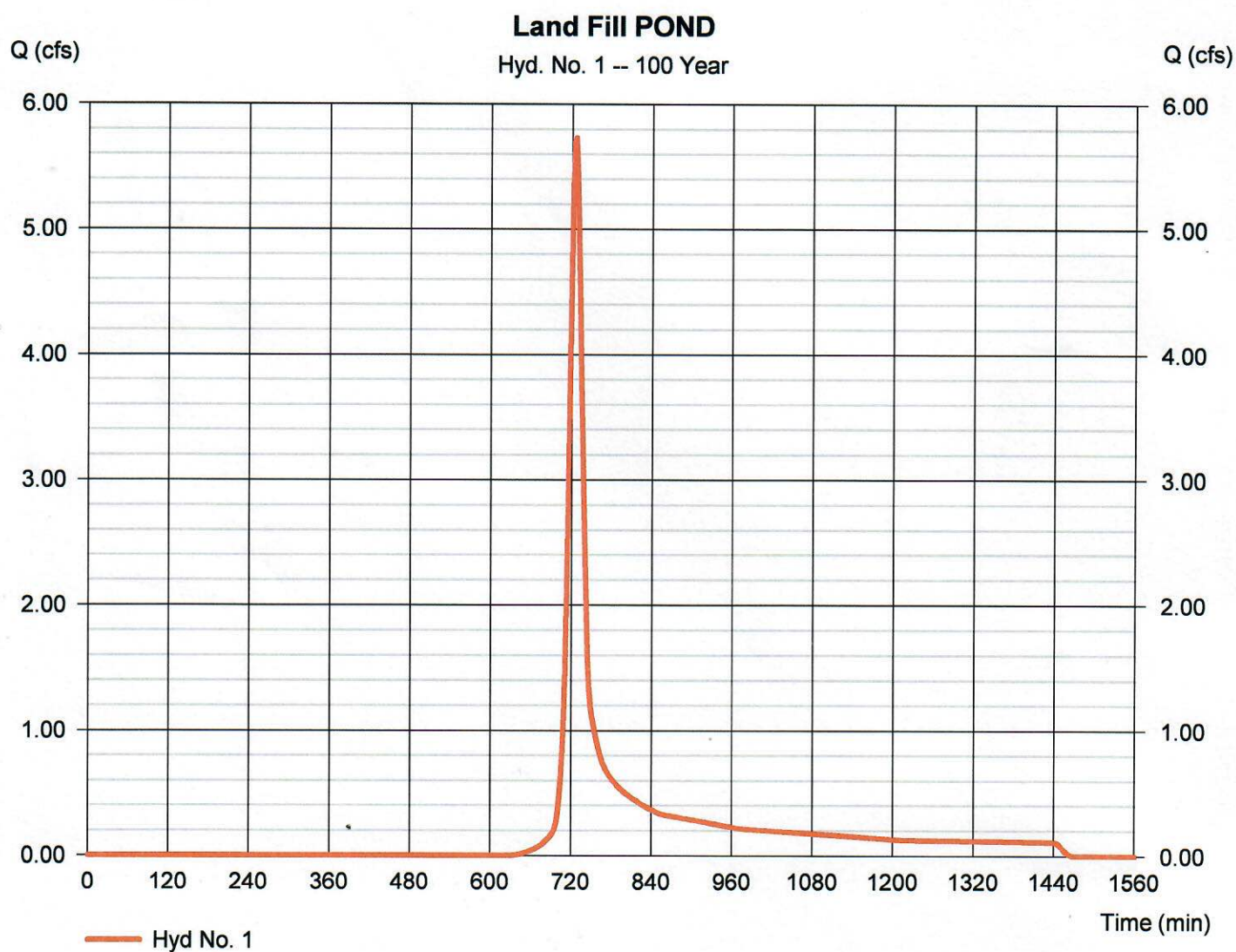
Wednesday, 02 / 23 / 2022

Hyd. No. 1

Land Fill POND

Hydrograph type = SCS Runoff
Storm frequency = 100 yrs
Time interval = 2 min
Drainage area = 6.300 ac
Basin Slope = 2.3 %
Tc method = LAG
Total precip. = 2.24 in
Storm duration = 24 hrs

Peak discharge = 5.734 cfs
Time to peak = 726 min
Hyd. volume = 18,562 cuft
Curve number = 82
Hydraulic length = 940 ft
Time of conc. (Tc) = 18.66 min
Distribution = Type II
Shape factor = 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

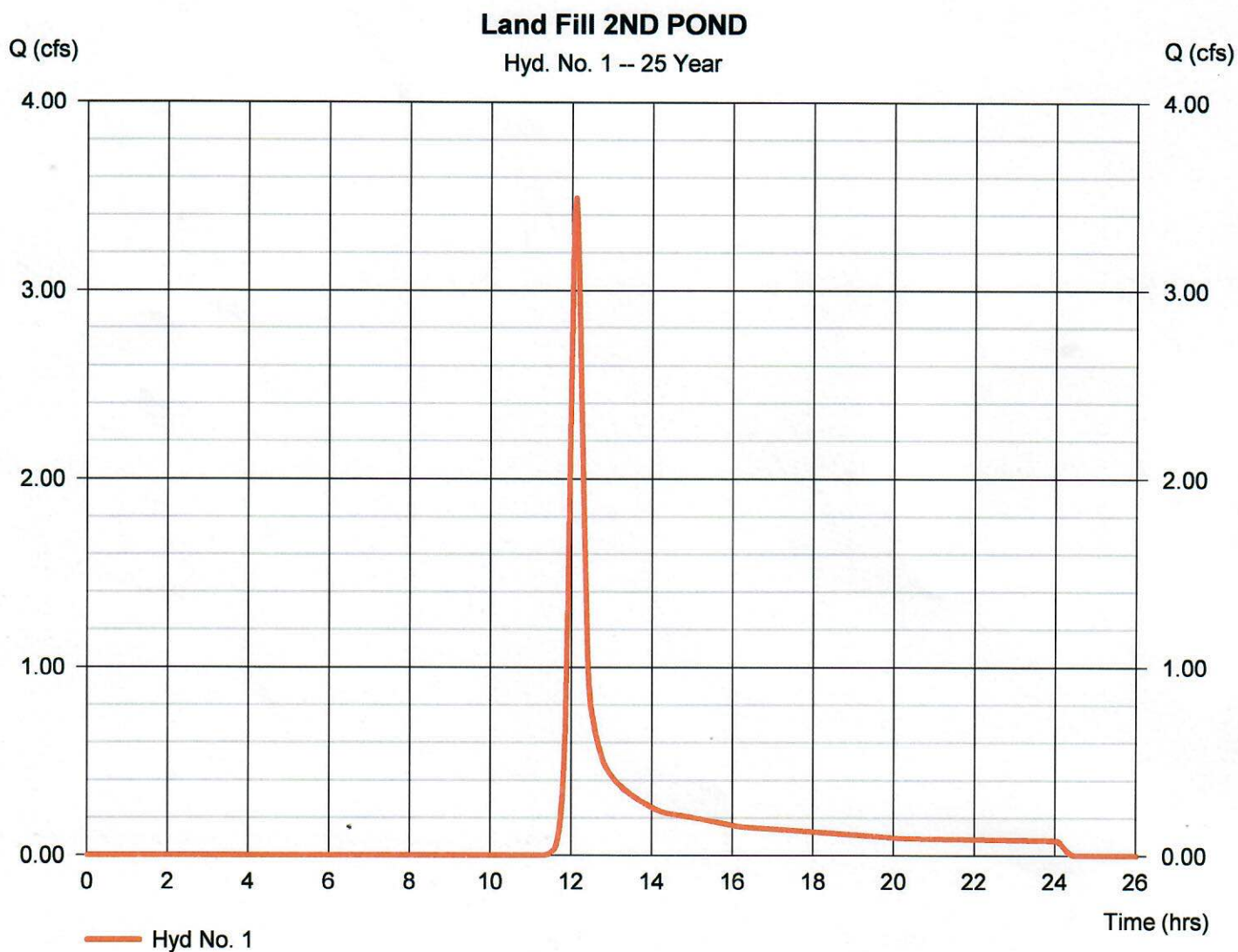
Wednesday, 02 / 23 / 2022

Hyd. No. 1

Land Fill 2ND POND

Hydrograph type = SCS Runoff
Storm frequency = 25 yrs
Time interval = 2 min
Drainage area = 6.750 ac
Basin Slope = 2.4 %
Tc method = LAG
Total precip. = 1.74 in
Storm duration = 24 hrs

Peak discharge = 3.492 cfs
Time to peak = 12.10 hrs
Hyd. volume = 11,862 cuft
Curve number = 82
Hydraulic length = 920 ft
Time of conc. (Tc) = 18.00 min
Distribution = Type II
Shape factor = 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020

Wednesday, 02 / 23 / 2022

Hyd. No. 1

Land Fill 2ND POND

Hydrograph type = SCS Runoff
Storm frequency = 100 yrs
Time interval = 2 min
Drainage area = 6.750 ac
Basin Slope = 2.4 %
Tc method = LAG
Total precip. = 2.24 in
Storm duration = 24 hrs

Peak discharge = 6.144 cfs
Time to peak = 12.10 hrs
Hyd. volume = 19,888 cuft
Curve number = 82
Hydraulic length = 920 ft
Time of conc. (Tc) = 18.00 min
Distribution = Type II
Shape factor = 484

