

**MASTER PLAN AGREEMENT FOR THE
WATTS REMUND FARM SUBDIVISION
MIDWAY CITY, UTAH**

This Master Plan Agreement (“Agreement”) is made and entered into by and between Midway City, a political subdivision of the State of Utah, (hereinafter referred to as the “City”), and MIDWAY SPRINGS, LLC, (hereinafter referred to as the “Developer”). The property which is included in the Master Plan, and which is the subject of this Agreement, includes 50.76 acres, which are owned or controlled by the Developer. The Developer and the City are, from time to time, hereinafter referred to individually as a “Party” and collectively as the “Parties.” Unless otherwise noted herein, the requirements and terms of this Agreement are in addition to the terms and conditions in any Development Agreement involving the same Property.

RECITALS

- A. The City has authorized the negotiation of and adoption of master plan agreements under appropriate circumstances where proposed development contains outstanding features which advance the policies, goals and objectives of the Midway City General Plan, preserves and maintains the open and rural atmosphere desired by the citizens of Midway City, and contributes to capital improvements which substantially benefit the City.
- B. The Developer is the owner of certain real property, the legal description of which is set forth in Exhibit “A”, the Master Plan, attached hereto and incorporated herein by this reference. All of the real property described in Exhibit A is included and subject to this Master Plan Agreement. Hereinafter, the entire parcel described in the Master Plan is referred to as the “Remund Farm Parcel” or the “Property”. The Remund Farm Parcel includes the following parcels:
 - 1. The Property, consisting of approximately 50.76 acres, which will be developed in three Phases, consisting of single family lots according to the terms of the this Agreement, future development agreements, and the rules and regulations of Midway City. The legal description of the Property is attached hereto and incorporated herein by this reference.
- C. Each Phase shall be subject to a Development Agreement, entered into by the City and the developer of that Phase. All Phases, regardless of the developer, shall be subject to the terms, conditions and restrictions of this Master Plan Agreement, and the Development Agreement which applies to that specific Phase.

- D. The Midway City Land Use Code requires that a Master Plan must demonstrate that approval of the Project in multiple phases can occur such that the Project can still function autonomously if subsequent phases are not completed. Therefore, the Master Plan application must demonstrate that sufficient property, water rights, roads, sensitive lands protection and open space are committed to in the first phase to allow the Project to function and meet Code requirements without subsequent phases. The City Council finds that this Master Plan meets that requirement.
- E. The Property is, and shall remain, subject to the City of Midway Zoning Ordinance and other City Ordinances and Resolutions. The Developer and the City desire to allow Developer and others to make improvements to the Property pursuant to applicable ordinances, resolutions and the terms and conditions of this Agreement.
- F. The improvements and changes to be made to the Property shall be consistent with the current ordinances and standards of the City, the terms and conditions of this Agreement, any applicable Development Agreement, and any future changes to building code and engineering standards of the City and the Midway City General Plan.
- G. The Developer and the City acknowledge and agree that the development and improvement of the Property pursuant to this Agreement will result in planning and economic benefits to the City and its residents, and will provide certainty useful to the Property and the City in ongoing future communications and relations with the community.
- H. The City's governing body has authorized the execution of this Agreement by Resolution 2018-~~8~~, attached as Exhibit B.

AGREEMENT

Section 1. Effective Date and Term. The term of this Agreement shall commence upon the signing of this Agreement (the "Effective Date") by both Parties, and shall run with the land. The terms and conditions contained herein shall inure to the benefit of, and be binding upon, the successors in interest, heirs or assigns, of the Developer.

Section 2. Definitions. Unless the context requires a different meaning, any term or phrase used in this Agreement that has its first letter capitalized shall have that meaning given to it by this Agreement. Certain terms and phrases are referenced below; others are defined where they appear in the text of this Agreement, including the Exhibits.

"Applicable Law" shall have that meaning set forth in Section 4.2 of this Agreement.

“Governing Body” shall mean the Midway City Council.

“City” shall mean the City of Midway, and shall include, unless otherwise provide, any and all of the City’s agencies, departments, officials, employees or agents.

Section 3. General Description of Project.

The Project consists of 50.76 acres.

The Project is in the RA-1-15 zone.

The Project contains 96 units and one single family lot.

The Project shall be built in three Phases:

Phase I shall consist of 38 units or pads and one single family lot, and associated improvements.

Phase II shall consist of 37 units or pads, and associated improvements.

Phase III shall consist of 21 units or pads, and associated improvements.

The Project is a Planned Unit Development with one single family lot outside of the P.U.D. The number of units in each of the first three phases may be adjusted to add or subtract the number of units in a specific phase to meet the needs of the developer but the total units in all phases shall not exceed 96. The parties agree that should the developer desire to develop in more than three phases, this agreement will need to be mutually amended to address any issues that breaking the development into additional phases may create.

Section 4. Obligations of the Developer and the City.

A. Obligations of the Developer:

- i. General Obligations: The Parties acknowledge and agree that the City’s agreement to perform and abide by the covenants and obligations of the City set forth herein is material consideration for the Developer’s agreement to perform and abide by the covenants and obligations of the Developer set forth herein.
- ii. Conditions for Master Plan Approval. The Developer shall comply with all of the following Conditions:
 - a) Payment of Fees: Developer agrees to pay all applicable Midway City fees as a condition of developing the Project on the Property, including all engineering and attorney fees and other outside consultant fees incurred by the City in relation to the Project. All fees, including outstanding fees for prior plan checks (whether or not such checks are currently valid) shall be paid

current prior to the recording of any plat or the issuance of any building permit for the Project or any portion thereof.

- b) **Water Rights:** The preliminary recommendation from the Water Board is that 173.87 acre feet of water will be required for the entire Project. This number may change based upon the determination of actual wetland acreage by the U.S. Army Corps of Engineers. The final number shall be determined by the Water Board and is anticipated to be between 144.143 acre feet and 173.87 acre feet. The Developer agrees to abide by the final requirement of the Water Board. The required water rights for each phase of the Project shall be officially transferred to the City in writing before the recording of each plat for the Project. The development rights vested herein are expressly conditioned on the transfer of the required water rights for each Phase of the Project. The water rights provided by the Developer shall meet all City policies and Ordinances for culinary and irrigation use, respectively.
- c) **Construction and/or Dedication of Project Improvements:** The Developer agrees to construct and/or dedicate Project improvements as directed by the City, including but not limited to roads, driveways, trails, amenities, landscaping, water, sewer, and other utilities as shown on the approved final plans and in accordance with current City standards. The Developer shall satisfactorily complete construction of all Project improvements no later than two (2) years after the recording of the plat for the particular Phase of the Project. Specifically, all roads within the Project will be private roads, and shall be maintained by the Home Owners' Association. There shall be a public access easement on the roads and public trails, which shall be noted on the Plat. There will be common area owned by the HOA, along with a clubhouse, swimming pool, tennis court, two play areas, community garden and activity barn, all of which are required to be constructed by the Developer or its successor in interest, and deeded to the HOA, who shall be responsible for the ongoing maintenance thereof.
- d) **Weed Control/Overburden:** The Developer and its successors and assigns shall eradicate, mow or trim weeds and vegetation at all times in all areas of the Project. This obligation to mow or trim weeds and vegetation does not apply to any areas of the Project that are wetlands. Wetlands areas are to remain undisturbed and native. As set forth in Exhibit C, dirt or overburden from any particular phase shall only be allowed in the designated dumping areas within Phase II and Phase III. The overburden shall not exceed three feet in depth within the dumping areas, and Developer shall, within thirty days of dumping the overburden, shape, grade, and seed the overburden, in a manner acceptable to the City Engineer. In conjunction with the foregoing, dirt or overburden generated as a result of the construction of Phase II may be

allowed to be temporarily placed on the Project's park property upon conditions and with time limitations imposed by the City at the time Phase II is commenced. Such placement of dirt or overburden shall be temporary, shall be surrounded by a silt fence or other appropriate erosion control devices, and shall not be allowed to become an eyesore or nuisance to surrounding properties.

- e) Open Space: The Developer shall provide 56.5 percent of the Property as dedicated Open Space. The Open Space will be common area, owned by the HOA. The Midway City Code requires that with each phase that is approved there is enough dedicated open space to comply with the requirements of the Code. For example, Phase I must have at least 50% open space for that particular phase. If Phase I has 75% open space, then Phase II and Phase III only needs to have 25% open space if both Phases are equal in acreage.
- f) Open Space Credit: The City Council hereby approves off-site open space for this proposal. Watts Enterprises owns much of the property around the River Road roundabout. The parcel is OMI-0563-0-026-034 and comprises 1.32 acres that will be deeded to the City. Watts Enterprises shall landscape the property and deed the required irrigation water to the City as it would if the open space is part of the open space within the proposed Remund Farms subdivision. The water for this open space has already been included in the calculation set forth in Section 4.A.(ii)(b). The Remund Farms HOA shall be required to maintain the entire 1.32 acres of open space in perpetuity, even though it is off-site, and an appropriate note explaining why the HOA is obligated to maintain the open space shall be placed on the Plat, and within the HOA CC&R's in order to avoid dispute with future property owners within Remund Farms Subdivision. It is expressly understood that the Developer received a density credit for 2.26 additional units within the Remund Farms subdivision in exchange for the dedication of the off-site open space, and the promise that the HOA would be obligated to maintain the open space in perpetuity just like any open space within its subdivision. Developer shall landscape the 1.32 acres no later than October 1, 2018.
- g) Density: The applicant is asking for approval for 97 dwellings in the development. The density is based on the base density of 2.5 units per acre as allowed for a PUD in the R-1-15 zone. Wetlands and their associated buffer areas receive a density credit of one unit every ten acres. Also, the developer is asking for density credit of 2.26 units for the off-site open space that will be deeded to the City.
- h) Traffic Study/ Road Requirements: The Developer has submitted a traffic study to the City as part of the Master Plan. Horrocks Engineers has reviewed that study to determine what road improvements are required, and a copy of

their recommendation is attached hereto as Exhibit "D" and incorporated herein by this reference. Developer agrees to be bound by the terms, conditions and road standards imposed by the City for each Phase. The City expressly agrees to allow the street cross-section within the Project to be reduced from 30 feet to 26 feet, as shown on the attached Exhibits and as approved by the City. All savings generated by this reduction in width shall be used by the Developer to extend the trail on 600 North. Prior to recording the plat for each phase, the actual costs and savings to the Developer will be calculated and the number of linear feet of trail to be installed by the Developer will be established. These numbers will be attached and adopted as Exhibit E. The linear feet of trail shall be installed on 600 North and/or other trails designated by the City, and shall be installed at the time the infrastructure is installed for each phase. Should the required number of linear feet be insufficient to finish the trail along 600 North, the City shall complete the remainder of the trail at its own cost.

- i) Public Participation Plan: The Developers did hold a public participation meeting on July 10, 2017 as required by the ordinance for master plan applications.
- j) Sensitive Lands: The Property contains wetlands that will not be disturbed through the development process. The wetlands will become part of the open space for the development and will be preserved. There is a stream/ditch that runs through the property. It will be impacted by the roads crossing the development because of the culverts that will cover the ditch. Midway Irrigation Company owns an easement to the ditch area and will need to approve modifications made to the current ditch. There is a warm spring on the property that will be preserved. There are also acres of wetlands on the property that are included in the open space areas of the development. A study has been submitted by the developer has been reviewed by three organizations that include the Army Corps of Engineers, Horrocks Engineers, and another third-party wetland expert that was decided by the City. There is concern by residents and of the area and the City regarding the location of wetlands and therefore the City has decided to have three entities review the study that has been submitted. The Developer agrees to be bound by the conditions reasonably imposed by the City as a result of that review.
- k) Hydrology Study: Developer shall conduct and pay for a hydrology study on site to attempt to determine any potential impacts of development and develop solutions to those impacts if any are discovered. Residents that live in the surrounding areas of the development are concerned about several issues including the high-water table of the area and surrounding wetlands. The concern is that disturbance of high water table will have a detrimental consequence on the water table of surrounding properties. The City requires that a hydrologist study this issue and has worked with the developer regarding the study. The location of roads and building pads may be adjusted in phases 2 and 3 as the study dictates. The Developer agrees to be bound by

the conditions reasonably imposed by the City as a result of the hydrology study.

- l) **Traffic Study:** The developers have submitted a traffic study to the City as part of the application. Horrocks Engineers has reviewed that study to determine what road improvements are required, and set forth requirements and recommendations. Please see letter from Horrocks Engineers attached as Exhibit F with requirements and recommendations incorporated herein by reference. The plans submitted by Developer conform to the requirements and recommendations of Horrocks Engineers.
- m) **Two Points of Access:** The development plans have two points of access onto 600 North. The developer has attempted to access from three other locations that include 250 North, 300 North and River Road. All three options were unattainable. The two points of access on 600 North do meet the City requirements regarding the two points of access ordinance.
- n) **Access Requirements:** Each phase of the Project must meet the access and cul-de-sac limitation requirements of the Code. A cul-de-sac is limited to 500' in length, unless approved otherwise by the City Council. The southwestern cul-de-sac measures greater than 500' (about 600') and that exception shall be allowed according to this Agreement.
- o) **Storm water control system:** The Developer shall install, at its sole cost and according to plans and specifications approved by the City, a storm water control system. On dedicated public roads, the ownership, maintenance, repair and replacement of the storm water system shall be the responsibility of the City.
- p) **Home Owners' Association:** The three Phases of the Remund Farm Master Plan will be part of one Home Owners' Association and shall be bound by the CCRs of that HOA. The CCRs shall be approved by the City.
- q) **The Project shall be connected to the City water and sewer lines as shown on the approved plans.**
- r) **The secondary water (outside irrigation) shall be provided by Midway Irrigation Company. Developer shall connect to Midway Irrigation Company's secondary system, as shown on the approved plans, and shall comply with all applicable rules and regulations of Midway Irrigation Company. Secondary water laterals and meters shall be installed by Developer for all landscaped common area and the lot.**
- s) **Trails:** The Trails Master Plan and the Master Parks Plan calls for a linear park and trail to run north and south across the proposal. The City feels this is a very important community amenity that will benefit current residents and future residents for generations. The trail is of highest priority and careful review of the alignment and landscaping must happen to assure the trail will function and have the effect that it is envisioned to have. If the trail were built per phase then it could take several years, if not more, to complete. As such,

the entire length of the trail shall be built at the time of the first phase. The portion of the trail within Phase 1 shall be a 6' wide paved public trail that will be constructed by the Developer. The remaining portion of the trail through Phase 2 and Phase 3 shall be 6' wide and will initially be covered in gravel, slag or other approved material by the City. Once Phase II begins development the trail through this portion shall be paved, with the same for Phase III. The trail plan also calls for a connection the Blackner property that is also part of the linear park trail system that will also be an 6' wide paved, boardwalk or slag (or similar material) trail, depending on the presence of wetlands and upon approval of the City. This trail will eventually connect to the Indian Summer subdivision with its part of the linear park trail system. The trail system requirements are more fully set forth in Exhibit G, which are incorporated herein by this reference.

- t) In addition to the other requirements contained herein, the following specific conditions shall apply to the trails:
 1. The trail on the Southwest side of the Project shall be paved, and shall run straight south from the boundary of the Project, through the Philpot property, and connect with the City road. The Developer shall obtain an easement from the Philpots for the installation of the trail at Developer's sole cost and expense. This trail shall be constructed by the Developer as part of Phase I. The Developer shall also fence both sides of the easement through the Philpots, at Developer's sole cost and expense.
 2. The eastern perimeter trail does not have to be paved. Instead, it shall be built using slag, or other similar material approved by the City.
- u) Phase I Environmental Study, Geo Tech and Water Study: The Developer has submitted the required Environmental Study, Geo Tech Study and requested water study. Horrocks Engineers has reviewed each (see studies and reports attached as Exhibit H). The conditions therein are incorporated by reference.
- v) Staggered Setbacks for homes: Midway City Code Section 16.16.8.5.c requires variable or staggered setbacks of homes. The Code allows setbacks to start at 25 feet from the road. The City and Developer agree that in this Project, the setbacks shall start at 28 feet, and shall be staggered as required by the Code, from 28 feet to 35 feet as mutually agreed to by the Developer and the City. The purpose of the code and this agreement is to help mitigate the "wall effect" that dwellings with the same setback on a straight street creates. A plat is required for final approval and the units on the plat will need to comply with this requirement.
- w) Additional Conditions: This Master Plan Agreement also incorporates all other conditions officially adopted and imposed by the City Council at the time of approval of this Master Plan Agreement.

B. Obligations of the City:

- i. **General Obligations:** The Parties acknowledge and agree that the Developer's agreement to perform and abide by the covenants and obligations of the Developer set forth herein is material consideration for the City's agreement to perform and abide by the covenants and obligations of the City set forth herein.
- ii. **Conditions of Approval:** The City shall not impose any further Master Plan Conditions on the Project other than those detailed in this Agreement, unless agreed to in writing by the Parties hereto. Additional requirements not in conflict with the terms and conditions of this Agreement shall be contained in a specific Development Agreement for each Phase. The Developer shall remain bound by all legally adopted Ordinances, Resolutions and policies of the City unless specifically agreed to otherwise herein.
- iii. **Acceptance of Improvements:** The City agrees to accept all Project improvements constructed by the Developer, or the Developer's contractors, subcontractors, agents or employees, provided that 1) the Midway City Planning and Engineering Departments review and approve the plans for any Project improvements prior to construction; 2) the Developer permits Midway City Planning and Engineering representatives to inspect upon request any and all of said Project improvements during the course of construction; 3) the Project improvements are inspected by a licensed engineer who certifies that the Project improvements have been constructed in accordance with the approved plans and specifications; 4) the Developer has warranted the Project improvements as required by the Midway City Planning and Engineering Departments; and 5) the Project improvements pass a final inspection by the Midway City Planning and Engineering Departments.

Section 4. Vested Rights and Applicable Law.

- A. **Applicable Law.** The rules, regulations, official policies, standards and specifications applicable to the development of the Property (the "Applicable Law") shall be in accordance with those set forth in this Agreement, and those rules, regulations, official policies, standards and specifications, including City Ordinances and Resolutions, in force and effect on the date the City Council granted preliminary approval to the Developer for the Project. The Developer expressly acknowledges and agrees that nothing in this Agreement shall be deemed to relieve the Developer from the obligation to comply with all applicable requirements of the City necessary for approval and recordation of subdivision plats, including the payment of fees and compliance with all other applicable Ordinances, Resolutions, regulations, policies and procedures of the City.

- B. State and Federal Law. Notwithstanding any other provision of this Agreement, this Agreement shall not preclude the application of changes in laws, regulations, plans or policies, to the extent that such changes are specifically mandated and required by changes in State or Federal laws or regulations (“Changes in the Law”) applicable to the Property. In the event the Changes in the Law prevent or preclude compliance with one or more of the provisions of this Agreement, such provisions of the Agreement shall be modified or suspended, or performance thereof delayed, as may be necessary, to comply with the Changes in the Law.

Section 5. Amendment. Unless otherwise stated in this Agreement, the Parties may amend this Agreement from time to time, in whole or in part, by mutual written consent. No amendment or modification to this Agreement shall require the consent or approval of any person or entity having any interest in any specific lot, unit or other portion of the Project. Each person or entity (other than the City and the Developer) that holds any beneficial, equitable, or other interests or encumbrances in all or any portion of the Project at any time hereby automatically, and without the need for any further documentation or consent, subjects and subordinates such interests and encumbrances to this Agreement and all amendments thereof that otherwise comply with this Section 5. Each such person or entity agrees to provide written evidence of that subjection and subordination within fifteen (15) days following a written request for the same from, and in a form reasonably satisfactory to, the City and/or the Developer.

Section 6. Cooperation and Implementation.

- A. Processing of Subsequent Approvals. Upon submission by the Developer of all appropriate applications and processing fees for any Subsequent Approval to be granted by the City, the City shall promptly and diligently commence and complete all steps necessary to act on the Subsequent Approval application including, without limitation, 1) the notice and holding of all required public hearings, and 2) the granting of the Subsequent Approval as set forth herein.

The City’s obligations under this Section 6 are conditioned on the Developer’s provision to the City, in a timely manner, of all documents, applications, plans and other information necessary for the City to meet such obligations. It is the express intent of the Developer and the City to cooperate and work diligently and in good faith to obtain any and all Subsequent Approvals. The City may deny an application for a Subsequent Approval by the Developer only if the application is incomplete, does not comply with existing law, or violates a City Ordinance or Resolution. If the City denies an application for a Subsequent Approval by the Developer, the City must specify the modifications required to obtain such approval.

- B. Other Governmental Permits.

1. The Developer shall apply for such other permits and approvals as may be required by other governmental or quasi-governmental agencies in connection with the development of, or the provision of services to the Project.
2. The City shall cooperate with the Developer in its efforts to obtain such permits and approvals, provided that such cooperation complies with Section 4.B of this Agreement. However, the City shall not be required by this Agreement to join, or become a party to any manner of litigation or administrative proceeding instituted to obtain a permit or approval from, or otherwise involving any other governmental or quasi-governmental agency.

Section 7. Default and Termination.

A. General Provisions.

1. Defaults by Developer. Any failure by either Party to perform any term or provision of this Agreement, which failure continues uncured for a period of thirty (30) days following written notice of such failure from the other Party, unless such period is extended by written mutual agreement, shall constitute a default under this Agreement. Any notice given pursuant to the preceding sentence shall specify the nature of the alleged failure and, where appropriate, the manner in which said failure may be satisfactorily cured. If the nature of the alleged failure is such that it cannot reasonably be cured within such thirty (30) day time period, then the commencement of the cure within such time period, and the diligent prosecution to completion of the cure thereafter, shall be deemed to be a cure within such thirty (30) day period. Upon the occurrence of an uncured default under this Agreement, the non-defaulting Party may institute legal proceedings to enforce the terms of this Agreement or, in the event of a material default, terminate this Agreement. If the default is cured, then no default shall exist and the noticing Party shall take no further action.
2. Termination. If the City elects to consider terminating this Agreement due to a material default of the Developer, then the City shall give to the Developer a written notice of intent to terminate this Agreement and the matter shall be scheduled for consideration and review by the City Council at a duly notice public meeting. The Developer shall have the right to offer written and oral evidence prior to or at the time of said public meeting. If the City Council determines that a material default has occurred and is continuing and elects to terminate this Agreement, the City Council shall send written notice of termination of this Agreement to the Developer by certified mail and this Agreement shall thereby be terminated thirty (30) days thereafter. In addition, the City may thereafter pursue any and all remedies at law or equity. By presenting evidence at such public meeting, the Developer does not waive any and all remedies available to the Developer at law or in equity.

3. Review by the City. The City may, at any time and in its sole discretion, request that the Developer demonstrate that the Developer is in full compliance with the terms and conditions of this Agreement. The Developer shall provide any and all information reasonably requested by the City within thirty (30) days of the request, or at a later date as agreed between the Parties.
4. Determination of Non-Compliance. If the City Council finds and determines that the Developer has not complied with the terms of this Agreement, and non-compliance may amount to a default if not cured, then the City may deliver a Default Notice pursuant to section 7.A of this Agreement. IF the default is not cured in a timely manner by the Developer, the City may terminate this agreement as provided in Section 7 of this Agreement an as provided under Applicable Law.
- B. Default by the City. In the event the City defaults under the terms of this Agreement, the Developer shall have all rights and remedies provided in Section 7 of this Agreement, and as provided under Applicable Law.
- C. Enforced Delay; Extension of Time of Performance. Notwithstanding anything to the contrary contained herein, neither Party shall be deemed to be in default where delays in performance or failures to perform are due to, and a necessary outcome of, war, insurrection, strikes or other labor disturbances, walk-outs, riots, floods, earthquakes, fires, casualties, acts of God, restrictions imposed or mandated by other governmental entities, enactment of conflicting state or federal laws or regulations, new or supplemental environmental regulations, or similar basis for excused performance which is not within the reasonable control of the Party to be excused. Upon the request of either Party hereto, an extension of time for such cause shall be granted in writing for the period of the enforced delay, or longer as may be mutually agreed upon.

Section 8. Notice of Compliance.

- A. Timing and Content. Within fifteen (15) days following any written request which the Developer may make from time to time, and to the extent that it is true, the City shall execute and deliver toe the Developer a written "Notice of Compliance," in recordable form, duly executed and acknowledge by the City, certifying that 1) this Agreement is unmodified and in full force and effect, or if there have been modifications hereto, that this Agreement is in full force and effect as modified and stating the date and nature of such modification; 2) there are no current uncured defaults under this Agreement or specifying the dates and nature of any such default; and 3) any other reasonable information requested by the Developer. The Developer shall be permitted to record the Notice of Compliance.
- B. Failure to Deliver. Failure to deliver a Notice of Compliance, or a written refusal to deliver a Notice of Compliance if the Developer is not in compliance, within the time set forth in Section 8.A shall constitute a presumption that as of fifteen (15) days from

the date of the Developer's written request: 1) this Agreement was in full force and effect without modification except as represented by the Developer; and 2) there were no uncured defaults in the performance of the Developer. Nothing in this Section, however, shall preclude the City from conducting a review under Section 7, or issuing a notice of default, notice of intent to terminate or notice of termination under Section 7 for defaults which commence prior to the presumption created under this Section 8, and which have continued uncured.

Section 9. Change in Developer, Assignment, Transfer and Required Notice. The terms and conditions of this Master Plan Agreement shall run with the land, and be binding upon the successors and assigns of the Developer. The rights of the Developer under this Agreement may be transferred or assigned, in whole or in part, with the written consent of the City, which shall not be unreasonably withheld. The Developer shall give notice to the City of any proposed transfer or assignment at least thirty (30) days prior to the proposed date of the transfer or assignment.

Section 10. Miscellaneous Terms.

- A. Incorporation of Recitals and Introductory Paragraph. The Recitals contained in this Agreement, and the introductory paragraph preceding the Recitals, are hereby incorporated into this Agreement as if fully set forth herein.
- B. Severability. If any term or provision of this Agreement, or the application of any term or provision of this Agreement to a particular situation, is held by a court of competent jurisdiction to be invalid, void or unenforceable, the remaining terms and provisions of this Agreement, or the application of this Agreement to other situations, shall continue in full force and effect unless amended or modified by mutual written consent of the Parties. Notwithstanding the foregoing, if any material provision of this Agreement, or the application of such provision to a particular situation, is held to be invalid, void or unenforceable by the final order of a court of competent jurisdiction, either Party to this Agreement may, in its sole and absolute discretion, terminate this Agreement by providing written notice of such termination to the other Party.
- C. Other Necessary Acts. Each Party shall execute and deliver to the other Party any further instruments and documents as may be reasonably necessary to carry out the objectives and intent of this Agreement, the Conditions of Current Approvals, and Subsequent Approvals and to provide and secure to the other Party the full and complete enjoyment of its rights and privileges hereunder.
- D. Other Miscellaneous Terms. The singular shall be made plural; the masculine gender shall include the feminine; "shall" is mandatory; "may" is permissive.
- E. Covenants Running With the Land and Manner of Enforcement. The provisions of this Agreement shall constitute real covenants, contract and property rights and equitable servitudes, which shall run with all of the land subject to this Agreement.

The burdens and benefits of this Agreement shall bind and inure to the benefit of each of the Parties, and to their respective successors, heirs, assigns and transferees.

Notwithstanding anything in this Agreement to the contrary, the owners of individual units or lots in the Project shall 1) only be subject to the burdens of this Agreement to the extent applicable to their particular unit or lot; and 2) have no right to bring any action under this Agreement as a third-party beneficiary. The City may look to the Developer, its successors and/or assigns, an owners' association governing any portion of the Project, or other like association, or individual lot or unit owners in the Project for performance of the provisions of this Agreement relative to the portions of the Projects owned or controlled by such party. The City may, but is not required to, perform any obligation of the Developer that the Developer fails adequately to perform. Any cost incurred by the City to perform or secure performance of the provisions of this Agreement shall constitute a valid lien on the Project, including prorated portions to the individual lots or units in the Project.

- F. Waiver. No action taken by any Party shall be deemed to constitute a waiver of compliance by such Party with respect to any representation, warranty, or condition contained in this Agreement. Any waiver by any Party of a breach or default of any condition of this Agreement shall not operate or be construed as a waiver by such Party of any subsequent breach or default.
- G. Remedies. Either Party may institute an equitable action to cure, correct or remedy any default, enforce any covenant or agreement herein, enjoin any threatened or attempted violation thereof, enforce by specific performance the obligations and rights of the Parties hereto, or to obtain any remedies consistent with the foregoing and the purpose of this Agreement; provided, however, that no action for monetary damages may be maintained by either Party against the other Party for any act or failure to act relating to any subject covered by this Agreement (with the exception of actions secured by liens against real property), notwithstanding any other language contained elsewhere in this Agreement. In no event shall either Party be entitled to recover from the other Party either directly or indirectly, legal costs or attorney's fees in any action instituted to enforce the terms of this Agreement (with the exception of actions secured by liens against real property).
- H. Utah Law. This Agreement shall be construed and enforced in accordance with the laws of the State of Utah.
- I. Attorney's Fees. In the event of litigation or arbitration between the Parties regarding an alleged breach of this Agreement, neither Party shall be entitled to any award of attorney's fees.
- J. Covenant of Good Faith and Fair Dealing. Each Party shall use its best efforts and take and employ all necessary actions in good faith consistent with this Agreement and Applicable Law to ensure that the rights secured to the other Party through this Agreement can be enjoyed.

Heber City, Utah 84032

If to Developer:

Midway Springs LLC
~~Wasatch Enterprises, LLC~~
5200 So Highland Dr #101
SLC, UT 84117

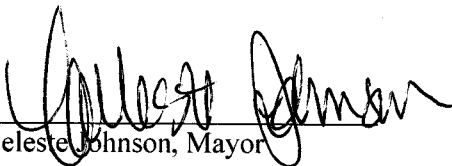
Section 12. Entire Agreement, Counterparts and Exhibits. Unless otherwise noted herein, this Agreement, including its Exhibits, is the final and exclusive understanding and agreement of the Parties and supersedes all negotiations or previous agreements between the Parties with respect to all or any part of the subject matter hereof. All waivers of the provisions of this Agreement must be in writing, and signed by the appropriate authorities of the City and of the Developer.

Section 13. Signing and Recordation of Agreement. Unless the City and the Developer mutually agree otherwise, this Agreement must be signed by both the Developer and the City no later than ninety (90) days after the Agreement is approved by a vote of the Midway City Council, or else the City's approval of the Project will be rescinded. The City Recorder shall cause to be recorded, at the Developer's expense, a fully executed copy of this Agreement in the Official Records of the County of Wasatch no later than the date on which the first plat for the Project is recorded.

IN WITNESS HEREOF, this Agreement has been entered into by and between the Developer and the City as of the date and year first above written.

CITY OF MIDWAY

Attest:



Celeste Johnson, Mayor



Brad Wilson, City Recorder

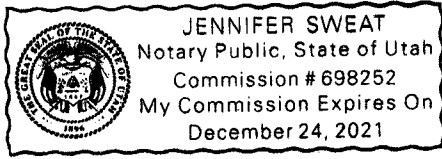


The seal is circular with a double-line border. The outer ring contains the text "MIDWAY CITY CORPORATION" at the top and "MIDWAY, UTAH" at the bottom. In the center, the word "SEAL" is written in large, bold, capital letters.

STATE OF UTAH)
 :SS
COUNTY OF WASATCH)

The foregoing instrument was acknowledged before me this 30 day of July, 2018, by Celeste Johnson, who executed the foregoing instrument in her capacity as the Mayor

of Midway City, Utah, and by Brad Wilson, who executed the foregoing instrument in his capacity as Midway City Recorder.



Jennifer Sweat
NOTARY PUBLIC

~~THE DEVELOPER OF THE REMUND
FARM SUBDIVISION~~

~~Midway Springs, LLC~~

~~_____~~

~~By: _____~~

~~Its: _____~~

see next page

STATE OF UTAH)
 :SS
COUNTY OF WASATCH)

The foregoing instrument was acknowledged before me this ___ day of _____,
2018, by _____, who executed the foregoing instrument in his capacity as the _____
of the Developer, Midway Springs, LLC.

NOTARY PUBLIC

of Midway City, Utah, and by Brad Wilson, who executed the foregoing instrument in his capacity as Midway City Recorder.

See previous page

NOTARY PUBLIC

THE DEVELOPER OF THE REMUND
FARM SUBDIVISION

Midway Springs, LLC

[Handwritten signature of Russell K. Watts]

By: RUSSELL K. WATTS

Its: MAN.

STATE OF UTAH)
 :SS
COUNTY OF WASATCH)

The foregoing instrument was acknowledged before me this 2 day of Aug., 2018, by Russell K. Watts, who executed the foregoing instrument in his capacity as the Manager of the Developer, Midway Springs, LLC.

[Handwritten signature of Barbara Bale]

NOTARY PUBLIC

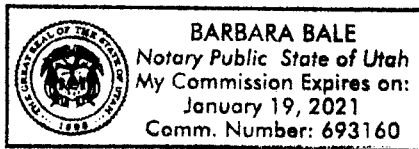




EXHIBIT A

~~EXHIBIT~~ A

 First American Title™	Title Insurance Commitment
	ISSUED BY First American Title Insurance Company
Schedule A	 ATLAS TITLE INSURANCE AGENCY, INC. <small>490 West 100 South Heber City, UT 84032 Ph: 435.657.1220 Fax: 435.657.1225</small>

Issued by: Atlas Title Insurance Agency, Inc.

File No.: 32229

Addr: 490 West 100 South, Heber, UT 84032 **Ph:** (435) 657-1220 **Fax:** (435) 657-1225

Escrow Officer: Kim Smith **Email:** kims@atlastitle.com

Title Officer: Michael H. Brown **Email:** mbrown@atlastitle.com

1. Commitment Date: May 15, 2017 at 7:55 AM

2. Policy (or Policies) to be issued:

POLICY AMOUNT

a. ALTA Owner's Policy of Title Insurance

ALTA Homeowner's Policy of Title Insurance

Proposed Insured: RKW 2006, LLC

b. ALTA Loan Policy of Title Insurance

ALTA Expanded Coverage Residential Loan Policy

Proposed Insured: Lender

Endorsements 8.1-06 and 9

Premium: \$50.00

3. Fee Simple interest in the land described in this Commitment is owned, at the Commitment Date, by

Parcel 1 & 2:

Remund Ranch, Inc., a Utah Corporation

Parcel 3:

Harold S. Remund and Vickie S. Remund, husband and wife as joint tenants

Parcel 4:

Harold Remund and Vickie Remund, as trustees of the Harold and Vickie Remund Family Trust, dated July 17th, 2013

Parcel 5 & 6:

Fitzwilliam Midway, LP

Parcel 7:

Fitzwilliam Five, LLC

Parcel 8:

Fitzwilliam One, LLC

4. The land referred to in this Commitment is described as follows: SEE EXHIBIT "A" ATTACHED HERETO



The following is shown for informational purposes only:

Property Address: Not Yet Assigned, Midway, UT 84049, 190 East 600 North, Midway, UT 84032, 210 East 600 North, Midway, UT 84049, Not Yet Assigned, Midway, UT 84049, 280 East 600 North, Midway, UT 84049, Not Yet Assigned, Midway, UT 84049, 260 East 600 North, Midway, UT 84049, and Not Yet Assigned, Midway, UT 84049 **Tax ID No.:** OMI-0429, OMI-0420, OMI-0420-1, OMI-0420-2, OMI-0402, OMI-0403-1, OMI-0403, and OMI-0402-1

By:  _____

Authorized Countersignature

(This Schedule A valid only when Schedule B is attached.)

	Title Insurance Commitment
	ISSUED BY First American Title Insurance Company
Exhibit A	

File No.: 32229

The Land referred to herein below is situated in the County of Wasatch, State of Utah, and is described as follows:

Parcel 1:

Beginning at a point 54 rods North and 18 rods East of the Southwest corner of the Northwest quarter of Section 35, Township 3 South, Range 4 East, Salt Lake Base and Meridian; thence North 30 rods; thence East 40 rods; thence South 40 rods; thence West 20 rods; thence North 10 rods; thence West 20 rods to the point of beginning.

Subject to the Fence Line Agreement recorded on 16 October 2003 as entry no. 264291, in book 659, at page 17, of Official Records.

Tax id no. OMI-0429**Parcel 2:**

Beginning at a point 20.35 chains West of the Northeast corner of the Northwest quarter South of Section 35, Township 3 South, Range 4 East, Salt Lake Base and Meridian; thence West 4.45 chains; thence South 25' West 9 chains; thence West 5.55 chains; thence South 25' West 10 chains; thence East 10 chains; thence North 28' East 19 chains to the point of beginning.

Less the following parcels:

Commencing West 1468.92 feet from the North quarter corner of Section 35, Township 3 South, Range 5 East, Salt Lake Base and Meridian; and running thence South 0°23' West 129.12 feet; thence North 89°28' West 100 feet; thence North 0°23' East 128.18 feet; thence East 100 feet to the point of beginning.

And:

Commencing West 1468.92 feet and South 0°23' West 129.12 feet from the North quarter corner of Section 35, Township 3 South, Range 4 East, Salt Lake Base and Meridian; and running thence South 0°23' West 100 feet; thence North 89°28' West 100 feet; thence North 0°23' East 100 feet; thence South 89°28' East 100 feet to the point of beginning.

Tax id no. OMI-0420**Parcel 3:**

Commencing West 1468.92 feet from the North quarter corner of Section 35, Township 3 South, Range 4 East, Salt Lake Base and Meridian; and running thence South 0°23' West 129.12 feet; thence North 89°28' West 100 feet; thence North 0°23' East 128.18 feet; thence East 100 feet to the point of beginning.

Tax id no. OMI-0420-1**Parcel 4:**

Commencing West 1468.92 feet and South 0°23' West 129.12 feet from the North quarter corner of Section 35, Township 3 South, Range 4 East, Salt Lake Base and Meridian; and running thence South 0°23' West 100 feet; thence North 89°28' West 100 feet; thence North 0°23' East 100 feet; thence South 89°28' East 100 feet to the point of beginning.

Tax id no. OMI-0420-2

Parcel 5:

Beginning West 363.0 feet and South 03°12' West 194.3 feet from the North quarter corner of Section 35, Township 3 South, Range 4 East, Salt Lake Base and Meridian; and running thence South 03°12' West 520.96 feet; thence North 69°10'16" West 167.58 feet; thence North 89°03'28" West 371.65 feet; thence South 77°31'15" West 192.78 feet; thence North 0°25' East 690.13 feet; thence East 476.88 feet; thence South 194.0 feet; thence East 263.56 feet to the point of beginning.

Tax id no. OMI-0402

Parcel 6:

Beginning West 363 feet and South 03°12' West 715.26 feet from the North quarter corner of Section 35, Township 3 South, Range 4 East, Salt Lake Base and Meridian; thence South 03°12' West 32.74 feet; thence South 62°28' East 69.4 feet; thence South 551.4 feet; thence North 87° West 995.28 feet; thence North 00°25' East 1278.22 feet, more or less, to the North line of Section 35; thence East 318.1 feet, more or less, to the West line of the Remund Dairy, Inc. Property; thence South 00°25' West 690.13 feet; thence North 77°31'15" East 192.78 feet; thence South 89°03'28" East 371.65 feet; thence South 67°10'16" East 167.58 feet to the point of beginning.

Less and excepting therefrom:

Commencing at a point which is the North quarter corner of Section 35, Township 3 South, Range 4 East, Salt Lake Base and Meridian, set in 1995; thence West 1026.573 feet to the true point of beginning; and running thence East 245.00 feet; thence South 00°25'00" West 156.0 feet; thence West 180.00 feet; thence South 00°25'00" West 92.00 feet; thence West 65.00 feet; thence North 00°25'00" East 248.0 feet to and along a fence to the true point of beginning.

Also less and excepting therefrom:

Beginning at a point which is the North quarter corner of Section 35, Township 3 South, Range 4 East, Salt Lake Base and Meridian, set in 1995; thence West 1026.573 feet to the true point of beginning; and running thence South 00°25'00" West 934.00 feet; thence West 283.18 feet; thence North 00°25'00" East 694.00 feet; thence East 188.10 feet; thence North 00°25'00" East 240.00 feet along a fence; thence East 95.07 feet to the true point of beginning.

Tax id no. OMI-0403-1

Parcel 7:

Beginning at a point which is the North quarter corner of Section 35, Township 3 South, Range 4 East, Salt Lake Base and Meridian, set in 1995; thence West 1026.573 feet to the true point of beginning; and running thence South 00°25'00" West 934.00 feet; thence West 283.18 feet; thence North 00°25'00" East 694.00 feet; thence East 188.10 feet; thence North 00°25'00" East 240.00 feet along a fence; thence East 95.07 feet to the true point of beginning.

Tax id no. OMI-0403

Parcel 8:

Commencing at a point which is the North quarter corner of Section 35, Township 3 South, Range 4 East, Salt Lake Base and Meridian, set in 1995; thence West 1026.573 feet to the true point of beginning; and running thence East 245.00 feet; thence South 00°25'00" West 156.0 feet; thence West 180.00 feet; thence South 00°25'00" West 92.00 feet; thence West 65.00 feet; thence North 00°25'00" East 248.00 feet to and along a fence to the true point of beginning.

EXHIBIT A/G



EXHIBIT B



RESOLUTION 2018-08

A RESOLUTION APPROVING A MASTER PLAN AGREEMENT FOR THE REMUND FARM SUBDIVISION

WHEREAS, Utah law authorizes municipalities to enter into master plan and development agreements for the use and development of land within the municipality; and

WHEREAS, the Midway City Council finds it in the public interest of the City of Midway to enter into a master plan agreement with the developer of the proposed Remund Farm Subdivision for the use and development of the land included within that proposed project;


NOW, THEREFORE, be it hereby **RESOLVED** by the City Council of Midway City, Utah, as follows:

Section 1: The Midway City Council approves the master plan agreement attached hereto and authorizes the Mayor of Midway City to execute the agreement on behalf of the City.

Section 2: The effect of this Resolution is subject to all conditions of the land use approval granted by the City for the proposed project.

PASSED AND ADOPTED by the Midway City Council on the 28th day of March 2018.

MIDWAY CITY



Celeste Johnson, Mayor

ATTEST:



Brad Wilson, Recorder



EXHIBIT C



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THIS DOCUMENT IS PREPARED FOR THE PROJECT ONLY. IT IS NOT TO BE USED FOR ANY OTHER PROJECTS OR PURPOSES WITHOUT THE WRITTEN CONSENT OF THE ENGINEER.

PAUL G. BERG

DATE: 12/15/2011

SCALE: 1" = 100'

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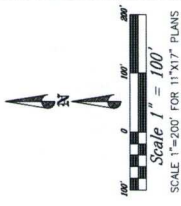
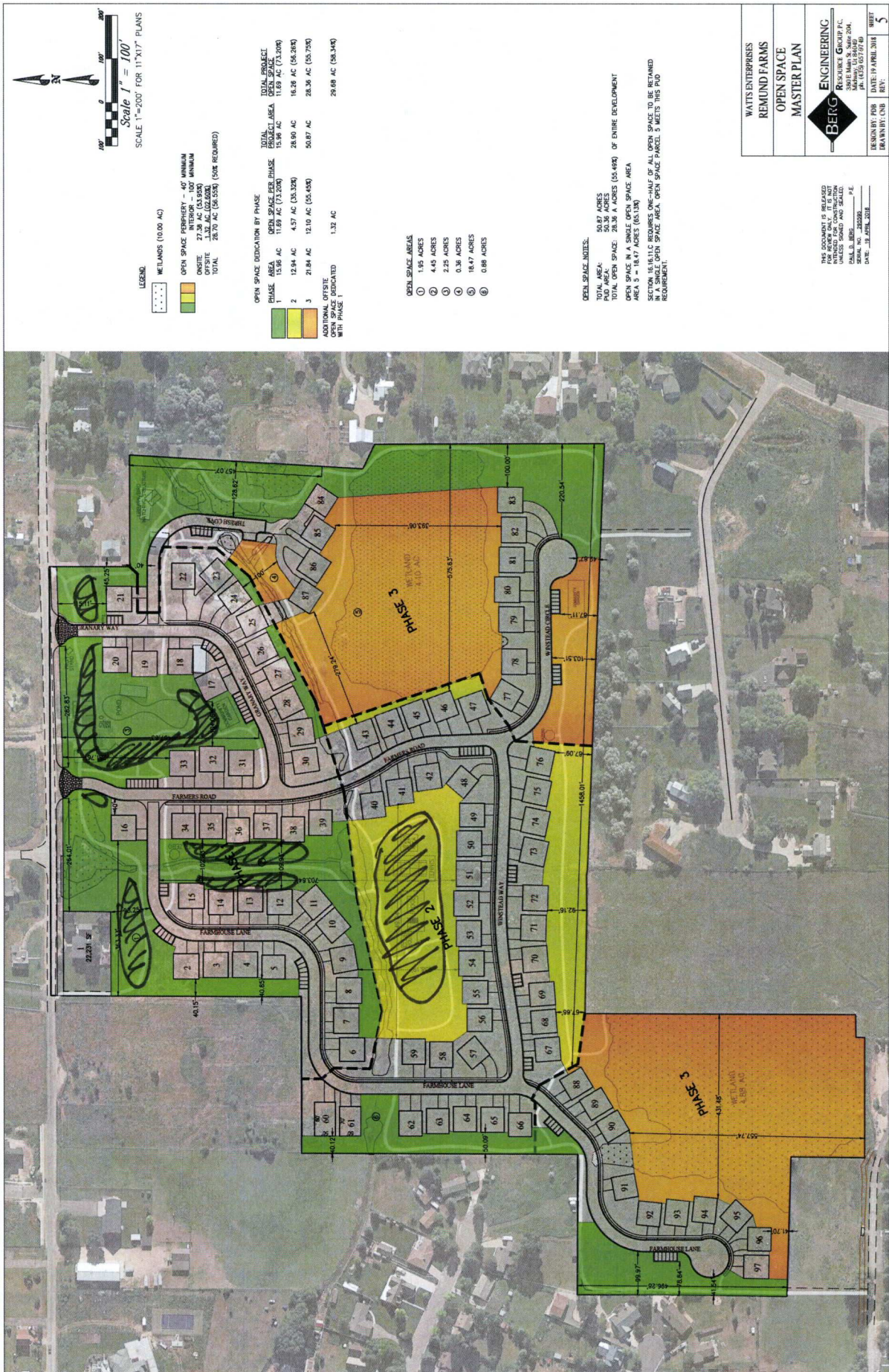
WATTS ENTERPRISES
REMYND FARMS
TOPSOIL STORAGE
EXHIBIT

BERG
ENGINEERING

PAUL G. BERG
REGISTERED PROFESSIONAL ENGINEER
LICENSED IN FLORIDA AND TEXAS
P.E.

DESIGNED BY: PBE
DRAWN BY: CNB
DATE: 12/15/2011
REV: 1

EXHIBIT C



WETLANDS (10.00 AC)
OPEN SPACE PERIMETER - 40' MINIMUM
INTERIOR - 100' MINIMUM
ON SITE 27.38 AC (58.55%)
TOTAL 28.70 AC (58.55%) (50% REQUIRED)

PHASE	AREA AC	OPEN SPACE AC	WETLANDS AC	TOTAL PROJECT AREA AC
1	12.94	4.57	10.00	27.51
2	21.84	12.10	10.00	44.04
3	15.47	0.88	10.00	26.35
TOTAL	50.25	17.55	30.00	97.80

- OPEN SPACE AREAS
- ① 1.95 ACRES
 - ② 4.45 ACRES
 - ③ 2.25 ACRES
 - ④ 0.38 ACRES
 - ⑤ 15.47 ACRES
 - ⑥ 0.88 ACRES

OPEN SPACE NOTES:
TOTAL AREA: 50.25 ACRES
PUD AREA: 50.25 ACRES
TOTAL OPEN SPACE: 28.70 ACRES (58.55%) OF ENTIRE DEVELOPMENT
OPEN SPACE IN A SINGLE OPEN SPACE AREA
AREA 3 = 15.47 ACRES (50.25%)
ALL OPEN SPACE TO BE RETAINED IN A SINGLE OPEN SPACE AREA. OPEN SPACE PARCEL 5 MEETS THIS PUD REQUIREMENT.

WATTS ENTERPRISES
REMUND FARMS
OPEN SPACE
MASTER PLAN

BERG ENGINEERING
10000 W. 10TH AVENUE
DENVER, CO 80231
PH: 303.751.1000
FAX: 303.751.1001
WWW.BERG-ENG.COM

DESIGNED BY: JTB
DATE: 18 APRIL 2011
DRAWN BY: CUB
REV: 5

THIS DOCUMENT IS RELEASED
UNLESS OTHERWISE SPECIFIED
UNLESS SIGNED AND SEALED
BY A LICENSED PROFESSIONAL ENGINEER
SERIAL NO. 228239
DATE: 18 APRIL 2011

EXHIBIT D

728 West 100 South
Heber, UT 84032
www.horrocks.com



Heber Office
Tel: 435.654.2226
Fax: 435.657.1160

February 21, 2018

Midway City
Attn: Michael Henke
75 North 100 West
Midway, Utah 84049

Subject: Midway Springs, Phase 1 Preliminary, and overall Master Plan Approval

Dear Michael:

Horrocks Engineers recently reviewed the above development plans for Master Plan Approval, and Preliminary Approval for Phase 1. The proposed development is located near 200 East and 600 North. The proposed development is 50.75 acres and contains 97 lots. The following issues should be addressed.

Wetlands

The development contracted with BIO-WEST to determine the extent and location of the existing wetlands. The wetland delineation was done in two separate delineations. The first delineation covered ground within Phase 1 and partially covering a portion of the proposed Phase 2 and the north corner of the proposed Phase 3. The second delineation covered the majority of the remaining site. However, the very southern portion of the proposed Phase 3 property, adjacent to the Philpot property, has not been delineated. The developer is currently showing this un-delineated property as wetlands.

The first delineation was submitted to Watts Enterprises through a letter dated, September 23, 2016. The second delineation was submitted to Watts Enterprises through a letter dated, June 1, 2017. Only the first delineation has been submitted to the US Army Corps of Engineers. On December 22, 2016 the US Army Corps of Engineers provided a Jurisdictional Determination for 0.50 acres of palustrine emergent wetlands within the first delineation. The second delineation has currently not been submitted to the US Army Corps of Engineers.

To ensure the accuracy of the delineation, Midway City contracted with Wetland Resources to provide a 3rd party review of the delineations. This 3rd party review determined that a small section of property within the first delineation was most likely wetlands. After working with BIO-WEST an amended document was sent to the US Army Corp of Engineers. In a letter dated, November 29, 2017, the US Army Corp of Engineers concurred with submitted delineation and provided a Jurisdictional Determination of 0.66 acres of palustrine emergent wetlands.

The second delineation has not been submitted to the US Army Corp of Engineers at this time. The developer is proposing to submit a delineation the US Army Corp of Engineers at the time of preliminary approval of the future phases.

Geotechnical Investigation

The geotechnical investigation performed 25 boring pits over the entire site. Soil samples were taken to determine the type of soil and depth of groundwater. Generally, the site is covered with topsoil, a sandy lean clay covering pot rock. The soil depth varies from very shallow to a maximum depth of 3 feet. The general topsoil depth determined from the 25 test pits is 12 inches. Each of the 25 test pits were dug to the surface of pot rock. To determine the groundwater elevation 6 piezometers were installed throughout the site. Each of the piezometers were installed to the top of pot rock.

Hydrogeologic Consulting Services

To better understand the site and predicate the groundwater elevation, and soil classification both above and below the layer of pot rock, the City is contracting with Loughlin Water Associates to conduct a geotechnical investigation below the layer of pot rock. Loughlin will oversee the approximately 10 borings. Each location will be bored to a depth of approximately 8' to 10'. Data within Phase 1 of the proposed development will be available prior to Final City Council approval. More long term data will be collected and analyzed within the future phases of the proposed development.

Phase 1 Environmental Site Assessment

Intermountain GeoEnvironmental Services, Inc. (IGES) has completed an Environmental Site Assessment (ESA) on the property. As stated within the Executive Summary, *"This Phase I ESA was performed in general accordance with the standards set forth in ASTM Document E 1527-13, Standard Practice for Environmental Site Assessment process."* The Executive Summary went on to state, *"No recognized environmental conditions were observed on the subject property or readily observable portions of adjacent properties."* A copy of the full report is available upon request.

Assessment of Surface Water Quality

At the direction of Midway City, Loughlin Water Associates conducted an Assessment of the Surface Water Quality. The assessment was done by collecting water samples from four locations throughout the site. The samples were tested for: Chloride and Total Dissolved Solids, Sulfate concentrations, Oil and grease, Coliform bacteria, E. coli bacteria, Phosphorus, and Ammonia Nitrate. The Conclusion of the report states, *"We selected parameters for laboratory analysis based on constituents that would be expected from a dairy farm and from naturally occurring geothermal water. Overall the results are within the range that we expected."* A copy of the full report is available upon request.

Water

- The proposed development will be served from the Gerber Mahogany Springs zone. The existing line within 600 North is shown as a 6" line. Per the Midway City Master Plan, the 600 North water line should be up-sized to a 12" line. To provide adequate fire flow within the development the water line shall be upsized and connected to the water line within River Road. Impact fees should pay to upsize the water line from an 8" line to a 12" line.
- To provide adequate fire flow within the lower cul-de-sac of the proposed Phase 3, the cul-de-sac road should be upsized to a 10" line or a connection should be made from the east cul-de-sac, at the bottom of the proposed development, to the existing water line within 300 North.
- The fire hydrant spacing shall not exceed 500'.

Irrigation

- The proposed development will connect to existing irrigation line within 600 North and install services with meters according to Midway Irrigation Company standards.
- Prior to final approval it should be determined whether the irrigation line within the proposed Phase 3 should be connected to the existing irrigation line within 300 North.

Roads

- A Traffic Impact Study was completed by Hales Engineering. The study indicates that the peak hour of operation is in the evening between 5:00 and 6:00 pm. The study indicates that each intersection is currently operating at a Level of Service (LOS) A. The study states that "All study intersections are anticipated to operate at LOS A during the evening peak hour with project traffic added." The traffic study was reviewed by a traffic engineer in our Pleasant Grove office. He generally agreed with the finding within traffic study.
- The proposed development will install a modified curb on each side of the road, with a 5' park strip and 5' sidewalk on each side of the road.
- All roads within the proposed development will be private roads.
- 600 North is classified in the Midway City Master Plan as a Local Collector with a right-of-way of 60' and a pavement section of 34'. The rebuilding of 600 North should be addressed.

Trails:

- The proposed subdivision is showing several public and private trails within the development.

Storm Drain

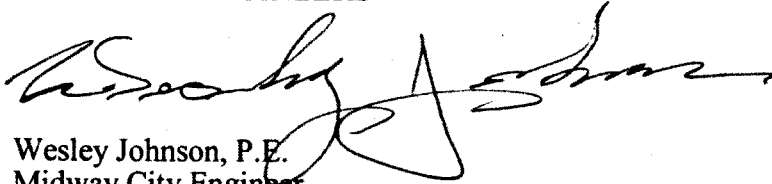
- The storm water system within the proposed development will be a private storm drain systems. All maintenance for the system will be provided by the HOA. Prior to final approval the storm drain calculations should be updated reflecting the PUD status of the development.

Landscaping

- Adjacent to 600 North and along the stream corridors and wetlands the landscaping plan shows a native grass mix. The irrigation system and mowing schedule should be discussed. Are there any maintenance plans for the wetlands?

Please feel free to call our office with any questions.

Sincerely,
HORROCKS ENGINEERS

A handwritten signature in black ink, appearing to read 'Wesley Johnson', written over the typed name below.

Wesley Johnson, P.E.
Midway City Engineer

cc: Paul Berg

Berg Engineering

EXHIBIT D. / FF

June 23, 2017

c/o Paul Berg – Berg Engineering
Watts Enterprises
Russ Watts
5200 South Highland Drive
Salt Lake City, Utah 84117

c. 801.673.5630

Subject: Midway Springs Traffic Impact Study

Dear Russ:

Thank you for inviting Hales Engineering to submit this proposal to complete a traffic impact study (TIS) for your proposed Midway Springs project. The following is an outline of our proposed scope of work and cost estimate to complete this study according to standard traffic impact study guidelines and our communication with Paul Berg. To meet the basic needs of a traffic impact study we propose to only evaluate the existing conditions for the intersections identified within this scope of work.

Scope of Work

Task 1: Project Kick-off and Site Visit

Hales Engineering will make one site visit to photograph and record existing geometric conditions (lane geometry, intersection control, speed limits, etc.) at the site and at the surrounding study intersections. Hales Engineering will also participate in one conference call with you or your representative to discuss the site plan.

Task 2: Data Collection

Hales Engineering will collect data for the weekday morning (7:00 to 9:00 a.m.) and evening (4:00 to 6:00 p.m.) peak hours at the following intersection(s):

- River Road / 600 North
- 200 East / 600 North

Based on the results of the data collection in combination with a review of the project trip generation, the single highest peak hour will be analyzed.



Nearby permanent count stations will be used to identify the seasonal adjustment factors that will be applied to the raw count data to normalize the counts.

Task 3: Trip Generation, Distribution and Assignment

Hales Engineering will perform trip generation for a single site plan to generate weekday and weekend daily and weekday a.m. and p.m. peak hour trips associated with the proposed development. Trip generation data will be calculated based on rates published by the Institute of Transportation Engineers (ITE), 9th Ed. of the *Trip Generation*, 2012.

Based on existing turning movement counts, Hales Engineering will distribute and assign project-generated trips for the single controlling peak hour to the project access points and study intersections for existing 2017 conditions.

Task 4: Existing (2017) Analysis

Hales Engineering will use Synchro / SimTraffic software to evaluate traffic for the controlling a.m. and p.m. peak hour conditions and identify necessary improvements without the proposed project at the following intersection(s):

- River Road / 600 North
- 200 East / 600 North

If any existing deficiencies are identified, we will make the appropriate recommendations for City, County, or State improvements to the system to bring it up to an acceptable level of service standard. The cost(s) for these improvements are typically borne by the jurisdictions that control and maintain these roadways.

Task 5: Existing (2017) Plus Project Analysis

This analysis will use the Synchro / SimTraffic software to determine the impact of a single site plan for the proposed development superimposed on top of the controlling a.m. and p.m. peak hour traffic conditions to identify any resulting improvements at the following intersection(s):

- River Road / 600 North
- 200 East / 600 North
- Midway Springs Accesses (2) / 600 North

If any existing plus project deficiencies are identified, we will make the appropriate recommendations to the system to bring it up to an acceptable level of service standard. The cost(s) for these improvements are typically borne by the developer or are completed in lieu of



paying impact fee assessments, or a combination thereof. These negotiations are typically between the developer and the municipality for which they are developing within.

Task 6: Report Preparation

Hales Engineering will summarize results of our study in a final report including the necessary text, tables and figures. Following completion of the report we will submit one (1) electronic version for your use and distribution. The final report will include key findings within our conclusions and recommendations on potential mitigation measures.

Cost Estimate

We anticipate that the breakdown of the cost to complete the six (6) tasks identified in the traffic impact study scope of work will be **\$3,800**.

Meeting Attendance/Out of Scope Work

Predicting the number of meetings and time commitments required to move a traffic impact study through the approval process varies from project to project. Therefore, in the best interest of our clients, we have not included any meetings beyond those identified in the scope of work. If additional meetings are necessary, they will be billed separately on a time and materials basis and will be attended by representatives of Hales Engineering only upon prior written or electronic approval given by you or a designated representative.

Schedule

If you agree to the terms and conditions of this letter, please countersign below. We will begin work after we have received the written authorization to proceed. We will then complete the report for your review within two weeks, if not sooner. This letter will serve as our contract along with the attached Standard Terms and Conditions.



Agreement

Invoices for work completed will be submitted monthly for payment.

Again, thank you for asking Hales Engineering to prepare this proposal. We look forward to working with you on this project. If you have any questions, please feel free to call.

Sincerely,
HALES ENGINEERING, LLC

A handwritten signature in black ink that reads "Ryan R. Hales".

Ryan Hales, PE, PTOE, AICP
Principal / Owner

Accepted by: _____

Signature: _____

Representing: _____

Date: _____

P1598-UT

HALES  ENGINEERING
innovative transportation solutions

STANDARD TERMS AND CONDITIONS

These STANDARD TERMS AND CONDITIONS apply to, and are made part of, the attached letter agreement ("Agreement") by and between HALES ENGINEERING, LLC, a Utah company, ("Consultant"), and the "Client" referenced in the signature block on the Agreement.

WITNESSETH THAT, in consideration of the premises and covenants hereinafter set forth, the parties agree as follows:

1. **Data to Be Furnished.** All information, data, reports, records and maps with respect to the Project which are available to Client and which Client deems reasonably necessary for the performance of work set forth in the Agreement, shall be furnished to Consultant without charge by Client.

2. **Personnel.** Consultant agrees that it will employ, at its own expense, all personnel necessary to perform the services required by this Agreement and in no event, shall such personnel be the employees of Client. All the services required hereunder shall be performed by Consultant and all personnel engaged therein shall be fully qualified under applicable federal, state and local law to undertake the work performed by them. Consultant assumes full and sole responsibility for the payment of all compensation and expenses of such personnel and for all state and federal income tax, unemployment insurance, Social Security, disability insurance and other applicable withholdings.

3. **Compensation.** Client shall pay Consultant an amount not to exceed the sum noted in the Agreement as consideration for the services described. Consultant shall submit invoices to the Client monthly. Client agrees to pay the invoices within 30 days of receipt. If payment is not received within 60 days, Consultant may, at its sole discretion, elect to stop work until payments are received. In that case, Consultant will notify Client that work has ceased. Client also agrees to pay all costs, including attorney's fees and court costs, incurred by Consultant to collect on past due invoices. If Client fails to make any payment due Consultant for services and expenses within thirty (30) days after receipt of Consultant's statement, the amounts due Consultant will be increased at the rate of 1.5% per month from due date identified on invoice.

4. **Ownership of Documents.** The work papers, drawings, photographs and any other written or graphic material, hereinafter materials, prepared by Consultant for this Project are instruments of the Consultant's service for use solely with respect to this Project and, unless otherwise provided, the Consultant shall be deemed the author of these documents and shall retain all common law, statutory and other reserved rights, including the copyright. The Client shall be permitted to retain copies, including reproducible copies of Consultant's materials for information and reference in connection with the Client's use on the Project. The Client or others shall not use the Consultant's materials on other projects, or for changes to this Project without the express written consent of the Consultant. Submission or distribution of documents to meet official regulatory requirements or for similar purposes in connection with the Project is not to be construed as publication or violation of copyright.

5. **Attorneys' Fees/Arbitration.** In the event that either party brings an action or claim arising out of or in connection with this Agreement, the prevailing party shall be entitled to reasonable and actual attorneys' fees incurred, as well as costs incurred, as well as expert witness fees. All disputes shall be resolved by way of binding Arbitration, which shall take place in Salt Lake City, Utah utilizing a single Arbitrator. Arbitration shall take place under the auspices of either the American Arbitration Association or JAMS, at the election of the party commencing Arbitration. The prevailing party shall also be entitled to be reimbursed for any and all Arbitration expenses incurred.

6. **Limitation of Liability.** Unless Client and Consultant otherwise agree in writing in consideration for an increase in Consultant's fee, Client agrees to limit Consultant's liability to Client to the sum of the Consultant's fee for any loss or damage, including but not limited to special and consequential damages arising out of or in connection with the performance of services or any other cause, including Consultant's professional negligent acts, errors, or omissions, and Client hereby releases and holds harmless Consultant from any liability above such amount.

7. **Modification/Termination.** No waiver, alteration, modification or termination of this Agreement shall be valid unless made in writing. This agreement may be terminated for convenience and without cause by either party upon seven days' written notice.

8. **Governing Law.** This Agreement shall be governed by and constructed in accordance with the laws of the State of Utah.

9. **Entire Agreement.** This Agreement sets forth the entire understanding between the parties as to the subject matter of this Agreement and merges all prior discussions, negotiations, letters of understanding or other promises, whether oral or in writing.

EXHIBIT E



P.O. Box 499
Lehi, UT 84043

Phone: 801-523-7900
Fax: 801-523-7911

To: Watts Development	Contact: Russ Watts
Address: Salt Lake City	Phone:
	Fax:
Project Name: Remund Farms 4' Road Width Credit	Bid Number: 18-0709
Project Location: Remund Farms, Midway, UT	Bid Date: 7/9/2018

Item #	Item Description	Estimated Quantity	Unit	Unit Price	Total Price
	Imported 12" Granular Fill To Build Road To Subgrade	10,530.00	SF	\$1.10	\$11,583.00
	12" Granular Fill	10,530.00	SF	\$1.10	\$11,583.00
	6" Roadbase	10,530.00	SF	\$0.75	\$7,897.50
	3" Asphalt Paving	10,530.00	SF	\$1.60	\$16,848.00

Total Bid Price: \$47,911.50

Notes:

- Unit pricing for the proposed road width difference from 30' to 26'.

<p>ACCEPTED: The above prices, specifications and conditions are satisfactory and are hereby accepted.</p> <p>Buyer: _____</p> <p>Signature: _____</p> <p>Date of Acceptance: _____</p>	<p>CONFIRMED: BD Bush Excavation</p> <p>Authorized Signature: _____</p> <p>Estimator: _____</p>
---	---

EXHIBIT F



June 23, 2017

c/o Paul Berg – Berg Engineering
Watts Enterprises
Russ Watts
5200 South Highland Drive
Salt Lake City, Utah 84117

c. 801.673.5630

Subject: Midway Springs Traffic Impact Study

Dear Russ:

Thank you for inviting Hales Engineering to submit this proposal to complete a traffic impact study (TIS) for your proposed Midway Springs project. The following is an outline of our proposed scope of work and cost estimate to complete this study according to standard traffic impact study guidelines and our communication with Paul Berg. To meet the basic needs of a traffic impact study we propose to only evaluate the existing conditions for the intersections identified within this scope of work.

Scope of Work

Task 1: Project Kick-off and Site Visit

Hales Engineering will make one site visit to photograph and record existing geometric conditions (lane geometry, intersection control, speed limits, etc.) at the site and at the surrounding study intersections. Hales Engineering will also participate in one conference call with you or your representative to discuss the site plan.

Task 2: Data Collection

Hales Engineering will collect data for the weekday morning (7:00 to 9:00 a.m.) and evening (4:00 to 6:00 p.m.) peak hours at the following intersection(s):

- River Road / 600 North
- 200 East / 600 North

Based on the results of the data collection in combination with a review of the project trip generation, the single highest peak hour will be analyzed.



Nearby permanent count stations will be used to identify the seasonal adjustment factors that will be applied to the raw count data to normalize the counts.

Task 3: Trip Generation, Distribution and Assignment

Hales Engineering will perform trip generation for a single site plan to generate weekday and weekend daily and weekday a.m. and p.m. peak hour trips associated with the proposed development. Trip generation data will be calculated based on rates published by the Institute of Transportation Engineers (ITE), 9th Ed. of the *Trip Generation*, 2012.

Based on existing turning movement counts, Hales Engineering will distribute and assign project-generated trips for the single controlling peak hour to the project access points and study intersections for existing 2017 conditions.

Task 4: Existing (2017) Analysis

Hales Engineering will use Synchro / SimTraffic software to evaluate traffic for the controlling a.m. and p.m. peak hour conditions and identify necessary improvements without the proposed project at the following intersection(s):

- River Road / 600 North
- 200 East / 600 North

If any existing deficiencies are identified, we will make the appropriate recommendations for City, County, or State improvements to the system to bring it up to an acceptable level of service standard. The cost(s) for these improvements are typically borne by the jurisdictions that control and maintain these roadways.

Task 5: Existing (2017) Plus Project Analysis

This analysis will use the Synchro / SimTraffic software to determine the impact of a single site plan for the proposed development superimposed on top of the controlling a.m. and p.m. peak hour traffic conditions to identify any resulting improvements at the following intersection(s):

- River Road / 600 North
- 200 East / 600 North
- Midway Springs Accesses (2) / 600 North

If any existing plus project deficiencies are identified, we will make the appropriate recommendations to the system to bring it up to an acceptable level of service standard. The cost(s) for these improvements are typically borne by the developer or are completed in lieu of



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We anticipate that the breakdown of the cost to complete the six (6) tasks identified in the traffic impact study scope of work will be **\$3,800**.

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Sincerely,
HALES ENGINEERING, LLC

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Ryan Hales, PE, PTOE, AICP
Principal / Owner

Accepted by: _____

Signature: _____

Representing: _____

Date: _____

P1598-UT

HALES ENGINEERING

innovative transportation solutions

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EXHIBIT G

EXHIBIT A/G



EXHIBIT H

EXHIBIT H

Ent 456063 Bk 1233 Pg 1439

**A CULTURAL RESOURCES INVENTORY OF THE
MIDWAY SPRINGS PROJECT, IN WASATCH COUNTY, UTAH**

by:

Wendy Simmons Johnson
Principal Investigator

Prepared for:

Bio-West, Inc.
1063 W 1400 N
Logan, Utah 84321

Prepared by:

Commonwealth Heritage Group, Inc.
3670 Quincy Avenue, Suite 203
Ogden, Utah 84403

Utah Archaeological Survey Permit No. 58

Utah State Antiquities Project No. U16HP0450 p\

Cultural Resources Report No. 2139

July 8, 2016

ABSTRACT

In May 2016, Bio-West of Logan, Utah, requested that Commonwealth Heritage Group, Inc. (Commonwealth) conduct a cultural resources inventory of the proposed Midway Springs Project in Wasatch County, Utah. Since this project would affect waters of the United States, this project must meet requirements of Section 404 of the Clean Water Act, and therefore, Bio-West is seeking a permit from the U.S. Army Corps of Engineers, Sacramento District. The project is located in T. 3S, R. 4E, Sec 35 on the USGS Quadrangle Heber City, Utah (1999). The purpose of this survey is to identify, record and evaluate cultural resources within the project area for their eligibility to the National Register of Historic Places.

The inventory of the current project resulted in the recordation of one Not Eligible turn-of-the-century farmstead. Therefore, Commonwealth recommends that construction of this project will have **No Adverse Effect** to historic properties. There is medium to high potential for privy, midden, and burn deposits at this farmstead site. Additionally there is little to moderate potential at other areas of the project for historic or prehistoric buried cultural resources.

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PROJECT PURPOSE

In May 2016, Bio-West, Inc., of Logan, Utah (Bio-West), requested that Commonwealth Heritage Group, Inc. (Commonwealth) conduct a cultural resources inventory of the proposed Midway Springs Project in Wasatch County, Utah. Since this project would affect waters of the United States, this project must meet requirements of Section 404 of the Clean Water Act, and therefore, Bio-West is seeking a permit from the U.S. Army Corps of Engineers, Sacramento District. The project is located in T. 3S, R. 4E, Sec 35 on the USGS Quadrangle Heber City, Utah (1999). (Figures 1-3). The purpose of this survey is to identify, record and evaluate cultural resources within the project area for their eligibility to the National Register of Historic Places (NRHP). Fieldwork was conducted under Archaeological Survey Permit No. 58, issued by the Public Lands Policy Coordination Office.

PROJECT DESCRIPTION

Watts Enterprises proposes to build 97 housing units for the Midway Springs project. Midway Springs is proposed as a family oriented, aesthetically pleasing, safe walkable neighborhood. Sensitive lands and water courses will be preserved in open space areas. A system of trails will be built throughout the development including links to 250 North and 600 North. A clubhouse, pool, children's play area and a pickle ball court will provide a family oriented development. The development will be well landscaped with open space areas and landscape buffers between lots and next to trails. The 600 North trail will be set back from the road providing a safer trail. Bulldozers will be used to level ground and back/trackshoes will be brought in to excavate basements and the pool. There will be no basements, since these are all patio homes that will be constructed slightly above existing grade.

ENVIRONMENT

The proposed project area is located within the Salt Lake Valley in northern Utah. The project area lies mainly within agricultural fields with an old homestead in the northeast corner of the project area. There are a number of invasive plant species present in the area including agricultural grasses and wetland species. In many areas throughout the project there is almost no ground visibility, due to thick introduced grasses. Cultural disturbances include plowing, seeding, ditch digging, road construction and home and outbuilding construction. Additionally, the wetlands area has been impacted by the uncapped, flowing wellhead in the northeast portion of the site. Natural disturbances include some wind and water erosion. The elevation of the project area is approximately 4,215 feet a.s.l. Topography is fairly flat but slopes gently to the wetlands area. Sediments are brown silty loams with a few gravels.

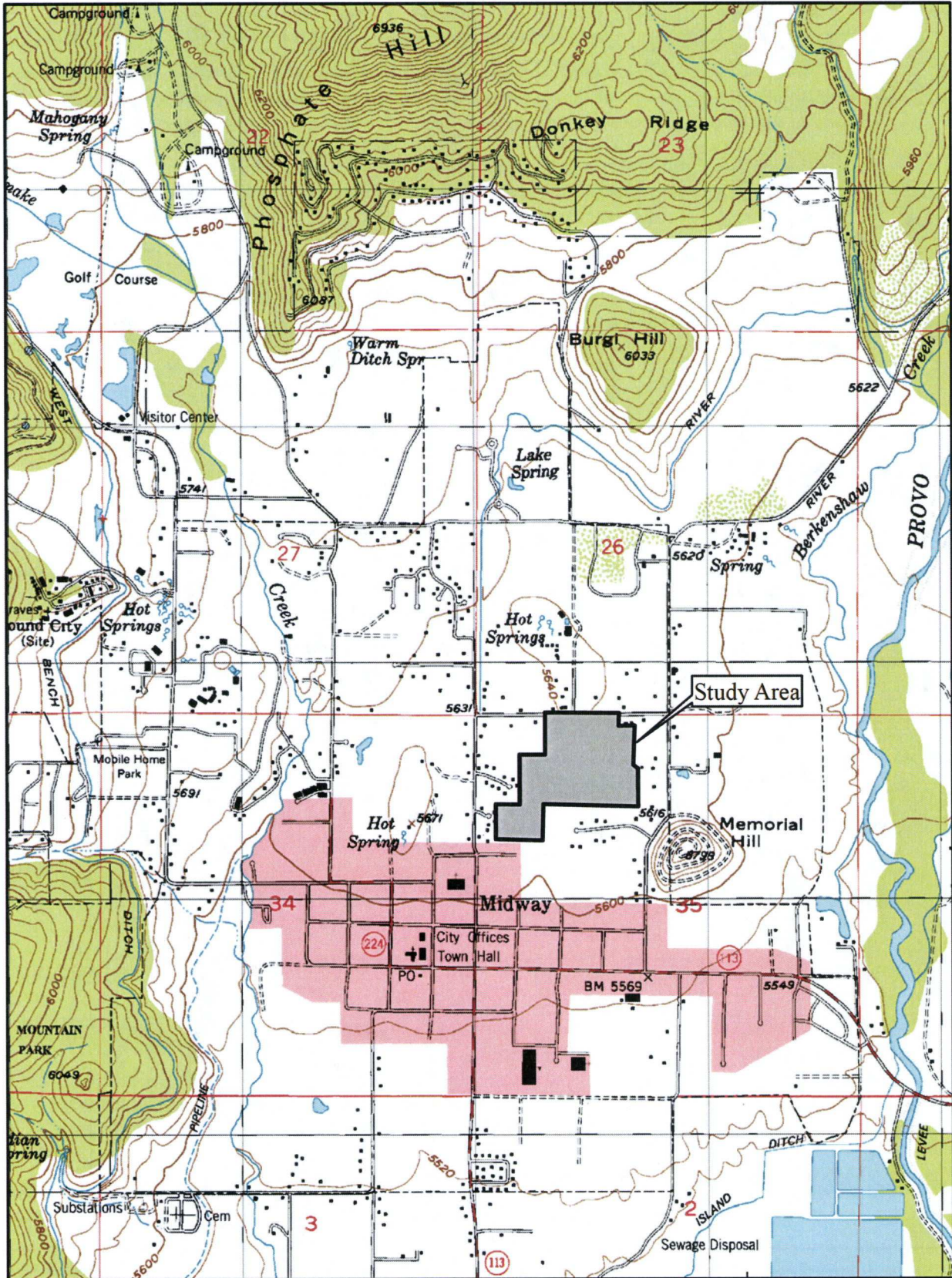


Figure 1. Study Area for the Midway Springs Project, Wasatch County, Utah. Taken from the USGS 7.5' Quadrangle Heber, Utah (1998)

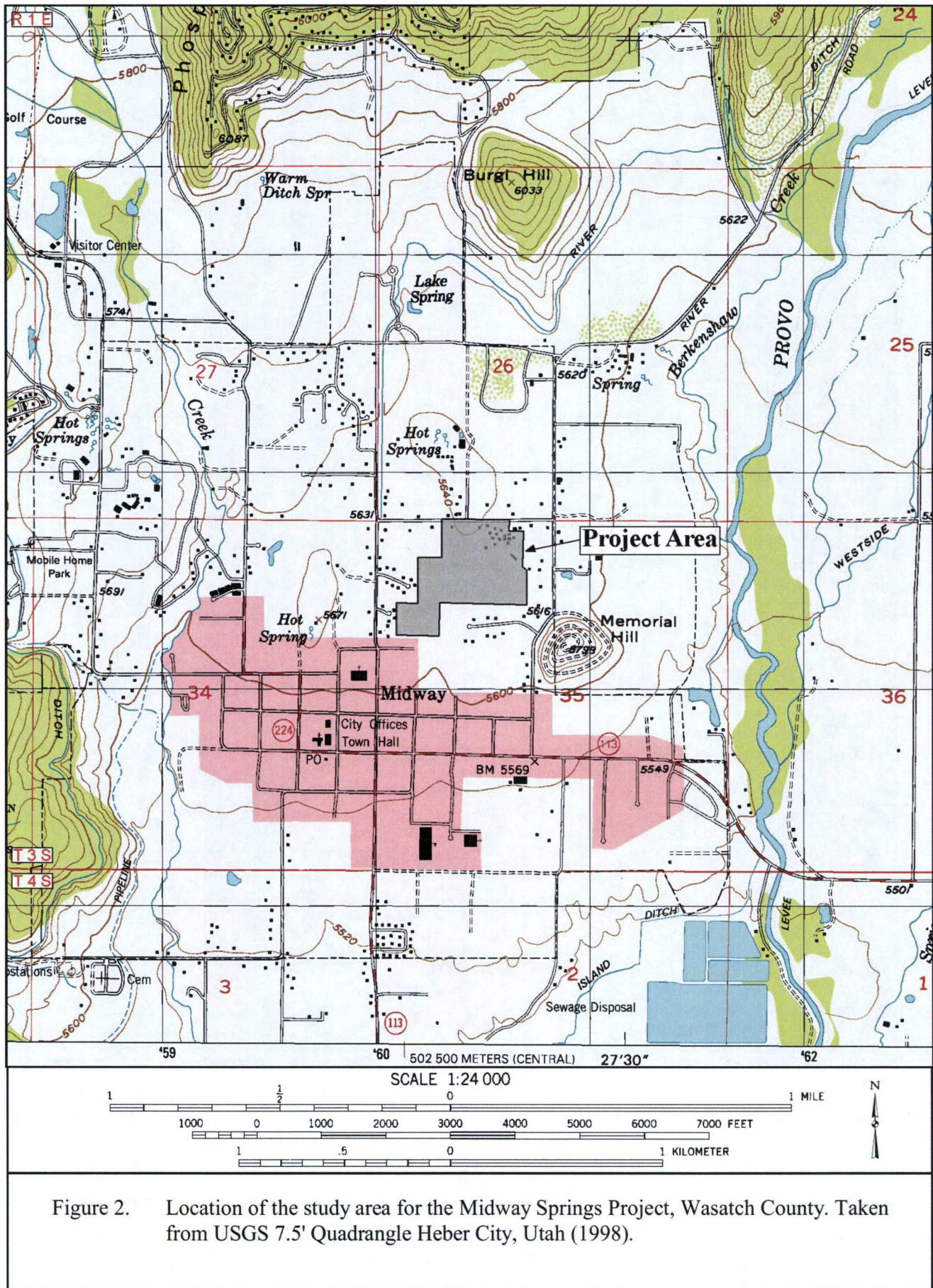


Figure 2. Location of the study area for the Midway Springs Project, Wasatch County. Taken from USGS 7.5' Quadrangle Heber City, Utah (1998).

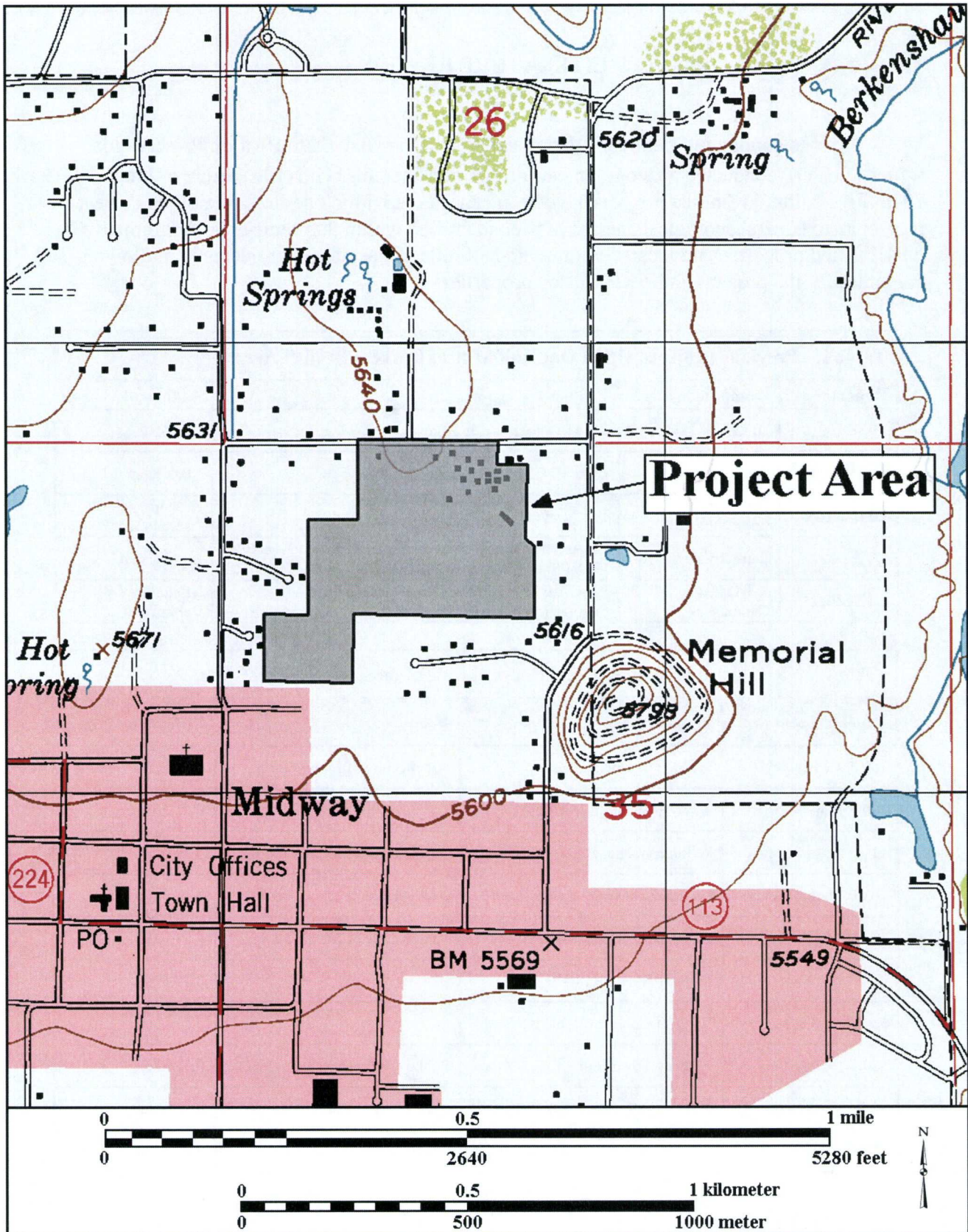


Figure 3. Close-up of the study area for the Midway Springs Project, Wasatch County. Taken from USGS 7.5' Quadrangle Heber City, Utah (1998).

LITERATURE REVIEW

Prior to conducting fieldwork, Arie LeeFlang, of the Utah State Historic Preservation Office (SHPO), conducted a Geographical Information Systems (GIS) file search on June 3, 2016. Five cultural resource projects have been carried out within one-half mile of the current project area. No archaeological sites have been identified within that same area. Additionally 10 NRHP listed properties are located within one-half mile of the current project area. Following are tables for the projects and NRHP listed properties:

Report #	Company	Project	Author(s)
U13UT0019	UDOT	SR-113 Charleston to Midway	Rich Allen
U15TD0711	Tetra Tech	Class III CRI, UT2 Zermatt, Midway	Mark Krapinski
U11GN1005	Pentacore Engineering	Lot 5 Level I Inventory in Midway	Kristoper Carambelas
U12EP0509	Earth Touch	An Archaeological Assessment of a Proposed T-Mobile USA Project, Midway Main Street/UT-SI04117D	Lorna Billat
U12KZ0221	Kristopher Carambelas	Level 1 CRI of Lot 10 in the Swiss Paradise Subdivision, Midway	Kristopher Carambelas

Address in Midway	Property Name	Notes	Distance to Project
180 N Center	William Coleman House	Architecture of John Watkins	0.11 miles
270 E Main Street	Attewall Wootton Jr. House		0.21 miles
110 E Main Street	William Bonner House	Architecture of John Watkins	0.17 miles
103 E Main Street	George Bonner Sr. House	Architecture of John Watkins	0.16 miles
90 E Main Street	George Bonner Jr. House	Architecture of John Watkins	0.17 miles
71 E Main Street	Midway Social Hall		0.17 miles
5 E Main Street	Watkins-Coleman House		0.2 miles
120 W Main Street	Midway Town Hall	Public Works Building	0.32 miles
22 W Hundred Street	John and Margaret Watkins House	Architecture of John Watkins	0.32 miles
102 W 100 N	Burgener-Boss Farmstead		0.27 miles

GLO survey plats for the area were consulted prior to the commencement of fieldwork and no cultural resource features were located within one-half mile of the current project area.

FIELD METHODOLOGY

The entire project area was surveyed by John Rasmussen and the author on June 1, 2016, in transects spaced no more than 15 m apart. USGS topographic maps, project maps, and aerial photographs provided by Bio-West were used to locate the project area. The project is located in T. 3N, R. 4E, Sec 35 on the USGS Quadrangle Heber City, Utah (1999). Approximately 50 acres were surveyed during this inventory.

RESULTS

In May 2016, Bio-West requested a cultural resources inventory of the Midway Springs Project in Wasatch County, Utah. One site, the Remund Farmstead (380 E 600 N, Midway) was recorded during this project (Figure 4).

380 E 600 N – Remund Farmstead

The Remund Farmstead existed as an active dairy farm until just a few years ago. Google Earth maps show many more buildings than are currently present. The property, today, consists of a residence, granary/barn, feeder barn, cattle sheds, and two modern sheds. These are described below.

Residence

This is a stone (pot-rock) cross-wing structure constructed in 1892 by Fredrick Remund. Early in the history of the city, this rock was frequently used in building construction. A major addition was constructed on the east side of the home in 1961 (Midway Historic Landmarks 2016). The forward facing gable or middle section of the building was constructed in 1892 and the stairs leading to the upper level were on the outside of the building. The *Walking Tour of Midway* pamphlet indicates that the west wing was built a few years later (Midway Historic Landmarks 2016).

The two wings are constructed of local pot rock, a local limestone material laid in a coursed rubble masonry pattern with tooled mortar joint. There is no entrance on the front façade; however, four windows are present. Two of the windows are located in the front facing gable of the original portion of the cross wing. One on each floor. These were likely one-over-one double-hung windows, but have been replaced with aluminum sliders. In spite of the change in windows, the window openings remain the original size and the original wooden pediment and sills are still present. There are two side-by-side windows on the cross gable of the house.

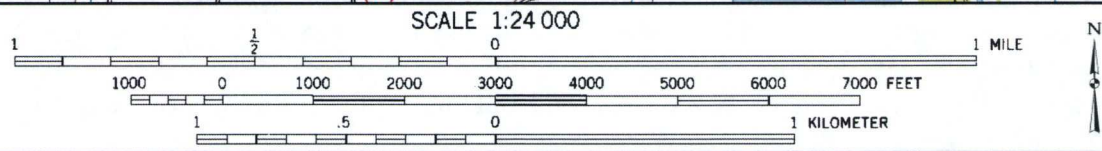
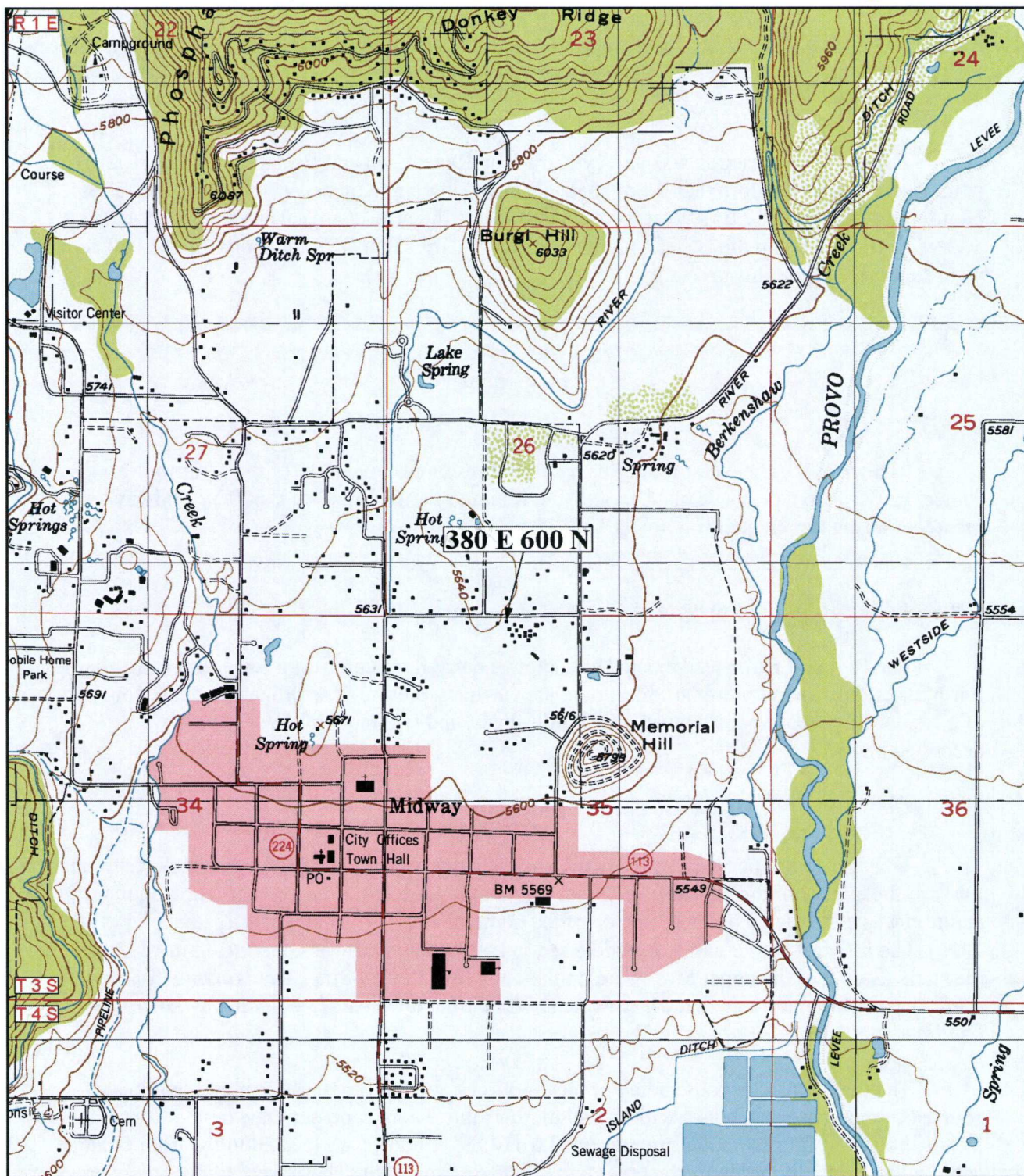


Figure 4. Location of the property at 380 E 600 N, Midway, Wasatch County, Utah. Taken from USGS 7.5' Quadrangle Heber City, Utah (1998).

One appears to hold the original window and the second has been replaced with the aluminum slider. The roof is covered with metal roofing and the eaves are overhanging.

The 1960s addition, located on the east side of the home is a side-facing gable constructed on a concrete foundation. The lower half of the main floor is constructed of unshaped local pot rock with wooden vertical siding above that. The gable end is enclosed with plaster in a Tudor half-timbered style with a balcony extending the length of the open gable end. The main entrance is a sliding-glass door flanked by two large aluminum windows with a fixed pane center and sliding windows on either side. This door is accessed by seven concrete steps leading to a rectangular shaped porch. The porch and stairs are surrounded by wrought iron railings. There is a wooden door with a single fixed-pane window in the gable end. A red brick chimney extends up through the roof of this addition.

Outbuilding 1

There are three historic outbuildings still standing along with two modern metal outbuildings. The first building (Outbuilding 1) appears to have originally been a pot rock gable-roof granary structure. The gable ends are enclosed in horizontal drop siding. There are two doors into the granary, on the east-façade; one just below ground level, and one about half way up the building. Wooden steps lead to both doors. The upper door is of plywood and the lower one is constructed of wooden planks.

There are three wooden shed roof additions; one on either side of the rock building and one that extends the length of the rear building. The additions on the north and south sides of the building appear to have been constructed early, possibly at the same time as the rock granary as evidenced by the slow-moving rotary saw cuts in the wood. The north addition is situated on a rock foundation and the front and side walls are constructed of drop siding. There are two door openings in the front, one regular door, and one larger door, possibly for equipment. The back wall is constructed of vertical board and batten siding and there is one six-pane fixed-sash window. There are two side-by side six-light fixed-sash windows in the north wall of the structure with many of the window panes and wooden dividers missing. The east shed-roof addition is constructed of horizontal drop siding and it appears that there are two large doors on the front. The side wall shows two windows covered up with plywood. The rafter trails are exposed and these exhibit slow-moving rotary saw cuts. The rear shed-roof addition is a 1920s balloon-frame construction, and the back wall is mostly open. The roof of the building was originally built with wooden shingles, was later covered with corrugated metal and, still later, with corrugated metal plates. Portions of the most recent plates have begun to break away from the roof.

Outbuilding 2

The second outbuilding appears to be a feeder barn. It is a wooden gable-roof structure with a loft in the gable. In the north end of the structure is a large opening likely for loading hay or other feed. Portions of the side walls of the building have already been torn down and what remains appears to be the loft and roof with wooden beams holding it up.

Outbuilding 3

The third historic building consists of two connected cow sheds. The sheds were constructed of wood with horizontal plank siding on a concrete foundation. The lower part of the south side of the shed(s) is open for cattle to shelter. The roof is covered with corrugated metal siding as are some of the sides of the building.

Modern Outbuildings

The two modern sheds are shed roof structures constructed of wooden beams with corrugated metal on the roofs and top sides of the structures.

Remund Farmstead History

The residence at 380 East 600 North was constructed by Frederick Remund (alternate spelling Friedrich Reymund) in 1886 (Wasatch County Treasurer's Office 2016; Remund n.d.). Frederick Remund was born March 30, 1853 in Bumpliz, Bern, Switzerland (Salt Lake County Death Records 1908-1949). His parents were Christian and Margaritha Hofman Remund (Remund n.d.). Frederick learned the trade of a Shoemaker and worked in Geneva, Switzerland and France. In 1874, Frederick moved back home and worked with a man named John Zwahlen. John was a member of the Church of Jesus Christ of Latter-day Saints (Mormons), and soon Frederick was converted to this church. The two men decided to travel to Salt Lake City where they could join the other church members gathering in the Utah Territory (Remund n.d.).

Frederick and John arrived in Salt Lake City on July 18, 1875 (Remund n.d.). Speaking no English the two men sought out other German-speaking members of the church and settled in Richfield, Sevier County, Utah. There they met their wives. Frederick married Anna Elizabeth Ott, also from Switzerland, on January 24, 1876 (Remund n.d.). The newlyweds lived in Richfield for nine years, where three of their children were born; Frederick, William Paul and Albert. Around 1884, the Remund family moved to Midway, a high Wasatch Mountains valley, where other Swiss immigrants had settled (Remund n.d.). The family purchased a small home and lived there until Frederick built a home on his farmstead, near the "Hot Pots." Frederick's life story describes how his "children carried the rocks and did other jobs to help build this house." Frederick also filed on 80 acres just north of town in an area known as "Dutch Fields" (GLO 2016; Remund n.d.). Frederick dug ditches and worked very hard to make a living as a farmer in Midway (Remund n.d.). Frederick and Anna had seven more children while living in Midway; Maria Pauline, Mary Matilda, Henry Arnold, Joseph Hyrum, Carl Ludwig (Charles), Annie Elizabeth and Lydia Lina.

In 1909, Frederick's wife, Anna Elizabeth, died in Provo of cancer. Frederick later married Theresa Lohr, and after her death married Elizabeth Baer. Sometime after 1911, Frederick sold his farm to Fred Jr. and move to Salt Lake City (Remund n.d.). While living in Salt Lake, he worked as a shoemaker and a janitor. Frederick Remund died on December 27, 1935 in Salt Lake City, Utah and was buried in Midway, Utah.

Fredrick Remund Jr. was born on May 6, 1877 in Richmond, Sevier County, Utah. He married Anna Elfreda Jaspersen on October 25, 1905 in Salt Lake City, Utah. Together they had six children; Karl F. Clive O, Grace, George W. Carol and Grant (US Census 1930). The youngest son, Grant, took over the farm from his father (Marilyn Larsen personal communication 2016). Paul "Grant" Remund was born on December 14, 1918 (US Social Security Claims Index). He married Iva Don Shumway on July 23, 1941 (Ancestry.com 2016). Together they had five children; Paul, Richard, Ranae, Roy and Harold. Grant died on October 31, 2003 and was buried in the Midway Cemetery. Iva Don lived in the old family home until her death on August 18, 2008 (Findagrave 2016). Their two sons, Harold and Roy, ran a dairy farm on the property until about 2013, when the family sold the property (Marilyn Larson, Personal Communication 2016).

NRHP RECOMMENDATIONS

The Farmstead at 380 E 600 N was evaluated for significance based on NRHP guidelines. Following are the NRHP Criteria followed in determining the eligibility of properties as set forth in 36 CFR 60.4:

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

(A) that are associated with events that have made a significant contribution to the broad patterns of our history; or

*(B) that are associated with the lives of persons significant in our past; or
(C) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or*

(D) that have yielded, or may be likely to yield, information important in prehistory or history.

Following is the site recommendation based upon the Criteria listed above.

380 E 600 N – Remund Farmstead

This site consists of a farmstead with a residence, three historic outbuildings and two modern outbuildings. This 1890s farmstead retains integrity of location, materials, feeling and association. However the residence lacks integrity of design and workmanship due to the 1960s addition on the west side of the home. Because the residence lacks integrity, this farmstead is recommended **Not Eligible** to the NRHP under any criteria.

RECOMMENDATION OF EFFECT

The inventory of the current project resulted in the recordation of one Not Eligible turn-of-the century farmstead. Therefore, Commonwealth recommends that construction of this project will have **No Adverse Effect** to historic properties. There is medium to high potential for privy, midden, and burn deposits at this site; however, little potential in the remaining project area.

This investigation was conducted with techniques that are considered adequate for evaluating cultural resources that are available for visual inspection on the ground surface and could be adversely impacted by the proposed project. However, there is the unlikely possibility of subsurface cultural deposits within the project area. Should such resources be discovered during the project, a report should be made immediately to the U.S. Army Corps of Engineers Regulatory Office located in Bountiful, Utah (801-295-8380).

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Wasatch County Treasurer's Office

2016 Online tax assessment records for 380 E 600 N, Midway Utah. Document accessed 31 May <<http://www.wasatch.utah.gov/Services/Property-Tax-Lookup>>

APPENDIX A

VITA

WENDY SIMMONS JOHNSON

Principal Investigator
Commonwealth Heritage Group, Inc.
3670 Quincy Avenue, Suite 203
Ogden, Utah 84403
(801) 394-0013

EDUCATION

BA	International Relations	Brigham Young University, Provo, Utah	1990
MA	Anthropology	Brigham Young University, Provo, Utah	1992

EXPERIENCE PROFILE

2002-
2016 Principal Investigator, Sagebrush Consultants, now known as Commonwealth Heritage Group, Inc. Supervisor: Michael R. Polk, Archaeologist/ Principal Investigator. Contract archaeological work on various projects in the Intermountain area. Duties include; project and field supervision, site evaluation, data collection, file searches, research and documentation of historic sites and events, participation in all phases of final report preparation, editing, drafting, ground survey of proposed project areas, the assessment of cultural resources within project scope, UHCS Reconnaissance Level Surveys, preparation of 106 site information forms, bids, cost proposals, MOA's, PA's, Specialist Work Plans, Treatment Plans, Research designs, other NEPA compliance documents, sections of management and mitigation plans, Pathfinder and GIS capabilities, photography, excavation and mapping of both prehistoric and historic sites, laboratory analysis and air photo interpretation.

1996-
2002 Weber County Elections Administrator, Ogden, Utah. Supervisor: Roger Brunner, Chief Deputy Clerk/Auditor. Supervised all aspects of elections and voter registration. Duties included; supervising staff of ten, preparation of public outreach material, training election judges, maintaining voter registration list, complying with all state and federal code in running elections.

1993-
1996 Senior Archaeologist, Sagebrush Archaeological Consultants, Ogden, Utah. Supervisor: Michael R. Polk, Archaeologist/Principal Investigator. Contract archaeological work on various projects in the Intermountain area. Duties include; project and field supervision, site evaluation, data collection, file searches, research and documentation of historic sites and events, participation in all phases of final report preparation.

SELECTED PUBLICATIONS AND REPORTS

2013 Paper Presented at SAA in Honolulu, Hawaii. *An Underground Store, The Skull Valley Goshute and Red Ink*. 78th Society for American Archaeology 78th Annual Meeting April, 2013.

2012 *Addendum to: Research Design for Mitigative Documentation at Site 42TO2390, the Tooele Valley Railroad, Tooele County, Utah*. Michael R. Polk, Wendy Simmons Johnson, and Cheryl R. Jeppson. Sagebrush Consultants Report No. 1914 (June 2012).

From Lampo Junction to Rozel: The Archaeological History of the Transcontinental Railroad across the Promontory Mountains, Utah. Michael R. Polk and Wendy Simmons Johnson. Sagebrush Consultants Report No. 1614 (April 2012).

- A Cultural Resource Inventory for a Segment of the Proposed Echo Trail, Summit County, Utah.* Wendy Simmons Johnson. Sagebrush Consultants Report No. 1882 (January 2012).
- 2011 *A Cultural Resource Survey of the Mona to Oquirrh Transmission Line, Additional Survey 12, Passive Avian Relocation, Tooele County, Utah.* Sandy Chynoweth Pagano and Wendy Simmons Johnson. Sagebrush Consultants Report No. 1875 (December 2011).
- An Architectural Reconnaissance Inventory of the Intersection at 250 West and SR-37 (1800 North) in Sunset, Davis County, Utah.* Wendy Simmons Johnson. Sagebrush Consultants Report No. 1839 (June 2011).
- An Archaeological and Paleontological Resources Survey of the SR-37 (1800 N) and 250 W Intersection in Sunset, Davis County, Utah.* Wendy Simmons Johnson. Sagebrush Consultants Report No. 1839 (June 2011).
- 2010 *The Lake Powell Pipeline Class III Preliminary Draft Report.* Don Southworth, Michael R. Polk, Wendy Simmons Johnson, Sandy Chynoweth Pagano, and Tiffany Tuttle Collins. Sagebrush Consultants Report No. 1731 (December 2010).
- Evaluation of Logan City Power Plant No. 3, Logan Canyon, Cache County, Utah.* Michael R. Polk and Wendy Simmons Johnson. Sagebrush Consultants Report No. 1787 (September 2010).
- 2009 *A Cultural Resources Inventory of the Proposed 800 West Project From 600 to 750 North, Logan, Cache County, Utah.* Wendy Simmons Johnson. Sagebrush Consultants Report No. 1753 (October 2009).
- A Cultural Resources Inventory of the Nielson Energy Inc. Ryckman Creek #9 Well, Uinta County, Wyoming.* Wendy Simmons Johnson and Jonathan Peart. Sagebrush Consultants Report No. 1751 (October 2009).
- Geomorphological and Lithic Analysis on Saylor Creek Range, Mountain Home Air Force Base, Owyhee County, Idaho.* Wendy Simmons Johnson, Michael R. Polk, and William Eckerle. Sagebrush Consultants Report No. 1592 (February 2009).
- 2008 *A Cultural Resources Survey for a Proposed 6.5 Mile Railroad Line from Corinne to Stinking Springs, Box Elder County, Utah.* Wendy Simmons Johnson and Sandy Chynoweth Pagano. Sagebrush Consultants Report No. 1716 (December 2008).
- 2007 *A Cultural and Paleontological Resource Inventory of the DeWitt Pipeline, Alternative 3, in Logan Canyon, Cache County, Utah.* Wendy Simmons Johnson. Sagebrush Consultants Report No. 1635 (August 2007).
- A Cultural Resources Survey for the 3200 South Reconstruction Project, Nibley, Cache County, Utah.* Sagebrush Consultants Report No. 1593 (June 2007).
- 2006 *Cultural Resource Inventory of the Post Clover Fire, Mountain Home Air Force Base, Owyhee County, Idaho.* Michael R. Polk and Heather M. Weymouth with contributions by Wendy Simmons Johnson and John D. Baker. Sagebrush Consultants Report No. 1449 (November 2006).
- 2004 *A Cultural Resources Inventory of Three Alternatives for the Hyde Park/North Logan Corridor Project, Cache County, Utah.* Wendy Simmons Johnson. Sagebrush Consultants Report No. 1309. 2005 (August 2004).
- Mitigation of Cultural Resource Sites 42Bo971 and 42Bo974 for the Dee's Land Exchange Project, Box Elder County, Utah.* Wendy Simmons Johnson, Sandy Chynoweth Pagano, Heather M. Weymouth and Shane Rumsey. Sagebrush Consultants Report No. 1245 (January 2004).

2002 Intensive Recordation of the Wasatch (42wa217) and Humbug Canals (42wa219), the Timpanogos Canal (42wa218), and Site 42wa201, Wasatch County, Utah. Report No. 1081. CUWCD. Wendy Simmons Johnson, Kevin C. O'Dell, Heather M. Weymouth and Sheri Murray Ellis

Commentary on Cultural Resources Studies for the 30th/31st/32nd Streets and Wall Avenue Projects in Ogden, Weber County, Utah, 1996-2002. Report No. 1282. Washington Infrastructure Services. Wendy Simmons Johnson.

1998 A Cultural Resources Survey of Pressurized Pipelines on Public Right-of-Ways for the Wasatch County Water Efficiency Project Wasatch County, Utah. Report No. 1110. Central Utah Water Conservancy District. Kevin C. O'Dell with contributions by Sheri Murray Ellis and Wendy Simmons Johnson.

A Cultural Resources Survey of Pressurized Pipelines for the Wasatch County Water Efficiency Project, Wasatch County, Utah. Central Utah Water Conservancy District. Report No. 1111. Heather M. Weymouth and James R. Christensen with contributions by Sheri Murray Ellis and Wendy Simmons-Johnson.



Balance in a changing world

Date: April 29, 2016

Mr. Bob Thomas
 Professional Wetland Scientist
 BIO-WEST, Inc.
 1063 West 1400 North
 Logan, UT 84321

Subject: Midway Threatened, Endangered, and Sensitive Species Survey

Dear Bob:

WMR Environmental LLC (WMR) was asked to conduct a threatened, endangered, and sensitive (T, E, S) species survey on a 51 acre site in Midway, Wasatch County, Utah. The proposed project would consist of the development of a residential subdivision that includes the preservation of as much open space as possible. The following document details the methods used to conduct the assessment, results, and recommendations for reducing disturbance to the wildlife community during the proposed project.

Executive Summary

WMR conducted a literature review and site visit and consulted with the Utah Division of Wildlife Resources (UDWR) to assess general wildlife habitat quality and to determine the presence of suitable habitat for state and federally-listed threatened, endangered and sensitive species on the 51 acre property in Midway, Utah (project area). Suitable habitat is not present and/or known distributions do not coincide with the project area for the three federally-listed threatened and endangered wildlife species found in Wasatch County. Additionally, suitable habitat is not present within the project area for 18 of the 22 Wasatch County specific state-listed wildlife species of concern. The four state-listed species that may be found within the project area include Bald Eagle (*Haliaeetus leucocephalus*), Bobolink (*Dolichonyx oryzivorus*), Short-eared Owl (*Asio flammeus*), and Smooth Green Snake (*Opheodrys vernalis*). The project area also provides habitat for other unlisted wildlife species including birds, mammals, amphibians, and reptiles.

Methods

WMR reviewed literature regarding habitat requirements and current and historic distributions of federally-listed threatened and endangered species and state-listed sensitive species for Wasatch County. The primary sources used were the UDWR Conservation Data Center (<http://dwr.cdc.nr.utah.gov/ucdc/>), eBird (<http://ebird.org>), an online, real-time bird checklist maintained by the Cornell Lab of Ornithology and the National Audubon Society, and Cornell Lab of Ornithology's Birds of North America Online (<http://bna.birds.cornell.edu/bna/>). WMR also used these sources to determine the project area's value to unlisted wildlife species.

During the site visit of the project area, a visual inspection was made to determine whether suitable and/or potentially suitable habitat for listed species is present, and to evaluate habitat for the general wildlife community. All wildlife sightings and habitat quality were recorded. The information collected during the site visit was used in conjunction with the literature review and WMR's professional judgment to determine the project area's wildlife value.

ADDRESS

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Results and Discussion

A site visit was conducted on April 28, 2016. The project area is generally located immediately south of 600 North and lies between Center Street to the west and River Road to the east. The project area is approximately 51 acres in size, and is located in a predominantly agricultural area, bordered on all sides by residential developments and livestock grazing. The project area is comprised primarily of weedy upland habitat, a small wetland complex, wet meadow, and pasture lands. Edges of the property, particularly along the eastern side, also have tall trees. Habitat in the project area is generally comprised of teasel (*Dipsacus fullonum*), crested wheatgrass (*Agropyron cristatum*), Canada thistle (*Cirsium arvense*), various pasture grasses, sedges (*Carex* spp.), and bulrushes (*Schoenoplectus* spp.).

A total of 25 special status wildlife species potentially occur in Wasatch County, including three federally listed species (Table 1) and 22 state-listed species (Table 2) (UDWR 2015a, UDWR 2015b). Tables 1 and 2 also identify habitat requirements for a given species and its likelihood of occurrence in the project area based on its habitat requirements and known distribution as listed by the UDWR Conservation Data Center and other applicable sources. Table 3 provides a list of bird species that are known to occur within 0.25-mile of the project area. Many of these species could potentially occur within the project area.

The project area does not contain suitable habitat for any of the three federally-listed species, nor are they likely to occur in the general area of the site (Table 1). However, the project area does offer potentially suitable habitat for four of the 22 state-listed species (Table 2). The Bald Eagle, which is listed by the state as a species of concern, has been documented within 0.25 mile of the project area (Table 3) and suitable roosting trees are present along the eastern boundary of the property. For a description of habitat requirements for the four state-listed species that may occur within the project area, please refer to Table 2.

During the site visit, an abundance of birds were observed throughout the project area. Abundant bird species included Barn swallows (*Hirundo rustica*), red-winged blackbirds (*Agelaius phoeniceus*), western meadowlarks (*Sturnella neglecta*), and killdeer (*Charadrius vociferous*). The killdeer, a ground nesting bird species, was observed presenting displays intended to protect nests (i.e. "broken wing display"). This suggests that avian reproductive activity, particularly for the killdeer, has begun within the project area.

Conclusions

Any construction or other activities that disturb the project area may have some impact on wildlife. However, impacts would likely be short-term in nature. The habitat within the project area is of marginal quality and likely provides breeding and foraging habitat for birds, mammals, amphibians, and reptiles. WMR recommends that construction be avoided during nesting and brood-rearing season for birds (spring and summer months) in order to comply with the Migratory Bird Treaty Act of 1918 as amended (MBTA) which makes it illegal to "pursue, hunt, take, capture, kill, attempt to take, capture or kill" any migratory bird or their eggs and nests without first obtaining a permit from the U.S. Fish and Wildlife Service (16 U.S.C. 703-712; Ch. 128; July 13, 1918; 40 Stat. 755). This includes creating enough disturbances (e.g., noise, vibrations, visual disturbances, etc.) to cause a bird to abandon a nest or fledglings. Virtually all bird species within the United States are protected under the MBTA and/or state law.

To comply with the MBTA, the following mitigation measures should be implemented during construction in the project area:

- Require that no nesting vegetation (which can include trees, shrubs, and herbaceous vegetation such as grasses and forbs) clearing occur during the typical nesting/brood rearing period from April 1st through August 30th.
- Have a qualified wildlife biologist perform a nest clearance survey immediately prior (within three days) to construction activities if any vegetation clearing or soil disturbance is required during the nesting/brood rearing period.

- If actively nesting and/or brood rearing birds are found within or reasonably near (≤ 200 feet) the vegetation clearance or soil disturbance area, clearance and construction should be postponed until breeding activity is completed (as assessed by a qualified wildlife biologist).

Please feel free to contact me with any questions and/or comments you might have. I can be reached by phone at (208) 852-0461 or by email at msipos@wmr-env.com. WMR is also available to assist in any additional wildlife-related permitting requirements, such as nest clearance surveys, that may be needed.

Sincerely,



Michael Sipos
Principal Wildlife Biologist
msipos@wmr-env.com

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[UDWRb] Utah Division of Wildlife Resources. 2015. Utah's State Listed Species by County. Utah Conservation Data Center. Available at: <http://dwrcdc.nr.utah.gov/ucdc/ViewReports/sslist.htm>

Table 1. Federally-listed threatened and endangered species occurring in Wasatch County.

Common Name	Scientific Name	Status*	Habitat Requirements	Habitat Present
Brown (Grizzly) Bear	<i>Ursus arctos</i>	LT (Extirpated)	This species is thought to have been extirpated from the state	Absent
Canada Lynx	<i>Lynx canadensis</i>	LT	The preferred habitat of the Canada lynx is montane coniferous forest.	Absent
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	LT	Western cuckoos in Arizona, New Mexico, s. California, Utah, and w. Texas prefer desert riparian woodlands (Sonoran Zones) comprised of willow, Fremont cottonwood (<i>Populus fremontii</i>), alder (<i>Alnus</i> sp.), walnut (<i>Juglans</i> sp.), box elder (<i>Acer negundo</i>), and dense mesquite (<i>Prosopis</i> spp. Nests most frequently placed in willows, but cottonwoods used extensively for foraging. Prefer patches of riparian habitat >81 ha in size and at least 100 m in width; canopy height 5–30 m; understory height 1–6 m. Understory vegetation includes: velvet ash (<i>Fraxinus pennsylvanica</i>), netleaf hackberry (<i>Celtis reticulata</i>), condalia (<i>Condalia lycioides</i>), and whitebrush (<i>Aloysia</i> spp.). Also found in orchards adjacent to river bottoms in Utah.	Absent

* LT = Listed as Threatened by the U.S. Fish and Wildlife Service

Table 2. State-listed sensitive species occurring in Wasatch County.

Common Name	Scientific Name	Status*	Habitat Requirements	Habitat Present
American Three-toed Woodpecker	<i>Picoides dorsalis</i>	SPC	The American three-toed woodpecker is found in Engelmann spruce, sub-alpine fir, Douglas fir, grand fir, ponderosa pine, tamarack, aspen, and lodgepole pine forests. In Utah, this woodpecker nests and winters in coniferous forests, generally above 2400 m (8,000 ft) elevation.	Absent
Bald Eagle	<i>Haliaeetus leucocephalus</i>	SPC	May occur occasionally in the vicinity of the project area. There are documented occurrences at nearby eBird hotspots (eBird 2016). Roosting and perching trees are present along the boundaries of the project area.	Present
Black Swift	<i>Cypseloides niger</i>	SPC	Nests on ledges or shallow caves in steep rock faces and canyons, usually near or behind waterfalls, and in sea caves. Ranges widely to forage over both forest and open areas in montane habitats.	Absent
Bluehead Sucker	<i>Catostomus discobolus</i>	CS	The bluehead sucker is a benthic species with a mouth modified to scrape algae from the surface of rocks. Members of the species spawn in streams during the spring and summer. Fast flowing water in high gradient reaches of mountain rivers has been identified as important habitat for bluehead sucker.	Absent
Bobolink	<i>Dolichonyx oryzivorus</i>	SPC	Potentially occurs, but the species is rare in Utah and has not been documented near the project area.	Potential
Bonneville Cutthroat Trout	<i>Oncorhynchus clarkii utah</i>	CS	This species can be found in a number of habitat types, ranging from high elevation mountain streams and lakes to low elevation grassland streams.	Absent
Brown (Grizzly) Bear	<i>Ursus arctos</i>	S-ESA	This species is thought to have been extirpated from the state.	Absent

Common Name	Scientific Name	Status*	Habitat Requirements	Habitat Present
Canada Lynx	<i>Lynx canadensis</i>	S-ESA	The preferred habitat of the Canada lynx is montane coniferous forest.	Absent
Colorado River Cutthroat Trout	<i>Oncorhynchus clarkii pleuriticus</i>	CS	Colorado River cutthroat trout naturally occur only in isolated high-elevation headwater streams.	Absent
Columbia Spotted Frog	<i>Rana luteiventris</i>	CS	This species seems to prefer isolated springs and seeps that have a permanent water source, although individuals are known to move over land in the spring and fall after breeding. During cold winter months, spotted frogs burrow in the mud and become inactive.	Absent
Ferruginous Hawk	<i>Buteo regalis</i>	SPC	During breeding, flat and rolling terrain in grassland or shrub steppe habitat is most often used. This species avoids high elevations, forests, and narrow canyons, occurring in grasslands, agricultural lands, sagebrush/saltbush/greasewood shrublands, and the periphery of pinyon-juniper forests.	Absent
Fringed Myotis	<i>Myotis thysanodes</i>	SPC	The fringed myotis inhabits caves, mines, and buildings, most often in desert and woodland areas.	Absent
Greater Sage-grouse	<i>Centrocercus urophasianus</i>	SPC	These birds inhabit sagebrush plains, foothills, and mountain valleys. Sagebrush is the predominant plant of quality habitat. Where there is no sagebrush, there are no Sage-Grouse. A good understory of grasses and forbs, and associated wet meadow areas, are essential for optimum habitat.	Absent

Common Name	Scientific Name	Status*	Habitat Requirements	Habitat Present
Lewis's Woodpecker	<i>Melanerpes lewis</i>	SPC	The major breeding habitat consists of open park-like ponderosa pine forests. The species is attracted to burned-over Douglas-fir, mixed conifer, pinyon-juniper, riparian, and oak woodlands, but is also found in the fringes of pine and juniper stands, and deciduous forests, especially riparian cottonwoods. Areas with a good under-story of grasses and shrubs to support insect prey populations are preferred. Dead trees and stumps are required for nesting.	Absent
Northern Goshawk	<i>Accipiter gentilis</i>	CS	This species prefers mature mountain forest and riparian zone habitats.	Absent
Roundtail Chub	<i>Gila robusta</i>	CS	The species prefers large rivers, and is most often found in murky pools near strong currents in the main-stem Colorado River, and in the Colorado River's large tributaries.	Absent
Short-eared Owl	<i>Asio flammeus</i>	SPC	Usually found in grasslands, shrublands, and other open habitat.	Potential
Smooth Greensnake	<i>Opheodrys vernalis</i>	SPC	This species prefers moist areas, especially moist grassy areas and meadows where the snake is camouflaged due to its solid green dorsal coloration.	Potential
Southern Leatherside Chub	<i>Lepidomeda aliciae</i>	SPC	A small minnow native to streams and rivers of the southeastern portion of the Bonneville Basin.	Absent
Townsend's Big-eared Bat	<i>Corynorhinus townsendii</i>	SPC	Townsend's big-eared bat can occur in many types of habitat, but the species is often found near forested areas. Caves, mines, and buildings are used for day roosting and winter hibernation.	Absent

Common Name	Scientific Name	Status*	Habitat Requirements	Habitat Present
Western Toad	<i>Bufo boreas</i>	SPC	This species occurs throughout most of Utah and can be found in a variety of habitats including slow moving streams, wetlands, desert springs, ponds, lakes, meadows, and woodlands.	Absent
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	S-ESA	Western cuckoos in Arizona, New Mexico, s. California, Utah, and w. Texas prefer desert riparian woodlands (Sonoran Zones) comprised of willow, Fremont cottonwood (<i>Populus fremontii</i>), alder (<i>Alnus</i> sp.), walnut (<i>Juglans</i> sp.), box elder (<i>Acer negundo</i>), and dense mesquite (<i>Prosopis</i> spp. Nests most frequently placed in willows, but cottonwoods used extensively for foraging. Prefer patches of riparian habitat >81 ha in size and at least 100 m in width; canopy height 5–30 m; understory height 1–6 m. Understory vegetation includes: velvet ash (<i>Fraxinus pennsylvanica</i>), netleaf hackberry (<i>Celtis reticulata</i>), condalia (<i>Condalia lycioides</i>), and whitebrush (<i>Aloysia</i> spp.). Also found in orchards adjacent to river bottoms in Utah.	Absent

* S-ESA = Federally-listed or candidate species under the Endangered Species Act. SPC = Wildlife species of concern. CS = Species receiving special management under a Conservation Agreement in order to preclude the need for Federal listing.

Table 3. Bird species known to occur within 5-miles of the project area (eBird 2016)

Common Name	Scientific Name	State Listed	Federally Listed
American Coot	<i>Fulica americana</i>	No	No
American Goldfinch	<i>Spinus tristis</i>	No	No
American Kestrel	<i>Falco sparverius</i>	No	No
American Pipit	<i>Anthus rubescens</i>	No	No
American Robin	<i>Turdus migratorius</i>	No	No
American Wigeon	<i>Anas americana</i>	No	No
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Yes	No
Barn Swallow	<i>Hirundo rustica</i>	No	No
Barrow's Goldeneye	<i>Bucephala islandica</i>	No	No
Black-billed Magpie	<i>Pica hudsonia</i>	No	No
Black-capped Chickadee	<i>Poecile atricapillus</i>	No	No
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>	No	No
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	No	No
Canada Goose	<i>Branta canadensis</i>	No	No
Caspian Tern	<i>Hydroprogne caspia</i>	No	No
Common Goldeneye	<i>Bucephala clangula</i>	No	No
Common Raven	<i>Corvus corax</i>	No	No
Dark-eyed Junco	<i>Junco hyemalis</i>	No	No
Downy Woodpecker	<i>Picoides pubescens</i>	No	No
Eared Grebe	<i>Podiceps nigricollis</i>	No	No
Eurasian Collared-Dove	<i>Streptopelia decaocto</i>	No	No
European Starling	<i>Sturnus vulgaris</i>	No	No
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	No	No
Gadwall	<i>Anas strepera</i>	No	No
Great Blue Heron	<i>Ardea herodias</i>	No	No
Greater White-fronted Goose	<i>Anser albifrons</i>	No	No
Green-winged Teal	<i>Anas crecca</i>	No	No
House Finch	<i>Haemorhous mexicanus</i>	No	No
House Sparrow	<i>Passer domesticus</i>	No	No
Killdeer	<i>Charadrius vociferus</i>	No	No
Lazuli Bunting	<i>Passerina amoena</i>	No	No
Mallard	<i>Anas platyrhynchos</i>	No	No
Merlin	<i>Falco columbarius</i>	No	No
Mourning Dove	<i>Zenaida macroura</i>	No	No
Mute Swan	<i>Cygnus olor</i>	No	No
Northern Flicker	<i>Colaptes auratus</i>	No	No

Common Name	Scientific Name	State Listed	Federally Listed
Northern Goshawk	<i>Accipiter gentilis</i>	No	No
Northern Pintail	<i>Anas acuta</i>	No	No
Northern Shoveler	<i>Anas clypeata</i>	No	No
Osprey	<i>Pandion haliaetus</i>	No	No
Prairie Falcon	<i>Falco mexicanus</i>	No	No
Red-tailed Hawk	<i>Buteo jamaicensis</i>	No	No
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	No	No
Ring-necked Duck	<i>Aythya collaris</i>	No	No
Ring-necked Pheasant	<i>Phasianus colchicus</i>	No	No
Rock Pigeon	<i>Columba livia</i>	No	No
Ruddy Duck	<i>Oxyura jamaicensis</i>	No	No
Sandhill Crane	<i>Grus canadensis</i>	No	No
Snow Goose	<i>Chen caerulescens</i>	No	No
Song Sparrow	<i>Melospiza melodia</i>	No	No
Swainson's Hawk	<i>Buteo swainsoni</i>	No	No
Turkey Vulture	<i>Cathartes aura</i>	No	No
Western Kingbird	<i>Tyrannus verticalis</i>	No	No
Western Meadowlark	<i>Sturnella neglecta</i>	No	No
Western Grebe	<i>Aechmophorus occidentalis</i>	No	No
White-faced Ibis	<i>Plegadis chihi</i>	No	No
Wilson's Snipe	<i>Gallinago delicata</i>	No	No
Yellow Warbler	<i>Setophaga petechia</i>	No	No



BIO-WEST, Inc.

1063 West 1400 North
Logan, Utah
84321-2291
Ph: 435.752.4202
Fx: 435.752.0507
www.bio-west.com

June 1, 2017

Watts Enterprises
Attention: Mr. Russ Watts
5200 South Highland Drive, Suite 101
Salt Lake City, UT 84117

Subject: 20.4-Acre Parcel Wetland Delineation, Midway, Utah

Dear Mr. Watts:

BIO-WEST, Inc. (BIO-WEST) is pleased to provide you with the results of the wetland delineation of the 20.4-acre Midway project area in Wasatch County, Utah. The project area is located adjacent to the southern boundary of a 29.2-acre area that BIO-WEST delineated for you in 2016. The project area is located between Center Street and River Road, approximately 800 feet south of 600 North Street in Midway, Utah. The project area is located approximately 0.5 mile northeast of downtown Midway, in Section 35 of Township 3 South, Range 4 East. The coordinates at the center of the project area are latitude 40°31'06.59" N and longitude 111°28'02.72" W. A location map and a topographic map illustrating the project area are attached to this letter.

Methods

A project area assessment was conducted on May 19, 2017, to delineate any wetlands or surface waters encountered. Methods were performed in accordance with the *US Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). In addition, the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Research and Development 2010), was used for regional specificity. The project area assessment included establishing sample points to determine if wetland characteristics were present. Western Mountains, Valleys, and Coast Region wetland delineation data forms were used to record conditions at sample points (attached).

BIO-WEST and Watts Enterprises worked together to install and monitor 14-shallow groundwater monitoring wells throughout the project area. The wells were installed on August 1, 2016 and monitored through the later summer and fall of 2016 and again in the spring of 2017 through the present. The results of the groundwater monitoring to date were used to help determine the wetland boundaries along with the analysis of sample point data.

At each sample point vegetation species and their relative abundance were recorded. Vegetation strata were used to determine the sampling-plot radius using the sampling point as the center. Trees and woody vines within a 30-foot radius of each sample point were recorded. Saplings, shrubs, and herbaceous vegetation within a 5-foot radius of each sample point were recorded. Those plant species considered dominant within each stratum were used to determine wetland or upland classification. Species comprising 20 percent or more of the total areal cover per stratum were considered dominant, following the guidelines of the US Army Corps of Engineers (Corps) 50/20 rule (Environmental Laboratory 1987). The wetland-indicator status of dominant plants was noted according to the Corps' *North American Digital Flora: National Wetland Plant List* (NWPL 2016).

Coastal Ecology
and Marine Biology

Environmental
Analysis
and Permitting

Geology/
Hydrogeology
and Remediation

Fisheries
and Aquatic Ecology

GIS Planning
and Analysis

Landscape
Architecture
and Environmental
Planning

Vegetation Resources

Watershed Sciences

Wetland Resources

Wildlife Resources



BIO-WEST, Inc.

June 1, 2017

general groundwater monitoring wells that exhibited a water table within 12 inches of the ground surface for 14 or more consecutive days during the growing season were considered to be located in wetlands or on the boundary between the wetlands and uplands. Wells that exhibited a deeper water table or a water table within 12 inches of the ground surface for less than 14 consecutive days during the growing season were considered to be located in uplands as described in the Western Mountains, Valleys, and Coast Region Delineation Manual (Research and Development 2010).

The 20.4-acre project area contains 7.7-acres of emergent wetland represented by sample points A2, A3, and A5. The emergent wetlands are illustrated in the attached Wetland Delineation Map. The wetlands are dominated by blue grass (*Poa pratensis*), common spikerush (*Eleocharis palustris*), and clover (*Trifolium repens*) and are either seasonally flooded or exhibit a water table within 12 inches of the soil surface during the growing season. The wetland hydrology appears to be tied to the locally high water table within the immediate vicinity of the project area.

The project area contains a 0.4-acre section of open water irrigation channel that is supported by irrigation water flowing into the project area from a larger off-site irrigation ditch to the west.

Conclusions

The 20.4-acre project area contains 7.7-acres of emergent wetland supported by a high groundwater table. The wetland areas were delineated using a combination of observations made at representative sample points and by monitoring the growing season groundwater table in the project area using shallow groundwater monitoring wells. The project area also contains 0.4-acre of irrigation ditch. The existing emergent wetlands and the irrigation ditch are connected to offsite waters and are likely considered jurisdictional areas by the U.S. Army Corps of Engineers.

It is possible that by stopping all irrigation within the project area the existing wetland boundaries as depicted here could be modified or reduced. This would take at least an additional growing season and possibly more of observation and documentation before any wetland mapping changes could be considered.

If you have questions about the delineation results or conclusions, I can be reached at (435) 752-4202 or bthomas@bio-west.com.

Sincerely,

Robert Thomas

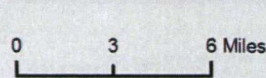
Professional Wetland Scientist

Attachments: Site Location Map
Topographic Map
Data Forms
Soil Map
National Wetland Inventory Map
Wetland Delineation Map
Photographs



From Salt Lake City: Travel on Interstate 80 West approximately 25 miles to Exit 146. Take off at Exit 146 and travel on U.S. Highway 189/40 approximately 13 miles south and turn right onto River Road before entering Heber, UT. Travel southwest on River Road approximately 3 miles to the traffic circle. Follow the traffic circle right and exit onto River Road going south. Travel south on River Road approximately 0.5 mile and take a right onto 600 North Street. Travel west on 600 North Street approximately 0.1 mile and the project entrance is on the left (south) side of 600 North Street.

Midway Springs Location Map



Map Date: 6/1/2017

Coordinate System: NAD 1983 UTM Zone 12N
Projection: Transverse Mercator Datum: North American 1983

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Midway Springs Property City/County: Midway, Wasatch Sampling Date: 5/19/2017
 Applicant/Owner: Russ Watts State: UT Sampling Point: a1
 Investigator(s): BT Section, Township, Range: S35, T3S, R4E
 Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): convex Slope (%): 1
 Subregion (LRR): E Lat: 40.518959214 N Long: 111.464671489W Datum: WGS 1984
 Soil Map Unit Name: Cv- Cudahy silt loam NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks:			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:														
1. <u>N/A</u>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)														
2. _____				Total Number of Dominant Species Across All Strata: <u>2</u> (B)														
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)														
4. _____				Prevalence Index worksheet: <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; text-align: center;">Total % Cover of:</td> <td style="width:50%; text-align: center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>75</u></td> <td>x 3 = <u>225</u></td> </tr> <tr> <td>FACU species <u>20</u></td> <td>x 4 = <u>80</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>95</u> (A)</td> <td><u>305</u> (B)</td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>75</u>	x 3 = <u>225</u>	FACU species <u>20</u>	x 4 = <u>80</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>95</u> (A)	<u>305</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>0</u>	x 2 = <u>0</u>																	
FAC species <u>75</u>	x 3 = <u>225</u>																	
FACU species <u>20</u>	x 4 = <u>80</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>95</u> (A)	<u>305</u> (B)																	
_____ = Total Cover																		
Sapling/Shrub Stratum (Plot size: _____)																		
1. <u>N/A</u>																		
2. _____																		
3. _____																		
4. _____																		
5. _____																		
_____ = Total Cover																		
Herb Stratum (Plot size: <u>5' radius</u>)																		
1. <u>Poa pratensis</u>	<u>75%</u>	<u>Y</u>	<u>FAC</u>															
2. <u>Taraxacum officinale</u>	<u>20%</u>	<u>Y</u>	<u>FACU</u>															
3. <u>Festuca sp.</u>	<u>5%</u>	<u>N</u>	<u>unk.</u>															
4. _____																		
5. _____																		
6. _____																		
7. _____																		
8. _____																		
9. _____																		
10. _____																		
11. _____																		
<u>100%</u> = Total Cover																		
Woody Vine Stratum (Plot size: _____)																		
1. <u>N/A</u>																		
2. _____																		
_____ = Total Cover																		
% Bare Ground in Herb Stratum <u>0%</u>																		
_____ = Total Cover																		
Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ 5 - Wetland Non-Vascular Plants ¹ ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																		
Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>																		
Remarks:																		

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Midway Springs Property City/County: Midway, Wasatch Sampling Date: 5/19/2017
 Applicant/Owner: Russ Watts State: UT Sampling Point: a2
 Investigator(s): BT Section, Township, Range: S35, T3S, R4E
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR): E Lat: 40.519090729 N Long: 111.464628195W Datum: WGS 1984
 Soil Map Unit Name: Cv- Cudahy silt loam NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>			

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. N/A				Number of Dominant Species That Are OBL, FACW, or FAC:	3 (A)
2. _____				Total Number of Dominant Species Across All Strata:	3 (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC:	100 (A/B)
4. _____				Prevalence Index worksheet:	
				Total % Cover of:	Multiply by:
				OBL species	x 1 = _____
				FACW species	x 2 = _____
				FAC species	x 3 = _____
				FACU species	x 4 = _____
				UPL species	x 5 = _____
				Column Totals:	(A) _____ (B) _____
				Prevalence Index = B/A = _____	
				Hydrophytic Vegetation Indicators:	
				___ 1 - Rapid Test for Hydrophytic Vegetation	
				<input checked="" type="checkbox"/> 2 - Dominance Test is >50%	
				___ 3 - Prevalence Index is ≤3.0 ¹	
				___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
				___ 5 - Wetland Non-Vascular Plants ¹	
				___ Problematic Hydrophytic Vegetation ¹ (Explain)	
				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Midway Springs Property City/County: Midway, Wasatch Sampling Date: 5/19/2017
 Applicant/Owner: Russ Watts State: UT Sampling Point: a3
 Investigator(s): BT Section, Township, Range: S35, T3S, R4E
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): convex Slope (%): 1
 Subregion (LRR): E Lat: 40.519449553 N Long: 111.465940276W Datum: WGS 1984
 Soil Map Unit Name: Cv- Cudahy silt loam NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks:			
The hydric soil and wetland hydrology determinations were inferred for the sampling point by using visual observations at the nearby groundwater monitoring well that was drilled through the restrictive pot rock layer.			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:																	
1. <u>N/A</u>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)																	
2. _____				Total Number of Dominant Species Across All Strata: <u>3</u> (B)																	
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)																	
4. _____				Prevalence Index worksheet:																	
_____ = Total Cover				<table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;">Total % Cover of:</td> <td style="width:50%;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = _____</td> </tr> <tr> <td>Column Totals: _____</td> <td>(A) _____ (B) _____</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = _____</td> </tr> </table>		Total % Cover of:	Multiply by:	OBL species _____	x 1 = _____	FACW species _____	x 2 = _____	FAC species _____	x 3 = _____	FACU species _____	x 4 = _____	UPL species _____	x 5 = _____	Column Totals: _____	(A) _____ (B) _____	Prevalence Index = B/A = _____	
Total % Cover of:	Multiply by:																				
OBL species _____	x 1 = _____																				
FACW species _____	x 2 = _____																				
FAC species _____	x 3 = _____																				
FACU species _____	x 4 = _____																				
UPL species _____	x 5 = _____																				
Column Totals: _____	(A) _____ (B) _____																				
Prevalence Index = B/A = _____																					
Sapling/Shrub Stratum (Plot size: _____)																					
1. <u>N/A</u>				Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ 5 - Wetland Non-Vascular Plants ¹ ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																	
2. _____																					
3. _____																					
4. _____																					
5. _____																					
_____ = Total Cover																					
Herb Stratum (Plot size: 5' radius)																					
1. <u>Poa pratensis</u>	50%	Y	FAC	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																	
2. <u>Trifolium repens</u>	20%	Y	FAC																		
3. <u>Eleocharis palustris</u>	20%	Y	OBL																		
4. <u>Carex nebrascensis</u>	10%	N	OBL																		
5. _____																					
6. _____																					
7. _____																					
8. _____																					
9. _____																					
10. _____																					
11. _____																					
100% = Total Cover																					
Woody Vine Stratum (Plot size: _____)																					
1. <u>N/A</u>																					
2. _____																					
_____ = Total Cover																					
% Bare Ground in Herb Stratum <u>0%</u>																					
Remarks:																					

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Midway Springs Property City/County: Midway, Wasatch Sampling Date: 5/19/2017
 Applicant/Owner: Russ Watts State: UT Sampling Point: a4
 Investigator(s): BT Section, Township, Range: S35, T3S, R4E
 Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): convex Slope (%): 1
 Subregion (LRR): E Lat: 40.519415244 N Long: 111.466101567W Datum: WGS 1984
 Soil Map Unit Name: Cv- Cudahy silt loam NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Remarks: The soil and upland hydrology determinations were inferred for the sampling point by using visual observations at the nearby groundwater monitoring well that was drilled through the restrictive pot rock layer.			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. <u>N/A</u>				Number of Dominant Species That Are OBL, FACW, or FAC:	<u>2</u> (A)
2. _____				Total Number of Dominant Species Across All Strata:	<u>4</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>50</u> (A/B)
4. _____				Prevalence Index worksheet:	
				Total % Cover of:	Multiply by:
				OBL species <u>0</u>	x 1 = <u>0</u>
				FACW species <u>0</u>	x 2 = <u>0</u>
				FAC species <u>50</u>	x 3 = <u>150</u>
				FACU species <u>50</u>	x 4 = <u>200</u>
				UPL species <u>0</u>	x 5 = <u>0</u>
				Column Totals:	<u>100</u> (A) <u>350</u> (B)
				Prevalence Index = B/A = <u>3.5</u>	
				Hydrophytic Vegetation Indicators:	
				<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation	
				<input type="checkbox"/> 2 - Dominance Test is >50%	
				<input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹	
				<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
				<input type="checkbox"/> 5 - Wetland Non-Vascular Plants ¹	
				<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Remarks:					

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Midway Springs Property City/County: Midway, Wasatch Sampling Date: 5/19/2017
 Applicant/Owner: Russ Watts State: UT Sampling Point: a5
 Investigator(s): BT Section, Township, Range: S35, T3S, R4E
 Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): convex Slope (%): 1
 Subregion (LRR): E Lat: 40.518031871 N Long: 111.469438643W Datum: WGS 1984
 Soil Map Unit Name: Cv- Cudahy silt loam NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks:			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>N/A</u>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2. _____				Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>66</u> (A/B)
4. _____				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
= Total Cover				
Sapling/Shrub Stratum (Plot size: _____)				
1. <u>N/A</u>				
2. _____				
3. _____				
4. _____				
5. _____				
= Total Cover				
Herb Stratum (Plot size: <u>5'</u> radius)				
1. <u>Poa pratensis</u>	<u>40%</u>	<u>Y</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ 5 - Wetland Non-Vascular Plants ¹ ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Taraxacum officinale</u>	<u>30%</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Trifolium repens</u>	<u>30%</u>	<u>Y</u>	<u>FAC</u>	
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
100% = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. <u>N/A</u>				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____				
= Total Cover				
% Bare Ground in Herb Stratum <u>0%</u>				
Remarks:				

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Midway Springs Property City/County: Midway, Wasatch Sampling Date: 5/19/2017
 Applicant/Owner: Russ Watts State: UT Sampling Point: a6
 Investigator(s): BT Section, Township, Range: S35, T3S, R4E
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR): E Lat: 40.517878377 N Long: 111.469258093W Datum: WGS 1984
 Soil Map Unit Name: Cv- Cudahy silt loam NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? N Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? N (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>			
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>			
Remarks:					

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:			
1. <u>N/A</u>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)			
2. _____				Total Number of Dominant Species Across All Strata: <u>2</u> (B)			
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)			
4. _____							
_____ = Total Cover							
Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:			
1. <u>N/A</u>						Total % Cover of: _____ Multiply by: _____	
2. _____						OBL species <u>0</u> x 1 = <u>0</u>	
3. _____						FACW species <u>0</u> x 2 = <u>0</u>	
4. _____						FAC species <u>50</u> x 3 = <u>150</u>	
5. _____						FACU species <u>50</u> x 4 = <u>200</u>	
_____ = Total Cover				UPL species <u>0</u> x 5 = <u>0</u>			
				Column Totals: <u>100</u> (A) <u>350</u> (B)			
				Prevalence Index = B/A = <u>3.5</u>			
Herb Stratum (Plot size: <u>5' radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:			
1. <u>Poa pratensis</u>	<u>50%</u>	<u>Y</u>	<u>FAC</u>			1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) 5 - Wetland Non-Vascular Plants ¹ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
2. <u>Taraxacum officinale</u>	<u>50%</u>	<u>Y</u>	<u>FACU</u>				
3. _____							
4. _____							
5. _____							
6. _____							
7. _____							
8. _____							
9. _____							
10. _____							
11. _____							
<u>100%</u> = Total Cover							
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
1. <u>N/A</u>							
2. _____							
_____ = Total Cover							
% Bare Ground in Herb Stratum <u>0%</u>							
Remarks:							

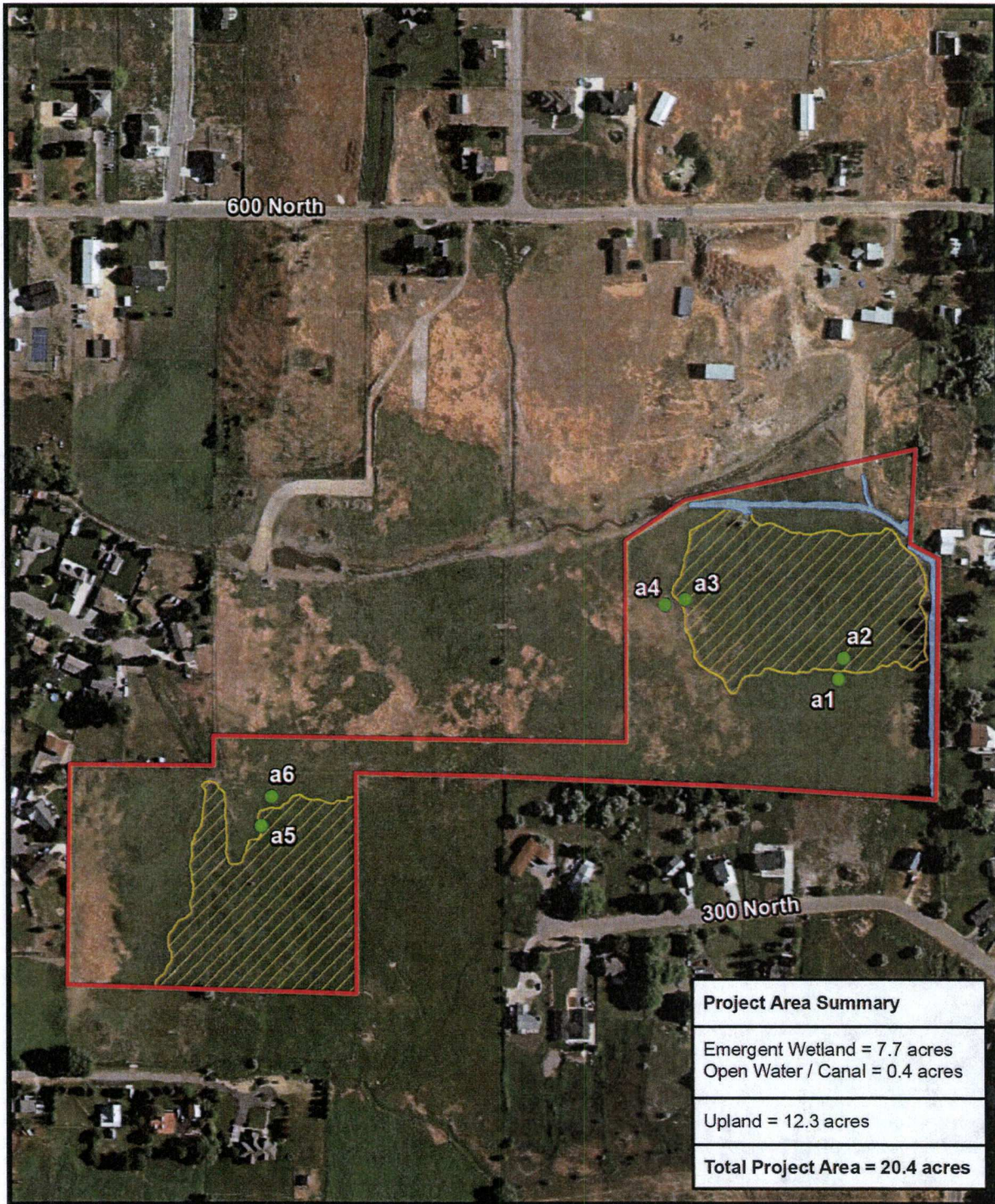


Soil Map—Heber Valley Area, Utah - Parts of Wasatch and Utah Counties

Map Scale: 1:5,720 if printed on A landscape (11" x 8.5") sheet.
 0 50 100 200 300 Meters
 0 250 500 1000 1500 Feet
 Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

Map Unit Legend

Heber Valley Area, Utah - Parts of Wasatch and Utah Counties (UT622)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Cv	Cudahy silt loam, cold variant	50.4	34.7%
Cw	Cudahy silt loam, cold variant, moderately deep water table	49.0	33.7%
HJE	Henefer soils, 25 to 50 percent slopes	3.6	2.5%
SpB	Spaa silt loam, 2 to 5 percent slopes	42.2	29.0%
Totals for Area of Interest		145.2	100.0%



Project Area Summary
Emergent Wetland = 7.7 acres Open Water / Canal = 0.4 acres
Upland = 12.3 acres
Total Project Area = 20.4 acres

BIO-WEST
www.bio-west.com
435.752.4202

- Sample Point
- Project Boundary
- Emergent Wetland
- Open Water / Canal

Midway Springs Wetland Delineation Map

0 175 350 Feet

Map Date: 5/23/2017
Coordinate System: NAD 1983 UTM Zone 12N
Projection: Transverse Mercator Datum: North American 1983



Sample Point A2.



Sample Point A2.



Sample Point A3.



Sample Point A4.



Sample Point A5.



Sample Point A5.



Sample Point A6.

EXHIBIT I

Ent 456063 Bk 1233 Pg 1485



Intermountain GeoEnvironmental Services, Inc.

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**Geotechnical Investigation
Midway Springs Subdivision
~600 North River Road
Midway, Utah**

Prepared for:

Watts Enterprises

IGES Project No. 01855-006

May 13, 2016



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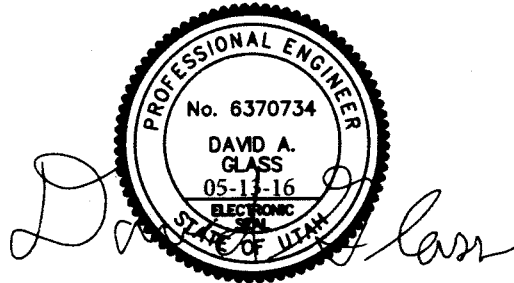
**Geotechnical Investigation
Midway Springs Subdivision
~600 North River Road
Midway City, Utah**

IGES Project No. 01855-006

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May 13, 2016

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Appendix A	Figure A-1	Site Vicinity Map
	Figure A-2	Geotechnical Map
	Figures A-3 to A-27	Test Pit Logs
	Figure A-28	Key to Soil Symbols and Terminology
Appendix B		Laboratory Results
Appendix C		USGS Design Maps Report

1.0 EXECUTIVE SUMMARY

This report presents the results of a geotechnical investigation conducted for the proposed Midway Springs subdivision to be located south of 600 North and west of River Road in Midway City, Utah. Based on the subsurface conditions encountered at the site, the subject site is considered suitable for the proposed construction provided that the recommendations presented in this report are implemented into the design and construction of the project. A brief summary of the critical recommendations is included below:

- The site is predominantly overlain by up to 18 inches of topsoil. In most areas, the topsoil was underlain by relatively hard 'pot rock', which consists of alluvial soils (sand and clay) that has been highly modified and cemented by calcium carbonate deposits. The pot rock is fairly hard and has engineering characteristics similar to limestone or dolomite. Consequently, excavation into the pot rock proved difficult – the backhoe could not excavate more than about 12 inches into the pot rock before meeting refusal.
- Shallow groundwater was encountered in twelve of the test pits completed for this investigation. The groundwater was measured at depths that varied from 1 to 3 feet below the existing grade. Shallow groundwater (less than 5 feet below existing grade) is expected to be prevalent throughout the property.
- Footings may be established *entirely* on pot rock or *entirely* on structural fill extending to pot rock. Shallow spread or continuous wall footings constructed as described above may be proportioned utilizing a maximum net allowable bearing pressure of **5,000 pounds per square foot (psf)** for dead load plus live load conditions.
- Finish floor elevations should be founded a minimum of 3 feet above the high groundwater elevation.
- Concrete slabs-on-grade should be constructed over a minimum of 4 inches of compacted gravel overlying undisturbed suitable native subgrade soils. The slab may be designed with a Modulus of Subgrade Reaction of **125 psi/inch**.
- Flexible pavement section of 3.5/10 (inches of asphalt/road base respectively) is recommended.

Recommendations for general site grading, design of foundations, slabs-on-grade, moisture protection and soil corrosivity as well as other aspects of construction are included in this report.

NOTE: The scope of services provided within this report is limited to the assessment of the subsurface conditions at the subject site. The executive summary is provided solely for purposes of overview and is not intended to replace the report of which it is part and should not be used separately from the report.

2.0 INTRODUCTION

2.1 PURPOSE AND SCOPE OF WORK

This report presents the results of a geotechnical investigation conducted for the proposed Midway Springs subdivision to be located south of 600 North and west of River Road in Midway City, Utah. The purposes of this investigation were to assess the nature and engineering properties of the subsurface soils and to provide recommendations for general site grading and the design and construction of foundations, slabs-on-grade, and pavement.

The scope of work completed for this study included a site reconnaissance, subsurface exploration, soil sampling, laboratory testing, engineering analyses, and preparation of this report. Our services were performed in accordance with our proposal dated March 22, 2016 and your signed authorization.

The recommendations presented in this report are subject to the limitations presented in the **Limitations** section of this report (Section 7.1).

2.2 PROJECT DESCRIPTION

The subject property is located south of 600 North and west of River Road in Midway City, Utah (see Figure A-1, *Site Vicinity Map*). Based on the concept plan provided by Watts, we understand that the project will consist of development for single-family residential lots. The 27.5-acre Koehle property to the east will be developed for 50 lots –the Remund property to the west will include 46 smaller cottage-type residential structures. The homes are expected to consist of conventional wood-framed structures, founded on spread footings. Due to the presence of shallow groundwater, the homes will be on-grade structures (no basements). The project will also include several acres of open space, a clubhouse with a pool, at least five ponds, interior roadways, landscaping, and utilities.

3.0 METHODS OF STUDY

3.1 FIELD INVESTIGATION

As a part of this investigation, subsurface soil conditions were explored by completing twenty-five exploratory test pits to depths ranging from 0.3 to 3½ feet below the existing site grade – deeper excavations could not be achieved due to refusal on hard ‘pot rock’ (alluvial soils heavily cemented with calcium carbonate). The approximate locations of the explorations are shown on Figure A-2 (*Geotechnical Map*) in Appendix A. Exploration points were placed to provide representative coverage across the site with the given site conditions at the time of the field work. Logs of the subsurface conditions as encountered in the explorations were recorded at the time of excavation by a member of our technical staff and are presented as Figures A-3 through A-27 in Appendix A. A *Key to Soil Symbols and Terminology* used on the test pit logs is included as Figure A-28.

The test pits were excavated with the aid of a Case 580 Super L rubber tired backhoe. Both bulk and relatively “undisturbed” soil samples were obtained in the test pit explorations. Bulk samples were placed in plastic bags and 5-gallon buckets. Relatively undisturbed soil samples were collected with the use of a 6-inch long brass tube attached to a hand sampler driven with a 2-lb sledge hammer (this type of sampling was very limited due to the presence of pot rock). All samples were transported to our laboratory to evaluate the engineering properties of the various earth materials observed. The soils were classified according to the *Unified Soil Classification System* (USCS). Classifications for the individual soil units are shown on the attached test pit logs.

3.2 LABORATORY INVESTIGATION

Geotechnical laboratory tests were conducted on selected relatively undisturbed and bulk soil samples obtained during our field investigation. The laboratory testing program was designed to evaluate the engineering characteristics of onsite earth materials. Laboratory tests conducted during this investigation include:

- Point load strength index (ASTM D5731)
- Corrosion testing - sulfate and chloride concentrations, pH and resistivity (AASHTO T288, T289, ASTM D4327 and C1580)

The results of the laboratory tests are presented on the test pit logs in Appendix A (Figures A-3 through A-27) and the test result summary sheets in Appendix B.

3.3 ENGINEERING ANALYSIS

Engineering analyses were performed using soil data obtained from the laboratory test results and empirical correlations from material density, depositional characteristics and classifications. Analyses were performed using formulas, calculations and software that represent methods currently accepted by the geotechnical industry. These methods include settlement, bearing capacity, lateral earth pressures, trench stability and pavement design. Appropriate factors of safety were applied to the results consistent with industry standards and the accepted standard of care.

4.0 GENERALIZED SITE CONDITIONS

4.1 SURFACE CONDITIONS

The site is relatively flat; maximum topographic relief across the site is approximately 40 feet, mostly accounted for by a topographic high along 600 North. The ground surface is primarily covered with native grasses, although the northern reaches of the property is largely exposed bare earth. A few trees and tree stumps are also present onsite, but are not widespread. Also, within the northern reaches of the property there are several structures, including at least one single-family residence and other appurtenant structures that appear to be barns, storage sheds, or similar. We understand these structures will be demolished to accommodate the new subdivision.

At the time of our subsurface investigation a small creek was flowing west to east through the center of the property. Also, a small hot spring was located near the property boundary along 600 North - a trench had been excavated to divert water from this spring into the creek near the center of the property.

Shallow groundwater appears to be prevalent at several locations – some of these locations have been identified as ‘wetlands’ on the plans provided by Watts (we understand that the ‘wetlands’ designation is informal pending further classification by a wetlands expert).

4.2 SUBSURFACE CONDITIONS

4.2.1 Earth Materials

Based on our observations, the site is predominantly overlain by up to 18 inches of topsoil; this material generally consists of clayey sand and was characterized by an abundance of roots. In some areas the topsoil was underlain by Lean CLAY (CL); however, in most cases the topsoil was underlain by “pot rock”.

“Pot rock” was encountered at depths ranging from near-surface to 3½ feet below existing grade. Pot rock consists of alluvial soils (clay or sand) that has been heavily modified and cemented by *calcium carbonite*, which was deposited as a result of local hydrothermal activity. This material is also referred to as *calcareous tufa* on geologic maps. Where encountered, the pot rock was relatively hard and had a consistency similar to a rock unit (e.g., limestone or dolomite). Excavating into this material proved to be very difficult; in most cases, the excavator met with refusal within the upper 12 inches of pot rock.

The stratification lines shown on the enclosed test pit logs represent the approximate boundary between soil types. The actual in-situ transition may be gradual. Due to the nature and depositional characteristics of the native soils, care should be taken in interpolating subsurface conditions between and beyond the exploration locations. Additional descriptions of these soil units are presented on the test pit logs (Figures A-3 through A-27 in Appendix A).

4.2.2 Groundwater

Groundwater was encountered in twelve of the test pits completed for this investigation; the test pits where groundwater was observed were generally located on the southern end of the site. Where observed, the groundwater was measured at depths that ranged from 1 to 3 feet below the existing grade. The maximum depth of excavation was about 3½ feet due to the presence of pot rock; as such, in test pits where groundwater was not encountered, it is possible that shallow groundwater could still be present (e.g., groundwater within the upper 5 feet).

Seasonal fluctuations in irrigation, precipitation, surface runoff from adjacent properties, or other on or offsite sources may increase moisture conditions. Groundwater conditions can be expected to rise or fall several feet seasonally depending on the time of year. The impact of groundwater will need to be carefully assessed during the planning and layout of the proposed development. At the time of this investigation IGES installed six 1-inch PVC piezometers in test pits 5, 6, 17, 22, 23 and 25.

4.2.3 Strength of Earth Materials

Three *point load* tests (ASTM D5731) were performed on samples of "pot rock" obtained from TP-6, 11 and 24 at respective depths of 1.0, 1.5 and 2.0 feet. The results indicate that the samples obtained from TP-6, 11 and 24 have a uniaxial compressive strength of 999, 471 and 5,516 psi respectively. The results of the *point load* tests are presented in Appendix B.

5.0 GEOLOGIC CONDITIONS

5.1 GEOLOGIC SETTING

Geology of the site has been mapped as part of the *Heber City Geologic Quadrangle* (Bromfield et al., 1970). The site is located in a small valley associated with the mouth of the Dutch Hollow drainage, located approximately ½ mile west of Heber Valley as shown on the *Site Vicinity Map* (Figure A-1). Natural hot springs are located within and around the immediate vicinity of the subject site. As such, the property is shown as being almost entirely underlain by Quaternary-aged Calcareous Tufa (locally known as “pot rock”), which is underlain by Quaternary-aged alluvium in the form of stream gravel and valley fill deposits. Memorial Hill to the southeast is comprised of interbedded limy sandstones siltstone, shale, and fossiliferous limestone of the Triassic-aged Thaynes Formation.

5.2 SEISMICITY AND FAULTING

An active fault is generally defined as a fault that has experienced movement with the Holocene Epoch (~11,700 years before present). There are no known active faults that pass through the subject site (Bromfield et al., 1970). The closest mapped active fault to the site is the Salt Lake Segment of the Wasatch Fault Zone, located approximately 18 miles to the west of the property. The Salt Lake City segment of the Wasatch Fault Zone was reportedly last active approximately 1,100 years ago, and has a recurrence interval of approximately 1,300 years. Analyses of ground shaking hazard along the Wasatch Front suggests that the Wasatch Fault Zone is the single greatest contributor to the seismic hazard in the region.

Following the criteria outlined in the 2012 International Building Code (IBC, 2012), spectral response at the site was evaluated for the *Maximum Considered Earthquake* (MCE) which equates to a probabilistic seismic event having a two percent probability of exceedance in 50 years (2PE50). Spectral accelerations were determined based on the location of the site using the *U.S. Seismic “Design Maps” Web Application* (USGS, 2012); this software incorporates seismic hazard maps depicting probabilistic ground motions and spectral response data developed for the United States by the U.S. Geological Survey as part of NEHRP/NSHMP (Frankel et al., 1996). These maps have been incorporated into both *NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures* (FEMA, 1997) and the *International Building Code* (IBC) (International Code Council, 2012).

To account for site effects, site coefficients that vary with the magnitude of spectral acceleration and *Site Class* are used. Site Class is a parameter that accounts for site amplification effects of soft soils and is based on the average shear wave velocity of the upper 100 feet. Based on our

understanding of the local geology, the subject site is appropriately classified as Site Class D (*Stiff Soil*). The spectral accelerations are calculated based on *Design Maps* and the site's approximate latitude and longitude of 40.5218° and -111.4679° respectively. Based on IBC criteria, the short-period (F_a) and long-period (F_v) site coefficients are 1.293 and 1.978, respectively. The *Spectral Response Accelerations* are presented in Table 5.2; a summary of the *Design Maps* analysis is presented in Appendix C. The *peak ground acceleration* (PGA) may be taken as 0.33g.

Table 5.2
Short and 1-Second Period Spectral Accelerations

Parameter	Short Period (0.2 sec)	Long Period (1.0 sec)
MCE Spectral Response Acceleration Site Class B (g)	$S_s = 0.633$	$S_l = 0.278$
MCE Spectral Response Acceleration Site Class D (g)	$S_{MS} = 0.819$	$S_{M1} = 0.417$
Design Spectral Response Acceleration (g)	$S_{DS} = 0.546$	$S_{D1} = 0.211$

5.3 OTHER GEOLOGIC HAZARDS

Geologic hazards and conditions can be defined as naturally occurring geologic conditions or processes that could present a danger to human life and property or result in impacts to conventional construction procedures. These hazards and conditions must be considered before development of the site. There are several hazards and conditions in addition to seismicity and faulting that may be present at the site, and which should be considered in the design of habitable structures and other critical structures. The other geologic hazard considered for this site are liquefaction and flooding.

5.3.1 Liquefaction

Liquefaction is the loss of soil strength or stiffness due to a buildup of excess pore-water pressure during strong ground shaking. Liquefaction is associated primarily with loose (low density), granular, saturated soil. Effects of severe liquefaction can include sand boils, excessive settlement, bearing capacity failures, and lateral spreading.

The site is generally underlain by soil that is heavily cemented "pot rock". Though shallow groundwater was observed across the site, Anderson, et al. (1994) deems the project site to have a 'very low' potential for liquefaction. This 'very low' designation is likely due to the presence

of pot rock, which is not susceptible to liquefaction. Liquefaction-susceptible soils, if present, would be located below the pot rock. The depth/thickness of the pot rock is currently unknown, since the backhoe used in the field work could not excavate more than about 1 or 2 feet into the pot rock.

A liquefaction study, which would include borings and/or CPT soundings to a depth of 50 feet, was not completed and is beyond our scope of services for this project.

5.3.2 Flooding

A hot spring was observed near the norther boundary of the site along 600 North. This area is near the topographic high point of the site. The water from the spring currently flows south near the center of the property where it flows into a creek that bisects the site flowing west to east. Groundwater was observed throughout the site at elevations lower than the observed spring; also, several wet areas identified as 'wetlands' on the *Geotechnical Map* (Figure A-2) further indicate that groundwater is at, or near the surface. Considering the presence of a hot springs, an apparent perennial stream, and near-surface groundwater, flooding from a rise in groundwater level could impact the proposed improvements.

The hot spring could potentially be formed from artesian pressure that exists below the pot rock. Special consideration should be given during excavation through the pot rock. It is conceivable that the pot rock forms a relatively impermeable cap over artesian groundwater conditions; as such, potential flooding could occur in excavated areas that extend beneath the pot rock layer into unconsolidated sediments, if artesian pressure exists.

6.0 ENGINEERING CONCLUSIONS AND RECOMMENDATIONS

6.1 GENERAL CONCLUSIONS

Based on the subsurface conditions encountered at the site, the subject site is suitable for the proposed development provided that the recommendations presented in this report are incorporated into the design and construction of the project. We recommend that as part of the site grading process any unsuitable soils currently present at the site be removed from beneath proposed footings or the footings be deepened to extend below the unsuitable soils.

We recommend that IGES be on site at key points during construction to see that the recommendations in this report are implemented. Footings may be established *entirely* on undisturbed native "pot rock" or *entirely* on structural fill extending to undisturbed native "pot rock". However, in most cases we anticipate footings will be poured directly on pot rock. Shallow spread or continuous wall footings constructed as described above may be proportioned utilizing a maximum net allowable bearing pressure of **5,000 pounds per square foot (psf)** for dead load plus live load conditions.

The following sub-sections present our recommendations for general site grading, pavement design, design of foundations, slabs-on-grade, lateral earth pressures, moisture protection and preliminary soil corrosion.

6.2 EARTHWORK

Prior to the placement of foundations, general site grading is recommended to provide proper support for foundations, exterior concrete flatwork, and concrete slabs-on-grade. Site grading is also recommended to provide proper drainage and moisture control on the subject property.

6.2.1 General Site Preparation

Within the areas to be graded (below proposed structures, fill sections, concrete flatwork, or pavement sections), any existing surface vegetation, topsoil, debris, and undocumented fill should be removed. Based on our field investigation the upper 1 to 2 feet should be grubbed to remove the majority of the roots, organic matter and soft unsuitable material; *below man-made improvements we anticipate removal of most or all surficial material down to pot rock*. Any existing utilities should be re-routed or protected in-place. Any soft/loose areas identified during proof-rolling should be removed and replaced with structural fill. An IGES representative should observe the site preparation and grading operations to assess site conditions once construction begins.

6.2.2 Excavations

Soft, disturbed, or otherwise unsuitable soils beneath foundations or concrete flatwork may need to be over-excavated and replaced with structural fill. The excavations should extend a minimum of 1-foot laterally for every foot of depth of over-excavation. Excavations should extend laterally at least two feet beyond slabs-on-grade. Structural fill should consist of granular materials and should be placed and compacted in accordance with the recommendations presented in this report.

6.2.3 Excavation Stability

The contractor is responsible for site safety, including all temporary slopes and trenches excavated at the site and design of any required temporary shoring. The contractor is responsible for providing the "competent person" required by OSHA standards to evaluate soil conditions. Based on our observations soil types are expected to consist largely of *Type C* soils. Also, the presence of shallow groundwater may contribute to potential trench instability; dewatering will likely be necessary to maintain a safe working area inside the trench. Close coordination between the competent person and IGES should be maintained to facilitate construction while providing safe excavations.

Based on Occupational Safety and Health (OSHA) guidelines for excavation safety, trenches with vertical walls up to 5 feet in depth may be occupied. Where very moist soil conditions or groundwater is encountered, or when the trench is deeper than 5 feet, we recommend a trench-shield or shoring be used as a protective system to workers in the trench. Sloping of the sides at 1.5H:1V (34 degrees from horizontal) may be used as an alternative to shoring or shielding. Where hard, competent pot rock is exposed, the trench walls may be left vertical pending field approval by the "competent person" overseeing temporary excavations. If trench excavations extend deeper than 6 feet into competent pot rock, or if the trench extends more than 4 feet *below* the pot rock, temporary shoring will likely be required.

6.2.4 Structural Fill and Compaction

All fill placed for the support of structures, flatwork or pavements, should consist of structural fill. Structural fill should consist of an approved imported material; we do not recommend the native clay soils be used as structural fill. Imported soil used as structural fill should be a relatively well-graded granular soil with a maximum fines content (minus No.200 mesh sieve) of 35 percent. Structural fill should be free of vegetation and debris, and contain no rocks larger than 4 inches in nominal size (6 inches in greatest dimension). Soil classifying as A-1-a is ideal; soils not meeting this criterion may be suitable for use as structural fill but must be approved by IGES prior to importation. Also, *topsoil* may not be incorporated into structural fill; this material must be kept segregated from other soils intended to be used as structural fill.

All structural fill should be placed in maximum 6-inch loose lifts if compacted by small hand-operated compaction equipment, maximum 8-inch loose lifts if compacted by light-duty rollers, and maximum 10-inch loose lifts if compacted by heavy duty compaction equipment that is capable of efficiently compacting the entire thickness of the lift. These values are *maximums*; the Contractor should be aware that thinner lifts may be necessary to achieve the required compaction criteria. We recommend that all structural fill be compacted on a horizontal plane, unless otherwise approved by IGES. Structural fill placed beneath footings and pavements should be compacted to at least 95 percent of the maximum dry density (MDD) as determined by ASTM D-1557. The moisture content should be at or slightly above the optimum moisture content (OMC) for all structural fill – compacting dry of optimum is discouraged. Any imported fill materials should be approved by IGES prior to importing. Also, prior to placing any fill, the excavations should be observed by IGES to confirm that unsuitable materials have been removed. In addition, proper grading should precede placement of fill, as described in the General Site Preparation and Grading subsection of this report.

All utility trenches backfilled below pavement sections, curb and gutter and concrete flatwork, should be backfilled with structural fill compacted to at least 95 percent of the MDD as determined by ASTM D-1557. All other trenches, including landscape areas, should be backfilled and compacted to a minimum of 90 percent of the MDD (ASTM D-1557).

Specifications from governing authorities having their own precedence for backfill and compaction should be followed where applicable.

6.2.5 Temporary Dewatering

Based on groundwater conditions, trench excavations and possibly foundation excavations will likely require dewatering. Temporary dewatering can be accomplished by placing a pump in a low section of the excavation or by placing well points around the excavation to lower the groundwater. More than one pump located along a section of trench may be required to sufficiently dewater and create safe and comfortable working conditions.

IGES can provide design recommendations for a dewatering system upon request. We would recommend any dewatering system be installed congruent with construction rather than attempting to modify an existing excavation.

6.3 FOUNDATIONS

Footings should be established *entirely* on suitable undisturbed pot rock or *entirely* on structural fill extending to undisturbed pot rock; native/fill transition zones are not allowed. If soft, loose, porous, or otherwise deleterious earth materials are exposed in the footing excavations, then the footings should be deepened further such that all footings bear on relatively uniform, competent

native earth materials (e.g., all foundations should bear on pot rock). Alternatively, the earth materials underlying the foundations may be over-excavated and replaced with structural fill, such that the entire foundation system is underlain by a minimum of 2 feet of structural fill. All footing excavations should be observed by IGES or other qualified geotechnical engineer prior to constructing footings.

Shallow spread or continuous wall footings constructed as described above may be proportioned utilizing a maximum net allowable bearing pressure of **5,000 pounds per square foot (psf)** for dead load plus live load conditions. A one-third increase may be used for transient wind and seismic loads. If required, all fill beneath the foundations should consist of granular structural fill and should be placed and compacted in accordance with our recommendations presented in Section 6.2.4 of this report.

All foundations exposed to the full effects of frost should be established at a minimum depth of 36 inches below the lowest adjacent final grade. Interior footings, not subjected to the full effects of frost (i.e., a continuously heated structure), may be established at higher elevations, however, a minimum depth of embedment of 12 inches is recommended for confinement purposes. The minimum recommended footing width is 20 inches for continuous wall footings and 30 inches for isolated spread footings.

6.4 SETTLEMENT

Settlements of properly designed and constructed conventional foundations, founded as described above (on pot rock), are anticipated to be on the order of ½ inch or less. Differential settlement is expected to be half of total settlement over a distance of 30 feet.

6.5 EARTH PRESSURES AND LATERAL RESISTANCE

Lateral forces imposed upon conventional foundations due to wind or seismic forces may be resisted by the development of passive earth pressures and friction between the base of the footing and the supporting soils. In determining the frictional resistance against concrete, a coefficient of friction of 0.45 for *granular soil* should be used. Where the foundations are poured directly on pot rock, a coefficient of friction of 0.70 may be used.

Ultimate lateral earth pressures from *granular soil* backfill acting against retaining walls and buried structures may be computed from the lateral pressure coefficients or equivalent fluid densities presented in Table 6.5.

The coefficients and densities presented in Table 6.5 assume no buildup of hydrostatic pressures. The force of the water should be added to the presented values if hydrostatic pressures are anticipated.

Table 6.5
Recommended Lateral Earth Pressure Coefficients

Condition	Level Backfill	
	Lateral Pressure Coefficient	Equivalent Fluid Density (pcf)
Active (Ka)	0.31	40
At-rest (Ko)	0.47	61
Passive (Kp)	3.25	423

Clayey soils drain poorly and may swell upon wetting, thereby greatly increasing lateral pressures acting on earth retaining structures; therefore, clayey soils should not be used as retaining wall backfill. Backfill should consist of imported granular material with an Expansion Index (EI) less than 20.

Walls and structures allowed to rotate slightly should use the active condition. If the element is constrained against rotation, the at-rest condition should be used. These values should be used with an appropriate factor of safety against overturning and sliding. A value of 1.5 is typically used. Additionally, if passive resistance is calculated in conjunction with frictional resistance, the passive resistance should be reduced by $\frac{1}{2}$.

6.6 CONCRETE SLAB-ON-GRADE CONSTRUCTION

To minimize settlement and cracking of slabs, and to aid in drainage beneath the concrete floor slabs, all concrete slabs should be founded on a minimum 4-inch layer of compacted gravel overlying undisturbed suitable native subgrade soils. The gravel should consist of free draining gravel with a 3/4-inch maximum particle size and no more than 5 percent passing the No. 200 mesh sieve. The slab may be designed with a Modulus of Subgrade Reaction of **125 psi/inch**.

All concrete slabs should be designed to minimize cracking as a result of shrinkage. Consideration should be given to reinforcing the slab with a welded wire fabric, re-bar, or fibermesh. Slab reinforcement should be designed by the structural engineer. We recommend that concrete be tested to assess that the slump and/or air content is in compliance with the plans and specifications. If slump and/or air content are measured above the recommendations contained in the plans and specifications, the concrete may not perform as desired. We recommend that concrete be placed in general accordance with the requirements of the American Concrete Institute (ACI).

A moisture barrier (vapor retarder) consisting of 10-mil thick Visqueen (or equivalent) plastic sheeting should be placed below slabs-on-grade where moisture-sensitive floor coverings or equipment is planned. Prior to placing this moisture barrier, any objects that could puncture it, such as protruding gravel or rocks, should be removed from the building pad. Alternatively, the building pad may be covered by two inches of clean sand.

6.7 MOISTURE PROTECTION AND SURFACE DRAINAGE

As part of good construction practices, moisture should not be allowed to infiltrate into the soils in the vicinity of the foundations. As such, design strategies to minimize ponding and infiltration near the structure should be implemented.

We recommend that hand watering, desert or Xeriscape landscaping be considered within 5 feet of the foundations. We further recommend roof runoff devices be installed around the entire perimeter of the home to collect and direct all runoff a minimum of 10 feet away from the addition. Irrigation valves should be placed a minimum of 5 feet from foundations. Additionally, the ground surface within 10 feet of residential structures should be constructed so as to slope a minimum of five percent away. Pavement sections should be constructed to divert surface water off of the pavement into storm drains.

6.8 ASPHALT CONCRETE PAVEMENT DESIGN

The prevailing pot rock is relatively hard and will behave similarly to a rock unit; as such, the pot rock is expected to provide good pavement support. However, the unconsolidated soils overlying the pot rock are expected to provide poor pavement support. Measured from final grade to the pot rock, we anticipate areas where the pavement section will be founded directly on pot rock, and other areas where placement of subbase will be required to fill in the gap between the native subgrade and overlying pavement sections.

No traffic information was available at the time this report was prepared, therefore, we have assumed an equivalent single axle load (ESAL) value of approximately 250,000 for a 20-year design life assuming an annual growth rate of 0%. Based on our analysis and assumptions presented above, we recommend the pavement design as shown in Table 6.8.1.

Prior to placing subbase or road base, all topsoil and soft/compressible clay soils must be overexcavated; we anticipate approximately 12 to 18 inches of overexcavation below existing grade in roadways (note that the actual depth of overexcavation may be more or less depending on the local site conditions). The overexcavated earth materials should be replaced with a minimum of 12 inches of subbase – greater thicknesses of subbase will be required where the road grade is significantly higher than existing grade. However, in the case where pot rock is less than 26 inches from finish grade, the subbase section may be proportionately reduced or

eliminated (e.g., if pot rock is 18 inches from finish grade, only 4 inches of subbase is needed, if pot rock is 14 inches from finish grade, subbase is not required).

Table 6.8.1
Flexible Pavement Section

Asphalt (in.)	Untreated Road Base (in.)	Subbase (in.)
3.5	10	12 in. min.*

*Pot rock need not be overexcavated to accommodate this section, the subbase section may be proportionately reduced/replaced with in-place pot rock, if present.

Asphalt has been assumed to be a high stability plant mix; base course material should be composed of crushed stone with a minimum CBR of 70 and the subbase should be a 3-inch minus pit run gravel with a minimum CBR of 30. The asphalt should be compacted to a minimum density of 96% of the Marshall value. The road base and subbase course should be compacted to at least 95% of the MDD of the modified proctor at or slightly above the OMC as determined by ASTM D1557.

It is our experience that pavement in areas where vehicles frequently turn around, backup, or load and unload, including round-a-bouts or trash enclosures, often experience more distress. If the owner wishes to prolong the life of the pavement in these areas, consideration should be given to using a Portland cement concrete (rigid) pavement in these areas. For these conditions, we recommend 5 inches of concrete overlying a minimum of 8 inches of road base. Previous recommendations regarding overexcavation of unsuitable soils and the placement of subbase also apply to the rigid pavement section discussed herein.

The (ESAL) value used for this pavement design does not account for construction traffic during the development of the subdivision. If traffic conditions vary significantly from our stated assumptions, IGES should be contacted so we can modify our pavement design parameters accordingly. Specifically, if the traffic counts are significantly higher or lower, we should be contacted to revise the pavement section design as necessary. The pavement section thickness above assumes that the majority of construction traffic including cement trucks, cranes, loaded haulers, etc. has ceased. If a significant volume of construction traffic occurs after the pavement section has been constructed, the owner should anticipate maintenance or a decrease in the design life of the pavement area.

6.9 PRELIMINARY SOIL CORROSION POTENTIAL

To evaluate the corrosion potential of concrete in contact with onsite native soil, a representative soil sample taken from TP-25 at a depth of 1.5 feet was tested in our soils laboratory for soluble sulfate content. Laboratory test results indicate that the sample tested had a sulfate content of 717 ppm. Based on this result, the onsite native soils are expected to exhibit a *low* potential for sulfate attack on concrete. A conventional Type I/II cement should be used for all concrete in contact with site soils.

To evaluate the corrosion potential of ferrous metal in contact with onsite native soil, a representative soil sample was tested in our soils laboratory for soil resistivity (AASHTO T288), soluble chloride content, and pH. The tests indicated that the onsite soil tested has a minimum soil resistivity of 603 OHM-cm, a soluble chloride content of 183, and a pH of 7.79. Based on this result, the onsite native soil is considered **severely corrosive** to ferrous metal. Consideration should be given to retaining the services of a qualified corrosion engineer to provide an assessment of any metal in contact with existing site soils, particularly ancillary water lines and reinforcing steel, and valves.

6.10 CONSTRUCTION CONSIDERATIONS

6.10.1 Shallow Groundwater

Shallow groundwater was encountered at several locations across the site. Also, areas identified as 'wetlands' on the preliminary site plan suggest groundwater is at, or near the surface in these areas. The contractor should anticipate groundwater issues during construction; dewatering for foundation and utility construction should be anticipated.

We recommend that IGES or the client take additional groundwater measurements prior to beginning construction in order to establish an annual high groundwater elevation and provide the groundwater information to the surveyors and the Civil Engineer to establish subdivision grades, layout and design. Additionally, due to the relatively high water table at the site, dewatering, subsurface drainage and other precautions should be implemented as needed (see dewatering recommendations presented in Section 6.2.5). The subdivision should be designed and graded such that the lowest finish floor is constructed a minimum of 3 feet above the high annual groundwater elevation.

6.10.2 Excavation Difficulty

Earth materials consisting of 'pot rock' were encountered over the entire site; these soils consist of cemented alluvial soils and exhibit engineering characteristics similar to limestone or dolomite. Where encountered, the backhoe met with refusal, and generally could not excavate

more than 12 inches into the pot rock. This material is expected to be difficult to excavate - special heavy-duty excavation equipment may be required, particularly for construction of utility trenches.

7.0 CLOSURE

7.1 LIMITATIONS

The recommendations presented in this report are based on our limited field exploration, laboratory testing, and understanding of the proposed construction. The subsurface data used in the preparation of this report were obtained from the explorations made for this investigation. It is possible that variations in the soil and groundwater conditions could exist between the points explored. The nature and extent of variations may not be evident until construction occurs. If any conditions are encountered at this site that are different from those described in this report, we should be immediately notified so that we may make any necessary revisions to recommendations contained in this report. In addition, if the scope of the proposed construction changes from that described in this report, IGES should be notified.

This report was prepared in accordance with the generally accepted standard of practice at the time the report was written. No warranty, expressed or implied, is made. It is the Client's responsibility to see that all parties to the project including the Designer, Contractor, Subcontractors, etc. are made aware of this report in its entirety. The use of information contained in this report for bidding purposes should be done at the Contractor's option and risk.

7.2 ADDITIONAL SERVICES

The recommendations made in this report are based on the assumption that an adequate program of tests and observations will be made during construction. IGES staff should be on site to verify compliance with these recommendations. These tests and observations should include, but not necessarily be limited to, the following:

- Observations and testing during site preparation, earthwork and structural fill placement.
- Observation of foundation soils to assess their suitability for footing placement.
- Observation of soft soil over-excavation and any temporary excavations or shoring.
- Consultation as may be required during construction.
- Quality control and observation of concrete placement.

IGES should perform observations of the foundation excavations prior to placement of concrete as recommended previously. We also recommend that project plans and specifications be reviewed by us to verify compatibility with our conclusions and recommendations. Additional information concerning the scope and cost of these services can be obtained from our office.

We appreciate the opportunity to be of service on this project. Should you have any questions regarding the report or wish to discuss additional services, please do not hesitate to contact us at your convenience at (801) 748-4044.

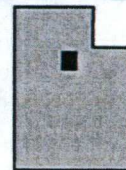
8.0 REFERENCES CITED

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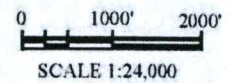
APPENDIX A



BASE MAP:
USGS Heber 7.5-Minute Quadrangle Topographic Map (2011)



MAP LOCATION



IGES[®]

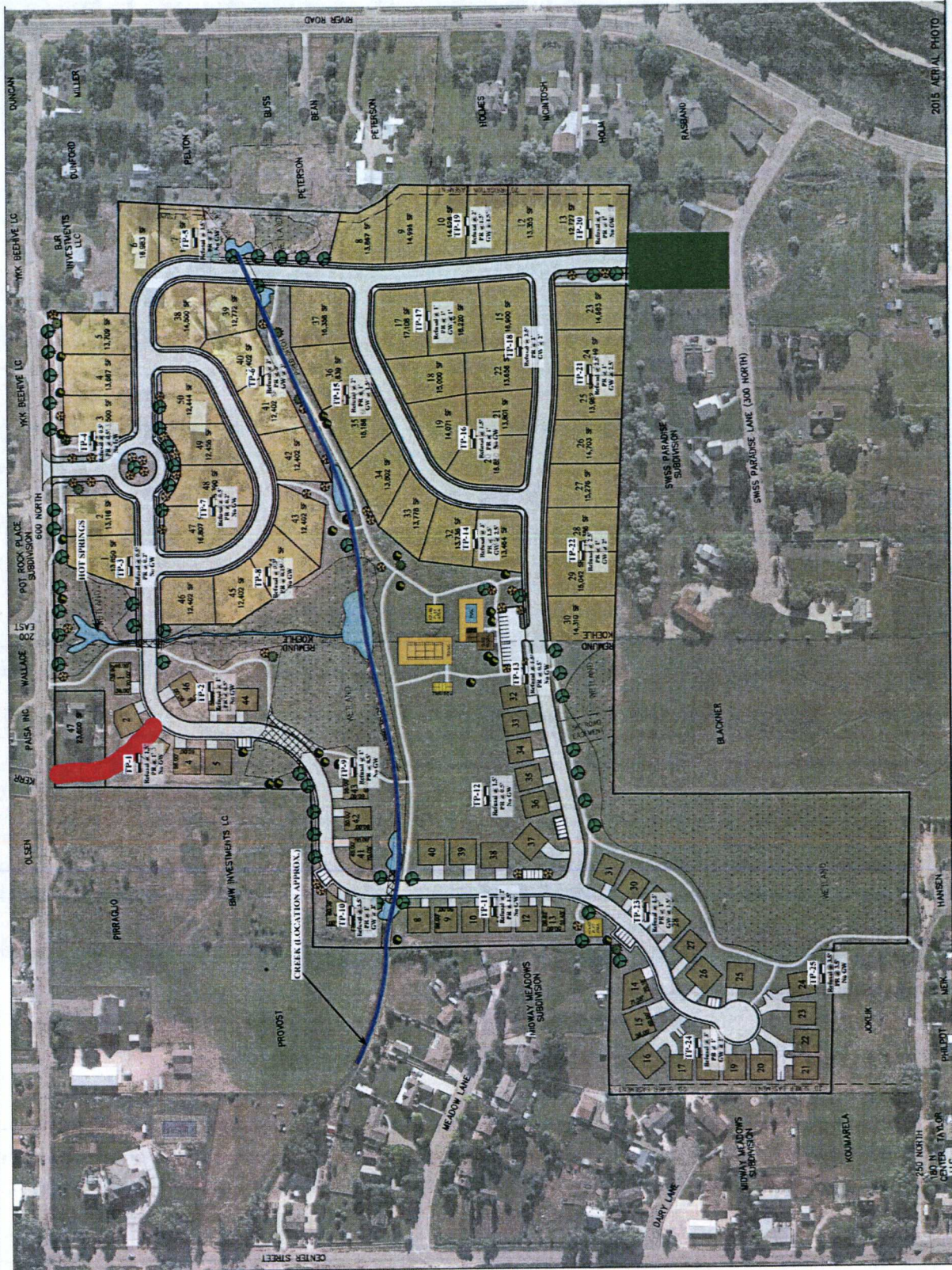
Project No. 01855-006

Geotechnical Investigation
Midway Springs Subdivision
~600 North and River Road
Midway City, Utah

SITE VICINITY MAP

Figure

A-1



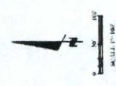
2015 AERIAL PHOTO

LEGEND

TP-1
 Approximate lot per Station with total depth
 depth by Part 16.1, 17.1, and with lot
 government (GIS)

TP-2
 Approximate lot per Station with total depth
 depth by Part 16.1, 17.1, and with lot
 government (GIS)

OW # 12
 OW # 13



IGES
 PROFESSIONAL ENGINEERS

Geotechnical Engineering
 10000 Highway 101
 Suite 100
 McKinney, TX 75069
 Phone: 972.463.1000

Figure
 A-2

GEOTECHNICAL MAP

Base Map: Concept Plan prepared by Berg Engineering, dated March 15, 2016

DATE		STARTED: 4/8/16		Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006				IGES Rep: TBL		TEST PIT NO:	
		COMPLETED: 4/8/16						Rig Type: Case 580		TP- 1 Sheet 1 of 1	
		BACKFILLED: 4/8/16						Backhoe			
DEPTH		ELEVATION		LOCATION				Moisture Content and Atterberg Limits			
FEET		SAMPLES		LATITUDE LONGITUDE ELEVATION				Plastic Limit Moisture Content Liquid Limit			
WATER LEVEL		GRAPHICAL LOG		MATERIAL DESCRIPTION				10 20 30 40 50 60 70 80 90			
		UNIFIED SOIL CLASSIFICATION						Dry Density(pcf)		Moisture Content %	
0				Topsoil - Clayey SAND - medium dense, slightly moist, brown							
1				Pot Rock - hard, slightly moist, white, heavily modified, strong cementation, porous							
2				Refusal at 1.5 feet No Groundwater Encountered Pot Rock Encountered at 1.0 feet							
3											
4											

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG 01855-006.GPJ IGES.GDT 5/12/16



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SAMPLE TYPE
 □ - GRAB SAMPLE
 ▣ - 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 ▼ - MEASURED
 ▽ - ESTIMATED

NOTES:

Figure
A-3

DATE		STARTED: 4/8/16		Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006				IGES Rep: TBL		TEST PIT NO: TP-2 Sheet 1 of 1										
		COMPLETED: 4/8/16						Rig Type: Case 580 Backhoe												
		BACKFILLED: 4/8/16																		
DEPTH		ELEVATION		LOCATION		Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits									
FEET		UNIFIED SOIL CLASSIFICATION		MATERIAL DESCRIPTION							<table border="1"> <tr> <td>Plastic Limit</td> <td>Moisture Content</td> <td>Liquid Limit</td> </tr> <tr> <td>10</td> <td>20</td> <td>30</td> </tr> <tr> <td>40</td> <td>50</td> <td>60</td> </tr> <tr> <td>70</td> <td>80</td> <td>90</td> </tr> </table>			Plastic Limit	Moisture Content	Liquid Limit	10	20	30	40
Plastic Limit	Moisture Content	Liquid Limit																		
10	20	30																		
40	50	60																		
70	80	90																		
SAMPLES		GRAPHICAL LOG																		
WATER LEVEL																				
0		Topsoil - Clayey SAND - medium dense, slightly moist, brown frequent fine roots																		
1		Calcium Carbonate "Pot Rock" - very dense, slightly moist, white, heavily modified, strong cementation, porous																		
2		Refusal at 1.0 feet No Groundwater Encountered Pot Rock Encountered at 0.5 feet																		
3																				
4																				

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG 01855-006.GPJ IGES.GDT 5/12/16



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SAMPLE TYPE
 ▮ - GRAB SAMPLE
 ▣ - 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 ▼ - MEASURED
 ▽ - ESTIMATED

NOTES:

Figure
A-4

DATE		STARTED: 4/8/16		Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006			IGES Rep: TBL		TEST PIT NO:						
		COMPLETED: 4/8/16					Rig Type: Case 580		Backhoe		TP-3				
		BACKFILLED: 4/8/16									Sheet 1 of 1				
DEPTH		ELEVATION		LOCATION			Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits			
FEET		SAMPLES		LATITUDE LONGITUDE ELEVATION								Plastic Limit Moisture Content Liquid Limit -----●----- 10 20 30 40 50 60 70 80 90			
		WATER LEVEL		MATERIAL DESCRIPTION											
		GRAPHICAL LOG		Topsoil - Clayey SAND - loose, dry to slightly moist, brown some fine roots Pot Rock - hard, slightly moist, white to light brown, heavily modified, strong cementation, porous - occasional diameters up to 1/4 inch with frequent fine holes typical											
		UNIFIED SOIL CLASSIFICATION		Refusal at 0.5 feet No Groundwater Encountered Pot Rock Encountered at 0.167 feet											
0															
1															
2															
3															
4															

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG: 01855-006.GPJ IGES.GDT 5/12/16



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SAMPLE TYPE

- ▬ - GRAB SAMPLE
- ☒ - 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL

- ▼ - MEASURED
- ∇ - ESTIMATED


NOTES:

Figure

A-5



DATE		STARTED: 4/8/16	Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006			IGES Rep: TBL	TEST PIT NO: TP-4 Sheet 1 of 1											
		COMPLETED: 4/8/16				Rig Type: Case 580 Backhoe												
		BACKFILLED: 4/8/16																
DEPTH		LOCATION			Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits								
ELEVATION	LATITUDE	LONGITUDE	ELEVATION	Plastic Limit						Moisture Content	Liquid Limit							
FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION													
0					Undocumented Fill - Poorly Graded GRAVEL - medium dense, slightly moist, gray brown Pot Rock - hard, slightly moist, white to light brown, heavily modified, strong cementation, porous - occasional diameters up to 1/4 inch with frequent fine holes typical Refusal at 0.25 feet No Groundwater Encountered Pot Rock Encountered at 0.2 feet					10	20	30	40	50	60	70	80	90
1																		
2																		
3																		
4																		

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG 01855-006.GPJ IGES.GDT 5/12/16





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SAMPLE TYPE

-  - GRAB SAMPLE
-  - 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL

-  - MEASURED
-  - ESTIMATED

NOTES:

Figure
A-6

DATE		STARTED: 4/8/16		Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006				IGES Rep: TBL		TEST PIT NO: TP- 5 Sheet 1 of 1														
		COMPLETED: 4/8/16						Rig Type: Case 580																
		BACKFILLED: 4/8/16						Backhoe																
DEPTH		ELEVATION	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	LOCATION			Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits									
LATITUDE LONGITUDE ELEVATION							Plastic Limit	Moisture Content	Liquid Limit															
MATERIAL DESCRIPTION							<table border="1"> <tr> <td>10</td> <td>20</td> <td>30</td> <td>40</td> <td>50</td> <td>60</td> <td>70</td> <td>80</td> <td>90</td> </tr> </table>									10	20	30	40	50	60	70	80	90
10	20	30	40	50	60	70	80	90																
0		Topsoil - Clayey SAND - medium dense, moist, brown																						
1		Pot Rock - hard, slightly moist, light brown, heavily modified, strong cementation, porous - frequent fine holes typical																						
2		Refusal at 1.5 feet Groundwater Encountered at 1.5 feet Pot Rock Encountered at 1.0 feet 1" PVC Piezometer Placed																						
3																								
4																								

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG 01855-006.GPJ IGES.GDT 5/12/16



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SAMPLE TYPE
 - GRAB SAMPLE
 - 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 - MEASURED
 - ESTIMATED

NOTES:

Figure
A-7

DATE		STARTED: 4/8/16 COMPLETED: 4/8/16 BACKFILLED: 4/8/16			Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006			IGES Rep: TBL Rig Type: Case 580 Backhoe		TEST PIT NO: TP- 6 Sheet 1 of 1	
DEPTH		LOCATION			Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits	
ELEVATION	FEET	LATITUDE	LONGITUDE	ELEVATION						Plastic Limit	Moisture Content
SAMPLES		MATERIAL DESCRIPTION			10 20 30 40 50 60 70 80 90						
WATER LEVEL		Undocumented Fill - Poorly Graded GRAVEL - medium dense, dry to slightly moist, gray brown									
GRAPHICAL LOG		Pot Rock - hard, slightly moist, light brown, heavily modified, strong cementation, porous - occasional diameters up to 1/16 inches with frequent fine holes typical									
UNIFIED SOIL CLASSIFICATION		Refusal at 3.0 feet Groundwater Encountered at 3.0 feet Pot Rock Encountered at 0.5 feet 1" PVC Piezometer Placed									

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG 01855-006.GPJ IGES.GDT 5/12/16



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- SAMPLE TYPE**
- GRAB SAMPLE
 - 3" O.D. THIN-WALLED HAND SAMPLER
- WATER LEVEL**
- MEASURED
 - ESTIMATED

NOTES:

Figure A-8

DATE		STARTED: 4/8/16		Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006				IGES Rep: TBL		TEST PIT NO: TP- 7 Sheet 1 of 1					
		COMPLETED: 4/8/16						Rig Type: Case 580							
		BACKFILLED: 4/8/16						Backhoe							
DEPTH		ELEVATION		LOCATION				Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits		
FEET	SAMPLES			WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	LATITUDE						LONGITUDE	ELEVATION	Plastic Limit
		MATERIAL DESCRIPTION													
0		Topsoil - Clayey SAND - loose, slightly moist, brown frequent fine roots Pot Rock - hard, slightly moist, white to brown, heavily modified, strong cementation, porous - frequent diameters up to 1/16 inches typical													
1		Refusal at 0.5 feet No Groundwater Encountered Pot Rock Encountered at 0.167 feet													
2															
3															
4															

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG 01855-006.GPJ IGES.GDT 5/12/16



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SAMPLE TYPE
 □ - GRAB SAMPLE
 ▣ - 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 ▼ - MEASURED
 ▽ - ESTIMATED

NOTES:

Figure
A-9

DATE		STARTED: 4/8/16			Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006			IGES Rep: TBL		TEST PIT NO: TP-8			
		COMPLETED: 4/8/16						Rig Type: Case 580		Backhoe		Sheet 1 of 1	
		BACKFILLED: 4/8/16											
DEPTH		LOCATION							Moisture Content and Atterberg Limits				
ELEVATION		LATITUDE			LONGITUDE		ELEVATION						
FEET		MATERIAL DESCRIPTION			Dry Density(pcf)		Moisture Content %		Percent minus 200				
SAMPLES									Liquid Limit				
WATER LEVEL									Plasticity Index				
GRAPHICAL LOG									Plastic Limit				
UNIFIED SOIL CLASSIFICATION									Moisture Content				
									Liquid Limit				
									Plastic Content				
									10 20 30 40 50 60 70 80 90				
0		Disturbed Agricultural Topsoil - Clayey SAND - loose, dry to slightly moist, brown											
		Pot Rock - very dense, slightly moist, white to brown, heavily modified, strong cementation, porous - frequent fine holes typical											
		Refusal at 0.33 feet											
		No Groundwater Encountered											
		Pot Rock Encountered at 0.167 feet											
1													
2													
3													
4													

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG 01855-006.GPJ IGES.GDT 5/12/16



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- SAMPLE TYPE**
- GRAB SAMPLE
 - 3" O.D. THIN-WALLED HAND SAMPLER
- WATER LEVEL**
- MEASURED
 - ESTIMATED

NOTES:

**Figure
A-10**

DATE		STARTED: 4/8/16		Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006			IGES Rep: TBL		TEST PIT NO: TP-9										
		COMPLETED: 4/8/16					Rig Type: Case 580		Backhoe		Sheet 1 of 1								
		BACKFILLED: 4/8/16																	
ELEVATION	DEPTH	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	LOCATION			Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits					
	FEET					LATITUDE	LONGITUDE	ELEVATION						Plastic Limit	Moisture Content	Liquid Limit			
	0					MATERIAL DESCRIPTION													
						Topsoil - Clayey SAND - dense, slightly moist, brown frequent moderate sized roots													
						Pot Rock - hard, slightly moist, white, heavily modified, strong cementation, porous													
	1					Refusal at 1.0 feet No Groundwater Encountered Pot Rock Encountered at 0.5 feet													
	2																		
	3																		
	4																		

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG: 01855-006.GPJ IGES.GDT 5/12/16



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SAMPLE TYPE
 - GRAB SAMPLE
 - 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 - MEASURED
 - ESTIMATED

NOTES:

Figure
A-11

DATE		STARTED: 4/8/16			Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006			IGES Rep: TBL		TEST PIT NO: TP-10						
		COMPLETED: 4/8/16						Rig Type: Case 580		Backhoe		Sheet 1 of 1				
		BACKFILLED: 4/8/16														
DEPTH		ELEVATION			LOCATION			Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits			
ELEVATION		FEET			LATITUDE LONGITUDE ELEVATION								Plastic Limit Moisture Content Liquid Limit			
		SAMPLES			GRAPHICAL LOG			UNIFIED SOIL CLASSIFICATION			MATERIAL DESCRIPTION			10 20 30 40 50 60 70 80 90		
0					Topsoil - Clayey SAND - dense, slightly moist, brown frequent moderate sized roots											
1					Pot Rock - hard, slightly moist to wet, light gray, heavily modified, strong cementation, porous											
2																
3		▼														
4					Refusal at 3.5 feet Groundwater Encountered at 3.0 feet Pot Rock Encountered at 1.0 feet											

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG 01855-006.GPJ IGES.GDT 5/12/16



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SAMPLE TYPE

- ▬ - GRAB SAMPLE
- ▩ - 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL

- ▼ - MEASURED
- ▽ - ESTIMATED

NOTES:

**Figure
A-12**

DATE		STARTED: 4/8/16		Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006				IGES Rep: TBL		TEST PIT NO: TP-11					
		COMPLETED: 4/8/16						Rig Type: Case 580		Sheet 1 of 1					
		BACKFILLED: 4/8/16						Backhoe							
DEPTH		ELEVATION		LOCATION				Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits		
FEET		SAMPLES		LATITUDE		LONGITUDE							ELEVATION		Plastic Limit
WATER LEVEL		GRAPHICAL LOG		UNIFIED SOIL CLASSIFICATION				MATERIAL DESCRIPTION				10 20 30 40 50 60 70 80 90			
0								Topsoil - Clayey SAND - dense, slightly moist, brown frequent moderate sized roots							
1															
2								Pot Rock - hard, slightly moist, white to light gray, heavily modified, strong cementation, porous							
3								Refusal at 2.0 feet No Groundwater Encountered Pot Rock Encountered at 1.5 feet							
4															

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG 01855-006.GPJ IGES.GDT 5/12/16



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SAMPLE TYPE
 □ - GRAB SAMPLE
 ▣ - 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 ▼ - MEASURED
 ▽ - ESTIMATED

NOTES:

**Figure
A-13**

DATE		STARTED: 4/8/16		Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006			IGES Rep: TBL		TEST PIT NO: TP-12 Sheet 1 of 1								
		COMPLETED: 4/8/16					Rig Type: Case 580 Backhoe										
		BACKFILLED: 4/8/16															
DEPTH	ELEVATION	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	LOCATION			Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits			
						LATITUDE	LONGITUDE	ELEVATION						Plastic Limit	Moisture Content	Liquid Limit	
	FEET					MATERIAL DESCRIPTION											
	0					Topsoil - Clayey SAND - loose, dry to slightly moist, brown frequent fine roots											
	1					Pot Rock - hard, slightly moist, light gray, heavily modified, strong cementation, porous											
	2					Refusal at 1.5 feet No Groundwater Encountered Pot Rock Encountered at 0.5 feet											
	3																
	4																

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG 01855-006.GPJ IGES.GDT 5/12/16



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SAMPLE TYPE

- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL

- MEASURED
- ESTIMATED

NOTES:

Figure



A-14



DATE STARTED: 4/8/16 COMPLETED: 4/8/16 BACKFILLED: 4/8/16		Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006				IGES Rep: TBL Rig Type: Case 580 Backhoe		TEST PIT NO: <h1 style="margin: 0;">TP-13</h1> Sheet 1 of 1															
										LOCATION LATITUDE LONGITUDE ELEVATION													
										DEPTH	ELEVATION	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION		Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index
0					[Symbol]		Topsoil - Clayey SAND - medium dense, dry to slightly moist, brown frequent fine roots							10	20	30	40	50	60	70	80	90	
1					[Symbol]		Pot Rock - hard, slightly moist, light gray, heavily modified, strong cementation, porous - occasional diameters up to 1/16 inches with frequent fine holes typical																
2							Refusal at 1.5 feet No Groundwater Encountered Pot Rock Encountered at 0.5 feet																
3																							
4																							

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG 01855-006.GPJ IGES.GDT 5/12/16



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SAMPLE TYPE
 - GRAB SAMPLE
 - 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 - MEASURED
 - ESTIMATED

NOTES:

Figure
A-15

DATE		STARTED: 4/8/16			Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006			IGES Rep: TBL		TEST PIT NO:		
DATE		COMPLETED: 4/8/16						Rig Type: Case 580 Backhoe		TP-14 Sheet 1 of 1		
DATE		BACKFILLED: 4/8/16										
DEPTH		LOCATION			Moisture Content and Atterberg Limits							
ELEVATION		LATITUDE LONGITUDE ELEVATION			MATERIAL DESCRIPTION		Dry Density(pcf)		Moisture Content %		Plasticity Index	
FEET							Percent minus 200		Liquid Limit		Plastic Limit Moisture Content Liquid Limit 	
SAMPLES		GRAPHICAL LOG									10 20 30 40 50 60 70 80 90	
WATER LEVEL		UNIFIED SOIL CLASSIFICATION										
0		Topsoil - Clayey SAND - loose, dry to slightly moist, brown frequent fine roots										
1		Sandy Lean CLAY - stiff, moist, dark brown CL										
2		Pot Rock - hard, slightly moist, light brown with orange staining, heavily modified, strong cementation, porous - occasional diameters up to 1/2 inches with frequent diameters of 1/16 and smaller typical										
3		Refusal at 3.0 feet Groundwater Encountered at 2.5 feet Pot Rock Encountered at 1.5 feet										
4												

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG 01855-006.GPJ IGES.GDT 5/12/16



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- SAMPLE TYPE**
- GRAB SAMPLE
 - 3" O.D. THIN-WALLED HAND SAMPLER
- WATER LEVEL**
- MEASURED
 - ESTIMATED

NOTES:

Figure
A-16

DATE		STARTED: 4/8/16 COMPLETED: 4/8/16 BACKFILLED: 4/8/16			Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006			IGES Rep: TBL Rig Type: Case 580 Backhoe		TEST PIT NO: TP-15 Sheet 1 of 1		
DEPTH		LOCATION			Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits		
ELEVATION	FEET	LATITUDE	LONGITUDE	ELEVATION						Plastic Limit	Moisture Content	Liquid Limit
		MATERIAL DESCRIPTION										
0		Topsoil - Clayey SAND - loose, dry to slightly moist, brown frequent fine roots										
1		Pot Rock - hard, wet, light gray, heavily modified, strong cementation, porous - frequent fine holes typical										
2		Refusal at 2.0 feet Groundwater Encountered at 1.5 feet Pot Rock Encountered at 1.0 feet										
3												
4												

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG 01855-006.GPJ IGES.GDT 5/12/16



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SAMPLE TYPE
 - GRAB SAMPLE
 - 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 - MEASURED
 - ESTIMATED

NOTES:

Figure
A-17

DATE		STARTED: 4/8/16		Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006			IGES Rep: TBL		TEST PIT NO: TP-16			
		COMPLETED: 4/8/16					Rig Type: Case 580 Backhoe		Sheet 1 of 1			
		BACKFILLED: 4/8/16										
DEPTH		LOCATION			Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits		
ELEVATION	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG						UNIFIED SOIL CLASSIFICATION	LATITUDE	LONGITUDE
		MATERIAL DESCRIPTION										
0		Topsoil - Clayey SAND - loose, dry to slightly moist, brown frequent fine roots in upper 6 inches										
1		Pot Rock - hard, slightly moist, light brown with some orange staining, heavily modified, strong cementation, porous - occasional diameters up to 1/16 inches with occasional fine holes typical										
2		Refusal at 1.5 feet No Groundwater Encountered Pot Rock Encountered at 1.0 feet										
3												
4												

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG 01855-006.GPJ IGES.GDT 5/12/16



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SAMPLE TYPE

- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL

- MEASURED
- ESTIMATED

NOTES:

**Figure
A-18**

DATE		STARTED: 4/8/16		Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006			IGES Rep: TBL		TEST PIT NO: TP-17 Sheet 1 of 1													
		COMPLETED: 4/8/16					Rig Type: Case 580 Backhoe															
		BACKFILLED: 4/8/16																				
DEPTH		LOCATION			LATITUDE	LONGITUDE	ELEVATION	Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits									
ELEVATION	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG									UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	Plastic Limit	Moisture Content	Liquid Limit					
	0												10	20	30	40	50	60	70	80	90	
	1		▼				Topsoil - Lean CLAY - medium stiff, moist, dark gray frequent fine roots															
	1						Pot Rock - hard, slightly moist, light brown with some orange staining, heavily modified, strong cementation, porous - occasional diameters up to 1/16 inches with occasional fine holes Reached at 1.0 feet Groundwater Encountered at 1.0 feet Pot Rock Encountered at 0.8 feet 1" PVC Piezometer Placed															
	2																					
	3																					
	4																					

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG 01855-006.GPJ IGES.GDT 5/12/16



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SAMPLE TYPE

- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL

- MEASURED
- ESTIMATED

NOTES:

Figure

A-19

DATE		STARTED: 4/8/16		Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006			IGES Rep: TBL		TEST PIT NO:												
		COMPLETED: 4/8/16					Rig Type: Case 580 Backhoe		TP-18 Sheet 1 of 1												
		BACKFILLED: 4/8/16																			
DEPTH		ELEVATION		LOCATION			Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits									
FEET		SAMPLES		LATITUDE LONGITUDE ELEVATION								Plastic Limit Moisture Content Liquid Limit 									
		WATER LEVEL		MATERIAL DESCRIPTION								10	20	30	40	50	60	70	80	90	
		GRAPHICAL LOG		Topsoil - Clayey SAND - loose, slightly moist, brown																	
		UNIFIED SOIL CLASSIFICATION					Sandy Lean CLAY - stiff slightly moist to moist, dark brown CL														
0				Pot Rock - hard, slightly moist to moist, light gray, heavily modified, strong cementation, porous - occasional diameters up to 1/16 inches with occasional fine holes typical																	
1							Refusal at 2.5 feet Groundwater Encountered at 2.0 feet Pot Rock Encountered at 1.0 feet														
2		▼																			
3																					
4																					

LOG OF TEST PITS - 4 LINE HEADER W ELEVY DAG 01855-006.GPJ IGES GDT 5/12/16



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SAMPLE TYPE
 - GRAB SAMPLE
 - 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 - MEASURED
 - ESTIMATED

NOTES:

Figure
A-20

DATE		STARTED: 4/8/16		Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006			IGES Rep: TBL		TEST PIT NO: TP-19					
DATE		COMPLETED: 4/8/16					Rig Type: Case 580		Backhoe		Sheet 1 of 1			
DATE		BACKFILLED: 4/8/16												
DEPTH		ELEVATION		LOCATION			Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits		
FEET		SAMPLES		LATTITUDE LONGITUDE ELEVATION								Plastic Limit Moisture Content Liquid Limit		
		WATER LEVEL		MATERIAL DESCRIPTION						10 20 30 40 50 60 70 80 90				
0				Topsoil - Clayey SAND - loose, slightly moist, brown frequent fine roots										
1				Sandy Lean CLAY - medium stiff, moist to wet, dark gray CL										
2		▼		Pot Rock - hard, slightly moist to moist, light gray, heavily modified, strong cementation, porous - occasional diameters up to 1/16 inches with occasional fine holes typical										
3				Refusal at 2.0 feet Groundwater Encountered at 1.5 feet Pot Rock Encountered at 1.5 feet										
4														

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG 01855-006.GPJ IGES.GDT 5/12/16



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SAMPLE TYPE
 □ - GRAB SAMPLE
 ▣ - 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 ▼ - MEASURED
 ▽ - ESTIMATED

NOTES:

Figure
A-21

DATE		STARTED: 4/8/16		Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006				IGES Rep: TBL		TEST PIT NO: TP-20 Sheet 1 of 1													
		COMPLETED: 4/8/16						Rig Type: Case 580 Backhoe															
		BACKFILLED: 4/8/16																					
DEPTH	ELEVATION	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	LOCATION			Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits									
						LATITUDE	LONGITUDE	ELEVATION						Plastic Limit	Moisture Content	Liquid Limit							
	FEET					MATERIAL DESCRIPTION						<table border="1"> <tr> <td>10</td> <td>20</td> <td>30</td> <td>40</td> <td>50</td> <td>60</td> <td>70</td> <td>80</td> <td>90</td> </tr> </table>			10	20	30	40	50	60	70	80	90
10	20	30	40	50	60	70	80	90															
	0					Topsoil - Clayey SAND - loose, dry to slightly moist, brown frequent fine roots																	
					CL	Sandy Lean CLAY - stiff, slightly moist, dark brown																	
	1					Pot Rock - hard, moist to wet, light gray, heavily modified, strong cementation, porous - frequent diameters up to 1/4 inches typical																	
	2																						
	3					Refusal at 3.0 feet No Groundwater Encountered Pot Rock Encountered at 1.0 feet																	
	4																						

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG 01855-006.GPJ IGES.GDT 5/12/16



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SAMPLE TYPE

- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL

- MEASURED
- ESTIMATED

NOTES:

Figure

A-22

DATE		Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah				IGES Rep. TBL		TEST PIT NO: TP-21											
STARTED: 4/8/16		Project Number 01855-006				Rig Type: Case 580		Sheet 1 of 1											
COMPLETED: 4/8/16						Backhoe													
BACKFILLED: 4/8/16																			
DEPTH		LOCATION				Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits								
ELEVATION	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION						MATERIAL DESCRIPTION	Plastic Limit	Moisture Content	Liquid Limit					
	0					Topsoil - Clayey SAND - loose, dry to slightly moist, yellow brown frequent fine roots													
	1				CL	Sandy Lean CLAY - stiff, moist, dark brown													
	2					Pot Rock - hard, moist to wet, light brown, heavily modified, strong cementation, porous - occasional diameters up to 1/4 inches with frequent fine holes typical													
	3					Refusal at 2.5 feet Groundwater Encountered at 2.0 feet Pot Rock Encountered at 1.0 feet													
	4																		

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG 01855-006.GPJ IGES.GDT 5/12/16



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SAMPLE TYPE
 □ - GRAB SAMPLE
 ▣ - 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 ▼ - MEASURED
 ▽ - ESTIMATED

NOTES:

Figure
A-23

DATE		Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah			IGES Rep: TBL Rig Type: Case 580 Backhoe		TEST PIT NO: TP-22 Sheet 1 of 1		
STARTED: 4/8/16		Project Number 01855-006			Moisture Content and Atterberg Limits		Plastic Limit Moisture Content Liquid Limit		
COMPLETED: 4/8/16									
BACKFILLED: 4/8/16		LOCATION			Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index
DEPTH		LATITUDE	LONGITUDE	ELEVATION					
ELEVATION	FEET	SAMPLES	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION				
0					Topsoil - Clayey SAND - medium dense, dry to slightly moist, brown				
				CL	Sandy Lean CLAY - stiff, moist, dark brown				
1					Pot Rock - hard, dry to moist, light brown with orange staining, heavily modified, strong cementation, porous - occasional diameters up to 1/2 inches with frequent diameters of 1/4 inches or smaller typical				
2					Refusal at 2.5 feet Groundwater Encountered at 2.0 feet Pot Rock Encountered at 1.0 feet 1" PVC Piezometer Placed				
3									
4									

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG 01855-006.GPJ IGES.GDT 5/12/16



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SAMPLE TYPE

- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL

- MEASURED
- ESTIMATED

NOTES:

Figure

A-24

DATE		STARTED: 4/8/16		Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006				IGES Rep: TBL		TEST PIT NO: TP-23 Sheet 1 of 1					
		COMPLETED: 4/8/16						Rig Type: Case 580 Backhoe							
		BACKFILLED: 4/8/16													
DEPTH		ELEVATION		LOCATION				Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits		
FEET		SAMPLES		LATITUDE		LONGITUDE							ELEVATION		Plastic Limit Moisture Content Liquid Limit
		WATER LEVEL		GRAPHICAL LOG		UNIFIED SOIL CLASSIFICATION		MATERIAL DESCRIPTION							
0								Topsoil - Clayey SAND - loose to medium dense, slightly moist, brown							
1								Pot Rock - hard, dry to moist, light brown with orange staining, heavily modified, strong cementation, porous - occasional diameters up to 1/8 inches typical							
2								Refusal at 1.5 feet Groundwater Encountered at 1.5 feet Pot Rock Encountered at 1.0 feet 1" PVC Piezometer Placed							
3															
4															

LOG OF TEST PITS - 4 LINE HEADER W/ELEV DAG 01855-006.GPJ IGES.GDT 5/12/16



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SAMPLE TYPE

- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL

- MEASURED
- ESTIMATED


NOTES:

Figure



A-25



DATE		STARTED: 4/8/16 COMPLETED: 4/8/16 BACKFILLED: 4/8/16			Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006			IGES Rep: TBL Rig Type: Case 580 Backhoe		TEST PIT NO: TP-24 Sheet 1 of 1		
DEPTH		LOCATION			Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits		
ELEVATION	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG						UNIFIED SOIL CLASSIFICATION	LATITUDE	LONGITUDE
0												
1												
2												
3												
4												

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG 01855-006.GPJ IGES.GDT 5/12/16



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SAMPLE TYPE
 - GRAB SAMPLE
 - 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
 - MEASURED
 - ESTIMATED

NOTES:

Figure
A-26

DATE		STARTED: 4/8/16			Geotechnical Investigation Midway Springs Subdivision South of 600 North and West of River Road Midway City, Utah Project Number 01855-006			IGES Rep: TBL		TEST PIT NO: TP-25							
DATE		COMPLETED: 4/8/16						Rig Type: Case 580 Backhoe		Sheet 1 of 1							
DATE		BACKFILLED: 4/8/16															
DEPTH	ELEVATION	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	LOCATION			Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits		
							LATITUDE	LONGITUDE	ELEVATION						Plastic Limit	Moisture Content	Liquid Limit
MATERIAL DESCRIPTION													10 20 30 40 50 60 70 80 90				
0 Topsoil - Sandy Lean CLAY - medium stiff, moist, yellow brown frequent fine roots																	
1 Lean CLAY - soft, moist to wet, light gray porous - occasional diameters up to 1/16 inches CL										10.6			●				
2 3 Pot Rock - hard, moist, yellow brown, heavily modified, strong cementation, porous - frequent fine pinholes typical																	
4 Refusal at 3.5 feet Groundwater Encountered at 2.0 feet Pot Rock Encountered at 3.3 feet 1" PVC Piezometer Placed																	

LOG OF TEST PITS - 4 LINE HEADER W ELEV DAG 01855-006.GPJ IGES.GDT 5/12/16



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SAMPLE TYPE

- ▬ - GRAB SAMPLE
- ⊞ - 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL

- ▼ - MEASURED
- ▽ - ESTIMATED

NOTES:

Figure

A-27

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS		USCS SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS (More than half of material is larger than the #200 sieve)	GRAVELS (More than half of coarse fraction is larger than the #4 sieve)	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
		GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
		GM	SILTY GRAVELS, GRAVEL-SILT-SAND MIXTURES
		GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS (More than half of coarse fraction is smaller than the #4 sieve)	SW	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
		SP	POORLY-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
FINE GRAINED SOILS (More than half of material is smaller than the #200 sieve)	SILTS AND CLAYS (Liquid limit less than 50)	ML	INORGANIC SILTS & VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS, CLAYEY SILTS WITH SLIGHT PLASTICITY
		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		OL	ORGANIC SILTS & ORGANIC SILTY CLAYS OF LOW PLASTICITY
		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILT
SILTS AND CLAYS (Liquid limit greater than 50)	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
	OH	ORGANIC CLAYS & ORGANIC SILTS OF MEDIUM-TO-HIGH PLASTICITY	
HIGHLY ORGANIC SOILS		PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

LOG KEY SYMBOLS

	BORING SAMPLE LOCATION		TEST-PIT SAMPLE LOCATION
	WATER LEVEL (level after completion)		WATER LEVEL (level where first encountered)

CEMENTATION

DESCRIPTION	DESCRIPTION
WEAKLY	CRUMBLES OR BREAKS WITH HANDLING OR SLIGHT FINGER PRESSURE
MODERATELY	CRUMBLES OR BREAKS WITH CONSIDERABLE FINGER PRESSURE
STRONGLY	WILL NOT CRUMBLE OR BREAK WITH FINGER PRESSURE

OTHER TESTS KEY

C	CONSOLIDATION	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	DS	DIRECT SHEAR
UC	UNCONFINED COMPRESSION	T	TRIAXIAL
S	SOLUBILITY	R	RESISTIVITY
O	ORGANIC CONTENT	RV	R-VALUE
CBR	CALIFORNIA BEARING RATIO	SU	SOLUBLE SULFATES
COMP	MOISTURE/DENSITY RELATIONSHIP	PM	PERMEABILITY
CI	CALIFORNIA IMPACT	-200	% FINER THAN #200
COL	COLLAPSE POTENTIAL	Gs	SPECIFIC GRAVITY
SS	SHRINK SWELL	SL	SWELL LOAD

MODIFIERS

DESCRIPTION	%
TRACE	<5
SOME	5 - 12
WITH	>12

GENERAL NOTES

1. Lines separating strata on the logs represent approximate boundaries only. Actual transitions may be gradual.
2. No warranty is provided as to the continuity of soil conditions between individual sample locations.
3. Logs represent general soil conditions observed at the point of exploration on the date indicated.
4. In general, Unified Soil Classification designations presented on the logs were evaluated by visual methods only. Therefore, actual designations (based on laboratory tests) may vary.

MOISTURE CONTENT

DESCRIPTION	FIELD TEST
DRY	ABSENCE OF MOISTURE, DUSTY, DRY TO THE TOUCH
MOIST	DAMP BUT NO VISIBLE WATER
WET	VISIBLE FREE WATER, USUALLY SOIL BELOW WATER TABLE

STRATIFICATION

DESCRIPTION	THICKNESS	DESCRIPTION	THICKNESS
SEAM	1/16 - 1/2"	OCCASIONAL	ONE OR LESS PER FOOT OF THICKNESS
LAYER	1/2 - 12"	FREQUENT	MORE THAN ONE PER FOOT OF THICKNESS

APPARENT / RELATIVE DENSITY - COARSE-GRAINED SOIL

APPARENT DENSITY	SPT (blows/ft)	MODIFIED CA. SAMPLER (blows/ft)	CALIFORNIA SAMPLER (blows/ft)	RELATIVE DENSITY (%)	FIELD TEST
VERY LOOSE	<4	<4	<5	0 - 15	EASILY PENETRATED WITH 1/2-INCH REINFORCING ROD PUSHED BY HAND
LOOSE	4 - 10	5 - 12	5 - 15	15 - 35	DIFFICULT TO PENETRATE WITH 1/2-INCH REINFORCING ROD PUSHED BY HAND
MEDIUM DENSE	10 - 30	12 - 35	15 - 40	35 - 65	EASILY PENETRATED A FOOT WITH 1/2-INCH REINFORCING ROD DRIVEN WITH 5-LB HAMMER
DENSE	30 - 50	35 - 60	40 - 70	65 - 85	DIFFICULT TO PENETRATED A FOOT WITH 1/2-INCH REINFORCING ROD DRIVEN WITH 5-LB HAMMER
VERY DENSE	>50	>60	>70	85 - 100	PENETRATED ONLY A FEW INCHES WITH 1/2-INCH REINFORCING ROD DRIVEN WITH 5-LB HAMMER

CONSISTENCY - FINE-GRAINED SOIL

CONSISTENCY	SPT (blows/ft)	TORVANE		FIELD TEST
		UNTRAINED SHEAR STRENGTH (tsf)	POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH (tsf)	
VERY SOFT	<2	<0.125	<0.25	EASILY PENETRATED SEVERAL INCHES BY THUMB. EXUDES BETWEEN THUMB AND FINGERS WHEN SQUEEZED BY HAND.
SOFT	2 - 4	0.125 - 0.25	0.25 - 0.5	EASILY PENETRATED ONE INCH BY THUMB. MOLDED BY LIGHT FINGER PRESSURE.
MEDIUM STIFF	4 - 8	0.25 - 0.5	0.5 - 1.0	PENETRATED OVER 1/2 INCH BY THUMB WITH MODERATE EFFORT. MOLDED BY STRONG FINGER PRESSURE.
STIFF	8 - 15	0.5 - 1.0	1.0 - 2.0	INDENTED ABOUT 1/2 INCH BY THUMB BUT PENETRATED ONLY WITH GREAT EFFORT.
VERY STIFF	15 - 30	1.0 - 2.0	2.0 - 4.0	READILY INDENTED BY THUMBNAIL.
HARD	>30	>2.0	>4.0	INDENTED WITH DIFFICULTY BY THUMBNAIL.



Key to Soil Symbols and Terminology

Figure A-28

APPENDIX B

Determination of the Point Load Strength Index of Rock

(ASTM D5731)



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Project: Midway Springs GTI**No: 01855-006**

Location: Midway City, Utah

Date: 4/25/2016

By: JDF

Test Device: Humboldt H-1342

Test Frame: GEOTAC Sigma-1 10K

Calibration Date: 8/19/2015

Boring No.	TP-6	TP-11	TP-24			
Sample:						
Depth:	1.0'	1.5'	2.0'			
Sample type	Block	Block	Block			
Core test type						
Distance between platen points, D (in.)	1.464	2.097	2.155			
D (mm)	37.186	53.264	54.737			
Smallest specimen width, W (in.)	2.097	2.117	3.161			
W (mm)	53.3	53.8	80.3			
Equivalent core area, D_e^2 (mm ²)	2521.8	3646.7	5595.6			
Failure load, P (lbf)	169	100	1629			
P (N)	752	445	7246			
Point load strength index, I_p (MPa)	0.30	0.12	1.29			
Size correction factor, F	1.002	1.089	1.199			
PLSI 50mm equivalent, $I_{p(50)}$ (MPa)	0.30	0.13	1.55			
Site specific correlation, C	23.1	24.4	24.5			
Uniaxial compressive strength, δ_{uc} (MPa)	6.89	3.25	38.03			
Uniaxial compressive strength, δ_{uc} (psi)	999	471	5516			

Entered by: _____

Reviewed: _____

APPENDIX C

5/6/2016

Design Maps Summary Report

USGS Design Maps Summary Report

User-Specified Input

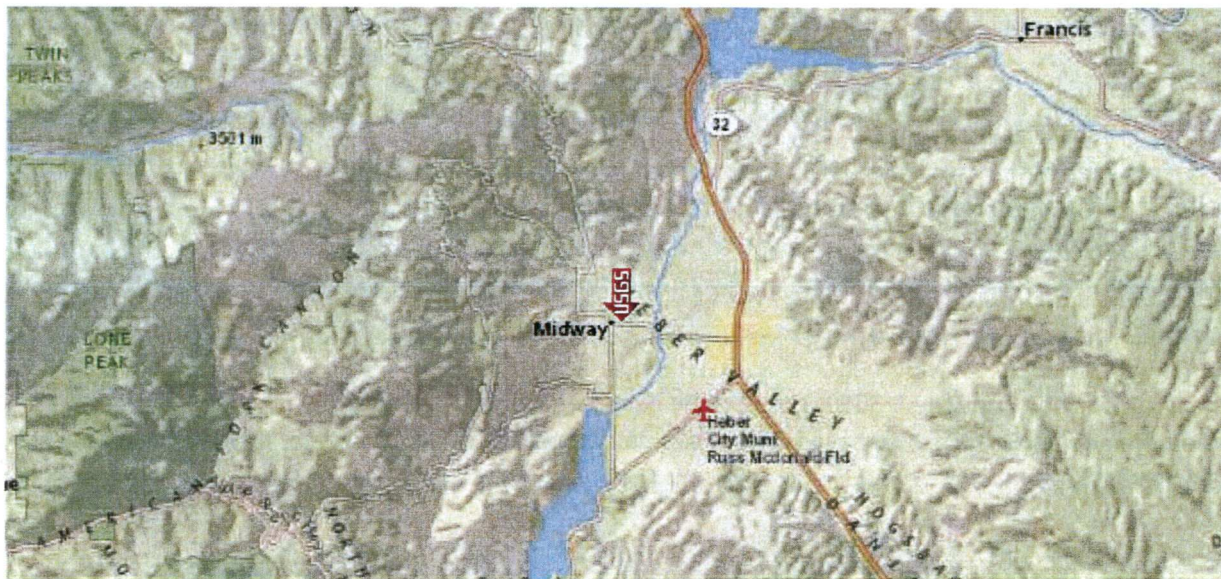
Report Title Midway Springs Subdivision
Fri May 6, 2016 21:19:16 UTC

Building Code Reference Document 2012 International Building Code
(which utilizes USGS hazard data available in 2008)

Site Coordinates 40.52178°N, 111.46791°W

Site Soil Classification Site Class D - "Stiff Soil"

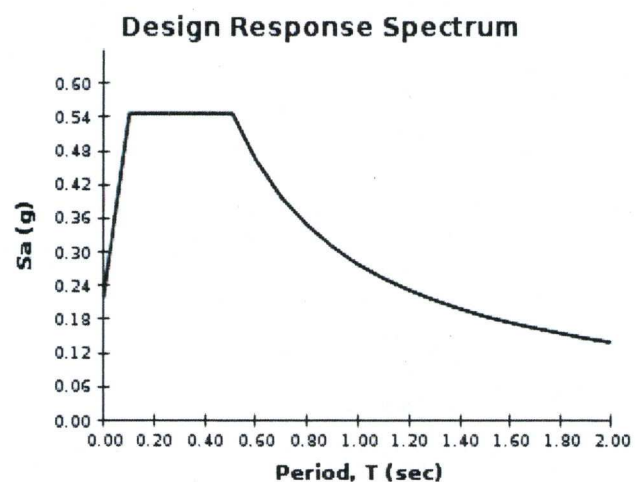
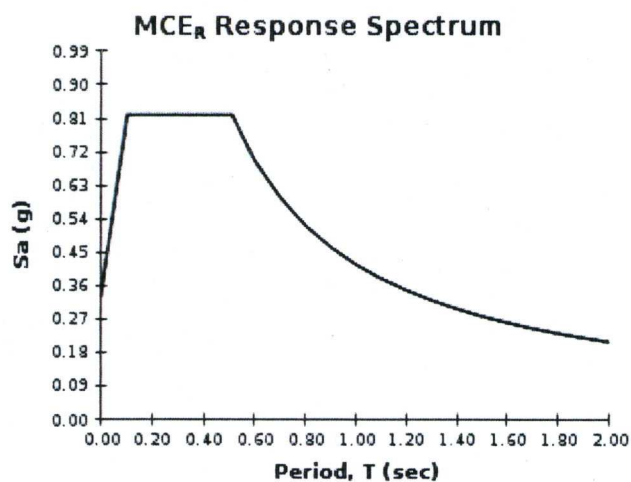
Risk Category I/II/III



USGS-Provided Output

$S_s = 0.633 \text{ g}$	$S_{MS} = 0.819 \text{ g}$	$S_{DS} = 0.546 \text{ g}$
$S_1 = 0.211 \text{ g}$	$S_{M1} = 0.417 \text{ g}$	$S_{D1} = 0.278 \text{ g}$

For information on how the S_s and S_1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.



Although this information is a product of the U.S. Geological Survey, we provide no warranty, expressed or implied, as to the accuracy of the data contained therein. This tool is not a substitute for technical subject-matter knowledge.



2012 International Building Code (40.52178°N, 111.46791°W)

Site Class D - "Stiff Soil", Risk Category I/II/III

Section 1613.3.1 — Mapped acceleration parameters

Note: Ground motion values provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain S_s) and 1.3 (to obtain S_1). Maps in the 2012 International Building Code are provided for Site Class B. Adjustments for other Site Classes are made, as needed, in Section 1613.3.3.

From **Figure 1613.3.1(1)** ^[1]

$$S_s = 0.633 g$$

From **Figure 1613.3.1(2)** ^[2]

$$S_1 = 0.211 g$$

Section 1613.3.2 — Site class definitions

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class D, based on the site soil properties in accordance with Section 1613.

2010 ASCE-7 Standard - Table 20.3-1
SITE CLASS DEFINITIONS

Site Class	\bar{v}_s	\bar{N} or \bar{N}_{ch}	\bar{s}_u
A. Hard Rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff Soil	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
E. Soft clay soil	<600 ft/s	<15	<1,000 psf

Any profile with more than 10 ft of soil having the characteristics:

- Plasticity index $PI > 20$,
- Moisture content $w \geq 40\%$, and
- Undrained shear strength $\bar{s}_u < 500$ psf

F. Soils requiring site response analysis in accordance with Section 21.1

See Section 20.3.1

For SI: 1ft/s = 0.3048 m/s 1lb/ft² = 0.0479 kN/m²

Section 1613.3.3 — Site coefficients and adjusted maximum considered earthquake spectral response acceleration parameters

TABLE 1613.3.3(1)
VALUES OF SITE COEFFICIENT F_a

Site Class	Mapped Spectral Response Acceleration at Short Period				
	$S_s \leq 0.25$	$S_s = 0.50$	$S_s = 0.75$	$S_s = 1.00$	$S_s \geq 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of S_s

For Site Class = D and $S_s = 0.633$ g, $F_a = 1.293$

TABLE 1613.3.3(2)
VALUES OF SITE COEFFICIENT F_v

Site Class	Mapped Spectral Response Acceleration at 1-s Period				
	$S_1 \leq 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 \geq 0.50$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of S_1

For Site Class = D and $S_1 = 0.211$ g, $F_v = 1.978$

Equation (16-37): $S_{MS} = F_a S_s = 1.293 \times 0.633 = 0.819 \text{ g}$

Equation (16-38): $S_{M1} = F_v S_1 = 1.978 \times 0.211 = 0.417 \text{ g}$

Section 1613.3.4 — Design spectral response acceleration parameters

Equation (16-39): $S_{DS} = \frac{2}{3} S_{MS} = \frac{2}{3} \times 0.819 = 0.546 \text{ g}$

Equation (16-40): $S_{D1} = \frac{2}{3} S_{M1} = \frac{2}{3} \times 0.417 = 0.278 \text{ g}$

Section 1613.3.5 — Determination of seismic design category

TABLE 1613.3.5(1)

SEISMIC DESIGN CATEGORY BASED ON SHORT-PERIOD (0.2 second) RESPONSE ACCELERATION

VALUE OF S_{DS}	RISK CATEGORY		
	I or II	III	IV
$S_{DS} < 0.167g$	A	A	A
$0.167g \leq S_{DS} < 0.33g$	B	B	C
$0.33g \leq S_{DS} < 0.50g$	C	C	D
$0.50g \leq S_{DS}$	D	D	D

For Risk Category = I and $S_{DS} = 0.546 g$, Seismic Design Category = D

TABLE 1613.3.5(2)

SEISMIC DESIGN CATEGORY BASED ON 1-SECOND PERIOD RESPONSE ACCELERATION

VALUE OF S_{D1}	RISK CATEGORY		
	I or II	III	IV
$S_{D1} < 0.067g$	A	A	A
$0.067g \leq S_{D1} < 0.133g$	B	B	C
$0.133g \leq S_{D1} < 0.20g$	C	C	D
$0.20g \leq S_{D1}$	D	D	D

For Risk Category = I and $S_{D1} = 0.278 g$, Seismic Design Category = D

Note: When S_1 is greater than or equal to 0.75g, the Seismic Design Category is **E** for buildings in Risk Categories I, II, and III, and **F** for those in Risk Category IV, irrespective of the above.

Seismic Design Category \equiv "the more severe design category in accordance with Table 1613.3.5(1) or 1613.3.5(2)" = D

Note: See Section 1613.3.5.1 for alternative approaches to calculating Seismic Design Category.

References

1. Figure 1613.3.1(1): [http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1\(1\).pdf](http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1(1).pdf)
2. Figure 1613.3.1(2): [http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1\(2\).pdf](http://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1(2).pdf)