PAYSON CITY

WASTEWATER TREATMENT PLANT

CAPITAL FACILITIES PLAN AMENDMENT

JULY 2023

BY:

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Forsgren Project No: 05-21-0008

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CHAPTER 1
INTRODUCTION

1.1 INTRODUCTION

This Capital Facilities Plan Amendment (CFP Amendment) has been developed for Payson City (Payson) for the Wastewater Treatment Plant (WWTP). The purpose of this CFP Amendment is to update the Capital Facilities Plan (CFP) with additional flow and loading information and develop/consider an additional alternative. Specifically, this CFP Amendment includes recent information for current and future wastewater flows and loads, summary of alternatives included in the CFP and details of a new alternative, selection of a preferred alternative, and an implementation plan.

This chapter provides background information about Payson, an overview of master planning efforts, and an introduction to the overall organization and contents of the amendment.

1.2 BACKGROUND

Payson is located in Utah County, was founded in 1850, and was incorporated in 1853. The population was 18,294 at the 2010 census and was estimated at 20,303 in 2019 (per Mountainlands Association of Government [MAG] data). The WWTP treats wastewater from Payson's municipal wastewater collection system, and also treats a portion of the municipal wastewater generated Elk Ridge City and City of Woodland Hills. The population of Elk Ridge was 2,436 at the 2010 census and was estimated at 4,335 in 2019 (per MAG data). Therefore, the total population served by the WWTP was 24,638 in 2019. Effluent from the WWTP is discharged to an unnamed drainage ditch, which is tributary to Beer Creek, which is tributary to the Benjamin Slough of Utah Lake. The history of the current WWTP is as follows:

- 1967: Modern facility constructed at current site, including headworks, primary clarifiers, trickling filters, final clarifier, anaerobic sludge digestion facility, and sludge drying beds.

- 1984: Major upgrade of facility, including addition of primary clarifier, primary trickling filter, conversion of old trickling filters and primary clarifiers to intermediate trickling filters and intermediate clarifiers, addition of second final clarifier, addition of filter building, and addition of chlorine contact tank.

- 2002: Major upgrade, including addition of new headworks, addition of STM Aerotor tanks, addition of new third final clarifier, conversion of original final clarifier to DAF thickening tank, addition of third anaerobic digester, addition of sludge drying beds, and addition of new shop/administration building.

- 2004: Addition of reuse pump station was constructed.

- 2010: Addition of sludge dewatering building.

1.3 PURPOSE AND NEED FOR PROJECT

Payson is subject to the statewide Technology-Based Phosphorus Effluent Limits (TBPEL) regulation adopted by the Utah Water Quality Board in 2014. The regulation requires that all discharging WWTPs produce effluent with a total phosphorus (TP) concentration of less than 1.0 mg/L as an annual mean. Payson received a variance in 2018 which extended the compliance date for the TBPEL to January 1, 2024. The current WWTP process cannot meet the TBPEL limit, and needs to be upgraded.

1.4 PREVIOUS MASTER PLANNING EFFORTS

Payson has completed two master planning projects related to the wastewater system within the past 5 years:

- "City of Payson Water Reclamation Facility Capital Facilities Plan", Aqua Engineering, 2019.
- "Sanitary Sewer Master Plan", Fregonese Associates/Bowen Collins Associates, July 2020.

1.5 GOALS OF THIS PLAN

Payson has established the following goals for this CFP amendment.

- Review design criteria for upgrade.
- Develop an additional alternative.
- Evaluate the alternatives and select a preferred alternative for further design and funding.
- Outline an implementation plan for construction of the improvements.

1.6 DOCUMENT ORGANIZATION

This document is organized to provide information in a sequential manner that considers a logical analysis of the existing system and requirements for the future system. The document's organization is as follows:

- **Chapter 1** provides an overview of Payson, the master planning effort, and the CFP amendment document organization.
- **Chapter 2** presents the current and future conditions, including population, flows, loads, treatment systems, and permits.
- **Chapter 3** discusses the development and screening of alternatives for upgrade of the WWTP, selection of a preferred alternative, and implementation plan.
- **Chapter 4** provides an environmental review for the project.

1.7 ABBREVIATIONS

This section presents common abbreviations used in this report.

ADF	average day flow
AF	acre-feet
AFY	acre-feet per year
BOD	biological oxygen demand, a measure of the organic matter in wastewater
CFP	Capital Facilities Plan
DPR	direct potable reuse
DWQ	Utah Division of Water Quality, a division of the Utah Department of Environmental Quality
ERU	equivalent residential unit
FT	feet
FT-MSL	feet-mean sea level, a measure of the elevation of a site or facility
GAL	gallons
GPCD	gallons per capita per day
GPD	gallons per day
GPM	gallons per minute
HP	horsepower
IGA	Intergovernmental Agreement
IPR	indirect potable reuse
KGAL	one thousand gallons
LF	linear feet
MDF	maximum day flow
MGAL	one million gallons
MGD	million gallons per day
mg/L	milligrams per liter, a measure of concentration
PER	persons
PF	peaking factor
PHF	peak hour flow
PPD	pounds per day
SBR	sequencing batch reactor, referring to a type of wastewater treatment process
TDS	total dissolved solids, a measure of dissolved ions in wastewater
TKN	total Kjeldahl nitrogen, a measure of the organic and ammonia nitrogen in wastewater
TIN	total inorganic nitrogen, a measure of nitrite, nitrate, and ammonia in wastewater
TMDL	total maximum daily load, loads assigned by DEQ for water quality protection
TP	total phosphorus, a measure of organic and inorganic phosphorus in wastewater
TSS	total suspended solids, a measure of the suspended matter in wastewater
USDA	United States Department of Agriculture, potential funding agency
WWTP	Wastewater Treatment Plant

CHAPTER 2
EXISTING AND FUTURE CONDITIONS

2.1 GENERAL

This chapter summarizes information regarding existing conditions presented in the CFP including population, wastewater flows, wastewater quality, and design criteria. New future design criteria values are also presented.

2.2 POPULATION

Table 2-1 shows the historical and projected future population for Payson and Elk Ridge as presented on page 6 of the CFP.

Table 2-1
Population as Presented in CFP

Year	Payson	Elk Ridge	Total
2010	18,294	2,436	20,730
2015	20,140	3,117	23,257
2020	22,832	3,898	26,730
2030	26,945	4,687	31,631
2040	31,798	5,635	37,433
2050	37,526	6,776	44,301

Table 2-2 shows the historical and projected future population for Payson, Elk Ridge and Woodland Hills expected to be served by the WWPT as presented by the Sanitary Sewer Master Plan (SSMP). Note that the full populations of Elk Ridge and Woodland Hills are not served by the WWTP.

Table 2-2
Population as Presented in SSMP

Year	Payson	Elk Ridge	Woodland Hills	Total
2019	28,763	1,996	889	31,648
2030	38,260	2,281	1,021	41,562
2040	52,565	2,727	1,207	56,499
2050	75,516	3,159	1,617	80,293

Table 2-3 shows the historical and projected future populations for Payson and Elk Ridge according to projections from Mountainlands Association Government (MAG).

Table 2-3
Population as Presented by MAG

Year	Payson	Elk Ridge	Total
2010	18,294	2,436	20,730
2015	19,494	3,144	22,638
2019	20,303	4,335	24,638
2020	21,000	4,500	25,500
2030	30,340	4,314	34,654
2040	42,727	5,166	47,893
2050	64,887	5,780	70,667

2.3 WASTEWATER FLOWS

Table 2-4 shows the projected wastewater flows from the various studies. Wastewater flow projections are based on the following unit flows:

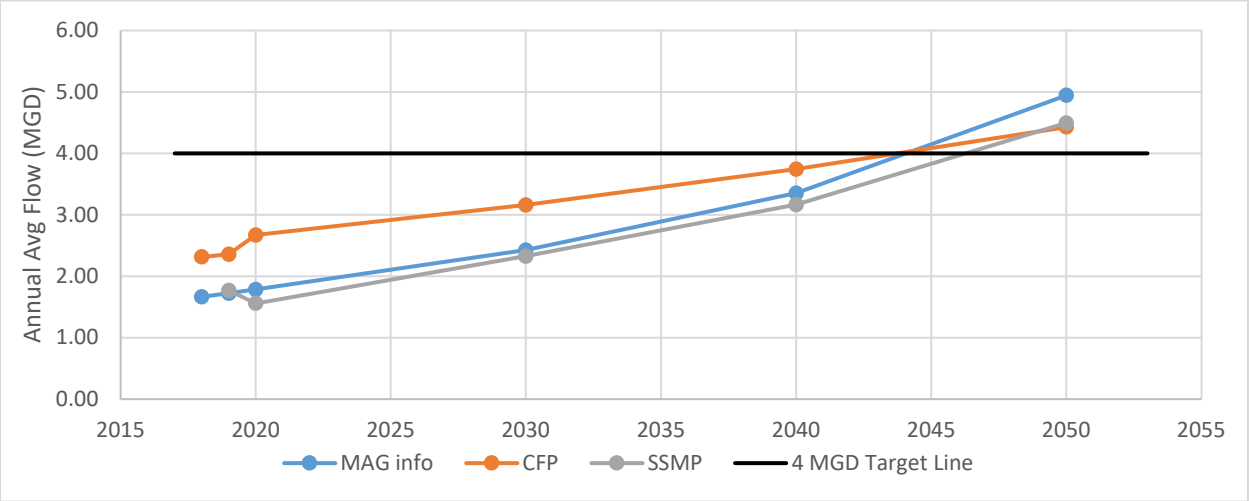
- CFP: 100 GPD/Capita as shown on page 10 of the CFP report.
- SSMP: Projected flows are presented on page 3-11 in the SSMP report. A unit flow is not specifically presented but can be calculated as 56 GPD/Capita.
- MAG: Population and flow data for 2018-2020 was reviewed for this amendment, and the average unit flow for the period was calculated at 70 GPD/Capita.

Table 2-4
Projected Wastewater Flows

Year	CFP Average Daily Flow (MGD)	SSMP Average Daily Flow (MGD)	MAG Average Daily Flow (MGD)
2020	2.67	1.56	1.79
2030	3.16	2.33	2.43
2040	3.74	3.16	3.35
2050	4.43	4.50	4.95

Figure 2-5 shows the projected wastewater flows. A design flow of 4.0 MGD has been selected since it will provide capacity for 20 years from when the WWTP upgrades are expected to be completed.

Figure 2-5
Projected Wastewater Flows



2.4 WASTEWATER LOADING

Wastewater loading conditions are presented on pages 10-16 of the CFP. Table 2-6 summarizes the historical influent loading from the CFP and historical values from 2018-2020, along with more recent data. Sampling practices at the WWTP were changed in July 2021 to increase accuracy, which has resulted in higher sampling values for the design parameters.

Table 2-6
Influent Wastewater Loading

	BOD (mg/L)	TSS (mg/L)	TKN (mg/L)	Total Phosphorus (mg/L)
Average (CFP)	162	77	25	Unknown
Average (2018-2020)	168.4	77.9	35.9	6.4
Average (7/1/21-11/30/21)	321	213	51.7	7.5
90th Percentile (7/1/21-11/30/21)	423	262	58.5	9.1

Figure 2-7
Influent BOD Concentrations

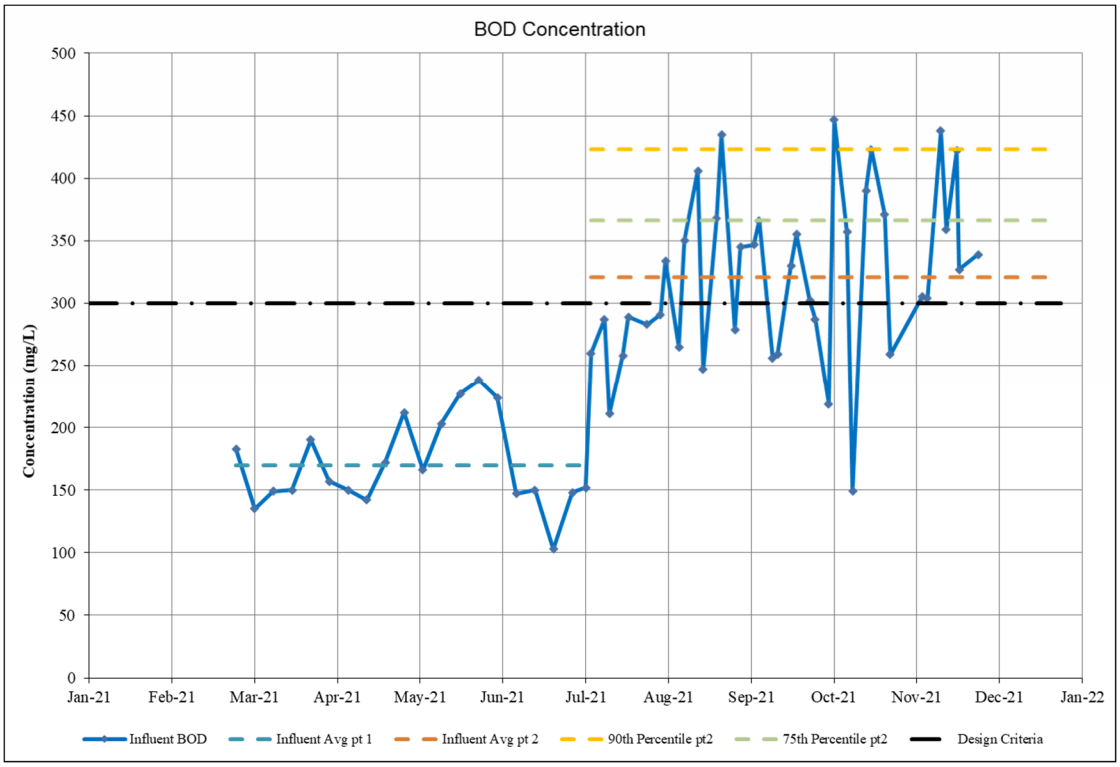


Figure 2-8
Influent TSS Concentrations

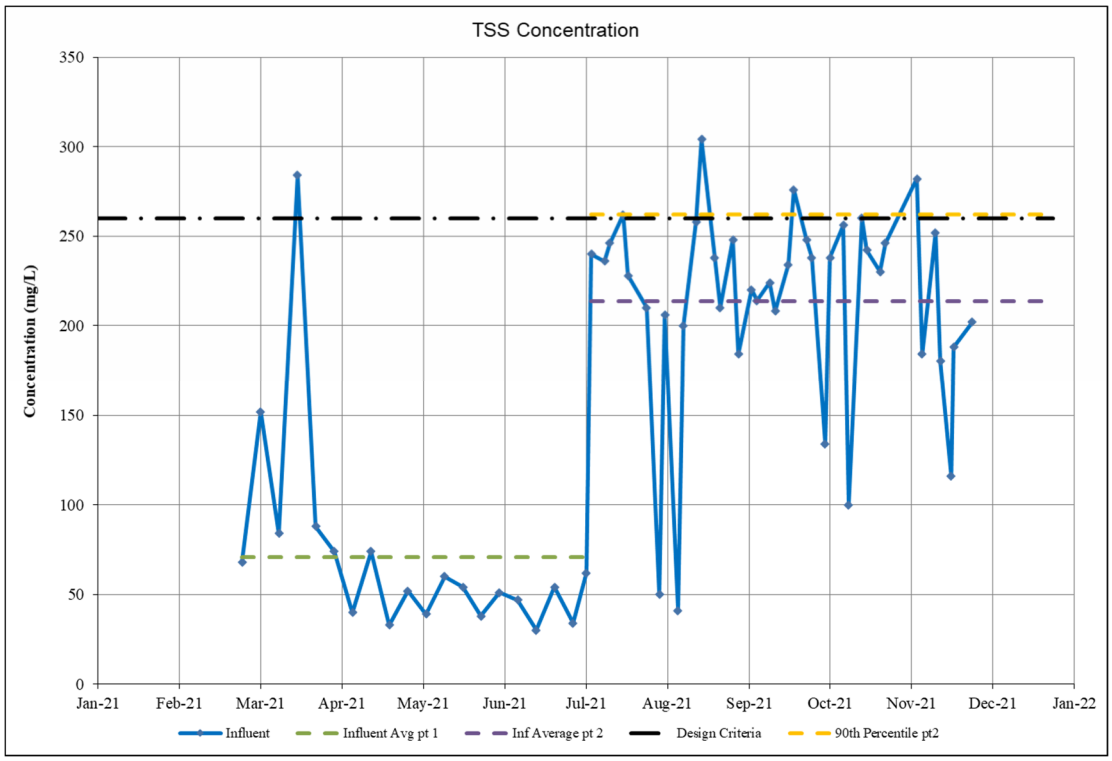


Figure 2-9
Influent TKN Concentrations

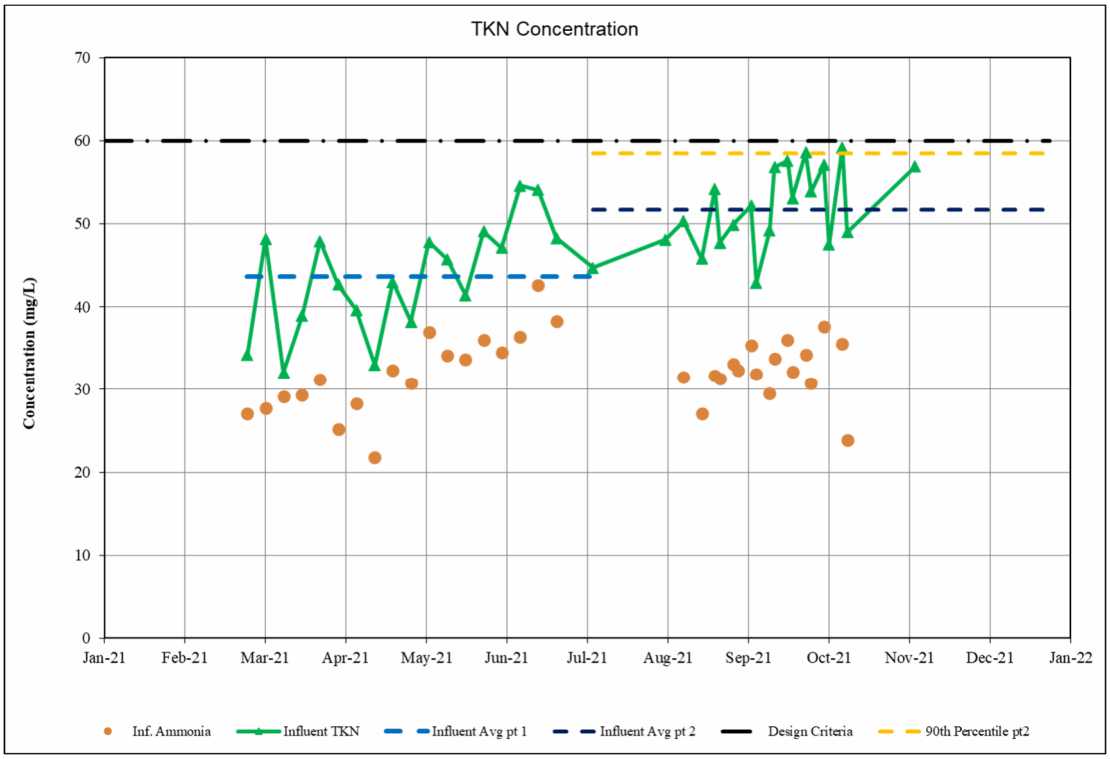
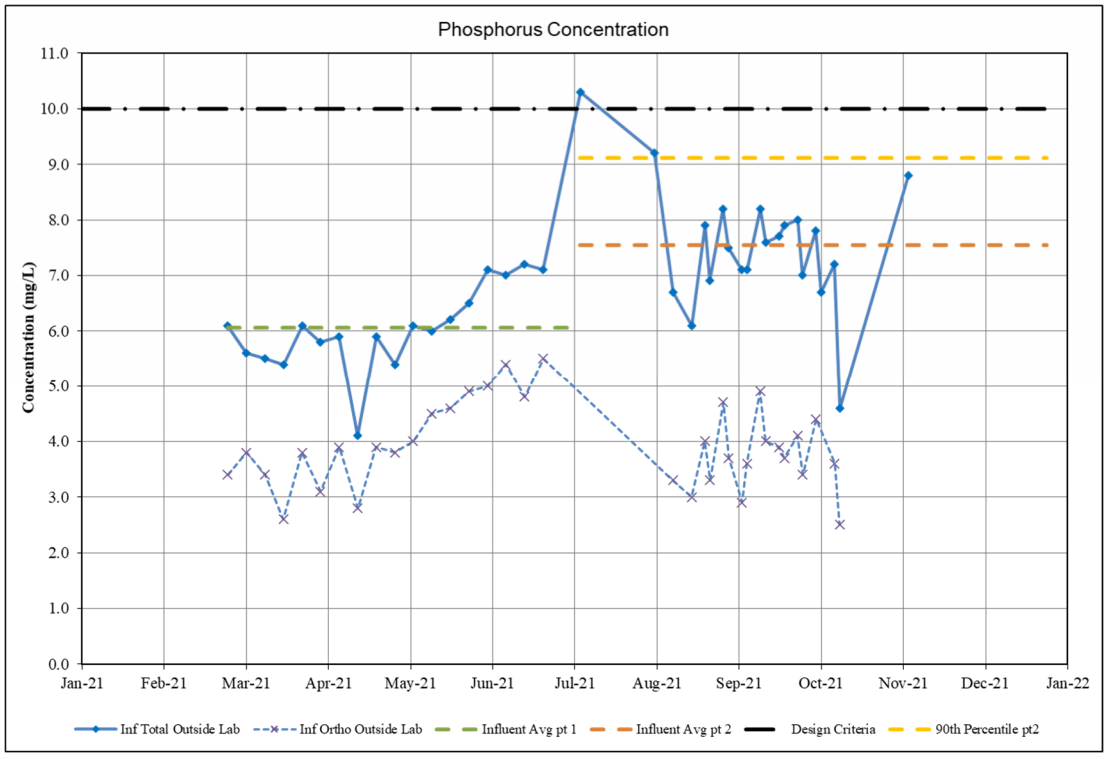


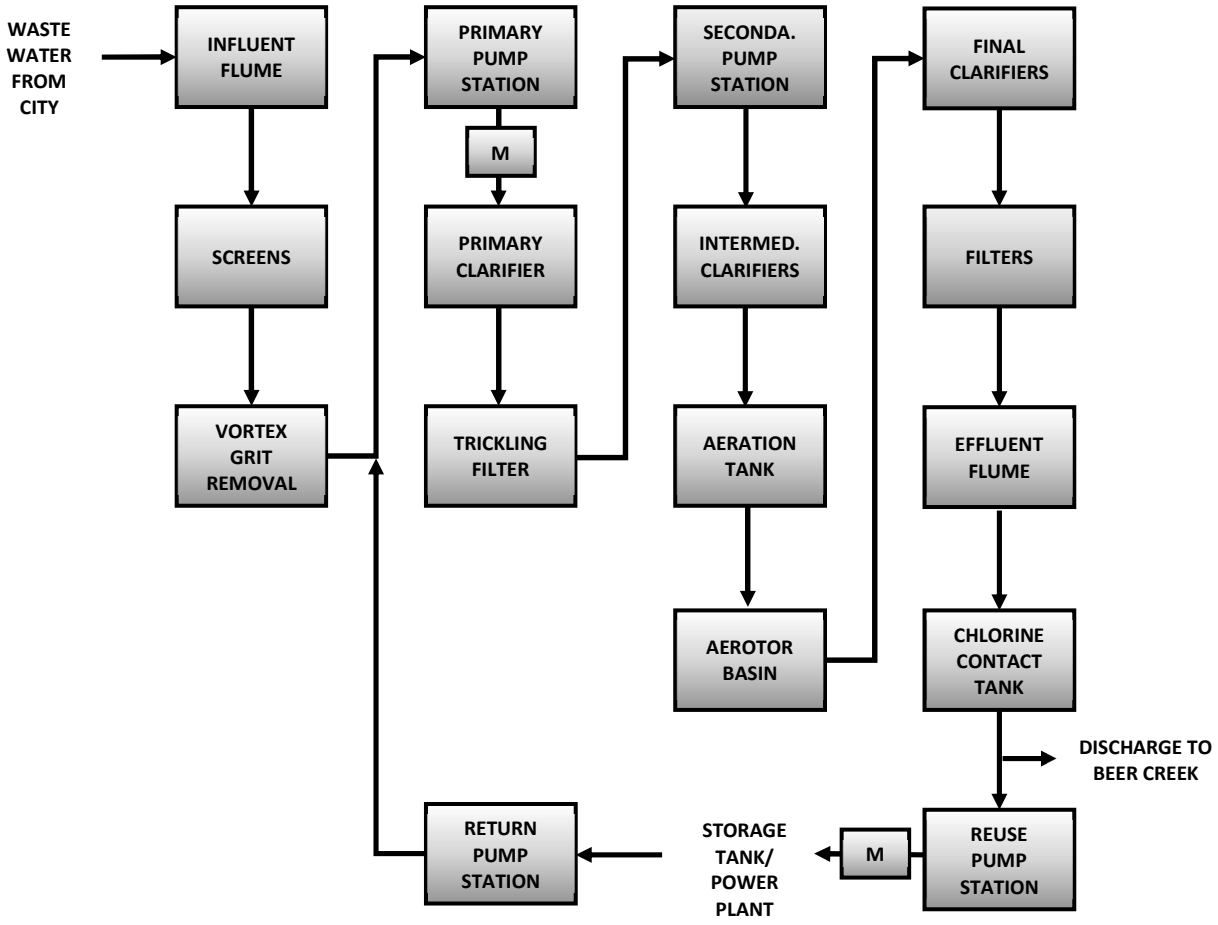
Figure 2-10
Influent Total Phosphorus Concentrations



2.5 EXISTING WWTP PROCESS SCHEMATIC

Figure 2-11 shows the existing WWTP process schematic.

Figure 2-11
Existing Process Schematic



2.6 DESIGN CRITERIA

The design criteria for the WWTP upgrade are presented on page 10 of the CFP. Table 2-12 summarizes the design criteria presented in the CFP.

Table 2-12
Design Criteria in CFP

Parameter	Unit Criteria	2040 Design Criteria	3 MGD Design Criteria (2027)	5 MGD Design Criteria (2058)
Population		37,433	30,000	50,000
Average Day Flow	100 GPD/CAP	3.75 MGD	3.00 MGD	5.00 MGD
BOD	203 mg/L	6,363 LB/DAY	5,079 LB/DAY	8,465 LB/DAY
TSS	239 mg/L	7,486 LB/DAY	5,979 LB/DAY	9,966 LB/DAY
TKN	40 mg/L	1,251 LB/DAY	1,000 LB/DAY	1,668 LB/DAY
Total Phosphorus	10 mg/L	312 LB/DAY	250 LB/DAY	417 LB/DAY

There are several items that should be noted about the design criteria.

- Several different design flows are presented for evaluation in the CFP. The CFP originally presented a preferred alternative based on a design flow of 3 MGD, but Payson subsequently elected to use 5 MGD as the design flow.

- The selected design criteria for BOD and TSS are much higher than the reported influent concentrations. The default standard design values required by the Utah wastewater regulations (BOD=0.17 LB/CAPITA/DAY, TSS=0.20 LB/CAPITA/DAY) are used in the CFP instead of the actual influent values.

Table 2-13 presents the loads using the 4 MGD future design flow rate, combined with the output from the additional increase requested from Payson Fruit Growers. Payson Fruit Growers is currently permitted for 1,400 LB/Day of BOD and they have requested to increase their permit limits. The unit criteria for BOD, TSS, TKN and TP are based on the 90th percentile for the recent sampling data.

Table 2-13
Updated Design Criteria (Average Day Conditions)

Parameter	Unit Criteria	4 MGD Design Criteria (2045)	Payson Fruit Growers Additional	Total
Population		57,000		57,000
Average Day Flow	70 GPD/CAP	4.0 MGD	0.02 MGD	4.02 MGD
BOD	400 mg/L	10,008 LB/DAY	400 LB/DAY	10,408 LB/DAY
TSS	260 mg/L	8,674 LB/DAY	133 LB/DAY	8,807 LB/DAY
TKN	60 mg/L	2,002 LB/DAY	4 LB/DAY	2,006 LB/DAY
Total Phosphorus	10.0 mg/L	333 LB/DAY	1 LB/DAY	334 LB/DAY

Table 2-14 summarizes the discharge limits that the WWTP will need to meet. The values presented represent the final limits for ammonia, TRC, and total phosphorus.

Table 2-14
UPDES Discharge Permit Requirements

Parameter	Units	Maximum Monthly Avg	Maximum Weekly Avg	Annual Avg	Daily Minimum	Daily Maximum
Flow	MGD	3.0				
BOD	mg/L	25	35			
TSS	mg/L	25	35			
Dissolved Oxygen	mg/L				4.0	
Ammonia (summer)	mg/L					7.0
Ammonia (fall)	mg/L					9.0
Ammonia (winter)	mg/L					12.0
Ammonia (spring)	mg/L					11.0
Total Phosphorus	mg/L			1.0		
Total Res. Chlor. (summer)	mg/L	0.72				0.84
Total Res. Chlor. (summer)	mg/L					0.49
Total Res. Chlor. (summer)	mg/L					0.29
Total Res. Chlor. (summer)	mg/L					0.48
E. coli	No./100 mL	126	157			

CHAPTER 3
ALTERNATIVES

3.1 GENERAL

This chapter provides information on the alternatives presented in the CFP, and information on a new alternative.

3.2 SUMMARY OF ALTERNATIVES CONSIDERED IN CFP

Page 30 of the CFP presents the following alternatives for the upgrade. Refer to Chapter 5 of the CFP more information on the alternatives.

1. Do nothing
2. 5 MGD with biological nutrient removal (BNR) and redundant chemical nutrient removal
3. 5 MGD with advanced biological nutrient removal (ABNR, official name for ClearAs algae treatment system)
4. 5 MGD with ABNR and aerobic stabilization
5. 5 MGD with BNR and aerobic sludge stabilization
6. 3 MGD with BNR and redundant chemical nutrient removal
7. 3 MGD with ABNR
8. 3 MGD with ABNR and aerobic stabilization
9. 3 MGD with BNR and aerobic stabilization

Note that in the CFP, Alternative 9 (3 MGD with BNR and aerobic stabilization) is presented as the preferred alternative. However, Alternative 9 only provides for a 3 MGD capacity, and Payson has subsequently elected to design the upgrade for 4-5 MGD. This means that the preferred alternative would be Alternative 5, since it has the same process components as Alternative 9.

Also note that the additional alternative is presented as a 3 MGD system. This is to allow for a fair comparison between the original alternatives and the additional alternative. The final design of the selected alternative will be a 4 MGD capacity system to meet the design criteria presented in Chapter 2 of this document (Table 2-9).

3.3 ADDITIONAL ALTERNATIVE TO BE CONSIDERED

Payson desires to review an additional alternative for the following reasons.

- The preferred alternative in the CFP does not appear to be a BNR system, even though it is called BNR. The scope presented on pages 48-50 of the CFP does not include an Anaerobic Tank, and the Anoxic and Aeration Tanks are undersized.

- The preferred alternative scope includes constructing a new primary clarifier. Since the anaerobic digesters are being converted to aerobic solids holding tanks, there is no need for primary clarification or the new boiler building. Untreated primary solids are sent to anaerobic digesters to produce biogas, but without anaerobic digesters there is no advantage to collecting primary solids. The primary clarifiers should be eliminated from the project.

- The new aeration tanks in the CFP are proposed to be very close to existing processes and tanks, and there are likely many underground utilities in the area. The plan presented will be difficult to construct while maintaining WWTP operations and may increase the project costs. A better plan would be to construct the new process tanks where the sludge drying beds are currently located and construct new sludge drying beds as required in the location of the existing process tanks after the new process is operational.

The additional alternative (Alternative 10) that Payson is considering is a BNR process using an oxidation ditch system. The process is based on the system currently operating at the Salem WWTP. The scope of the upgrade will be the same as Alternative 5, with following changes.

- *Add New Anaerobic Tank*: The BNR process will consist of an Anaerobic Tank and Oxidation Ditch. The Anaerobic Tank will be used as part of the phosphorus removal process, while the Oxidation Ditch creates anoxic and aerated zones to finalize phosphorus removal and accomplish nitrogen removal. We propose to construct the BNR system on the north side of the property where the existing sludge drying beds are located.

- *New BNR Oxidation Ditch*: The proposed Oxidation Ditch is based on the Evoqua Orbal system successfully installed at the Salem WWTP. The Orbal system is simpler to operate and has reduced capital costs when compared to the aeration basin system presented in the CFP, produces high quality effluent, and uses biological nutrient removal. This will take the place of the Anoxic Basin and Aerobic Basin that are part of Alternative 5. The Primary Clarifier included in Alternative 5 is not needed with the BNR system.

Figure 3-1 shows the process schematic for Alternative 10. Figure 3-2 shows a site layout.

Figure 3-1
Alternative 10 Process Schematic

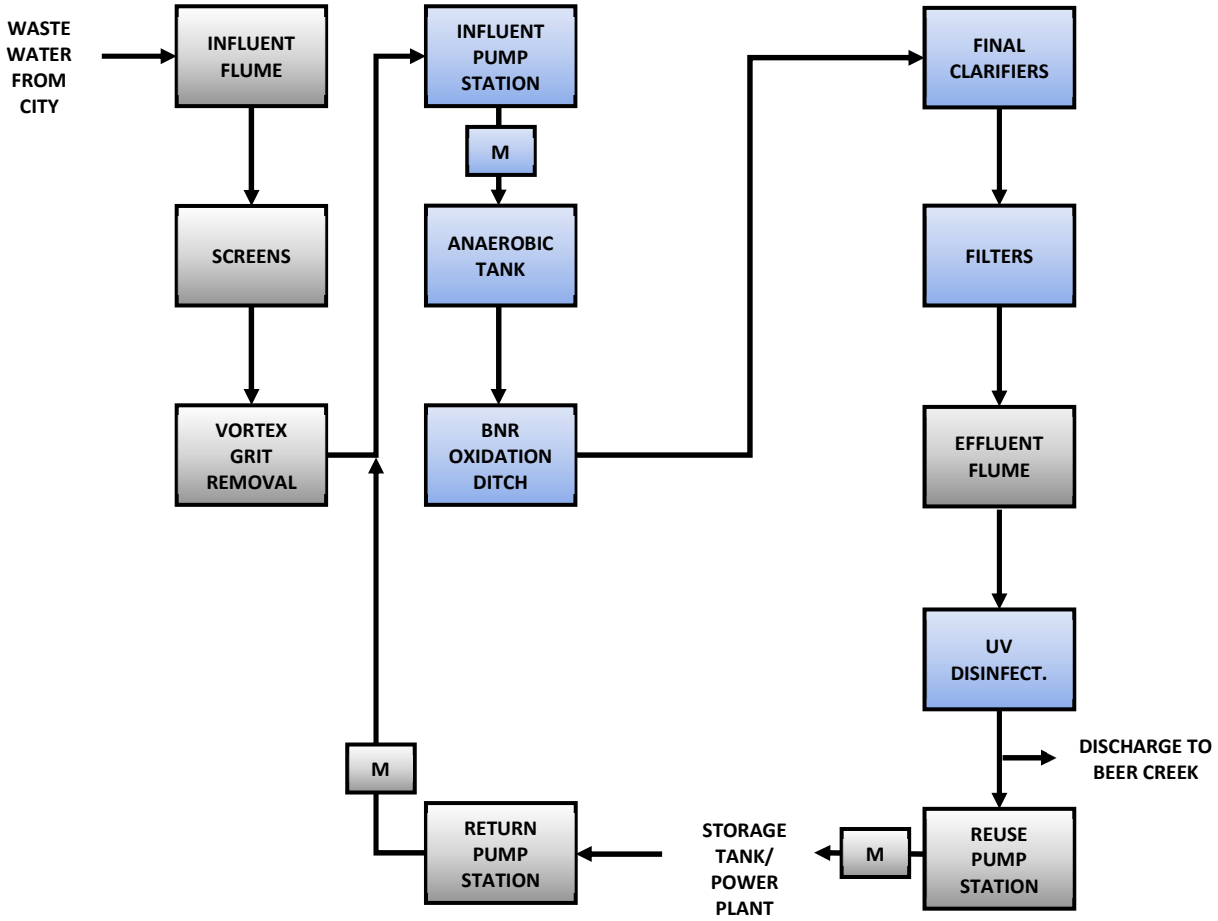


Figure 3-2
Alternative 10 Site Layout

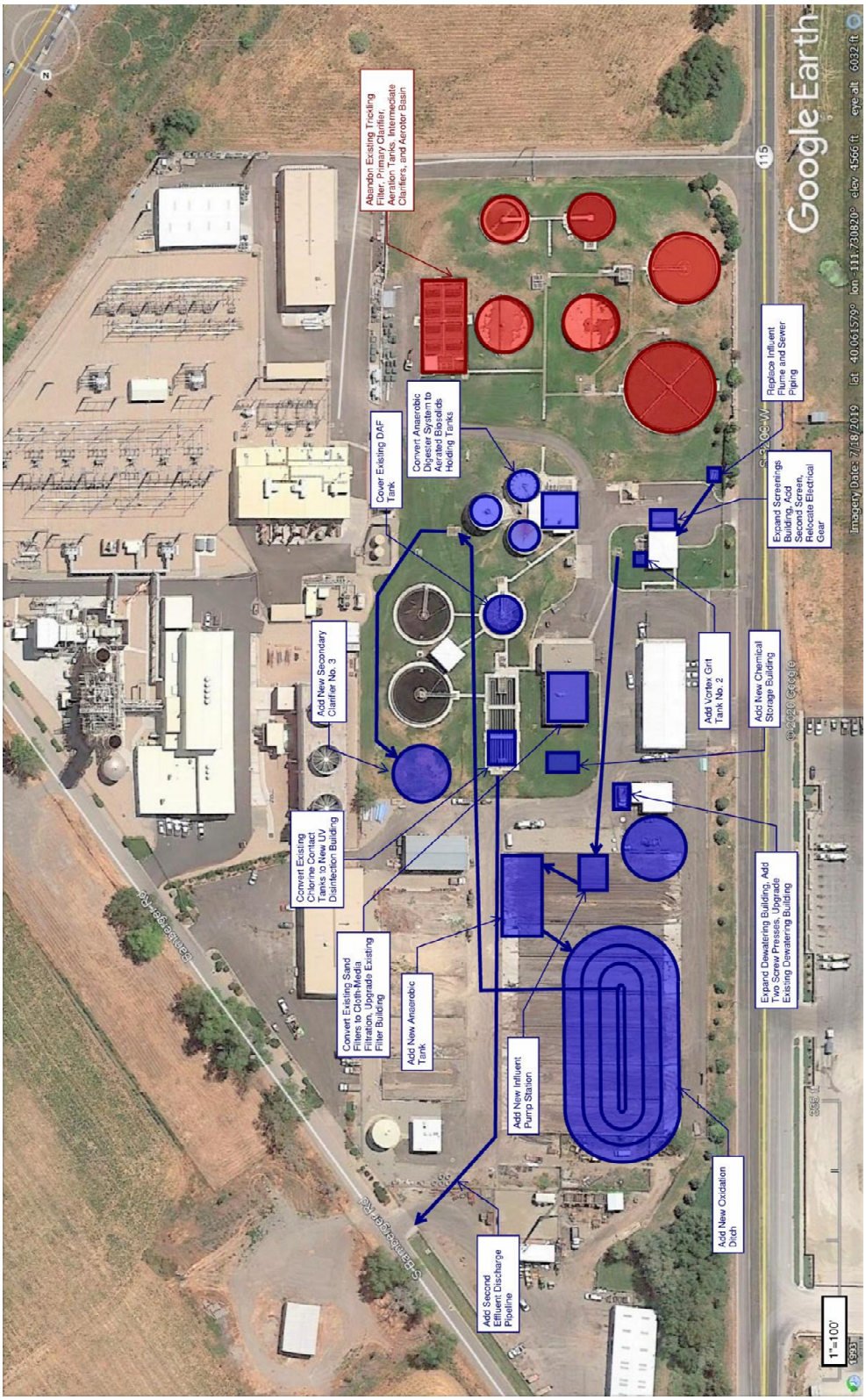


Table 3-1 shows the estimated costs for Alternative 10 compared with Alternative 5 (as presented in the CFP). Note that the items to which there is no scope change from the CFP remain the same. Line with orange highlighting are those items that are removed when moving from Alternative 5 to Alternative 10, while lines with yellow highlighting are items added. Costs for new items are based on unit costs used in the CFP.

Table 3-1
Alternative 10 Costs

ITEM	DESCRIPTION	CFP COST	FORSGREN/ HAZEN PROPOSAL COST
1	Site Work and Yard Piping	$300,000	$300,000
2	Plant Repairs	$150,000	$150,000
3	Demolition	$124,500	$124,500
4	Headworks	$182,500	$182,500
5	Primary Lift Station	$323,750	$323,750
6	Anaerobic Tank		$776,000
7	Anoxic Basin	$816,000	
8	Orbal Ditch		$4,260,000
9	Aerobic Basin	$2,180,000	
10	Primary Clarifier	$1,930,000	
11	Final Clarifier	$1,150,000	$1,150,000
12	Solid Handling	$720,000	$720,000
13	Chemical Storage	$254,400	$254,400
14	UV Basin	$2,400,000	$2,400,000
15	Reuse Pump Station Remodel	$110,000	$110,000
16	Filter Building Upgrade	$910,000	$910,000
17	Convert Anaerobic Digester to Aerobic Eq Tanks	$380,000	$380,000
18	Electrical (20%)	$2,386,230	$2,408,230
19	Construction Cost Subtotal	$14,317,380	$14,449,380
20	Contingency (20%)	$2,863,476	$2,889,876
21	**Construction Cost Total**	**$17,180,856**	**$17,339,256**
22	Engineering, Construction Observation (10%)	$1,718,086	$1,733,926
23	Legal & Permitting (5%)	$859,043	$866,963
24	**Total Probable Cost**	**$19,757,984**	**$19,940,144**

3.4 SCREENING OF ALTERNATIVES AND SELECTION OF PREFERRED ALTERNATIVE

The alternatives are evaluated by looking at several criteria, described below, and establishing a weighting value and positive or negative impact for each criteria. The criteria definitions are described below.

- Capital Costs: Initial capital costs associated with implementing a new treatment facility include: construction of the new facilities; engineering design, construction observation, inspection, and materials testing; legal; fiscal; land and right of ways; start-up and operations training; preparation of operation and maintenance manuals; mapping; administrative; and all other miscellaneous project costs necessary to have an operating treatment plant. Construction cost of the new treatment facility will be the largest cost item associated with the project. When preparing opinions of probable construction cost, the same basis of establishing cost opinions is used to evaluate all the principal alternatives and to project future costs.

- O&M/Life Cycle Costs: The annual costs for operations and maintenance (O&M) are important factors in the evaluation of alternative treatment processes. The principal elements of O&M costs are energy, chemicals and equipment replacement. A present worth analysis is performed using the estimated capital construction costs and yearly O&M costs based on a 20 year life span of the equipment.

- Wastewater Industry Experience: Certain processes have a longer "track record" in use with wastewater treatment, which can present an advantage in which the bugs have been worked out in the system. Newer technologies with fewer installations may experience operational difficulties when applied to a wastewater stream with different characteristics.

- Process Flexibility: Process flexibility is defined as the ability of a process to adapt to variations in wastewater strength and wastewater quantity on a daily and seasonal basis.

- Process Redundancy: Redundancy is having multiple trains of processes or tanks. The current WWTP does not have redundancy for the primary clarifier or trickling filter. In the event these processes need to be taken out of service, treatment will be compromised. Redundancy is a key item for treatment plants.

- Process Complexity: Process complexity addresses the effort and skill level required of the operations staff to run the treatment system and the associated time requirements. Process complexity may be partially offset by increased plant automation; however, automation may also introduce a different type of complexity, so a different skill set is required of the operations staff. Process complexity is often a compromise with effluent quality; the relationship being that additional complexity provides greater process control and thus enhances the potential to produce a higher quality effluent. The complexity of the treatment system used will result in the amount of training and experience the

operator needs.

- Power Requirements: Power is typically the largest operating budget item for a treatment plant. Mechanical treatment of water requires numerous pumps and pieces of equipment to move the water from one process to the next and to remove the contaminants. Electricity costs were included in the overall O&M costs. Power requirements for each alternative would have an impact on the size and complexity of a back-up power supply.

- Chemical Requirements: Physical treatment processes normally require varying amounts of chemicals, primarily to achieve removal of contaminants and provide cleaning of process components. Greater chemical requirements affect the workload and safety of operations staff.

- Worker Safety: Different processes have different impacts on operator safety. For example, pumping systems operating at high pressures may present a risk of failure and physical injury. Chemical systems present a handling safety risk.

- Reliability/Maintainability: Process reliability refers to the ability of a process to produce an effluent of consistent quality. Reliability is a factor that is both inherent in the design and dependent upon the reliability of each piece of equipment selected by the manufacturer including valves, motors, instruments, pumps etc., all comprising the total treatment system. Reliability is salient to a treatment system because the treatment plant protects the environment. The treatment facility will accept the responsibility of meeting the discharge permit, a permit that has financial penalties associated with prolonged and egregious violations. All of the processes can produce an effluent that meets the preliminary effluent limits under normal conditions, however, their ability to reliably meet the effluent limits with fluctuating conditions varies.

Table 3-2 presents the ranking matrix for the alternatives. The rating value ranges from 1 to 5 and reflects how each selection criteria fulfills the requirement (1 being poorly and 5 being excellently). The weight value indicates how important each criteria is. Note that a higher total value is better. Note that Alternatives 6-9 are not included in this analysis since the scope of those alternatives is not for the selected design flow.

Table 3-2
Ranking Matrix

Selection Criteria	Weight	Alternative 2		Alternative 3		Alternative 4		Alternative 5		Alternative 10	
		BNR, Anaerobic Digestion		ABNR, Anaerobic Digestion		ABNR, Aerobic Sludge Stabil.		BNR, Aerobic Sludge Stabil.		Ox Ditch BNR, Aerobic Sludge Stabil.	
		Rating	Total Value	Rating	Total Value	Rating	Total Value	Rating	Total Value	Rating	Total Value
Capital Cost	20%	4	0.80	2	0.40	2	0.40	5	1.00	5	1.00
O&M/Life-cycle Cost	10%	3	0.30	2	0.20	2	0.20	3	0.30	5	0.50
Wastewater Industry Experience	15%	5	0.75	1	0.15	1	0.15	5	0.75	4	0.60
Process Flexibility	10%	5	0.50	3	0.30	3	0.30	5	0.50	4	0.40
Process Redundancy	5%	5	0.25	4	0.20	4	0.20	5	0.25	4	0.20
Process Complexity/Operability	10%	3	0.30	1	0.10	1	0.10	4	0.40	5	0.50
Power Requirements	10%	4	0.40	3	0.30	3	0.30	4	0.40	5	0.50
Chemical Requirements	5%	4	0.20	2	0.10	2	0.10	4	0.20	4	0.20
Worker Safety	10%	2	0.20	2	0.20	3	0.30	4	0.40	4	0.40
Reliability/Maintainability	5%	4	0.20	2	0.10	3	0.15	5	0.25	5	0.25
Totals	100%		**3.90**		**2.05**		**2.20**		**4.45**		**4.55**

3.5 COST EFFECTIVENESS EVALUATION

DWQ requires that facility planning studies include a Cost Effectiveness Analysis as described in the EPA requirements for facilities planning for federally funded projects (40 CFR 35.2030(b)(3)). This section reviews the Cost Effectiveness Analysis requirements and describes how this report addresses the requirements.

1. General Requirements: "(3) A cost-effectiveness analysis of the feasible conventional, innovative and alternative wastewater treatment works, processes and techniques capable of meeting the applicable effluent, water quality and public health requirements over the design life of the facility while recognizing environmental and other non-monetary considerations. The planning period for the cost-effectiveness analysis shall be 20 years. The monetary costs to be considered must include the present worth or equivalent annual value of all capital costs and operation and maintenance costs. The discount rate established by EPA for the construction grants program shall be used in the cost-effectiveness analysis. The population forecasting in the analysis shall be consistent with the current Needs Survey. A cost-effectiveness analysis must include:"

   The evaluation of various treatment alternatives is contained in Chapter 5 of the Capital Facilities Plan, including the capital and annual operation costs which are summarized in section 5.11. Population forecasting is presented in Chapter 2 of the CFP Amendment.

2. Specific Requirement 1: "(i) An evaluation of alternative flow reduction methods. (If the grant applicant demonstrates that the existing average daily base flow (ADBF) from the area is less than 70 gallons per capita per day (gpcd), or if the Regional Administrator determines the area has an effective existing flow reduction program, additional flow reduction evaluation is not required.)"

   As discussed in section 2.3 of the CFP Amendment, recent data puts Payson's per capita flow at around the 70 GPCD threshold. Note that these values are based on population estimates rather than actual population surveys. In review of the historical influent flow data (see Section 2.2 of the Capital Facilities Plan), Payson does not appear to have a significant infiltration/inflow problem (there are no clear seasonal trends in flow). To address flow reduction methods, Payson will continue to install PVC pipe and will ensure that construction and installation procedures reduce the potential I/I.

3. Specific Requirement 2: "(ii) A description of the relationship between the capacity of alternatives and the needs to be served, including capacity for future growth expected after the treatment works become operational. This includes letters of intent from significant industrial users and all industries intending to increase their flows or relocate in the area documenting capacity needs and characteristics for existing or projected flows;"

   The WWTP upgrade will be designed with considerations for future expansion from the design ADF of 4.1 MGD to a potential future flow of 6.0 MGD. Smaller unit processes

such as the influent screening and UV disinfection will include extra channels for addition of future equipment, while space will set aside for larger unit processes such as clarifiers.

4. Specific Requirement 3: "(iii) An evaluation of improved effluent quality attainable by upgrading the operation and maintenance and efficiency of existing facilities as an alternative or supplement to construction of new facilities;"

   All alternatives considered and the preferred alternative selected are based on the continued use of existing structures where possible.

5. Specific Requirement 4: "(iv) An evaluation of the alternative methods for the reuse or ultimate disposal of treated wastewater and sludge material resulting from the treatment process;"

   The WWTP currently provide Type I reuse water for use as cooling water at the neighboring power plant. This significantly reduces the demand on other water sources. The WWTP will continue to provide water to the power plant after the upgrade.

   The WWTP will continue to dispose of sludge at the city-owned landfill for the near future. As sludge volumes increase and opportunities increase for beneficial reuse of sludge, sludge processing systems will be reviewed for feasibility.

6. Specific Requirement 5: "(v) A consideration of systems with revenue generating applications;"

   Two potential revenue generating applications for this project include: (1) the sale of reuse water for commercial use, and (2) the production of Class A biosolids for resale. Reuse water is currently sold to the power plant. Reuse of biosolids has been determined to not be feasible at this time, as discussed in number 5 above. This will be revisited periodically to determine if it should be pursued.

7. Specific Requirement 6: "(vi) An evaluation of opportunities to reduce use of, or recover energy;"

   Several energy reducing measures were considered, including VFDs on the aeration system and advanced DO/ORP controls to reduce aeration demands and therefore energy usage. These strategies will be incorporated into the design. Energy recovery is not planned at this time because anaerobic digestion will not be used due to its impacts on the proposed biological nutrient removal system.

8. Specific Requirement 7: "(vii) Cost information on total capital costs, and annual operation and maintenance costs, as well as estimated annual or monthly costs to residential and industrial users."

Capital and O&M costs for each alternative are presented in Chapter 5 of the Capital Facility Plan. User rate information is presented in section 5.11 of the Capital Facilities Plan.

3.6 IMPLEMENTATION PLAN

This section presents an implementation plan of the preferred alternative. The following items discuss the path forward for WWTP upgrade.

1. Prepare preliminary (30%) design package and cost estimate.
2. Secure funding.
3. Complete design phase of project.
4. If state funds are used for the project, complete NEPA and Anti-Degradation Review studies.
5. Submit for DWQ review and approval to construct.
6. Implement rates and impact fees changes as necessary.
7. Select contractor.
8. Construct project.
9. Startup new system.

3.7 IMPLEMENTATION PLAN

The current approximate schedule for this project is listed below.

- Capital Facilities Plan Amendment Submittal: January 2022
- 100% Design Package Submittal: August 2022
- Start Construction: October 2022
- Complete Construction: October 2024

3.8 ADDITIONAL INFORMATION

3.8.1 Cost Estimate Update

Since the completion of this CFP Amendment text (this chapter was written in March 2021), a draft Preliminary Design Report (PDR) has been completed. Due to changes in the project scope and escalation of construction costs, the project cost has increased. See the PDR for more information.

3.8.2 Sludge Disposal

Sludge produced by the WWTP will continue to be disposed of in the City-owned solid waste landfill.

3.8.3 Preliminary Waste Load Allocation and Discharge Limits

DWQ provided preliminary WLAs and discharge limits for the upgrade project. See appendix A for more information.

3.8.4 Anti-Degradation Review

The City completed a UPDES permit renewal package, which included an ADR section. See appendix B for more information.

3.8.5 Green Project Reserve

The WWTP currently provides Type II reuse water for use as cooling water at the neighboring power plant, which significantly reduces the demand on other water sources within the City. The WWTP will continue to provide water to the power plant after the upgrade. The City also intends to include sufficient facility upgrades to have the ability to provide Type I reuse to the City's pressurized irrigation system. This will be accomplished through the addition of the UV disinfection system and upgrades to the filter building and reuse pump station remodel.

3.8.6 Public Participation

The public participation included the following. See Appendix C for additional information.

- June 19, 2019: City Council was given a presentation by Aqua Engineering on the treatment plant upgrade project. At that time the City was still analyzing the ClearAs algae treatment technology, so any public present at the meeting were informed of the City's plans to move forward with upgrading the treatment plant. The layout of the proposed plant upgrade was discussed and shown to the Council and those present at the meeting, and the next steps in the upgrade process were discussed.

- January 19, 2022: City Council was given a presentation by Forsgren Associates outlining the new preferred alternative as described in this CFP Amendment.

CHAPTER 4
ENVIRONMENTAL REVIEW

4.1 GENERAL

This chapter provides a review of the environmental factors associated with the alternatives.

4.2 EVALUATION OF ENVIRONMENTAL FACTORS

This section discusses the various environmental factors, and how each is affected by the proposed alternative. Figure 4-1 shows a view of the surrounding area of the proposed site. Note that the proposed improvements for all alternatives are within the existing WWTP site property and are on ground previously disturbed and used for structures and processes.

Figure 4-1
Area Map

4.2.1 Environmental Information

The proposed WWTP site location is provided in Figure 4-1. The address of the facility is:

1062 N Main St.
Payson, UT 84651

Payson City is situated at an elevation of 4,700' above sea level (ASL) and the proposed treatment plant will be located at an elevation of 4,565' ASL. Payson receives roughly 17.5' of precipitation on an annual basis and the prevailing winds originate from the southwest (10 mph). The summers are warm and winters are cold, with average seasonal high/low temperatures of 93/63°F in the summer and 40/20°F in the winter.

4.2.2 Historical and Archaeological Sites

Since the improvements are located on ground that has been previously disturbed and used for structures, there are no historical and archaeological sites impacted. See Appendix D for a concurrence letter from the State Historic Preservation Office (SHPO).

4.2.3 Topography, Geology, and Soils

The WWTP site is located in the flatlands downgradient of the Wasatch Mountains in southern Utah Valley. The site is overlain by asphalt, road base, and clayey topsoil. The subsurface soils contain upper Pleistocene aged silt and clay deposits associated with the transgressive phase of the Lake Bonneville cycle. For more information regarding the soils, please see the Geotechnical Report in Appendix D.

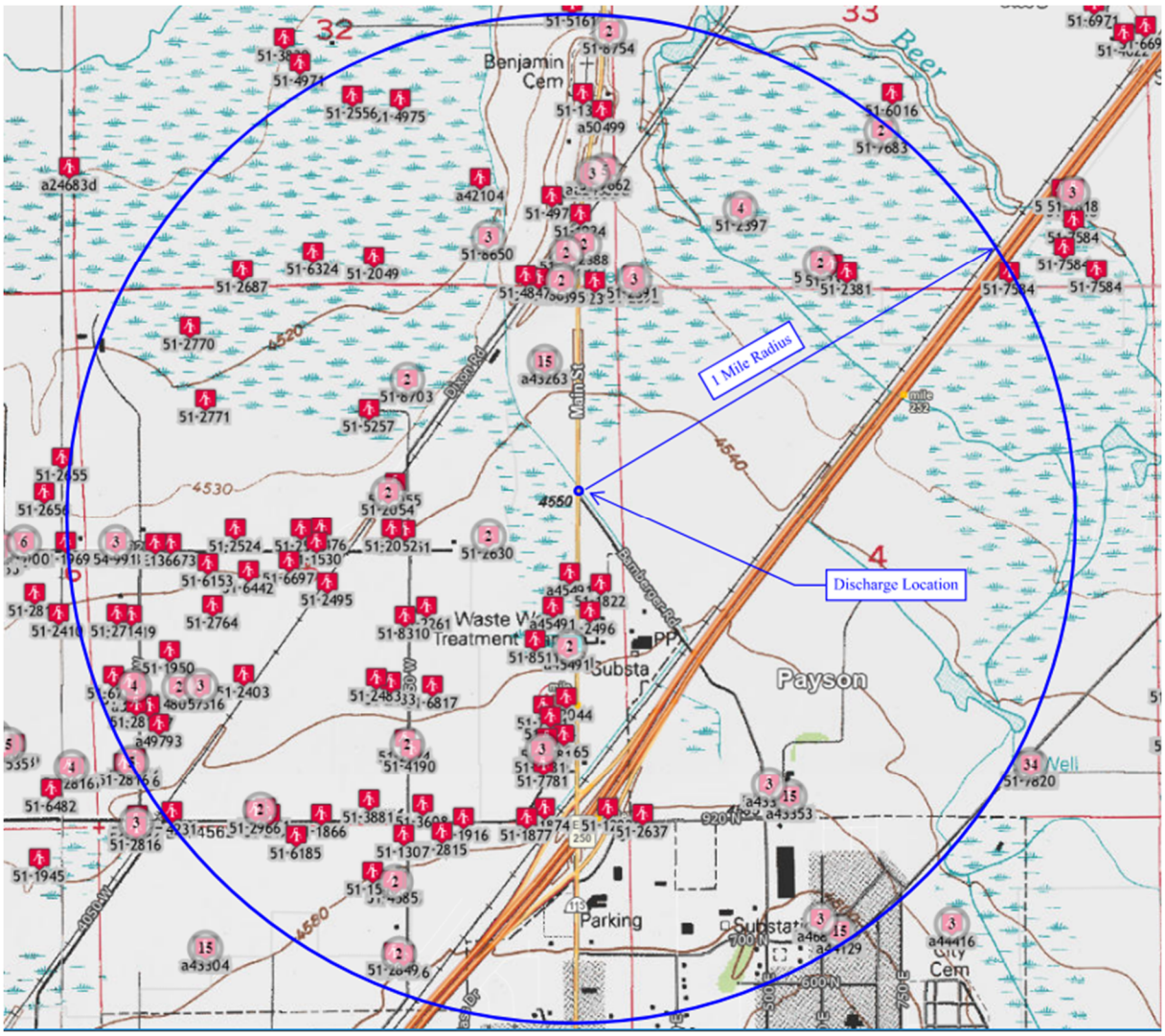
4.2.4 Surface and Groundwater Hydrology

Surface water near the WWTP site includes Beer Creek, which is located about 0.5 miles to the northeast of the site, and an unnamed drainage ditch located on the west side of the site. Effluent water from the WWTP and the power plant are piped to the drainage ditch, which conveys the water about 1 mile north to Beer Creek.

Groundwater levels are shallow, ranging from 5 feet to 7 feet deep on the WWTP property. See the Geotechnical Report for additional information.

There are numerous wells and water rights within a 1-mile radius of the project site (see Figure 4-2). The predominate uses are potable water, livestock watering, and irrigation.

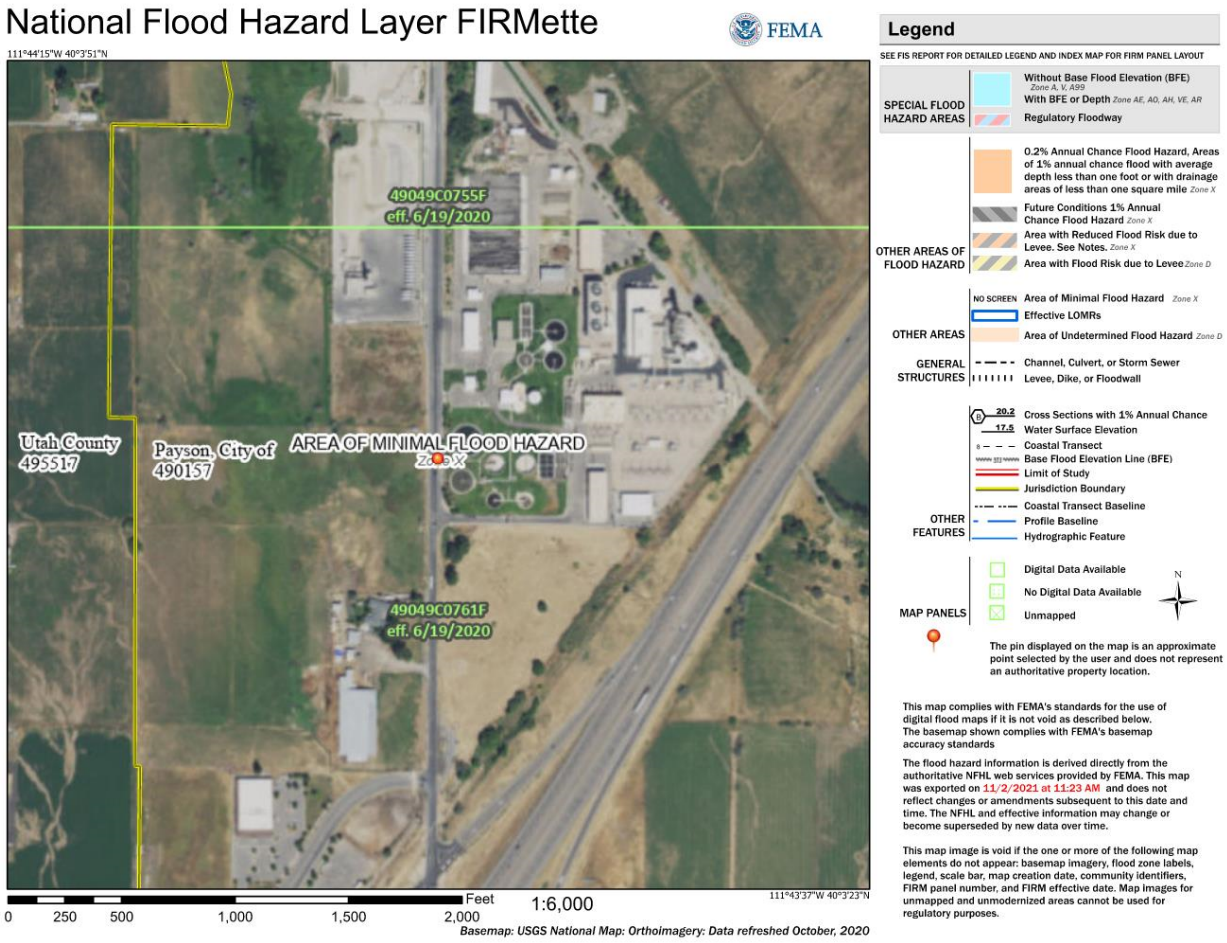
Figure 4-2
Wells and Springs Within 1-Mile Radius From Discharge Point



4.2.5 Floodplains and Wetlands

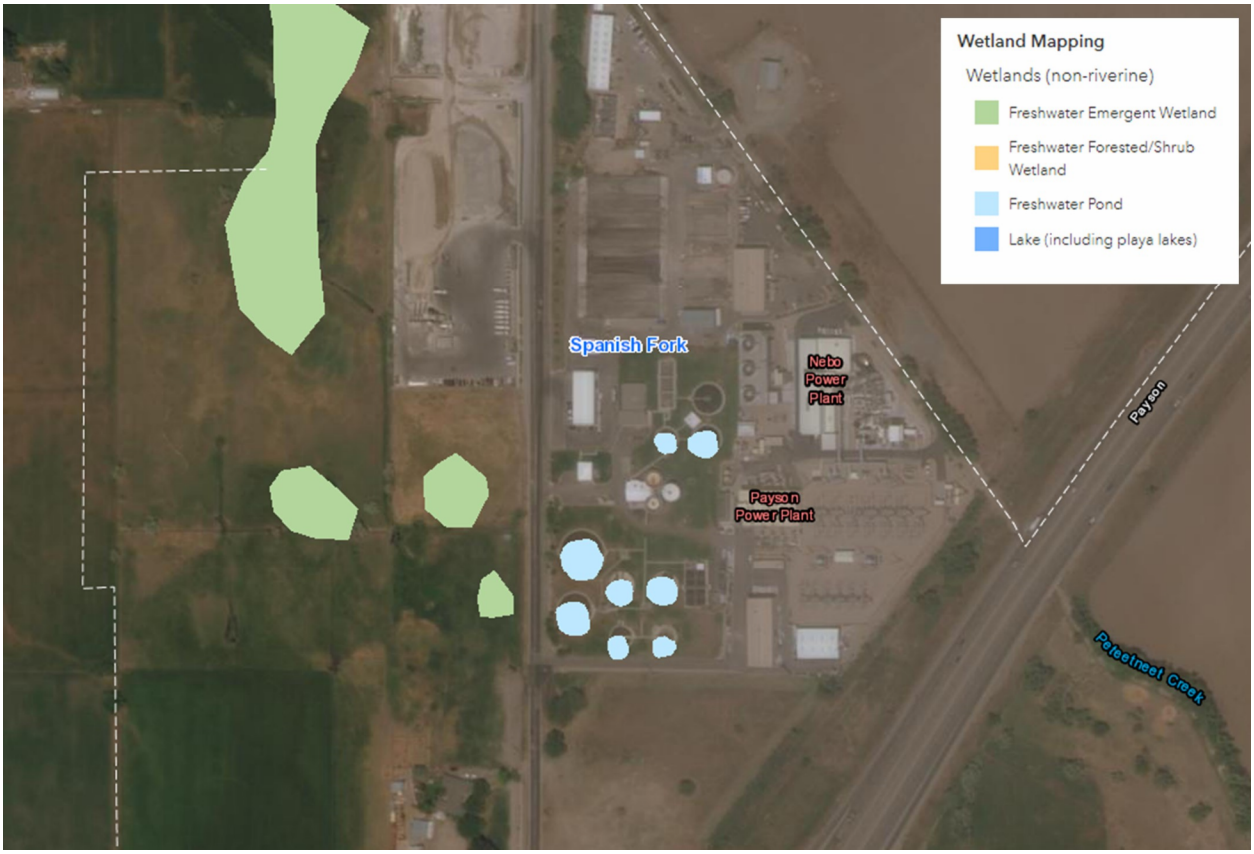
The proposed site is not in a floodplain. See Figure 4-3 for a FEMA map of the area and Appendix D for the approval correspondence from the local Floodplain Manager.

Figure 4-3
Floodplain Map



The proposed site is not in a wetland area. See figure 4-4 for a map of the wetlands and Appendix D for correspondence letter from the US Army Corp of Engineers.

Figure 4-4
Wetlands Map



4.2.6 Agricultural Lands

The proposed site is not agricultural land. The site scored a Farmland Conversion Impact Rating of zero, signifying that the site does not have great potential for agricultural purposes. See Appendix D for the email response from Bir Thapa at the NRCS Utah State office

4.2.7 Wild and Scenic Rivers

There are no rivers impacted by the project.

4.2.8 Fish and Wildlife Protection

According to the US Fish and Wildlife Service the project will not have any effect on any threatened species. See email concurrence from Field Supervisor, Yvette Converse, in the appendix. Utah Wildlife resources Assistant director, Nicole Nielson has also confirmed no adverse effects on any wildlife or wildlife habitat.

4.2.9 Air Quality

This project is not expected to have an adverse effect on air quality. Odors will be managed, and no biogas will be produced by the system. See Appendix D for the Utah Division of Air Quality project approval correspondence.

4.2.10 Water Quality and Quantity

This project will not adversely affect water quality and quantity. Quality will be improved as compared to current conditions, and quantity will increase as population and wastewater flows increase.

4.2.11 Direct and Indirect Impacts

Based on this environmental review, there are not expected to be any direct or indirect impacts at the proposed site.

4.2.12 Mitigating Adverse Impacts

There are no adverse impacts to mitigate.

4.3 EVALUATION RESULTS

The proposed site is clear of any negative environmental impacts. The construction of the improved treatment plant will not disturb any new land and all construction will be kept inside the confines of the existing site.

APPENDIX A

	Effluent Limitations				
Parameter	Maximum Monthly Ave	Maximum Weekly Ave	Annual Average	Daily Minimum	Daily Maximum
Total Flow	5.0	-	-	-	-
BOD_5, mg/L	25	35	-	-	-
BOD_5 Min. % Removal	85	-	-	-	-
TSS, mg/L	25	35	-	-	-
TSS Min. % Removal	85	-	-	-	-
Dissolved Oxygen, mg/L	-	-	-	4.0	-
Total Ammonia (as N), mg/L					
Summer (Jul-Sep)	2.5	-	-	-	2.0
Fall (Oct-Dec)	6.5	-	-	-	5.5
Winter (Jan-Mar)	6.0	-	-	-	6.0
Spring (Apr-Jun)	4.5	-	-	-	2.0
Total Phosphorus, mg/L	-	-	1	-	-
TRC, mg/L					
Summer (Jul-Sep)	0.72	-	-	-	0.48
Fall (Oct-Dec)	0.37	-	-	-	0.28
Winter (Jan-Mar)	0.28	-	-	-	0.23
Spring (Apr-Jun)	0.40	-	-	-	0.29
E. coli, No./100mL	126	157	-	-	-
WET, Chronic Biomonitoring					IC_{25}> XX% effluent
Summer (Jul-Sep)	-	-	-	-	76%
Fall (Oct-Dec)	-	-	-	-	51%
Winter (Jan-Mar)	-	-	-	-	39%
Spring (Apr-Jun)	-	-	-	-	58%
Oil & Grease, mg/L	-	-	-	-	10.0
pH, Standard Units	-	-	-	6.5	9.0
Current Metal Limits adjusted to Preliminary WLA Values					
Cyanide	0.0058	-	-	-	0.026
Selenium	0.0055	-	-	-	0.0219
Mercury	0.000013	-	-	-	0.0029

Potential Metals Limits, Pending RP Analysis				
	µg/L		mg/L	
Parameter	Chronic	Acute	Chronic	Acute
Aluminum		902		0.902
Arsenic	196	408	0.196	0.408
Cadmium	0.8	10.4	0.0008	0.0104
Chromium VI	13.7	18.9	0.0137	0.0189
Chromium III	353	6,739	0.353	6.739
Copper	38.5	61.3	0.0385	0.0613

Cyanide	5.8	26.0	0.0058	0.026
Based on Free Cyanide Value				
Iron		1,203		1.203
Lead	24.4	572	0.0244	0.572
Mercury	0.013	2.9	0.000013	0.0029
Nickel	222	1,820	0.222	1.82
Selenium	5.5	21.9	0.0055	0.0219
Silver		49.2		0.0492
Tributylin	0.080	0.55	0.00008	0.00055
Zinc	508	464	0.508	0.464

The Reuse limitations

Parameter	Outfall 001R Effluent Limitations *a, *p, *q				
	Max Monthly Average	Max Weekly Median	Max Daily Average	Minimum	Maximum
Turbidity, NTU *p	--	--	2	--	5
TRC, mg/L *m, *q	--	--	--	1	--
BOD_5, mg/L	10	--	--	--	--
E. coli, No/100mL *o	--	ND*q	--	--	9
pH, Standard Units	--	--	--	6.0	9.0

Parameter	Type II Reuse Outfall 001R Effluent Limitations *a				
	Max Monthly Average	Max Weekly Median	Max Daily Average	Minimum	Maximum
BOD_5	25	--	--	--	--
TSS	25	35	--	-	--
E. coli, No/100mL *o	--	126	--	--	500
pH, Standard Units	--	--	--	6.0	9.0

Utah Division of Water Quality
Statement of Basis
ADDENDUM
Wasteload Analysis and Antidegradation Level I Review

Date: **March 17, 2022**

Prepared by: **Suzan Tahir**
Standards and Technical Services

Facility: **Payson City Wastewater Treatment Facility Payson, UT**
UPDES No. UT0020427

Receiving water: **Beer Creek (2B, 3C, 4)**

This addendum summarizes the wasteload analysis that was performed to determine water quality based effluent limits (WQBEL) for this discharge. Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on in-stream water quality. The wasteload analysis also takes into account downstream designated uses (UAC R317-2-8). Projected concentrations are compared to numeric water quality standards to determine acceptability. The numeric criteria in this wasteload analysis may be modified by narrative criteria and other conditions determined by staff of the Division of Water Quality.

Discharge

Outfall 001: Irrigation Ditch → Beer Creek → Benjamin Slough → Utah Lake

The maximum daily design discharge is 6.03 MGD and the maximum monthly design discharge is 5.0 MGD for the facility.

Receiving Water

The receiving water for Outfall 001 is an unnamed irrigation ditch, which is tributary to Beer Creek, which drains to Benjamin Slough and then to Utah Lake.

Per UAC R317-2-13.5.c, the designated beneficial uses for Beer Creek (Utah County) from 4850 West (in NE1/4NE1/4 sec. 36, T.8 S., R.1 E.) to headwaters are 2B, 3C, and 4.

- *Class 2B - Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.*

- *Class 3C - Protected for nongame fish and other aquatic life, including the necessary aquatic organisms in their food chain*

- *Class 4 - Protected for agricultural uses including irrigation of crops and stock watering.*

Typically, the critical flow for the wasteload analysis is considered the lowest stream flow for seven consecutive days with a ten year return frequency (7Q10). Due to a lack of flow records for Beer Creek, the 20th percentile of flow measurements was calculated to estimate seasonal critical flow in the receiving water (Table 1). No flow records were found for the irrigation ditch and it was assumed the ditch has no flow during critical conditions.

Payson Power (UPDES UT0025518) also discharges to the same irrigation ditch and has the potential to discharge concurrently with the Payson City Wastewater Treatment Plant discharge; however, based on information provided by the permittee, Payson Power would not discharge when the wastewater treatment plant discharge is at the maximum (AQUA Engineering 2017a).

Table 1: Annual critical low flow

Season	Flow (cfs)			
	Payson Power Discharge During Chronic Conditions	Payson Power Discharge During Acute Conditions	Irrigation Ditch above WWTP	Beer Creek above confluence with Irrigation Ditch
Summer	0.0	0.0	0.0	2.49
Fall	0.0	0.0	0.0	7.38
Winter	0.0	0.0	0.0	12.02
Spring	0.0	0.0	0.0	5.54

TMDL

Beer Creek and tributaries from confluence with Spring Creek to headwaters (UT16020202-027_00) is listed as impaired for E. coli, pH, Total Ammonia as N, and Macroinvertebrates according to the 303(d) list in the *Utah's Combined 2018/2020 Integrated Report* (UDWQ 2021). Benjamin Slough from confluence with Utah Lake to Beer Creek confluence (UT16020202-030_00) is listed as impaired for Total Ammonia as N. Utah Lake (UT-L-16020201-004_01) is listed as impaired for Harmful Algal Blooms, Total Phosphorus, Eutrophication, PCBs in Fish Tissue and Total Dissolved Solids (TDS).

Mixing Zone

The maximum allowable mixing zone is 15 minutes of travel time for acute conditions, not to exceed 50% of stream width, and 2,500 feet for chronic conditions, per UAC R317-2-5. Water quality standards must be met at the end of the mixing zone.

The actual length of the mixing zone was not determined; however, it was presumed to remain within the maximum allowable mixing zone dimensions. Acute limits were calculated using 50% of the seasonal critical low flow.

Parameters of Concern

The potential parameters of concern identified for the discharge/receiving water were total suspended solids (TSS), dissolved oxygen (DO), BOD5, total phosphorus (TP), total nitrogen (TN), total ammonia (TAN), E. coli, pH, and total residual chlorine (TRC) as determined in consultation with the UPDES Permit Writer.

Water Quality Modeling

A QUAL2Kw model of the receiving water was built and calibrated to synoptic survey data collected in October of 2013 by DWQ staff using standard operating procedures (UDWQ 2012). The model of Beer Creek extends 4 kilometers downstream from the confluence with the unnamed irrigation ditch to near the crossing with South 4850 West.

Receiving water quality data were obtained from monitoring site 4995420 Beer Creek above Payson WWTP at U-115 Crossing for the period 2000-2020. The average seasonal value was calculated for each constituent with available data in the receiving water. Effluent parameters were characterized using data from monitoring site 4995410 Payson WWTP.

Since design parameters were not provided for pH, I assumed conservative seasonal values for acute pH (pH=8.0) and chronic pH (pH=7.5).

The QUAL2Kw model was used for determining the WQBELs. Effluent concentrations were adjusted so that water quality standards were not exceeded in the receiving water. Where WQBELs exceeded secondary standards or categorical limits, the concentration in the model was set at the secondary standard or categorical limit.

The calibration and wasteload models are available for review by request.

WET Limits

The percent of effluent in the receiving water in a fully mixed condition, and acute and chronic dilution in a not fully mixed condition are calculated in the WLA in order to generate WET limits. The LC_{50} (lethal concentration, 50%) percent effluent for acute toxicity and the IC_{25} (inhibition concentration, 25%) percent effluent for chronic toxicity, as determined by the WET test, needs to be below the WET limits, as determined by the WLA. The WET limit for LC_{50} is typically 100% effluent and does not need to be determined by the WLA.

Table 2: WET Limits for IC_{25}

Season	Percent Effluent
Summer	76%
Fall	51%
Winter	39%
Spring	58%

Effluent Limits

The effect of the effluent on the DO in the receiving water was evaluated using the QUAL2Kw model. A DO sag downstream resulting from the plant discharge was predicted by the model in Beer Creek. However, the DO recovered and limits beyond secondary standards are not required for DO and BOD_5 (Table 3). QUAL2Kw rates, input and output for DO and eutrophication related constituents are summarized in Appendix A.

The ammonia limits for both acute and chronic toxicity were determined. The previous permit only had limits for ammonia resulting from acute toxicity (max. daily limit). In 2008, the chronic ammonia criteria were extended to 3C and 3D waters.

The limits for total residual chlorine were determined assuming an average decay rate of 42 /day (at 20 C^o) and a travel time in the unnamed irrigation ditch of 107 minutes prior to discharge to Beer Creek (AQUA Engineering 2017b). The analysis for TRC is summarized in Appendix B.

A mass balance mixing analysis was conducted for conservative constituents such as dissolved metals. The WQBELs for conservative constituents are summarized in Appendix C.

Table 3: Water Quality Based Effluent Limits Summary

Effluent Constituent	Acute			Chronic		
	Standard	Limit	Averaging Period	Standard	Limit	Averaging Period
Flow (MGD)		6.03	1 day		5.0	30 days
Ammonia (mg/L)[1]						
Summer (Jul-Sep)		2.0			2.5	
Fall (Oct-Dec)	Varies	5.5	1 hour	Varies	6.5	30 days
Winter (Jan-Mar)		6.0			6.0	
Spring (Apr-Jun)		2.0			4.5	
Min. Dissolved Oxygen (mg/L)	3.0	4.0	Instantaneous	5.0	5.0	30 days
BOD_5 (mg/L)	None	35	7 days	None	25	30 days
Total Residual Chlorine (mg/L)						
Summer (Jul-Sep)		0.72			0.48	
Fall (Oct-Dec)	0.019	0.37	1 hour	0.011	0.28	4 days
Winter (Jan-Mar)		0.28			0.23	
Spring (Apr-Jun)		0.40			0.29	
1: Ammonia limit due to toxicity requirements.						

Models and supporting documentation are available for review upon request.

Antidegradation Level I Review

The objective of the Level I ADR is to ensure the protection of existing uses, defined as the beneficial uses attained in the receiving water on or after November 28, 1975. No evidence is known that the existing uses deviate from the designated beneficial uses for the receiving water. Therefore, the beneficial uses will be protected if the discharge remains below the WQBELs presented in this wasteload.

A Level II Antidegradation Review (ADR) is required for this discharge since the pollutant concentration and load is increasing under this permit renewal.

Documents:

WLA Document: *payson_potw_wla_2022.docx*
QUAL2Kw Calibration Model: *payson_potw_cal_2013.xlsm*
QUAL2Kw Wasteload Model: *payson_wla_2022.xlsm*

References:

AQUA Engineering. 2017a. *Discharge Flows to Beer Creek from Payson City and UAMPS.*

AQUA Engineering. 2017b. *Payson Chlorine Decay Rates*.

Neilson, B.T., A.J. Hobson, N. von Stackelberg, M. Shupryt, and J.D. Ostermiller. 2012. *Using QUAL2K Modeling to Support Nutrient Criteria Development and Wasteload Analyses in Utah*.

Utah Division of Water Quality. 2012a. *Utah Wasteload Analysis Procedures Version 1.0*.

Utah Division of Water Quality. 2012b. *Field Data Collection for QUAL2Kw Model Build and Calibration Standard Operating Procedures Version 1.0*.

Utah Division of Water Quality. 2021. *Utah's Combined 2018/2020 Integrated Report.*

WASTELOAD ANALYSIS [WLA] Date: 3/17/2022

Appendix A: QUAL2Kw Analysis for Eutrophication

Discharging Facility:	PaysonWWTP		
UPDES No:	UT-0020427		
Permit Flow [MGD]:	5.00	Maximum Monthly Flow	
	6.03	Maximum Daily Flow	
Receiving Water:	Beer Creek		
Stream Classification:	2B, 3C, 4		
Stream Flows [cfs]:	2.49	Summer (July-Sept)	Critical Low Flow
	7.38	Fall (Oct-Dec)	
	12.01	Winter (Jan-Mar)	
	5.54	Spring (Apr-June)	
Fully Mixed:	NO		
Acute River Width:	50%		
Chronic River Width:	100%		

Modeling Information

A QUAL2Kw model was used to determine these effluent limits.

Model Inputs

The following is upstream and discharge information that was utilized as inputs for the analysis.
Dry washes are considered to have an upstream flow equal to the flow of the discharge.

Headwater/Upstream Information	Summer	Fall	Winter	Spring
Flow (cfs)	2.5	7.4	12.0	5.5
Temperature (deg C)	21.1	8.7	6.0	14.9
Specific Conductance (µmhos)	1139	1139	1139	1139
Inorganic Suspended Solids (mg/L)	49.1	47.9	37.3	38.2
Dissolved Oxygen (mg/L)	8.4	10.5	11.7	9.2
$CBOD_5$ (mg/L)	3.0	3.1	5.2	5.5
Organic Nitrogen (mg/L)	1.500	1.500	1.500	1.500
NH4-Nitrogen (mg/L)	0.060	0.230	0.540	0.340
NO3-Nitrogen (mg/L)	1.279	1.820	1.528	1.211
Organic Phosphorus (mg/L)	0.076	1.660	0.079	0.084
Inorganic Ortho-Phosphorus (mg/L)	0.224	0.171	0.228	0.286
Phytoplankton (µg/L)	0.0	0.0	0.0	0.0
Detritus [POM] (mg/L)	5.5	5.3	4.1	4.2
Alkalinity (mg/L)	235	235	235	235
pH	7.9	8.0	8.3	8.4

Discharge Information - Payson POTW

Chronic	Summer	Fall	Winter	Spring
Flow (MGD)	5.0	5.0	5.0	5.0
Temperature (deg C)	22.3	15.7	11.5	17.0
Specific Conductance (µmhos)	1442	1442	1442	1442
Inorganic Suspended Solids (mg/L)	4.0	3.9	4.7	5.0
Organic Nitrogen (mg/L)	5.000	5.000	5.000	5.000
NO3-Nitrogen (mg/L)	23.440	27.210	24.790	23.160
Organic Phosphorus (mg/L)	0.000	0.000	0.000	0.000
Inorganic Ortho-Phosphorus (mg/L)	1.000	1.000	1.000	1.000
Phytoplankton (µg/L)	0.000	0.000	0.000	0.000
Detritus [POM] (mg/L)	0.0	0.0	0.0	0.0
Alkalinity (mg/L)	215	200	193	203
pH	7.5	7.5	7.5	7.5

Acute	Summer	Fall	Winter	Spring
Flow (MGD)	6.0	6.0	6.0	6.0
Temperature (deg C)	22.3	15.7	11.5	17.0
Specific Conductance (µmhos)	1442	1442	1442	1442
Inorganic Suspended Solids (mg/L)	4.0	3.9	4.7	5.0
Organic Nitrogen (mg/L)	10.000	10.000	10.000	10.000
NO3-Nitrogen (mg/L)	23.440	27.210	24.790	23.160
Organic Phosphorus (mg/L)	0.000	0.000	0.000	0.000
Inorganic Ortho-Phosphorus (mg/L)	1.000	1.000	1.000	1.000
Phytoplankton (µg/L)	0.000	0.000	0.000	0.000
Detritus [POM] (mg/L)	0.0	0.0	0.0	0.0
Alkalinity (mg/L)	215	200	193	203
pH	8.0	8.0	8.0	8.0

Discharge Information - Payson Power

Chronic	Summer	Fall	Winter	Spring
Flow (MGD)	0.0	0.0	0.0	0.0

Acute	Summer	Fall	Winter	Spring
Flow (MGD)	0.0	0.0	0.0	0.0

All model numerical inputs, intermediate calculations, outputs and graphs are available for discussion, inspection and copy at the Division of Water Quality.

Effluent Limitations

Current State water quality standards are required to be met under a variety of conditions including in-stream flows targeted to the 7-day, 10-year low flow (R317-2-9).

Other conditions used in the modeling effort reflect the environmental conditions expected at low stream flows.

Effluent Limitations based upon Water Quality Standards for DO, and Ammonia and Total Residual Chlorine Toxicity

In-stream criteria of downstream segments for Dissolved Oxygen will be met with an effluent limitation as follows:

Chronic	**Standard**	**Summer**	**Fall**	**Winter**	**Spring**
Flow (MGD)	N/A	5.00	5.00	5.00	5.00
NH4-Nitrogen (mg/L)	Varies	2.5	6.5	6.0	4.5
$CBOD_5$ (mg/L)	N/A	25.0	25.0	25.0	25.0
Dissolved Oxygen [30-day Ave] (mg/L)	5.0	5.0	5.0	5.0	5.0

Acute	**Standard**	**Summer**	**Fall**	**Winter**	**Spring**
Flow (MGD)	N/A	6.0	6.0	6.0	6.0
NH4-Nitrogen (mg/L)	Varies	2.0	5.5	6.0	2.0
$CBOD_5$ (mg/L)	N/A	35.0	35.0	35.0	35.0
Dissolved Oxygen [Minimum] (mg/L)	3.0	4.0	4.0	4.0	4.0

Summary Comments

The mathematical modeling and best professional judgement indicate that violations of receiving water beneficial uses with their associated water quality standards, including important down-stream segments, will not occur for the evaluated parameters of concern as discussed above if the effluent limitations indicated above are met.

Coefficients and Other Model Information

Parameter	*Value*	*Units*
Stoichiometry:		
Carbon	40	gC
Nitrogen	7.2	gN
Phosphorus	1	gP
Dry weight	100	gD
Chlorophyll	1	gA
Inorganic suspended solids:		
Settling velocity	0.001	m/d
Oxygen:		
Reaeration model	Thackston-Dawson	
Temp correction	1.024	
Reaeration wind effect	None	
O2 for carbon oxidation	2.69	gO2/gC
O2 for NH4 nitrification	4.57	gO2/gN
Oxygen inhib model CBOD oxidation	Exponential	
Oxygen inhib parameter CBOD oxidation	0.60	L/mgO2
Oxygen inhib model nitrification	Exponential	
Oxygen inhib parameter nitrification	0.60	L/mgO2
Oxygen enhance model denitrification	Exponential	
Oxygen enhance parameter denitrification	0.60	L/mgO2
Oxygen inhib model phyto resp	Exponential	
Oxygen inhib parameter phyto resp	0.60	L/mgO2
Oxygen enhance model bot alg resp	Exponential	
Oxygen enhance parameter bot alg resp	0.60	L/mgO2
Slow CBOD:		
Hydrolysis rate	0	/d
Temp correction	1.047	
Oxidation rate	0.103	/d
Temp correction	1.047	
Fast CBOD:		
Oxidation rate	10	/d
Temp correction	1.047	
Organic N:		
Hydrolysis	0.88120891	/d
Temp correction	1.07	
Settling velocity	0.099218	m/d
Ammonium:		
Nitrification	0.2064034	/d
Temp correction	1.07	
Nitrate:		
Denitrification	0.28353818	/d
Temp correction	1.07	
Sed denitrification transfer coeff	0.053355	m/d
Temp correction	1.07	
Organic P:		
Hydrolysis	0.79805215	/d
Temp correction	1.07	
Settling velocity	0.096605	m/d
Inorganic P:		
Settling velocity	0.04793	m/d
Sed P oxygen attenuation half sat constant	0.53889	mgO2/L

Phytoplankton:		
Max Growth rate	2.8944	/d
Temp correction	1.07	
Respiration rate	0.480803	/d
Temp correction	1.07	
Death rate	0.86518	/d
Temp correction	1	
Nitrogen half sat constant	15	ugN/L
Phosphorus half sat constant	2	ugP/L
Inorganic carbon half sat constant	1.30E-05	moles/L
Phytoplankton use HCO3- as substrate	Yes	
Light model	Smith	
Light constant	57.6	langleys/d
Ammonia preference	25.4151	ugN/L
Settling velocity	0.468545	m/d
Bottom Plants:		
Growth model	Zero-order	
Max Growth rate	10.8314	gD/m2/d or /d
Temp correction	1.07	
First-order model carrying capacity	100	gD/m2
Basal respiration rate	0.2458802	/d
Photo-respiration rate parameter	0.01	unitless
Temp correction	1.07	
Excretion rate	0.046004	/d
Temp correction	1.07	
Death rate	0.036896	/d
Temp correction	1.07	
External nitrogen half sat constant	711.113	ugN/L
External phosphorus half sat constant	123.473	ugP/L
Inorganic carbon half sat constant	7.44E-05	moles/L
Bottom algae use HCO3- as substrate	Yes	
Light model	Smith	
Light constant	41.6646	mgO^2/L
Ammonia preference	28.99375	ugN/L
Subsistence quota for nitrogen	31.0379	mgN/gD
Subsistence quota for phosphorus	2.26157	mgP/gD
Maximum uptake rate for nitrogen	770.252	mgN/gD/d
Maximum uptake rate for phosphorus	36.4362	mgP/gD/d
Internal nitrogen half sat ratio	1.468463	
Internal phosphorus half sat ratio	3.2861345	
Nitrogen uptake water column fraction	1	
Phosphorus uptake water column fraction	1	
Detritus (POM):		
Dissolution rate	2.318491	/d
Temp correction	1.07	
Settling velocity	0.08897	m/d
pH:		
Partial pressure of carbon dioxide	370	ppm
TRC:		
Decay rate	0.8	/d

Atmospheric Inputs:	Summer	Fall	Winter	Spring
Min. Air Temperature, F	57.7	29.5	24.0	45.0
Max. Air Temperature, F	90.5	51.0	44.9	74.2
Dew Point, Temp., F	58.6	35.0	30.3	48.5
Wind, ft./sec. @ 21 ft.	9.8	7.5	7.6	9.2
Cloud Cover, %	10%	10%	10%	10%

Other Inputs:	
Bottom Algae Coverage	75%
Bottom SOD Coverage	100%
Prescribed SOD, gO_2/m^2/day	0

WASTELOAD ANALYSIS [WLA] Date: 3/17/22
Appendix B: Total Residual Chlorine

Discharging Facility: PaysonWWTP
UPDES No: UT-0020427

CHRONIC

	Season	Receiving Water	Standard	Payson WWTP Effluent	Payson Power Effluent	Total Effluent	Mixing Zone Boundary	Dilution Factor	Effluent Limit Without Decay	Temperature (°C)	Decay Rate @ 20 °C (/day)	Decay Rate @ T °C (/day)	Travel Time (min)	Decay Coefficient	Effluent Limit
Discharge (cfs)	Summer	2.5		7.7	0.0	7.7	10.2	0.3							
	Fall	7.4		7.7	0.0	7.7	15.1	1.0							
	Winter	12.0		7.7	0.0	7.7	19.7	1.6							
	Spring	5.5		7.7	0.0	7.7	13.3	0.7							
Temperature (°C)	Summer			22.3	30.0	22.3									
	Fall			15.7	25.9	15.7									
	Winter			11.5	27.5	11.5									
	Spring			17.0	23.6	17.0									
TRC (mg/L)	Summer	0.000	0.011						0.015	22.3	42	46.7	107.568	0.03	0.48
	Fall	0.000	0.011						0.021	15.7	42	34.4	107.568	0.08	0.28
	Winter	0.000	0.011						0.028	11.5	42	28.4	107.568	0.12	0.23
	Spring	0.000	0.011						0.019	17.0	42	36.6	107.568	0.06	0.29

ACUTE

	Season	Receiving Water	Standard	Payson WWTP Effluent	Payson Power Effluent	Total Effluent	Mixing Zone Boundary	Dilution Factor	Effluent Limit Without Decay	Temperature (°C)	Decay Rate @ 20 °C (/day)	Decay Rate @ T °C (/day)	Travel Time (min)	Decay Coefficient	Effluent Limit
Discharge (cfs)	Summer	1.2		9.3	0.0	9.3	10.6	0.1							
	Fall	3.7		9.3	0.0	9.3	13.0	0.4							
	Winter	6.0		9.3	0.0	9.3	15.3	0.6							
	Spring	2.8		9.3	0.0	9.3	12.1	0.3							
Temperature (°C)	Summer			22.3	30.0	22.3									
	Fall			15.7	25.9	15.7									
	Winter			11.5	27.5	11.5									
	Spring			17.0	23.6	17.0									
TRC (mg/L)	Summer	0.000	0.019						0.022	22.3	42	46.7	107.568	0.03	0.71
	Fall	0.000	0.019						0.027	15.7	42	34.4	107.568	0.08	0.35
	Winter	0.000	0.019						0.031	11.5	42	28.4	107.568	0.12	0.26
	Spring	0.000	0.019						0.025	17.0	42	36.6	107.568	0.06	0.38

124.66667

WASTELOAD ANALYSIS [WLA] Date: 3/17/2022

Appendix C: Mass Balance Mixing Analysis for Conservative Constituents

Discharging Facility:	PaysonWWTP		
UPDES No:	UT-0020427		
Permit Flow [MGD]:	5.00	Maximum Monthly Discharge	
	6.03	Maximum Daily Discharge	
Payson Power:	0.00	Discharge	
Receiving Water:	Beer Creek		
Stream Classification:	2B, 3C, 4		
Stream Flows [cfs]:	2.49	Summer (July-Sept)	Critical Low Flow
Fully Mixed:	NO		
Acute River Width:	50%		
Chronic River Width:	100%		
Mixed Flow [cfs]:	10.2	Chronic	
	10.6	Acute	

Modeling Information

A mass balance mixing analysis was used to determine these effluent limits.

All model numerical inputs, intermediate calculations, outputs and graphs are available for discussion, inspection and copy at the Division of Water Quality.

Effluent Limitations

Current State water quality standards are required to be met under a variety of conditions including in-stream flows targeted to the 7-day, 10-year low flow (R317-2-9).

Other conditions used in the modeling effort reflect the environmental conditions expected at low stream flows.

Effluent Limitations for Protection of Recreation (Class 2B Waters)

Physical

Parameter	Maximum Concentration
pH Minimum	6.5
pH Maximum	9.0

Bacteriological

E. coli (30 Day Geometric Mean)	206	(#/100 mL)
E. coli (Maximum)	668	(#/100 mL)

Effluent Limitations for Protection of Aquatic Wildlife (Class 3C Waters)

Physical

Parameter	Maximum Concentration
Temperature (deg C)	27
Temperature Change (deg C)	4

Inorganics	Chronic Standard (4 Day Average)	Acute Standard (1 Hour Average)
Parameter	Standard	Standard
Phenol (mg/L)		0.010
Hydrogen Sulfide (Undissociated) [mg/L]		0.002

Total Recoverable Metals	Chronic Standard (4 Day Average)[1]			Acute Standard (1 Hour Average)[1]		
Parameter	Standard	Background[2]	Limit	Standard	Background[2]	Limit
Aluminum (µg/L)	N/A[3]	5.4	NONE	750	5.4	902
Arsenic (µg/L)	150	7.7	196	340	7.7	408
Cadmium (µg/L)	0.8	0.5	0.8	8.7	0.5	10.4
Chromium VI (µg/L)	11.0	2.5	13.7	16.0	2.5	18.9
Chromium III (µg/L)	268	2.5	353	5,600	2.5	6,739
Copper (µg/L)	30.4	5.3	38.5	51.6	5.3	61.3
Cyanide (µg/L)	5.2	3.5	5.8	22.0	3.5	26.0
Iron (µg/L)				1,000	6.7	1,203
Lead (µg/L)	18.5	0.3	24.4	475	0.3	572
Mercury (µg/L)	0.012	0.008	0.013	2.4	0.0	2.9
Nickel (µg/L)	168	0.5	222	1,513	0.5	1,820
Selenium (µg/L)	4.6	1.9	5.5	18.4	1.9	21.9
Silver (µg/L)				40.9	0.1	49.2
Tributylin (µg/L)	0.072	0.048	0.080	0.46	0.05	0.55
Zinc (µg/L)	387	10.0	508	387	10.0	464

1: Based upon a Hardness of 399 mg/l as CaCO3

2: Background concentration average of monitoring data

3: Where the pH is equal to or greater than 7.0 and the hardness is equal to or greater than 50 ppm as $CaC0_3$ in the receiving water after mixing, the 87 ug/L chronic criterion (expressed as total recoverable) will not apply, and aluminum will be regulated based on compliance with the 750 ug/L acute aluminum criterion (expressed as total recoverable).

Organics [Pesticides]	Chronic Standard (4 Day Average)			Acute Standard (1 Hour Average)		
Parameter	Standard	Background[1]	Limit	Standard	Background[1]	Limit
Aldrin (µg/L)				1.5	1.0	1.7
Chlordane (µg/L)	0.0043	0.0029	0.0048	1.2	0.0	1.4
DDT, DDE (µg/L)	0.001	0.001	0.001	0.55	0.00	0.66
Diazinon (µg/L)	0.17	0.11	0.19	0.17	0.11	0.19
Dieldrin (µg/L)	0.0056	0.0038	0.0062	0.24	0.00	0.29
Endosulfan, a & b (µg/L)	0.056	0.038	0.062	0.11	0.04	0.13
Endrin (µg/L)	0.036	0.024	0.040	0.086	0.024	0.100
Heptachlor & H. epoxide (µg/L)	0.0038	0.0025	0.0042	0.26	0.00	0.31
Lindane (µg/L)	0.08	0.05	0.09	1.0	0.1	1.2
Methoxychlor (µg/L)				0.03	0.02	0.03
Mirex (µg/L)				0.001	0.001	0.001
Nonylphenol (µg/L)	6.6	4.4	7.3	28.0	4.4	33.1
Parathion (µg/L)	0.0130	0.0087	0.0144	0.066	0.009	0.078
PCB's (µg/L)	0.014	0.009	0.015			
Pentachlorophenol (µg/L)	15.0	10.1	16.6	19.0	10.1	21.4
Toxephene (µg/L)	0.0002	0.0001	0.0002	0.73	0.00	0.88

1: Background concentration assumed 67% of chronic standard

Radiological	Maximum Concentration		
Parameter	Standard	Background[1]	Limit
Gross Alpha (pCi/L)	15	10.1	16.6

1: Background concentration assumed 67% of chronic standard; TDS is based on observed ambient data

Effluent Limitation for Protection of Agriculture (Class 4 Waters)

	Maximum Concentration		
Parameter	Standard	Background[1]	Limit
Total Dissolved Solids (mg/L)	1,200	754	1,344
Boron (mg/L)	0.75	0.2	0.9
Arsenic, Dissolved (µg/L)	100	7.7	130
Cadmium, Dissolved (µg/L)	10	0.5	13.1
Chromium, Dissolved (µg/L)	100	2.5	131
Copper, Dissolved (µg/L)	200	5.3	263
Lead, Dissolved (µg/L)	100	0.3	132
Selenium, Dissolved (µg/L)	50	1.9	65.5
Gross Alpha (pCi/L)	15	10.1	16.6

1: Background concentration assumed 67% of chronic standard; TDS is based on observed ambient data

APPENDIX B

UTAH DEPARTMENT of ENVIRONMENTAL QUALITY
WATER QUALITY

Division of Water Quality (DWQ)
UPDES Program

UPDES Municipal (POTW) Permit Application

Part I. General Information (40 CFR 122.21(j)(1) and (9))

UPDES Permit No.: UT0020427

Facility Name: Payson City Wastewater Treatment Plant

Facility Location: 1062 N Main St

City Payson State UT Zip 84651

Facility Mailing Address: Same

City _____ State _____ Zip _____

Facility Contact: Jeff Hiatt **Title:** Sewer Superintendent

Phone Number: 801-465-5277 **Email Address:** jeffh@payson.org

Name of Signatory: _____ **Title:** _____

Is the applicant the facility owner, operator or both? (check only one response.)

☒ Owner ☐ Operator ☐ Both

Indicate below any existing environmental permits. (Check all that apply and type the corresponding permit number for each.)

☐ RCRA (hazardous waste) ☐ UIC (underground injection control) ☐ PSD (air emissions)

☐ Nonattainment program (CAA) ☐ NESHAPs (CAA) ☐ Dredge or fill (CWA Section 404)

☐ Other (specify) _____

Nature of Business CFR (40 CFR 122.21(f)(8))

Describe the nature of your business

This is a publicly owned treatment work treating wastewater from Payson City.

UTAH DEPARTMENT of ENVIRONMENTAL QUALITY
WATER QUALITY

Division of Water Quality (DWQ)
UPDES Program

UPDES Municipal (POTW) Permit Application

Part II. Facility Information

Population served?	24,000

Design and Actual Flow Rates

Provide design and actual flow rates in designated spaces.

Design Flow Rate	
3.0	mgd

Annual Average Flow Rates (Actual)					
Five Years Ago		**Four Years Ago**		**Three Years Ago**	
1.68	mgd	1.66	mgd	1.72	mgd
Two Years Ago		**Last Year**		**Current Year**	
1.67	mgd	1.72	mgd	1.76	mgd

Maximum Daily Flow Rates (Actual)					
Five Years Ago		**Four Years Ago**		**Three Years Ago**	
2.81	mgd	2.26	mgd	3.09	mgd
Two Years Ago		**Last Year**		**Current Year**	
1.98	mgd	2.34	mgd	2.20	mgd

Describe the treatment for each outfall

	Outfall No. 001	**Outfall No.** 001R	**Outfall No.** _____
Highest Level of Treatment (check all that apply per outfall)	☐ Primary ☐ Equivalent to secondary ☐ Secondary ☒ Advanced ☐ Other (specify) _____	☐ Primary ☐ Equivalent to secondary ☐ Secondary ☒ Advanced ☐ Other (specify) _____	☐ Primary ☐ Equivalent to secondary ☐ Secondary ☐ Advanced ☐ Other (specify) _____
Design Removal Rates by Outfall			
BOD_5	85 %	85 %	%
TSS	85 %	85 %	%
Phosphorus	☒ Not applicable %	☒ Not applicable %	☐ Not applicable %
Nitrogen	☒ Not applicable %	☒ Not applicable %	☐ Not applicable %
Other (specify)	☒ Not applicable %	☒ Not applicable %	☐ Not applicable %

UPDES Municipal (POTW) Permit Application

Part II. Facility Information *continued*

Does the POTW use chlorine for disinfection, use chlorine elsewhere in the treatment process, or otherwise have reasonable potential to discharge chlorine in its effluent? ☒ YES ☐ NO

Describe the type of disinfection used for the effluent for each outfall. If disinfection varies by season, describe below.

Chlorine is used for disinfection for both outfalls on a year-round basis.

	Outfall No. _____	**Outfall No. _____**	**Outfall No. _____**
Disinfection type			
Seasons used			
Dechlorination used?	☐ Not applicable ☐ Yes ☐ No	☐ Not applicable ☐ Yes ☐ No	☐ Not applicable ☐ Yes ☐ No

MAP: Attach a USGS topographic map or aerial photo extending one mile beyond the property boundaries of the site, the facility or activity boundaries, any treatment area(s), outfall(s), major drainage patterns, and the receiving surface waters stated above.

☒ Map Attached

UTAH DEPARTMENT of ENVIRONMENTAL QUALITY
WATER QUALITY

Division of Water Quality (DWQ)
UPDES Program

UPDES Municipal (POTW) Permit Application

Part II. Facility Information *continued*

Are improvements to the facility scheduled?

☒ YES If YES, explain below.

☐ NO If NO, Skip to Part III

Briefly list and describe the schedule improvements.

1. Upgrade to BNR and expand capacity (see CFP amendment)

2.

3.

4.

Provide scheduled or actual dates of completion for improvements.

Scheduled or Actual Dates of Completion for Improvements

Scheduled Improvement (from above)	Affected Outfalls (list outfall number)	Begin Construction (MM/DD/YYYY)	End Construction (MM/DD/YYYY)	Begin Discharge (MM/DD/YYYY)	Attainment of Operational Level (MM/DD/YYYY)
1. Upgrade	001, 001R	01/01/2023	12/31/2024	10/01/2024	01/01/2025
2.					
3.					
4.					

UTAH DEPARTMENT of ENVIRONMENTAL QUALITY
WATER QUALITY

Division of Water Quality (DWQ)
UPDES Program

UPDES Municipal (POTW) Permit Application

Part III. Sampling Information

Provide all parameter sampling data with analytical results, reporting limit and any laboratory flags on an Excel spreadsheet. *An Excel Spreadsheet will be provided upon request.*

Has WET testing been conducted during the last 5 years? ■ YES ☐ NO

Indicate the acute and chronic WET tests (PASS or FAIL) results for the past 5 years. If no WET testing for the quarter, then leave blank (e.g., for semi-annual or annual testing or missed testing events).

See attached summary table

Year	Outfall No. ________				Outfall No. ________				Outfall No. ________			
	Acute		Chronic		Acute		Chronic		Acute		Chronic	
	Qtr 1	☐ PASS	Qtr 1	☐ PASS	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL
	Q				Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL
	Q	☐ FAIL		☐ FAIL	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL
	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL
	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL
	Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL
	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL
	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL
	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL
	Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL
	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL
	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL
	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL
	Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL
	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL
	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL
	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL	Qtr 1	☐ PASS ☐ FAIL
	Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL	Qtr 2	☐ PASS ☐ FAIL
	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL	Qtr 3	☐ PASS ☐ FAIL
	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL	Qtr 4	☐ PASS ☐ FAIL

Describe any cause(s) of toxicity:

We did have some high ammonia which caused a fail. We did do 2 weeks of testing more to get two passes in a row.

UPDES Municipal (POTW) Permit Application

Part IV. Compliance Information

Has the facility had an parameter exceedances over the past five years? ☑YES ☐NO

If Yes, provide the below information:

Parameter	Exceedance	Month/Year	Cause
See attached data spreadsheet			

UPDES Municipal (POTW) Permit Application

Part IV. Compliance Information ***continued***

Facility monitoring data.

Please provide the past **five years** of all parameters required to be monitored in the UPDES permit. The data can be entered in the section below or an excel spreadsheet. Attached additional sheets if needed.

Month	Year	Parameter	Min	Max	Avg	MDL/RL*
See attached data spreadsheets						

*MDL/RL is the analysis method detection limit or reporting limit located on the laboratory analysis report.

UTAH DEPARTMENT of ENVIRONMENTAL QUALITY
WATER QUALITY

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Part V. Outfalls and Receiving Water(s)

Provide the latitude and longitude to the nearest second for each dewatering outfall. The specified location should be after all treatment and before release to the receiving water. Provide the name of the initial receiving water. If the initial receiving water is unnamed, please also indicate the closed named drainage the receiving water flows into (i.e. unnamed tributary of City Creek). Attach additional sheets if necessary for more outfalls.

Each outfall to a different receiving water segment is subject to additional application fees and annual fees.

Outfall No.	Average daily flow rate	Latitude	Longitude	Receiving Surface Waters (Name)
001	0-1.75 mgd	40 ° 03 ' 41 "	111 ° 43 ' 49 "	Beer Creek
001R	0-1.75 mgd	40 ° 03 ' 41 "	111 ° 43 ' 49 "	Payson Power Plant
	mgd	° ' "	° ' "	

Do any of the outfalls described above have a season or periodic discharges?

☐ YES ■ NO

If so, provide the following information for each applicable outfall.

	Outfall No. _____	Outfall No. _____	Outfall No. _____
Number of times per year discharges occurs			
Average duration of each discharge (specify units)			
Average flow of each discharge	mgd	mgd	mgd
Months in which discharge occurs			

Part VI. Collection System

Service Area(s)	Population Served	Miles of Pipe
Payson City	24,000	90
Total Population Served	24,000	**Total Miles of Pipe** 90

USMP Program implemented? ■ YES ☐ NO

UPDES Municipal (POTW) Permit Application

Part VII. Pretreatment Information

Does the facility have an approved pretreatment program? ☒ YES ☐ NO

If YES, skip to next section

If No, complete the below industrial user forms and inspections as needed.

A. Industrial Pretreatment Wastewater Survey

Check any of the following that have occurred in the past five years either at the wastewater treatment plant or in the collection system:

- ☐ Foaming
- ☐ Unusual colors
- ☐ Plugged collection lines caused by grease
- ☐ Plugged collection lines caused by sand
- ☐ Plugged collection lines caused by other debris
- ☐ Discharging of excessive BOD
- ☐ Discharging of excessive suspended solids
- ☐ Smells unusually bad or unusual smells
- ☐ Upsets of the treatment plant due to unknown conditions

Does the facility have any industrial users (IUs) which meet any of the following criteria:

1. **Has a lot of process wastewater (5% of the flow at the waste treatment facility or more than 25,000 gallons per work day.)**
   a. Examples: food processor, dairy, slaughterhouse, industrial laundry.

☐ YES ☐ NO

1. **Is subject to federal categorical pretreatment standards**;
   a. Examples: metal plating, cleaning or coating of metals, blueing of metals, aluminum extruding, circuit board manufacturing, tanning animal skins, pesticide formulating or packaging, and pharmaceutical manufacturing or packaging,

☐ YES ☐ NO

2. **Is a concern to the POTW.**
   a. Examples: septage hauler, restaurant and food service, car wash, hospital, photo lab, carpet cleaner, commercial laundry.

☐ YES ☐ NO

Do any users of the water treatment facility caused any of the following to occur:

☐ YES ☐ NO A discharge which creates a fire or explosion hazard in the collection system.
☐ YES ☐ NO A discharge which creates toxic gases, vapor or fumes in the collection system.
☐ YES ☐ NO A discharge of solids or thick liquids which creates flow obstructions in the collection system.
☐ YES ☐ NO An acidic discharge (low pH) which causes corrosive damage to the collection system.
☐ YES ☐ NO Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause problems in the collection system or at the waste treatment facility.
☐ YES ☐ NO Waste haulers are prohibited from discharging without permission.
☐ YES ☐ NO Does the facility believe that illegal dumping is occurring in the jurisdiction?

UPDES Municipal (POTW) Permit Application

Part VII. Pretreatment Information *continued*

Complete and submit a preliminary inspection of each business that is discharging process wastewater to the wastewater treatment plant

B. PRELIMINARY INSPECTION FORM

Inspection Date _____ Inspection Time _____

Name of Business _____ Person Contacted _____
Street Address _____ City _____
Email Address _____ Phone Number _____

Description of Business:

Principal product or service:

Raw Materials used:

Production process is: ☐ Batch ☐ Continuous ☐ Both

If yes, briefly describe seasonal production cycle.

This facility generates the following types of wastes (check all that apply):

1. ☐ Domestic wastes (Restrooms, employee showers, etc.)
2. ☐ Cooling water, non-contact
3. ☐ Boiler/Tower blowdown
4. ☐ Cooling water, contact
5. ☐ Process
6. ☐ Equipment/Facility washdown
7. ☐ Air Pollution Control Unit
8. ☐ Storm water runoff to sewer
9. ☐ Other describe

Wastes are discharged to (check all that apply):

☐ Evaporation
☐ Ground water
☐ Sanitary sewer
☐ Other (describe below)
☐ Storm sewer
☐ Surface water
☐ Waste haulers

Name of waste hauler(s), if used

_____ _____ _____

Is a grease trap installed? ☐ Yes ☐ No
Is it operational? ☐ Yes ☐ No

UPDES Municipal (POTW) Permit Application

Part VII. Pretreatment Information *continued*

B. PRELIMINARY INSPECTION FORM *continued*

Does the business discharge a lot of process wastewater?

- More than 5% of the flow to the waste treatment facility? ☐ Yes ☐ No
- More than 25,000 gallons per work day? ☐ Yes ☐ No

Does the business do any of the following or manufacture any of the following?

- ☐ Adhesives
- ☐ Aluminum Forming
- ☐ Battery Manufacturing
- ☐ Car Wash
- ☐ Carpet Cleaner
- ☐ Copper Forming
- ☐ Dairy
- ☐ Electric & Electronic Components
- ☐ Explosives Manufacturing
- ☐ Food Processor
- ☐ Foundries
- ☐ Hospital
- ☐ Industrial Porcelain Ceramic Manufacturing
- ☐ Inorganic Chemicals Mfg. or Packaging
- ☐ Iron & Steel
- ☐ Laundries
- ☐ Metal Finishing, Coating or Cleaning
- ☐ Mining
- ☐ Nonferrous Metals Manufacturing
- ☐ Organic Chemicals Manufacturing or Packaging
- ☐ Paint & Ink Manufacturing
- ☐ Pesticides Formulating or Packaging
- ☐ Petroleum Refining
- ☐ Pharmaceuticals Manufacturing or Packaging
- ☐ Photo Lab
- ☐ Plastics Manufacturing
- ☐ Restaurant & Food Service
- ☐ Rubber Manufacturing
- ☐ Septage Hauler
- ☐ Slaughter House
- ☐ Soaps & Detergents Manufacturing
- ☐ Steam Electric Generation
- ☐ Tanning Animal Skins
- ☐ Textile Mills

Are any process changes or expansions planned during the next three years? ☐ Yes ☐ No

If yes, attach a separate sheet to this form describing the nature of planned changes or expansions.

_____ _____

Inspector Name Printed | Wastewater Treatment Facility

Any questions regarding the form or assistance with inspecting business please contact

Jennifer Robinson
Pretreatment Coordinator
Division of Water Quality
P. O. Box 144870
Salt Lake City, Utah 84114-4870

Phone: (801) 536-4383
Fax: (801) 536-4301
E-Mail:jenrobinson@utah.gov

UPDES Municipal (POTW) Permit Application

Part VII. Pretreatment Information *continued*

Either list all businesses below or provide a list of business licenses issued in the facilities service area.

	Name of Business	Jurisdiction	SIC Codes	Total Average Process Flow (gpd)	Total Average Facility Flow (gpd)	Facility Description (dentist, manufacturing [state product], dairy, assisted living facility, etc.)
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						

UTAH DEPARTMENT of ENVIRONMENTAL QUALITY
WATER QUALITY

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Part VIII. Bisolids Information

Was the Biosolids Annual Report submitted? ■ YES ☐ NO

■ Attach a Biosolids Management Plan with application

Serve Connections? 8,200

Provide the total dry metric tons per the latest 365-day period of sewage sludge generated, treated, used and disposed of:

Practice	Dry Metric Tons per 365-day Period
Amount generated at the facility	377
Amount treated at the facility	377
Amount used (i.e., received from offsite) at the facility	
Amount disposed of at the facility	377

Treatment Provided at Your Facility

Identify the treatment process(es) used at your facility to reduce pathogens in sewage sludge

- ☐ Preliminary operations (e.g., sludge grindling and degritting)
- ☐ Stablilization
- ☐ Composting
- ☐ Disinfection
- ☐ Heat drying
- ☐ Methane or biogas capture and recovery
- ■ Thickening (concentration)
- ■ Anaerobic digestion
- ☐ Conditioning
- ■ Dewatering (e.g. centrifugation, sludge drying beds, sludge lagoons)
- ☐ Thermal reduction

Sewage Sludge Disposal Method

Land Application of Bulk Sewage Sludge

Is sewage sludge form your facility applied to the land? ☐ YES ■ NO If No, Skip to next section

Total dry metric tons per 365-day period of sewage sludge applied to all land sites:

Surface Disposal

Is sewage sludge from your facility placed on a surface disposal site?

☐ YES ☐ NO If No, Skip to next section

Total dry metric tons of sewage sludge from your facility placed on all surface disposal sites per 365-day period: _____

Do you own or operate all surface disposal sites to which you send sewage sludge for disposal?

☐ YES ☐ NO If No, complete the below information

Surface disposal site *you do not operate*

Site name _____

Mailing address _____

City _____ State _____ Zip _____

Contact Name _____ Title _____

Phone Number _____ Email Address _____

UPDES Municipal (POTW) Permit Application

Part VIII. Bisolids Information *continued*

Incineration

Is sewage sludge from your facility fired in a sewage sludge incinerator?
☐ YES ■ NO If No, Skip to next section

Total dry metric tons of sewage sludge from your facility fired in all sewage sludge incinerators per 365-day period: _____

Do you own or operate all sewage sludge incinerators in which sewage sludge from facility is fired?
☐ YES ☐ NO If No, complete the below information

Incinerator location *you do not operate*

Site name _____

Mailing address _____

City _____ State _____ Zip

Contact Name _____ Title _____

Phone Number _____ Email Address _____

Disposal in a Municipal Solid Waste Landfill

Is sewage sludge from your facility placed on a municipal solid waste landfill?
■ YES ☐ NO If No, Skip to next section

Total dry metric tons of sewage sludge from your facility placed in this municipal solid waste landfill per 365-day period: _____

Do you own or operate the municipal solid waste landfill in which sewage sludge is disposed?
■ YES ☐ NO If No, complete the below information

Municipal Solid Waste Landfill *you do not operate*

Site name _____

Mailing address _____

City _____ State _____ Zip _____

Contact Name _____ Title _____

Phone Number _____ Email Address _____

UTAH DEPARTMENT of ENVIRONMENTAL QUALITY
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Part IX. Reuse Information

Is wastewater applied to land?

☐ YES ■ NO If YES, complete the below information.

Land Application Site and Discharge Data

Location	Size	Average Daily Volume Applied	How often
	acres	gpd	☐ Seasonal ☐ Continuous ☐ Intermittent
	acres	gpd	☐ Seasonal ☐ Continuous ☐ Intermittent
	acres	gpd	☐ Seasonal ☐ Continuous ☐ Intermittent

Seasonal land application.

Indicate months of seasonal land application

☐ January	☐ April	☐ July	☐ October
☐ February	☐ May	☐ August	☐ November
☐ March	☐ June	☐ September	☐ December

Where is the Reuse water distributed

- ☐ Residential irrigation
- ☐ Urban uses
  - ○ Non-residential landscape irrigation
  - ○ Golf course irrigation
  - ○ Toilet flushing
  - ○ Fire protection
- ☐ Irrigation of food crops (direct contact with edible part) – spray irrigation
- ☐ Irrigation of food crops *(Non direct contact with edible part) – no spray irrigation*
- ☐ Irrigation
  - ○ Sod farms
  - ○ Silviculture
  - ○ Limited access highway rights of way
  - ○ Other areas where human access is restrict or unlikely to occur
- ☐ Irrigation of animal feed crops other than pasture for milking animals
- ☐ Impoundment of wastewater where direct human contact is not allowed or is unlikely to occur
- ■ Cooling water
- ☐ Soil compaction or duct control in construction areas
- ☐ Other

☐ **Attached an updated Reuse Project Plan**

An updated Reuse Project Plan is required during every permit renewal.

UPDES Municipal (POTW) Permit Application

Part X. Antidegradation Review

The objective of antidegradation rules and policies is to protect existing high quality waters and set forth a process for determining where and how much degradation is allowable for socially and/or economically important reasons. In accordance with Utah Administrative Code (UAC R317-2-3), an antidegradation review (ADR) is a permit requirement for any project that will increase the level of pollutants in waters of the state. The rule outlines requirements for both Level I and Level II ADRs, as well as public comment procedures. This review form is intended to assist the applicant and Division of Water Quality (DWQ) staff in complying with the rule but is not a substitute for the complete rule in R317-2-3.5. Additional details can be found in the *Utah Antidegradation Implementation Guidance* and relevant sections of the guidance are cited in this review form.

ADRs should be among the first steps of an application for a UPDES permit because the review helps establish treatment expectations. The level of effort and amount of information required for the ADR depends on the nature of the project and the characteristics of the receiving water. To avoid unnecessary delays in permit issuance, DWQ recommends that the process be initiated at least one year prior to the date a final approved permit is required.

DWQ will determine if the project will impair beneficial uses (Level I ADR) using information provided by the applicant and whether a Level II ADR is required. The applicant is responsible for conducting the Level II ADR. For the permit to be approved, the Level II ADR must document that all feasible measures have been undertaken to minimize pollution for socially, environmentally or economically beneficial projects resulting in an increase in pollution to waters of the state.

For permit requiring a Level II ADR, this antidegradation form must be completed and approved by DWQ before any UPDEs permit can be issued. Typically, the ADR form is completed in an iterative manner in consultation with DWQ. The applicant should first complete the statement of social, environmental and economic importance (SEEI) in Section C and determine the parameters of concern (POC) in Section D. Once the POCs' are agreed upon by DWQ, the alternatives analysis and selection of preferred alternative Section E can be conducted based on minimizing degradation resulting from discharge of the POCs. Once the applicant and DWQ agree upon the preferred alternative, the review is considered complete, and the form is submitted to DWQ.

What are the designated uses of the receiving water (R317-2-6)?

- ☐ Domestic Water Supply
- ☒ Recreation
- ☒ Aquatic Life
- ☒ Agricultural Water Supply
- ☐ Great Salt Lake

Antidegradation Category 1, 2 or 3 of receiving water (R317-2-3.2, -3.3, and -3.4): 3

UPDES Municipal (POTW) Permit Application

Part X. Antidegradation Review *continued*

Effluent flow reviewed: *typically, this should be the maximum daily discharge at the design capacity of the facility. Exceptions should be noted.*

The upgrade design is based on projections for the year 2045, which are for 4.03 MGD annual average flow, 5.02 MGD max month flow, and 6.03 MGD max daily flow.

What is the application for? (Check all that apply)

- ☐ A UPDES permit for a new facility, project, or outfall.
- ■ A UPDES permit renewal with an expansion of modification of an existing wastewater treatment works.
- ☐ A UPDES permit renewal requiring limits for a pollutant not covered by the previous permit and/or an increase to existing permit limits.
- ☐ A UPDES permit renewal with no charges in facility operations.

Section B. Is a Level II ADR required?

This section of the form is intended to help applicants determine if a Level II ADR is required for specific permitted activities. In addition, the Executive Secretary may require a Level II ADR for an activity with the potential for major impact on the quality of waters of the state (R317-2-3.5a.1).

B1. The UPDES permit is new or is being renewed and the proposed effluent concentration and loading limits are higher than the concentration and loading limits in the previous permit and any previous antidegradation review(s).

- ■ YES – (Proceed to B3 of the Form)
- ☐ NO – No Level II ADR is required and there is no need to proceed further with the review questions. Continue to the Certification Statement and Signature page.

B2. Will any pollutants use assimilative capacity of the receiving water, i.e. do the pollutant concentrations in the effluent exceed those in the receiving waters at critical conditions? For most pollutants, effluent concentrations that are higher than the ambient concentrations require an antidegradation review? For a few pollutants such as dissolved oxygen, and antidegradation review is required if the effluent concentrations are less than the ambient concentrations in the receiving water. (Section 3.3.3 of Implementation Guidance)

- ☐ YES – (Proceed to B4 of the Form)
- ☐ NO – No Level II ADR is required and there is no need to proceed further with the review questions. Continue to the Certification Statement and Signature page.

UPDES Municipal (POTW) Permit Application

Part X. Antidegradation Review *continued*

B3. Are water quality impacts of the proposed project temporary and limited (Section 3.3.4 of Implementation Guidance)? Proposed projects that will have temporary and limited effects on water quality can be exempted form a Lev le II ADR.

☐ YES – Identify the reason used to justify this determination if B4.1 and proceed to Section G. No Level II ADR is required.

☒ NO – A Level II ADR is required (Proceed to Section C)

B3.1 Complete this question only if the applicant is requesting a Level II review exclusion for temporary and limited projects (See R317-2-3.5(b)(3) and R317-2-3.5(b)(4)). For projects requesting a temporary and limited exclusion please indicate the factor(s) used to justify this determination (check all that apply and provide details as appropriate) (Section 3.3.4 of Implementation Guidance):

☐ Water quality impacts will be temporary and related exclusively to sediment or turbidity and fish spawning will not be impaired.

Factors to be considered in determining whether water quality impacts will be temporary and limited:

a) The length of time during which water quality will be lowered:	
b) The perfect change in ambient concentrations of pollutants:	
c) Pollutants affected:	
d) Likelihood for long-term water quality benefits:	
e) Potential for any residual long-term influences on existing uses:	
f) Impairment of fish spawning, survival and development of aquatic fauna excluding fish removal efforts:	
Additional justification, as needed:	

UPDES Municipal (POTW) Permit Application

Part X. Antidegradation Review *continued*

Level II ADR

Section C, D, E, and F of the form constitute the Level II ADR Review. The applicant must provide as much detail as necessary for DWQ to perform the antidegradation review. Questions are provided for the convenience of applicants; however, for more complex permits it may be more effective to provide the required information in a separate report. Applicants that prefer a separate report should record the report name here and proceed to Section G of the form.

Option Report Name: _____

Section C. Is the degradation from the project socially and economically necessary to accommodate important social or economic development in the area in which the waters are located? *The applicant must provide as much detail as necessary for DWQ to concur that the project is socially and economically necessary when answering the questions in the section. More information is available in Section 6.2 of the Implementation Guidance.*

C1. Describe the social and economic benefits that would be realized through the proposed project, including the number and nature of jobs created and anticipated tax revenues.

The benefits include providing additional treatment capacity to serve the projected future population of the city. Population growth will allow for additional commercial and industrial jobs and associated tax revenues.

C2. Describe any environmental benefits to be realized through implementation of the proposed project.

The upgraded system will provide a higher level of treatment, including increased removal of nutrients (nitrogen and phosphorus).

C3. Describe any social and economic losses that may result from the project, including impacts to recreation or commercial development.

No losses have been identified.

C4. Summarize any supporting information from the affected communities on preserving assimilative capacity to support future growth and development.

The project is designed to serve the population projected through 2045.

UPDES Municipal (POTW) Permit Application

Part X. Antidegradation Review *continued*

C5. Please describe any structures or equipment associated with the project that will be placed within or adjacent to the receiving water.

None.

C6. Will the discharge potentially impact a drinking water source, e.g., Class 1C waters? Depending upon the locations of the discharge and its proximity to downstream drinking water diversions, additional treatment or more stringent effluent limits or additional monitoring, beyond that which may otherwise be required to meet minimum technology standards or in stream water quality standards, may be required by the Director in order to adequately protect public health and the environment (R317-2-3.5 d.).

☐ YES
☒ NO

Section D. Identify and rank (from increasing to decreasing potential threat to designated uses) the parameters of concern. *Parameters of concern are parameters in the effluent at concentrations greater than ambient concentrations in the receiving water. The applicant is responsible for identifying parameter concentrations in the effluent and DWQ will provide parameter concentrations for the receiving water. More information is available in Section 3.3.3 of the Implementation Guidance.*

Parameters of Concern:

Rank	Pollutant	Ambient Concentration	Effluent Concentration
1. BOD			<15 mg/L
2. TSS			<15 mg/L
3. Ammonia			<2 mg/L
4. Dissolved Oxygen			>5 mg/L
5. Phosphorus			<1 mg/L

UPDES Municipal (POTW) Permit Application

Part X. Antidegradation Review *continued*

Pollutants Evaluated that are not Considered Parameters of Concern:

Pollutant	Ambient Concentration	Effluent Concentration	Justification
1. TRC			Switching to UV disinfection
2.			
3.			
4.			
5.			

Section E. Alternative Analysis Requirements of Level II Antidegradation Review. *Level II ADRs require the applicant to determine whether there are feasible less-degrading alternatives to the proposed project. More information is available in Section 5.5 and 5.6 of the Implementation Guidance.*

E1. The UPDES permit is being renewed without any changes to flow or concentrations. Alternative treatment and discharge options including changes to operations and maintenance were considered and compared to the current processes. NO economically feasible treatment or discharge alternatives were identified that were not previously considered for any previous antigradation review(s).

☐ YES – (Proceed to Section F)
☒ NO or Does Not Apply (Proceed to E2)

E2. Attach as an appendix to this form a report that describes that following factors for all alternative treatment options (see 1) a technical descriptions of the treatment process, including construction costs and continued operation and maintenance expenses, 2) the mass and concentration of discharge constituents, and 3) a description of the reliability of the system, including the frequency where recurring operation and maintenance may lead to temporary increases in discharged pollutants. Most of this information is typically available from a Facility Plan, if available.

Report Name: Payson City WWTP Capital Facilities Plan, and CFP Amendment

E3. Describe the proposed method and cost of the baseline treatment alternative. The baseline treatment alternative is the minimum treatment required to meet water quality based effluent limits (WQBEL) as determined by the preliminary or final wasteload analysis (WLC) and any secondary or categorical effluent limits.

See reports

UPDES Municipal (POTW) Permit Application

Part X. Antidegradation Review *continued*

E4. Were any of the following alternatives feasible and affordable?

Alternative	Feasible	Reason Not Feasible/Affordable
Pollutant Trading	☐ YES ■ NO	Not applicable
Water Recycling/Reuse	■ YES ☐ NO	
Land Application	☐ YES ■ NO	All water is used for cooling tower
Connection to Other Facilities	☐ YES ■ NO	Not practical
Upgrade to Existing Facility	■ YES ☐ NO	
Total Containment	☐ YES ■ NO	Not practical
Improved O&M of Existing Systems	■ YES ☐ NO	
Seasonal or Controlled Discharge	☐ YES ■ NO	Not applicable
New Construction	■ YES ☐ NO	
No Discharge	☐ YES ■ NO	Not pratical

E5. From the applicant's perspective, what is the preferred treatment option?

BNR oxidation ditch as presented in the CFP Amendment.

UPDES Municipal (POTW) Permit Application

Part X. Antidegradation Review *continued*

E6. Is the preferred option also the least polluting feasible alternative?

☒ YES ☐ NO

If No, what were less degrading feasible alternative(s)?

If No, provide a summary of the justification for not selecting the least polluting feasible alternative and if appropriate, provide a more detailed justification as an attachment.

Section F. Optional Information

F1. Does the applicant want to conduct optional public review(s) in addition to the mandatory public review? Level II ADRs are public noticed for a thirty day comment period. More information is available in Section 3.7.1 of the Implementation Guidance.

☐ YES ☒ NO

F2. Does the project include an optional mitigation plan to compensate for the proposed water quality degradation?

☐ YES ☒ NO

Report Name: _____

UTAH DEPARTMENT of ENVIRONMENTAL QUALITY
WATER QUALITY

Division of Water Quality (DWQ)
UPDES Program

UPDES Municipal (POTW) Permit Application

Part XI. Certification Statement and Signature

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

DAVID C. TUCKETT	David C Tuckett	Payson City Manager	8/31/2022
PRINT Signatory Authority	**Signature**	**Title**	**Date**

The Division of Water Quality may request addition information.

Important: The UPDES Permit Application will not be considered complete unless you answer every question. If an item does not apply to you, enter "Not Applicable" to show that you considered the question.

The UPDES Permit Application, must be signed as follows:

1) For a corporation, a responsible corporate officer shall sign the NOT, a responsible corporate officer means:
   a. A President, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation; or
   b. The manager of one or more manufacturing, production, or operating facilities, if
      i. The manager is authorized to make management decisions that govern the operation of the regulated facility, including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental statutes and regulations:
      ii. The manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and
      iii. Authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
2) For a partnership of sole proprietorship, the general partner or the proprietor, respectively; or
3) For a municipality, state or other public agency, either a principal executive officer or ranking elected official shall sign the application; in this subsection, a principal executive officer of any agency means;
   a. The chief executive officer of the agency; or
   b. A senior executive officer having responsibility for the overall operations of a principal geographic unit or division of the agency.

Where to File the UPDES Permit Application form:

Please submit the original form with a signature in ink to the below address. Remember to retrain a copy for your records.

UPDES sent by mail:

Division of Water Quality
195 North 1950 West
PO Box 144870
Salt Lake City, UT 84114-4870

OFFICE USE ONLY

Date received: ___/___/___ **Received by:** _____ **Document No:** _____

via: ☐ Email ☐ Fax ☐ Webportal ☐ Mail ☐ Hand Delivery

APPENDIX C

RESOLUTION NO. 06-05-2019 D

A RESOLUTION SUPPORTING A BIOLOGICAL UPGRADE TO THE PAYSON CITY MUNICIPAL WASTEWATER TREATMENT PLANT FOR SELECTED BIOLOGICAL PHOSPHORUS REMOVAL TECHNOLOGY

WHEREAS, The Payson City Wastewater Treatment Plant (Plant) provides wastewater treatment services to its residents; and

WHEREAS, the Plant is subject to UPDES Discharge Permit NO. UT0020427; and

WHEREAS, the Plant is required to achieve technology-based phosphorus effluent limits (TBPEL) on or before January 1, 2020 unless a variance is granted; and

WHEREAS, Payson City applied for a variance on December 29, 2017. The variance request was based upon the fact that Payson is in the process of evaluating numerous alternatives for a facility to meet TBPEL requirement; and

WHEREAS, the Division of Water Quality granted a variance to Payson City on October 18, 2018, subject to various conditions, one of which is for the City Council to adopt a resolution supporting the pursuit of a plant upgrade to meet the biological phosphorus removal technology.

NOW THEREFORE, BE IT RESOLVED, by the Payson City Council, that PAYSON informs the Division Water Quality Board that it supports upgrading its wastewater treatment plant for the selected biological phosphorus removal technology. The preliminary numbers supporting the plant upgrade is approximately $12,467,000.00.

Passed and adopted by the Payson City Council this 5th day of June, 2019.

William R. Wright, Mayor

ATTEST:

Kim E. Holindrake, Deputy Recorder

PAYSON CITY SEAL UTAH

Payson City

-Wastewater Facilities Plan

Presented by: Brad Rasmussen 6/19/19

AQUA ENGINEERING

1

ClearAs Update

- South Davis is currently not running
- Found Toxicity in Water
- Search for Toxicity
- North Plant Water Works
- Moving Project to North Plant

- Revenue Stream not verified
  - Will not be available for Payson Financing

AQUA ENGINEERING

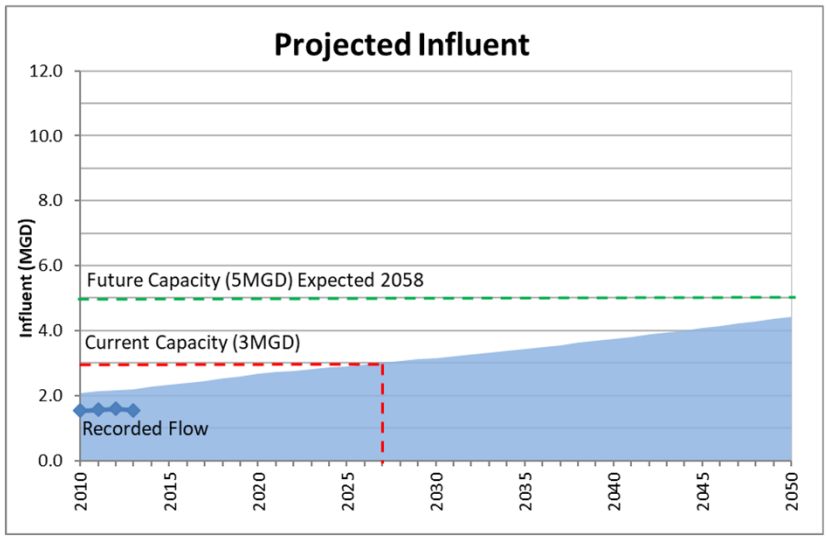
2

Wastewater Treatment Plant Needs

- Repair Existing Equipment
- Redundancy for Existing Processes
- Nutrient Removal
- Expansion for Growth

3

Flow Projections



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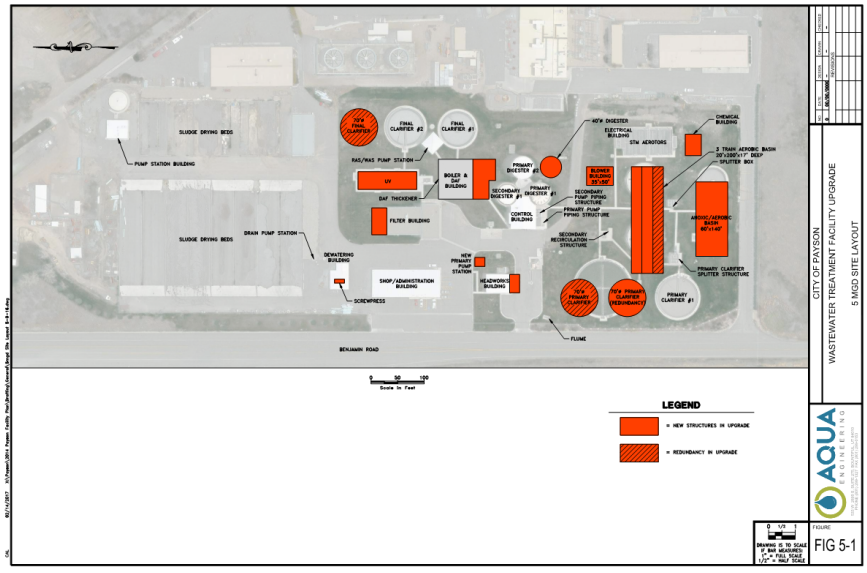
5 MGD Alternatives

5

5 MGD Expansion



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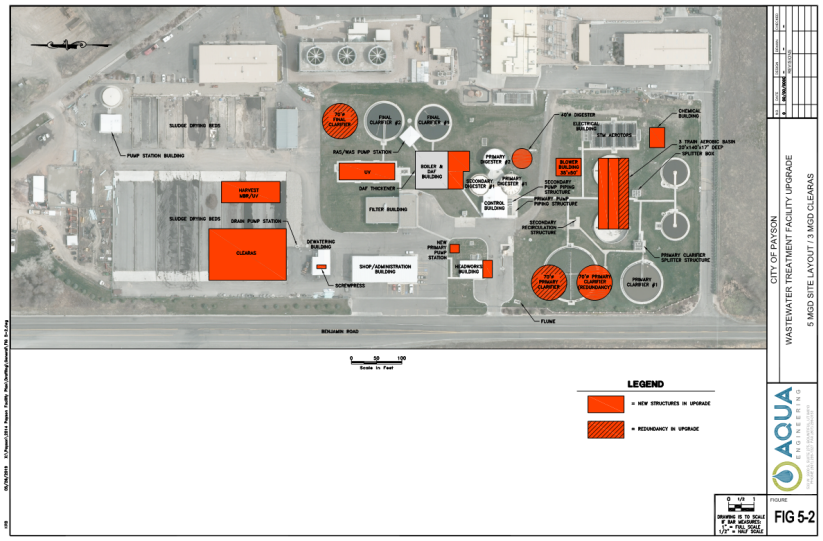
5 MGD Expansion with ClearAs



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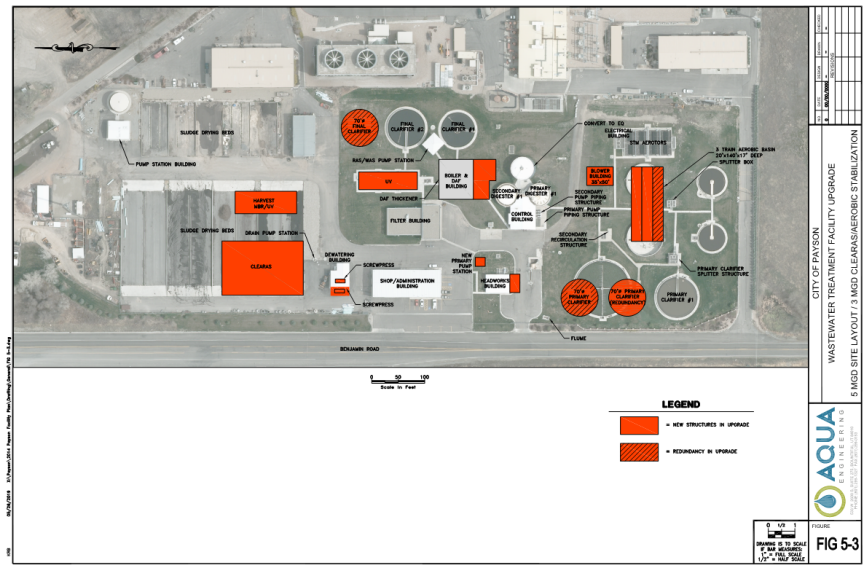
5 MGD Expansion ClearAs Aerobic Stabilization



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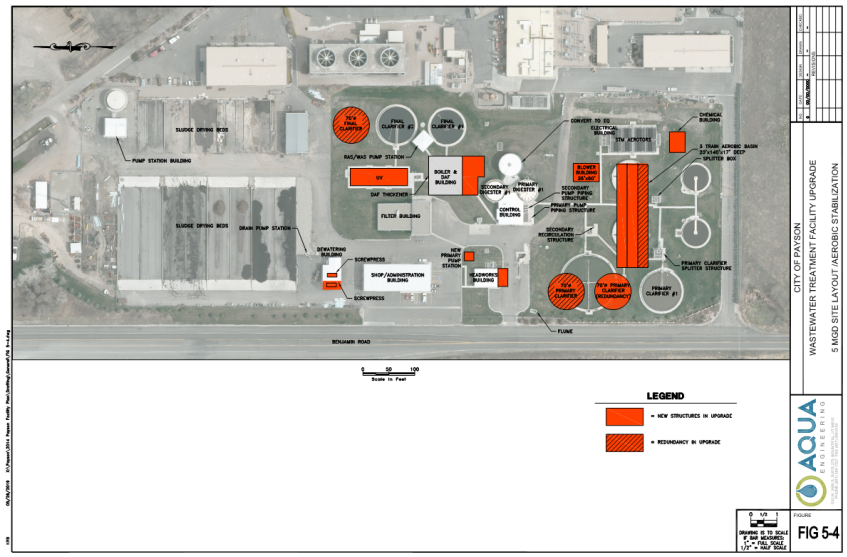
5 MGD Expansion Aerobic Stabilization



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5 MGD Summary

	Capital Cost	Annual Operating and Debt Service	Monthly User Fee*
5 MGD Expansion	$22,533,440	$4,590,192	$58.43
5 MGD Expansion with ClearAs	$40,277,663	$7,417,160	$94.41
5 MGD Expansion ClearAs Aerobic Stabilization	$37,225,466	$7,212,004	$91.80
5 MGD Expansion Aerobic Stabilization	$19,757,984	$4,403,638	$56.05

*Assumes 6,547 Connections

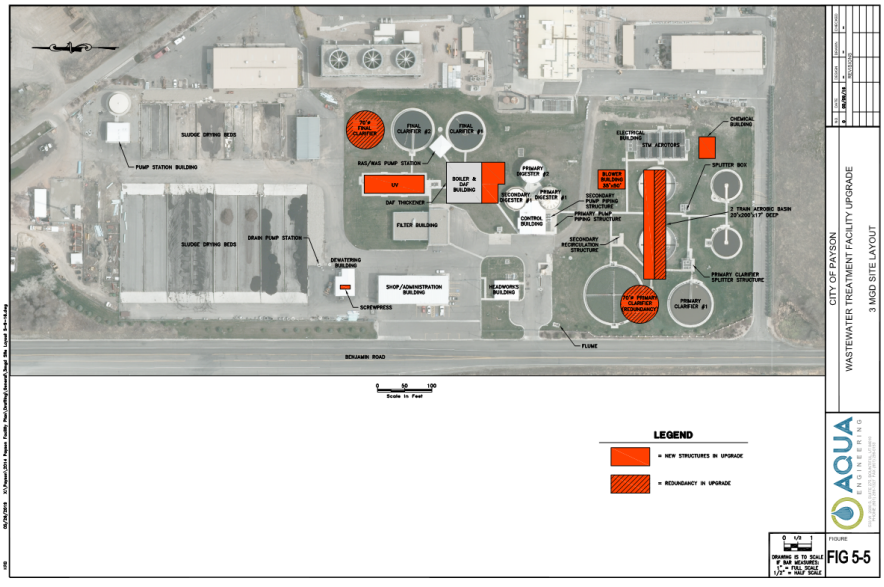
10

3 MGD Alternatives

AQUA ENGINEERING

11

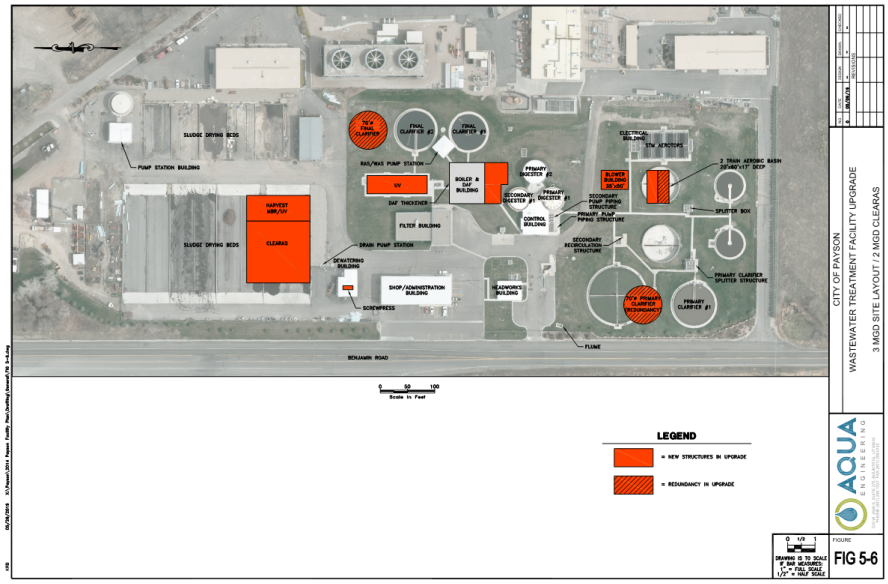
3 MGD Expansion



AQUA ENGINEERING

12

3 MGD Expansion with ClearAs



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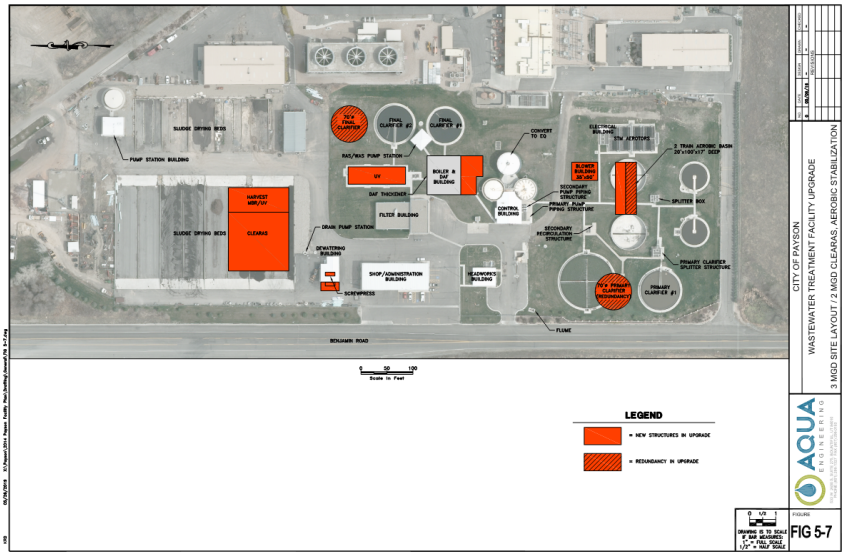
3 MGD Expansion ClearAs Aerobic Stabilization



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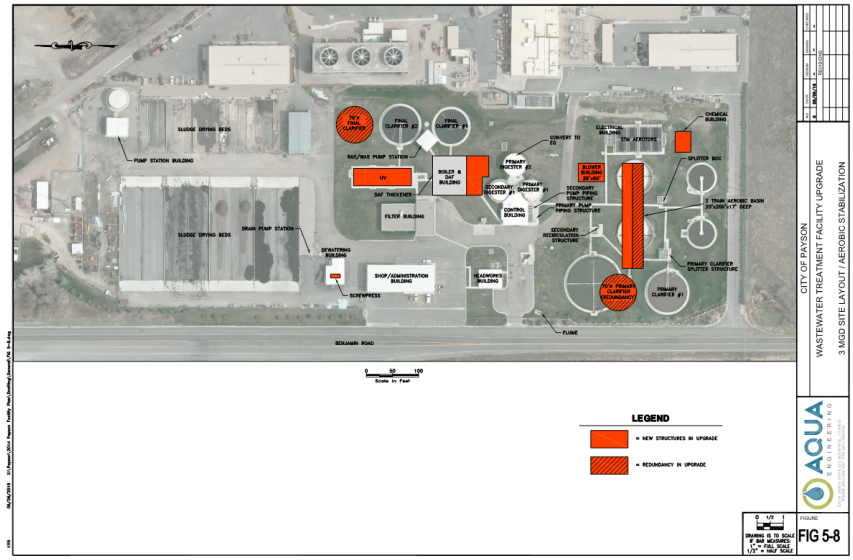
3 MGD Expansion Aerobic Stabilization



15

3 MGD Summary

	Capital Cost	Annual Operating and Debt Service	Monthly User Fee*
3 MGD Expansion	$13,436,618	$3,157,687	$40.19
3 MGD Expansion with ClearAs	$26,453,306	$4,539,536	$57.78
3 MGD Expansion ClearAs Aerobic Stabilization	$25,136,493	$4,451,025	$56.65
3 MGD Expansion Aerobic Stabilization	$12,476,138	$2,995,405	$38.13

*Assumes 6,547 Connections

16

3 MGD Expansion Aerobic Stabilization NPV

3 MGD 20 Year NPV				
Year	Capital Expense	Current Debt Service	Operational Cost	Net Annual Cost
2020	$12,476,138	$891,892	$1,816,812	$15,184,843
2021		$890,526	$1,871,317	$2,761,842
2022		$897,292	$1,927,456	$2,824,748
2023		$339,375	$1,985,280	$2,324,655
2024		$340,888	$2,044,838	$2,385,726
2025		$351,108	$2,106,183	$2,457,291
2026		$344,734	$2,169,369	$2,514,103
2027		$347,820	$2,234,450	$2,582,270
2028			$2,301,483	$2,301,483
2029			$2,370,528	$2,370,528
2030	$10,922,769		$2,441,644	$13,364,413
2031			$2,514,893	$2,514,893
2032			$2,590,340	$2,590,340
2033			$2,668,050	$2,668,050
2034			$2,748,092	$2,748,092
2035			$2,830,534	$2,830,534
2036			$2,915,450	$2,915,450
2037			$3,002,914	$3,002,914
2038			$3,093,001	$3,093,001
2039			$3,185,791	$3,185,791
NET Present Value				$59,252,476
Discount Rate				3%

17

Recommendation

- Construct 3 MGD Upgrade (3 MGD Expansion Aerobic Stabilization)
- Expand Treatment when Necessary
  - Growth
  - New permit requirements
- Lower Monthly Rate for Current Customers

18

Questions

19

PAYSON CITY
CITY COUNCIL MEETING AND WORK SESSION
Payson City Center, 439 W Utah Avenue, Payson UT 84651
Wednesday, June 19, 2019

CONDUCTING	Mayor William Wright
ELECTED OFFICIALS	Linda Carter, Brett Christensen, Taresa Hiatt, Brian Hulet, Doug Welton
STAFF PRESENT	David Tuckett, City Manager Mark Sorenson, City Attorney Sara Hubbs, Finance Director/City Recorder Kim E. Holindrake, Deputy City Recorder Travis Jockumsen, Dev. Serv. Director/City Engineer, PW Director Brad Bishop, Police Chief Jill Spencer, City Planner Scott Spencer, Fire Chief Karl Teemant, Recreation Director
OTHERS	Brian Baker – Zions Public Finance, Jonathan Ward – Zions Public Finance, Janean Thomas, Brent Oakeson – Utah Local Governments Trust, Brad Rassmussen – Aqua Engineering

Mayor Wright called this meeting of the City Council of Payson City, Utah, to order at 5:05 p.m. The meeting was properly noticed.

A. WORK SESSION
1. Discussion regarding assessment areas

Brian Baker and Jonathan Ward reviewed Special Assessment Areas (SAA) and Public Infrastructure Districts (PID), which are tools for the city install infrastructure. Methods to financing public projects include save up and set aside, pay as you go, grant financing, and debt financing. Positives may include interest is earned, no interest paid, those who use the project pay for it, and the project is completed immediately. Negatives include requires interest payment, long wait time to complete project, risk of inflation costs, possible conditions for use, and arduous qualification process. SAA's are a subset of bond issuance, and the source of credit and source of repayment don't have to be the same source. SAA's encompass a specific geographic area to ensure that those benefited from the improvements pay for the improvements. An SAA may include improvements such as curb, gutter, sidewalk, drainage, street lighting, etc. SAA's started as a retrofit financing tool, and evolved into a financing tool for the installation of public infrastructure in an undeveloped area.

PID's became effective May 14, 2019 to enable property owners in 100% agreement to create a taxing sub-district in the city. They agree to be assessed a property tax, which is limited to .015 of every dollar of taxable value within the PID. The funds must be used for public infrastructure. PID's are created to keep the city out of the liability by establishing a board that controls meetings, publishes notices, levies and collects the tax, sets the budget, etc.

Creating an SAA involves an intent resolution to define the SAA including property and project, a public protest hearing, and defines the assessment method and amount. During the public hearing if more than 40% protest, the SAA can't be established. If less than 40% protest, the council may decide whether to force the assessment. Then if moving forward, the city conducts a 60-day protest period, designation resolution, and construction bid opening. A Board of Equalization would be established post construction for three consecutive days for a one-hour minimum and could change the result in city expense. The city then passes an assessment ordinance and bond resolution that triggers a pre-payment timeline. Assessments are levied on an equal and uniform basis according to the benefits received. The area includes all property that directly benefits from the improvements and no other. Some properties may carry a larger proportionate burden than others. The public hearing includes a publication of the Notice of Intent for four consecutive weeks as well as a double mailing delivered within 10 days of the first publication.

(15-minute break)

B. PRAYER & PLEDGE OF ALLEGIANCE (6:15 p.m.)

Prayer offered by Talon Harmon.

Pledge of Allegiance led by Cade Oakeson.

C. CONSENT AGENDA
1. Approval of the June 5, 2019 City Council and Redevelopment Agency Meeting
2. Resolution – Deferral Agreement for the Saints Peter and Paul Orthodox Church
3. Ordinance – Adoption of the Holdaway-Pleasant Flats Annexation located adjacent to and south of SR-198 extending to 100 South and between 1300 East and 1500 East
4. Ordinance – Adoption of the Payson Heights Annexation located east of the High Line Canal, west of Nebo Loop Road, and south of the Payson View Estates development (1600 South)
5. Ordinance – Adoption of the Condie Annexation located at 2252 W Salem Canal Rd

MOTION: Councilmember Hulet – To approve the consent agenda. Motion seconded by Councilmember Hiatt. Those voting yes: Linda Carter, Brett Christensen, Taresa Hiatt, Brian Hulet, Doug Welton. The motion carried.

(Note: The resolution and agreement for Item 2 were not available so the item will be addressed at a future meeting.)

D. PETITIONS, REMONSTRANCES & COMMUNICATIONS
1. Public Forum (6:18 p.m.)

No public comments.

2. Staff and Council Reports

Staff Reports

PUBLIC WORKS – Director Travis Jockumsen stated there are many projects being addressed that are moving forward quickly. Staff has received good compliments from developers. The water lines

are being installed at the RV Park and then the power lines will be installed. Water laterals are being installed along 500 West and then the road will be finished and paved.

FIRE AND AMBULANCE – Chief Spencer stated the Fire Department is gearing up for the fireworks season. Sells can begin next Monday. Fireworks can be discharged three days before and one day after the holiday. Information on fireworks restrictions will be distributed to sellers and posted on social media. There are concerns with the tall grass in the canyon and other areas.

POLICE – Chief Brad Bishop reported there were two large methamphetamine seizures last week, which they are seeing a lot of this lately at gas stations and Walmart. May statistics include 110 arrests, 196 offenses, 228 citations, 320 violations, 1,247 calls for service, 5 DUI's, 420 traffic stops, and 30 traffic accidents. Officers will be helping with the Veterans Home annual 5K race on Saturday. There is a bike race through town on June 28 and 29.

RECREATION – Director Karl Teemant reported baseball season is wrapping up in the next week with tournaments the first and second weeks of July. The pool is open with open swim from 1 p.m. to 7 p.m. The pickleball courts are almost complete with the surface scheduled the week of July 14.

Council Reports

Councilmember Christensen stated he is excited for the upcoming city events.

Councilmember Hulet asked if any knows who is mowing the lawn at the Huish building and old One Man Band Building. He would like to know to thank them. The mural is being painted at the library. He and Mayor Wright met with a developer from California that picked Payson to do some investing.

Councilmember Carter reported she knows several who are opposed to the golf course that don't golf or enjoy it. She was humiliated when the Ladies Association hosted a team play with 75 women at the golf course because of the clubhouse restrooms. The women were lined up to use the restroom and only two out of the four stalls were working. The golf course is beautiful with beautiful views. When push comes to shove, people are brought to the golf course to show off Payson; yet the toilets couldn't get fixed. She feels bad because the only project left out of the PARC tax funding was these toilets. She wishes she had voted against the PARC tax projects.

Mayor Wright stated he received compliments for the Development Services Department from a company building in Payson who deals with 16 different cities in Utah. Of those cities, they said Payson is shining.

Councilmember Welton thanked staff because a lot is happening in Payson. He questioned the branding study to roll out by Onion Days because the budget needs to be discussed. He wants to make sure it goes well. A search for Payson Recreation doesn't show up on line; he wants to find ways for it to show up. Representative Mike McKell seems to think there is funding for the I-15 project in Payson. He is excited the pressurized irrigation is being done. Main Street near 800 South and the High School is cut up and needs to be repaved and not just patched. This needs to be a priority. He would like a work session regarding the new ballparks, and there needs to be a traffic study on the road. He feels the new ballfields should be distributed in other areas of the city. There are safety concern with kids walking to the pool so there needs to be barriers just during the summer because of vehicles cutting through the parking lot.

Councilmember Hiatt thanked Jill Spencer and Daniel Jensen for meeting with her to update development projects; she really appreciates the Development Services Department. All the city staff is awesome.

3. Scout Attendance Certificates

Councilmember Carter presented scout attendance certificates to Cade Oakeson, Chase Christensen, Joshua Cox, and Talon Harmon. She asked them to state their favorite thing in scouting.

4. CTC: Mayor's Team/Individual Recognition (6:53 p.m.)

Mayor Wright recognized Janean Thomas from Payson High School for receiving the Teacher of the Year Award. Janean Thomas stated she has been at Payson High School eight years and teaches sewing, child development, fashion, and preschool classes. She loves being at the school and loves the great kids.

5. Presentation of Trust Accountability Program Award (6:55 p.m.)

Brent Oakeson presented the city with the Trust Accountability Program Award for the fifth year in a row. The purpose of the program is to reduce losses and accidents. The city receives a return check of 5% of its liability premium and now after the five years, the city qualifies for a discount of 4.5%.

6. Presentation and approval of the Payson City Wastewater Treatment Plant Upgrade

Brad Rassmussen updated the city on the ClearAs (algae) process. The pilot project at the South Davis Plant is not working because of something toxic in the water. The pilot project at the North Davis Plant is working and moving forward. The revenue stream has not been verified and will not be available for Payson financing. The Payson Wastewater Treatment Plant needs repair of the existing equipment, redundancy for existing processes, nutrient removal, and expansion for growth. The current capacity is three million gallons per day (3MGD), which could be reached by about 2030 with a projected population of 31,600. The projected future capacity by 2058 is five million gallons per day (5MGD). The plant expansion includes four different scenarios, i.e. expansion, expansion with ClearAs, expansion ClearAs aerobic stabilization, and expansion aerobic stabilization. He recommends constructing the 3MGC expansion aerobic stabilization, which expands the plant when necessary for growth and new permit requirements as well as providing a lower monthly rate for current customers. Then in about seven years, the plant would be upgraded to the 5MGD.

Councilmember Hulet stated wastewater impact fees need to pay for the growth expansion. He questioned raising the wastewater impact fee.

Councilmember Welton stated the wastewater cycle runs every 20 years and impact fees need to be spent every six years.

Councilmember Christensen questioned if the facility could be constructed in phases.

Brad Rassmussen clarified the Legislature makes it difficult to plan ahead and save impact fees to build a large project. Essentially, he is proposing construction in phases, which will assist in the financing.

E. ACTION ITEMS
   1. PUBLIC HEARING/Resolution – Amendments to the current Fiscal Year 2018-2019 Budget (7:20 p.m.)

Staff Presentation:
Sara Hubbs reviewed the amendments to the Fiscal Year 2018-2019 Budget.

- Library donation received - $300 - Books
- Library donation received - $10,000 – Library improvements
- Streets Land - $30,000 – Cul-de-sac property condemnation
- Pay It Forward - $2,182 – Pay It Forward Race
- Public Safety Impact Fee - $7,500 – Fire District feasibility study with Santaquin City
- Solid Waste Equipment - $490,000 - Pay off compactor
- Vehicles and Equipment Sales - $36,549.59 – Allocated back to proper departments
- Pickleball Courts - $70,000 - Upgrade electrical system and curb and gutter.
- Police Grants - $6,863.01 – Reimburse overtime
- West Outfall Sewer Line - $60,000 Design and engineering for project.
- Miss Payson - $3,928 - Operations
- Miss Payson - $6,085 - Scholarships
- Library - $6,600 - Grant
- Economic Development - $1,600 - Donations – Tour of Utah
- Pool - $6,000 - Repairs
- Sewer Line Project - $50,000 – 700 South repair

MOTION: Councilmember Welton – To open the public hearing. Motion seconded by Councilmember Hulet. Those voting yes: Linda Carter, Brett Christensen, Taresa Hiatt, Brian Hulet, Doug Welton. The motion carried.

Public Hearing:
No public comments.

MOTION: Councilmember Welton – To close the public hearing. Motion seconded by Councilmember Carter. Those voting yes: Linda Carter, Brett Christensen, Taresa Hiatt, Brian Hulet, Doug Welton. The motion carried.

Council Discussion:
Discussion regarding including 20% to 25% contingency in large projects, funding for Main Street repairs.

MOTION: Councilmember Hulet – To pass the resolution to adopt the amended Fiscal Year 2018-2019 Budget. Motion seconded by Councilmember Christensen. A roll call vote was taken as follows and the motion carried.

Yes - Linda Carter
Yes - Brett Christensen
Yes - Taresa Hiatt
Yes - Brian Hulet
Yes - Doug Welton

2. PUBLIC HEARING – The issuance and sale of not more than $2,800,000 aggregate principal amount of Sewer Revenue Bonds, Series 2019 and any potential economic impact that the project to be financed with the proceeds of that portion of the bonds issued under the Act may have on the private sector and related matters. (7:34 p.m.)

Staff Presentation:
Dave Tuckett stated that previously the council passed the parameters resolution for the Sewer Revenue Bonds and now the public hearing needs to be held. The bonds are for the collapsed sewer line replacement. Staff looked at several options, and the best rate is for a five-year, interest-only bond. This bond will then be wrapped into the wastewater facility bond in two years. Impact fees cannot be used for this project. Funds could be appropriated in the budget for this project to pay it down to pay less interest. Following the public hearing, the city can move forward. Staff will look at paying it down.

MOTION: Councilmember Welton – To open the public hearing. Motion seconded by Councilmember Hulet. Those voting yes: Linda Carter, Brett Christensen, Taresa Hiatt, Brian Hulet, Doug Welton. The motion carried.

Public Hearing:
No public comments.

MOTION: Councilmember Hulet – To close the public hearing. Motion seconded by Councilmember Welton. Those voting yes: Linda Carter, Brett Christensen, Taresa Hiatt, Brian Hulet, Doug Welton. The motion carried.

3. Amendments to the Payson Gateway Subdivision located on the northwest corner of the intersection of 800 South and 800 West (7:40 p.m.)

Staff Presentation:
Jill Spencer reviewed the Payson Gateway Subdivision amendments that extend lots 2, 3, and 4 an additional 58 feet to the north as well as reconfiguring the interior lot lines. Notice was sent to the property owners along 800 South and 800 West. Staff has not received any comments.

Council Discussion:
Councilmember Welton stated the city is addressing sewer bonding, pressurized irrigation bonding, and needs four million for the new ballfields. He knows the city wants growth, but questioned whether right now is the right time. He feels growth is coming regardless and people are going to build.

Mayor Wright stated he doesn't feel the city will need to pay four million. Staff is working on other options. This is a discussion for another time.

MOTION: Councilmember Hulet – To approve the amended Payson Gateway Subdivision for lots 2, 3, 4, and 5 to change the boundaries. Motion seconded by Councilmember Carter. A roll call vote was taken as follows and the motion carried.

Yes	-	Linda Carter
Yes	-	Brett Christensen
Yes	-	Taresa Hiatt
Yes	-	Brian Hulet
Yes	-	Doug Welton

4. Resolution – Amendments to the Payson City Fee Schedule (7:46 p.m.)

Staff Presentation:
Travis Jockumsen stated the public works fees that haven't been used in the last six years have been removed, and the fee for bonding and inspections for a consultant is covered.

MOTION: Councilmember Welton – To approve (resolution) the amendments to the Payson City fee schedule. Motion seconded by Councilmember Hiatt. A roll call vote was taken as follows and the motion carried.

Yes	-	Linda Carter
Yes	-	Brett Christensen
Yes	-	Taresa Hiatt
Yes	-	Brian Hulet
Yes	-	Doug Welton

5. Resolution – Authorizing the City Treasurer to Write-Off Certain Uncollectible Debt (7:48 p.m.)

Staff Presentation:
Cheryl Hobbs reviewed the uncollectible debt write-offs including bankruptcy, deceased residents, and collections accounts that total $34,373.12, which is lower than last year of $44,676.57. During the last year, staff has worked out payment arrangements and collected $15,577.80 instead of sending them to collections. The collections agency collected $14,724.86 over the past year. She clarified that the city bills a month behind, a resident can then get a month behind, and then there is a final billing, which puts the resident three months behind. It can total quite a lot depending on usage; some residential bills are over $300 or $400 per month. If the account goes to collections, it goes on their credit.

MOTION: Councilmember Hulet – To authorize (resolution) the city treasurer to write-off certain uncollectible debts. Motion seconded by Councilmember Christensen. A roll call vote was taken as follows and the motion carried.

Yes	-	Linda Carter
Yes	-	Brett Christensen
Yes	-	Taresa Hiatt
Yes	-	Brian Hulet
Yes	-	Doug Welton

6. Resolution – Annexation Agreement for the Holdaway-Pleasant Flats Annexation (7:50 p.m.)

Staff Presentation:
Daniel Jensen stated staff worked with the applicant on grammatical or clarifying (redlined) items to finalize the annexation agreement.

MOTION: Councilmember Hulet – To approve (resolution) the annexation agreement for the Holdaway-Pleasant Flats Annexation. Motion seconded by Councilmember Carter. A roll call vote was taken as follows and the motion carried.

Yes	-	Linda Carter
Yes	-	Brett Christensen
Yes	-	Taresa Hiatt
Yes	-	Brian Hulet
Yes	-	Doug Welton

7. Resolution – Annexation Agreement for the Condie Annexation (7:53 p.m.)

Staff Presentation:
Jill Spencer stated the annexation agreement is consistent with the approval given by the city council a month ago, which the applicant has reviewed.

MOTION: Councilmember Welton – To approve (resolution) the annexation agreement for the Condie Annexation. Motion seconded by Councilmember Hiatt. A roll call vote was taken as follows and the motion carried.

Yes	-	Linda Carter
Yes	-	Brett Christensen
Yes	-	Taresa Hiatt
Yes	-	Brian Hulet
Yes	-	Doug Welton

8. Resolution – Law Enforcement Services Agreement with Mountain View Hospital (7:55 p.m.)

Staff Presentation:
Dave Tuckett stated staff has been working with Mountain View Hospital on costs, and the start date was changed to August 1 because the city needs to hire additional officers. The agreement is for 1.5 years and the intent is to continue to renew it. They have approved and signed the agreement. The officers are housed at the hospital; but if there is an event or emergency that occurs, these officers will respond. The coverage is Monday through Friday from 6 p.m. to 6 a.m. and Saturday and Sunday is 24-hour coverage.

Chief Brad Bishop stated the hospital also has their own security to cover.

MOTION: Councilmember Welton – To approve (resolution) the law enforcement services agreement with Mountain View Hospital. Motion seconded by Councilmember Hiatt. A roll call vote was taken as follows and the motion carried.

Yes - Linda Carter
Yes - Brett Christensen
Yes - Taresa Hiatt
Yes - Brian Hulet
Yes - Doug Welton

9. Resolution – Interlocal Agreement with Utah County regarding Communities That Care (8:00 p.m.)

Staff Presentation:
Mark Sorenson stated this is a contract renewal with Utah County. A grant, which is no longer available, changes the amount of staff time with Communities That Care.

MOTION: Councilmember Welton – To approve (resolution) the interlocal agreement with Utah County regarding Communities That Care in Payson City. Motion seconded by Councilmember Hiatt. A roll call vote was taken as follows and the motion carried.

Yes - Linda Carter
Yes - Brett Christensen
Yes - Taresa Hiatt
Yes - Brian Hulet
Yes - Doug Welton

10. Resolution – Amendments to the Personnel Policy (8:02 p.m.)

Staff Presentation:
Mark Sorenson stated the Legislature passed House Bill 163 that criminalizes the use of government property by public servants. It criminalizes the personal use of public property but doesn't allow for the government entity to correct a use retroactively. The effective date is July 1, 2019. Adding it to the city's personnel policy protects the city staff, mayor, and council for any incidental, lawful use.

MOTION: Councilmember Carter – To accept (resolution) the amendments to the personnel policy. Motion seconded by Councilmember Christensen. A roll call vote was taken as follows and the motion carried.

Yes - Linda Carter
Yes - Brett Christensen
Yes - Taresa Hiatt
Yes - Brian Hulet
Yes - Doug Welton

11. Resolution of Intent – Municipal Boundary Adjustment between Payson City and Salem City (8:07 p.m.)

Staff Presentation:
Mark Sorenson stated 2200 West (Arrowhead Trail Road) will be entirely in Salem with the corner of the intersection in Payson. The road goes out to the new Salem sewer facility. A notice will be

published for three consecutive weeks and then the item comes before the council to finalize the adoption.

MOTION: Councilmember Hulet – To adopt the resolution of intent to adjust the common Boundary with Salem City and Payson City. Motion seconded by Councilmember Hiatt. A roll call vote was taken as follows and the motion carried.

Yes	-	Linda Carter
Yes	-	Brett Christensen
Yes	-	Taresa Hiatt
Yes	-	Brian Hulet
Yes	-	Doug Welton

C. ADJOURNMENT

MOTION: Councilmember Hiatt – To adjourn. Motion seconded by Councilmember Carter. Those voting yes: Linda Carter, Brett Christensen, Taresa Hiatt, Brian Hulet, Doug Welton. The motion carried.

The meeting adjourned at 8:10 p.m.

/s/ Kim E. Holindrake
Kim E. Holindrake, Deputy City Recorder

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Wastewater Treatment Plant Upgrade

Preliminary Design
Cost Estimate Discussion
January 19, 2021

FORSGREN Associates Inc.

Project Goals

1) Provide best long-term solution at the best cost.
2) Meet the expected growth demands.
3) Convert process to biological nutrient removal.
4) Design for easier future expansion.
5) Provide Type II reuse water, with space for Type I.
6) Meet future low nutrient limits for Utah Lake with minimal changes.
7) Reduce odors.
8) Improve staff safety:
   - Equipment maintenance challenges.
   - Equipment replacement difficulties.
   - Electrical system safety issues.
9) Leverage existing assets first:
   - Use existing site.
   - Reuse/repurpose existing buildings/structures where possible.
10) Reduce ongoing maintenance costs.

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Summary

- Preliminary cost estimate: $50M-$55M
- How does this compare?
  - In line with neighboring cities.
- Why are costs higher?
  - Vision for the project (scope) has changed.
  - Construction costs have escalated due to supply problems and labor shortages (COVID).
- How are we minimizing impact of higher costs?
  - Getting more accurate costs earlier.
  - Reusing buildings/structures where possible.
  - Considering ways to reduce scope.
  - Looking at rates/financing options.

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Cost Comparison

- Payson: $52M/4.0 MGD = $13.00/gallon
- Salem: $20M/1.5 MGD = $13.33/gallon
- Spanish Fork: $115M/6.6 MGD = $17.42/gallon
- Provo: $113M/10 MGD = $11.30/gallon

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Causes of Cost Increase

- Construction cost escalation
- Underestimation of original scope
- Vision of the project has evolved (goals)

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Construction Cost Changes

- Metrics for the past year
  - Construction cost index up 8%
  - Consumer price index up 6%
  - Producer price index up 6%
- High volume of local construction work
- Labor shortages
- Materials supply problems
- COVID
- *Construction costs will continue to rise*

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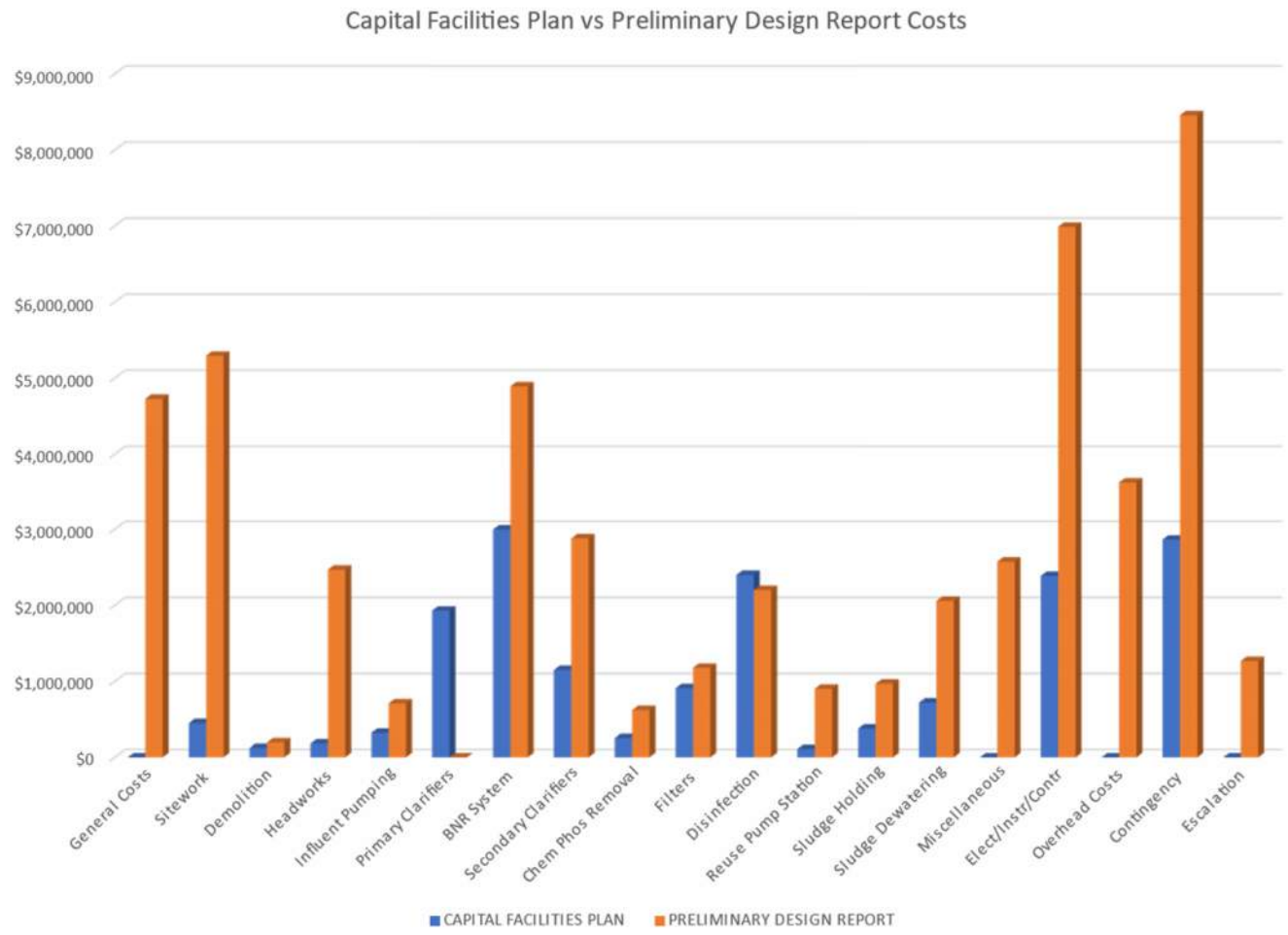
Cost Comparison with Facility Plan



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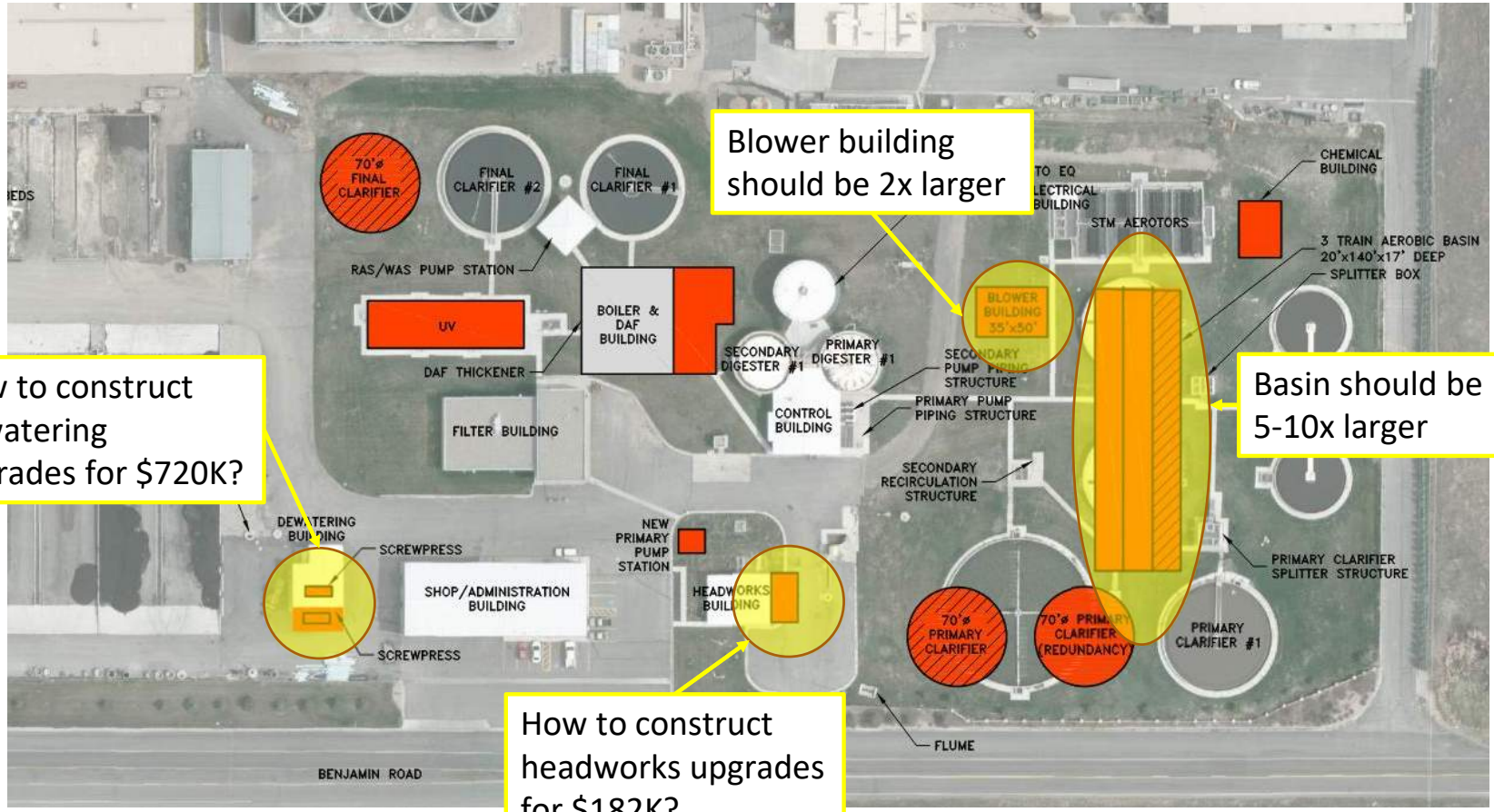
Facility Plan Evolution



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New Major Structures

- Headworks
  - Existing screens capacity: 4.5 MGD each (2 units)
  - Would need to add on to building, connect to old
- Secondary Clarifier
- RAS/WAS Pump Station
- Sludge Dewatering Building
  - Existing press capacity: 225 LB/HR
  - Required phase 1 capacity: 1,000 LB/HR
- Sludge Tanks Blower Building
  - Blowers: 6’ L x 5’ W x 6.5’ T
- Reuse Tank and Pump Station
- Odor Control
- Water Department Building

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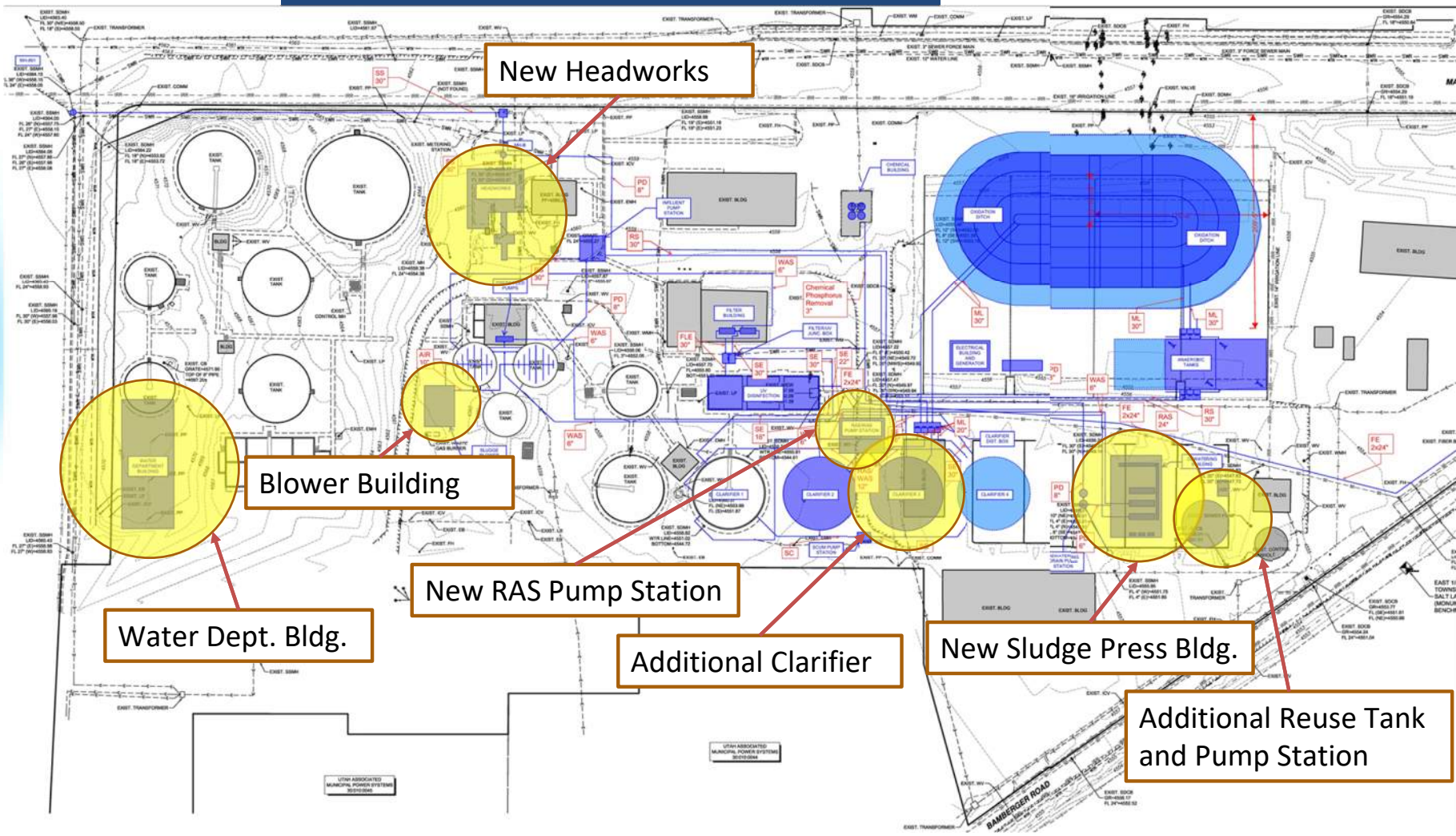
Updated Site Plan



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Existing Condition - Headworks

- Electrical clearances inadequate (code violation)
- Difficult to access equipment
- No cranes to remove equipment
- Ventilation system not functional
- Electrical area classification violations
- Concrete degradation
- Equipment damage by H_2S

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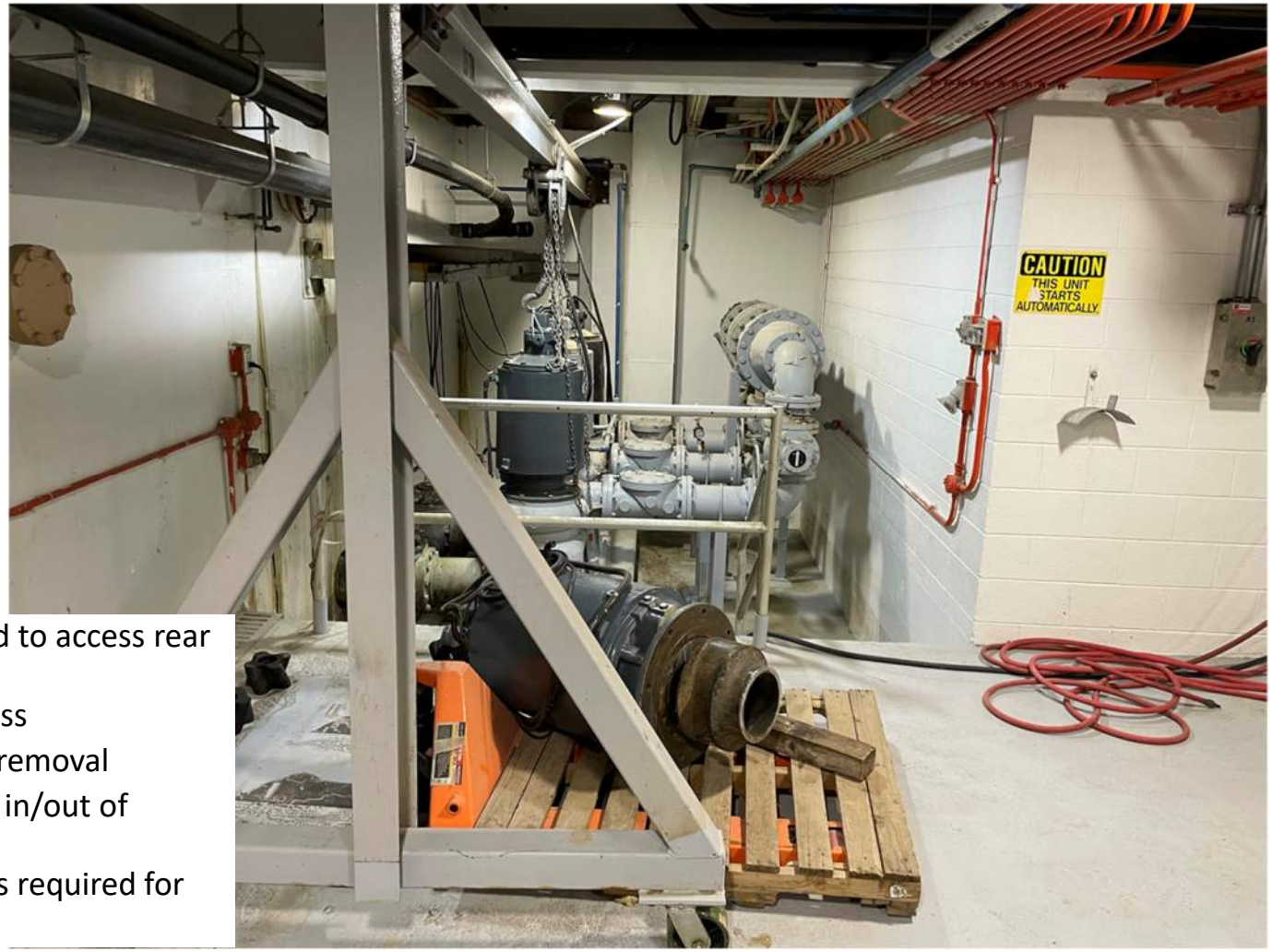
Existing Condition – Primary Pump Sta.



- Plant shutdown required to access rear pumps
- Limited equipment access
- Safety issue with pump removal
- Challenge getting pump in/out of building
- Additional city resources required for maintenance

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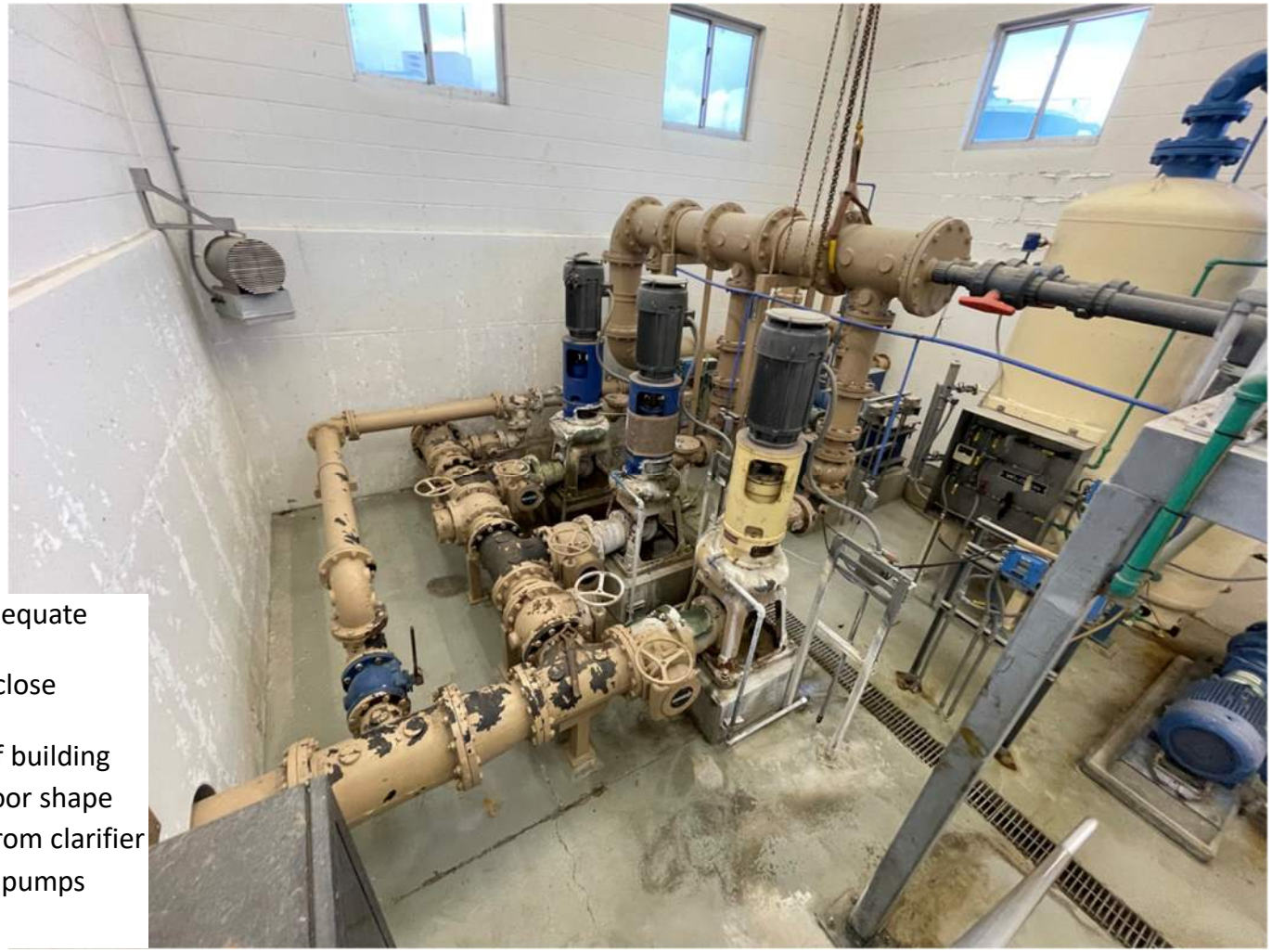
Existing Condition – RAS Pump Sta.



- Electrical clearances inadequate (code violation)
- Equipment installed too close together
- No way to get tank out of building
- Building is generally in poor shape
- No way to isolate flows from clarifier
- No way to safely remove pumps from building

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Financing and Rates Considerations

- Financing
  - Look at 30-year loan, use excess funds to pay off early
  - Get as much funding as possible from DWQ
- Impact Fees
  - Can increase to $3,000 for WWTP portion
- Rates
  - DWQ affordability limit = $53.67

Item	Current Rates	Original $23M Project	Updated $55M Project			
		20 YR Loan, w/o Imp. Fees	20 YR Loan, w/o Imp. Fees	20 YR Loan, w/ Imp. Fees	30 YR Loan, w/o Imp. Fees	30 YR Loan, w/ Imp. Fees
Base Rate	$36.18	$42.00	$61.00	$54.00	$52.00	$45.00
Volume Rate (per 1,000 gal)	$1.18	$1.50	$1.50	$1.50	$1.50	$1.50
Avg Monthly Bill (5,000 gal)	$42.08	$49.50	$68.50	$61.50	$59.50	$52.50

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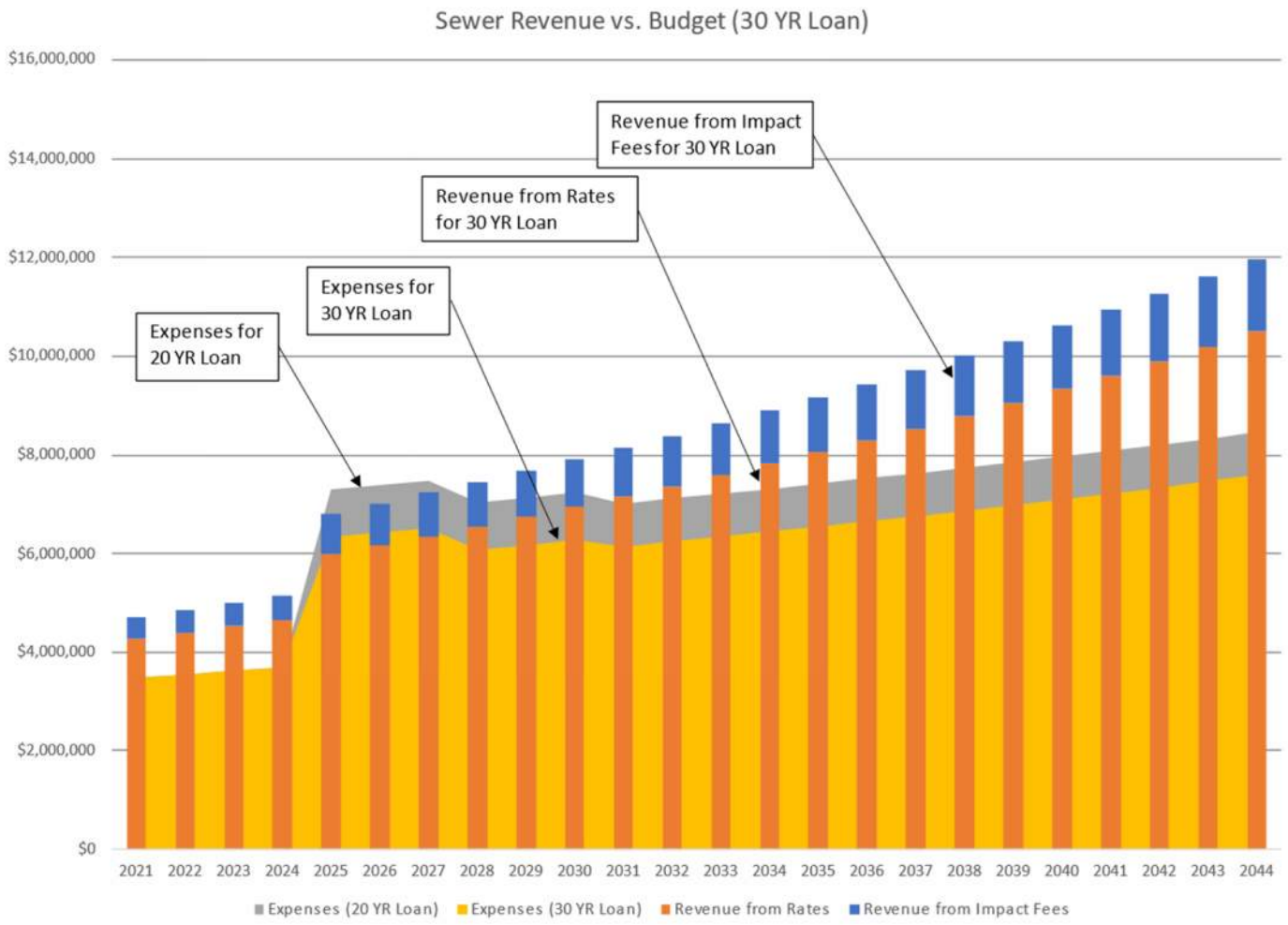
Revenue vs. Budget Challenge



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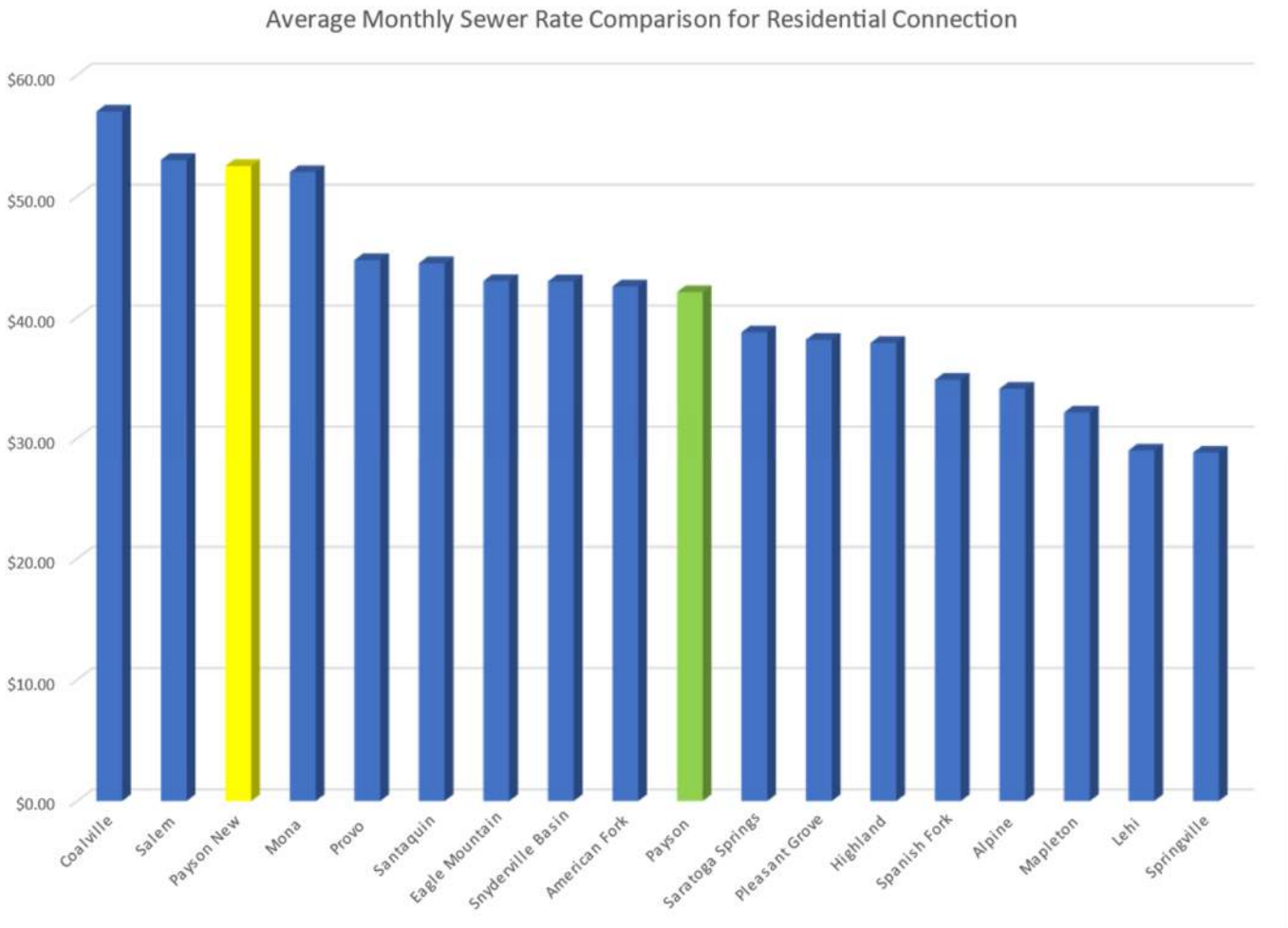
Rate Comparison



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What's Next?

- Obtain additional funding from state
  - Additional loan funds ($2M-$10M)
  - New principal forgiveness funds ($2M)
  - Water Quality Finance Committee Meeting – January 20
  - Water Quality Board Meeting – January 26
- Close state loan
  - Parameters resolution to authorize full budget for project (February)
  - Resolution for new rates (February/March)
  - Need to close loan in early May
- Finalize full funding package
  - Targeting summer of 2022
- Move forward with design
  - Need to be under construction in fall of 2022
  - Deadline to complete construction is fall of 2024

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PAYSON CITY
CITY COUNCIL MEETING AND WORK SESSION
Payson City Center, 439 W Utah Avenue, Payson UT 84651
Wednesday, January 19, 2022

CONDUCTING	William R. Wright, Mayor
ELECTED OFFICIALS	Brett Christensen, Linda Carter, Taresa Hiatt, Brian Hulet (6:00 p.m.) Bob Provstgaard, William R. Wright
STAFF PRESENT	David Tuckett, City Manager Cathy Jensen, Finance Director Kim E. Holindrake, City Recorder Jason Sant, City Attorney Brad Bishop, Police Chief Robert Mills, Development Services Director Travis Jockumsen, Public Works Director/City Engineer Scott Spencer, Fire Chief Jill Spencer, City Planner Chris Van Aken, Planner II Janeen Dean, Community Events Coordinator Karl Teemant, Community Services Director
OTHERS	Brittany Johnson – Library Board, Jen Hickens, Jason Broome – Forsgren Associates, Chris Thunhorst

William R. Wright, Mayor, called this meeting of the City Council of Payson City, Utah, to order at 6:00 p.m. The meeting was properly noticed.

A. PRAYER & PLEDGE OF ALLEGIANCE

Prayer offered by Bill Wright.

Pledge of Allegiance led by Bob Provstgaard.

B. CONSENT AGENDA
1. Approval of the January 5, 2022 City Council Meeting Minutes

MOTION: Councilmember Provstgaard – To approve the consent agenda. Motion seconded by Councilmember Christensen. Those voting yes: Linda Carter, Brett Christensen, Taresa Hiatt, Bob Provstgaard. The motion carried.

C. PETITIONS, REMONSTRANCES & COMMUNICATIONS
1. Public Forum

No public comments.

2. Staff and Council Reports

Staff Reports

POLICE – Chief Brad Bishop reported the COVID testing site at Wasatch Mental Health has been backed up the last couple weeks. It will be moved to the ball parks and swim pool parking lots beginning January 24 for about 8 to 9 weeks.

Council Reports

Councilmember Provstgaard reported he, Dave Tuckett, and Mayor Wright attended the city council day with the Legislature and Senate. The State has been commissioned to create a new flag. It will be a great challenge to meet all the diversities for the flag. They toured the senate/house chambers in the 90's and toured it again today. We have a stronger voice as advocates for Payson City in the Senate and House. They met with President Christensen and his group regarding MTECH who presented to the senate/house for funding, which was very positive. They are very close to building. He thanked staff and the landfill staff in keeping the landfill clean.

Councilmember Hiatt appreciates the landfill staff in cleaning up along streets; they do an awesome job. Kudos to all the employees.

Councilmember Carter appreciates the city staff and all they do; they put in a lot of hours. The Hometown Heroes event was good. The Chamber banquet was a nice night. She's thankful for the Chamber and the work they do.

Councilmember Christensen stated the Chamber banquet was good. A shout out to the Parks Department that cleared out a tree causing a safety issue. He would like to see more sidewalks, widen them, make them useable, and clean them up. It's good to see Forebay being used by snowmobiles, snowshoeing, and bikers. Staff does a great job.

D. ACTION ITEMS
   1. Public Hearing/Resolution – Amendments to the Fiscal Year 2021-2022 Budget (6:12 p.m.)

Staff Presentation:
Dave Tuckett reviewed the proposed budget amendments.

- $16,000 Additional professional services – janitorial
- $27,000 Additional Christmas decoration rehabilitating
- $150,000 Additional for Hidden Cove Park
- $25,456 Move excess golf tournament revenue to Economic Development
- $257,377 Rebuild power engine through insurance reimbursements
- $12,000 Grounds trailer; old trailer can't be rebuilt
- $20,800 Increased revenue to replace football helmets
- $65,000 Power F350 sold and replacement vehicle
- $10,000 Bandstand repairs with 2021 Municipal Recreation Grant
- $34,700 Additional for the Water Department mini-X
- $20,212 Additional for City Engineer position including payroll transfers from planning to engineering
- $60,000 16-inch water pipe crossing the golf course

- $40,000 Golf course water pump motor repairs
- $20,800 Fire water tender chassis increase
- $23,850 Cinderella theater donations and increased revenue
- $7,000 Additional City Hall roof repairs
- $70,000 Parris RV tax incentives
- $40,800 Additional Power Plant generator rebuild
- $9,500 Donations raised for half of Kacee Fields statue
- $12,900 Business Park RDA sidewalk match improvements
- $10,000 Additional Fire skid steer through grant
- $1,600 Additional for Council retreat

MOTION: Councilmember Christensen – To open the public hearing regarding amendments to the Fiscal Year 2021-2022 Budget. Motion seconded by Councilmember Carter. Those voting yes: Linda Carter, Brett Christensen, Taresa Hiatt, Brian Hulet, Bob Provstgaard. The motion carried.

Public Comment:
No public comments.

MOTION: Councilmember Provstgaard – To close the public hearing. Motion seconded by Councilmember Christensen. Those voting yes: Linda Carter, Brett Christensen, Taresa Hiatt, Brian Hulet, Bob Provstgaard. The motion carried.

Council Discussion:
Councilmember Provstgaard questioned the status of the air conditioning at the city center. He would like to address it sooner than later.

Dave Tuckett stated it needs to be addressed with the new budget. There are some funds in current budget, but some funds were spent on portable units. There will be additional budget adjustments in a couple months. Buildings will be discussed at the budget retreat.

Cathy Jensen noted some funds were used for roof repairs, but there is still some funding for air conditioning.

MOTION: Councilmember Provstgaard – To approve (resolution) the budget adjustments 1 through 22 with the total of $909,539. Motion seconded by Councilmember Christensen. A roll call vote was taken as follows and the motion carried.

Yes	-	Linda Carter
Yes	-	Brett Christensen
Yes	-	Taresa Hiatt
Yes	-	Brian Hulet
Yes	-	Bob Provstgaard

2. Resolution – Library Board Appointments (6:30 p.m.)

Presentation:
Brittany Johnson stated Library Board elections were held and Ann Humpherys will continue as chair, Brittany Johnson as vice chair, and Emily Edman as secretary. She thanked Rebecca Billings for her

service on the Board. Her replacement is Jen Hickens who has lived in Payson for the last 20 years and has been a long-time patron of the Payson Library. She has led the story time for twelve years expanding the children's programs and organizing and decorating the story-time room. She has a love for the Payson library and instilling a love of reading and literacy in children. She is very excited for this opportunity.

Jen Hickens stated she is excited to be here.

Council Discussion:
Mayor Wright thanked her for her dedication to the library. The Council is actively looking to build a new library.

MOTION: Councilmember Hulet – To approve (resolution) Jen Hickens to a 3-year term on the Library board. Motion seconded by Councilmember Carter. A roll call vote was taken as follows and the motion carried.

Yes	-	Linda Carter
Yes	-	Brett Christensen
Yes	-	Taresa Hiatt
Yes	-	Brian Hulet
Yes	-	Bob Provstgaard

3. Review of the Peteetneet Museum Restroom Remodel

Staff Presentation:
Janeen Dean stated there are a lot of new events at the Peteetneet throughout the day and evening. She reviewed pictures of the current restrooms. It is a huge task keeping the restrooms working. The architect has already been paid for these drawings by the People Preserving Peteetneet. The remodel estimate is about $252,000. The 50/50 matching grants want to know if funds are already secured. Then the City can apply to receive a half match. She feels the community could also pitch in funds.

Council Discussion:
Councilmember Christensen can't imagine having this as a public facility without fixing the restrooms. The City was penalized with the audit again for having too much money.

Councilmember Hulet stated he is a proponent in having good bathrooms. He saw a survey once, and the first thing people judge at a facility or business are the bathrooms. He questioned if there is a grant this large for $135,000.

Karl Teemant stated a grant he looked into will give up to $500,000. It's not a typical historical grant for $10,000. It is a competitive grant so there is no guarantee. The next cycle is due in June. With these matching grants, the City spends 100% and is then reimbursed.

Dave Tuckett stated the Council could reopen the budget amendments to address the funds now. Funding would come from the General Fund. Staff can then apply and also put it in the next budget.

Councilmember Christensen is in favor of reopening the budget amendments to take care of this.

MOTION: Councilmember Provstgaard – To reopen the amendments to the fiscal year 2021-2022 budget. Motion seconded by Councilmember Christensen. A roll call vote was taken as follows and the motion carried.

Yes	-	Linda Carter
Yes	-	Brett Christensen
Yes	-	Taresa Hiatt
Yes	-	Brian Hulet
Yes	-	Bob Provstgaard

1. Public Hearing/Resolution – Amendments to the Fiscal Year 2021-2022 Budget (Continued)

MOTION: Councilmember Provstgaard – To reopen the public hearing with the intent of amending the fiscal year 2021-2022 budget in amount of $275,000 for the restrooms at the Peteetneet. Motion seconded by Councilmember Carter. Those voting yes: Linda Carter, Brett Christensen, Taresa Hiatt, Brian Hulet, Bob Provstgaard. The motion carried.

Public Comment:
No public comments.

MOTION: Councilmember Hulet – To close the public hearing. Motion seconded by Councilmember Carter. Those voting yes: Linda Carter, Brett Christensen, Taresa Hiatt, Brian Hulet, Bob Provstgaard. The motion carried.

MOTION: Councilmember Provstgaard – To amend (resolution) the budget for an additional $275,000 for the purpose of the renovation of the restrooms at the Peteetneet. Motion seconded by Councilmember Carter. A roll call vote was taken as follows and the motion carried.

Yes	-	Linda Carter
Yes	-	Brett Christensen
Yes	-	Taresa Hiatt
Yes	-	Brian Hulet
Yes	-	Bob Provstgaard

4. Resolution – Orchard Grove Annexation petition for consideration of acceptance and further review located at approximately 11804 South 4600 West consisting of 21.43 acres (6:50 p.m.)

Staff Presentation:
Chris Van Aken reported the Orchard Grove Annexation is four parcels totaling 21.43 acres. The applicant went through the new process with the County, and the annexation is not creating an island or peninsula.

Council Discussion:
Councilmember Hiatt questioned if there isn't enough sewer capacity, why annex more property.

Chris Van Aken stated this is acceptance for review further. Staff will get into the details if accepted for further review. Staff will work to make sure it's in line with the General Plan.

Councilmember Hulet stated the General Plan shows part of the frontage as commercial.

Councilmember Provstgaard sees low density in the General Plan.

MOTION: Councilmember Christensen – To accept the Orchard Grove Annexation petition for consideration of acceptance and further review located at approximately 11804 South 4600 West. Motion seconded by Councilmember Carter. A roll call vote was taken as follows and the motion carried.

Yes	-	Linda Carter
Yes	-	Brett Christensen
Yes	-	Taresa Hiatt
Yes	-	Brian Hulet
Yes	-	Bob Provstgaard

5. Final plat approval for Quail Mountain Subdivision, Plat A, located at approximately 370 South 1300 East in the R-1-10 Residential Zone (6:55 p.m.)

Staff Presentation:
Chris Van Aken stated the preliminary plan was approved November 17, 2021, and this is the final plat for 26 lots in the R-1-10 Zone. It also meets the General Plan and East Side Comprehensive Plan.

MOTION: Councilmember Hulet – To approve the final plat for the Quail Mountain Subdivision, Plat A, at approximately 370 South 1430 East in R-1-10 Residential Zone. Motion seconded by Councilmember Christensen. Those voting yes: Linda Carter, Brett Christensen, Taresa Hiatt, Brian Hulet, Bob Provstgaard. The motion carried.

6. Resolution – Amendments to the Payson City Fee Schedule

Staff Presentation:
Travis Jockumsen stated this is a continuation of the last pressurized irrigation rate discussion a few months ago. The costs have been adjusted because the water rates were raised with the last budget. The current base rate is $24.63 per month, and the proposed base rate would be $19.00 per month. Then monthly usage from 1,000 to 50,000 gallons would be $0.60 per 1,000 gallons, 50,001 to 90,000 gallons would be $0.75 per 1,000 gallons, and 90,001 or more gallons would be $1.00 per 1,000 gallons. The idea is to keep the pressurized irrigation cheaper than culinary water but cover the cost of improvements. In comparison, a resident paying $295.56 yearly would now pay for $294.00 yearly. A monthly bill goes up during the summer for everyone because of usage. The equal pay option is available. These charges are per meter.

Dave Tuckett stated when this was started a couple years ago, the Council wanted it as revenue neutral as possible. These examples of the current yearly rate and new yearly rate show this. If a resident uses the same amount of water, their bill should be pretty equal. If a resident uses more, it goes up.

Council Discussion:
Councilmember Provstgaard asked about delivering the CUP water in the next two years. At some point, the CUP water will have to be addressed. He wants to start looking at it and educating the residents. He would like to see data projections going forward.

Travis Jockumsen noted the CUP water is probably about four years out. The cost will be approximately $1.7 million per year. CUP water is not included in this rate structure.

Dave Tuckett stated there are a couple options with the CUP water. It can be deferred for a 10-year period to pay over 40 years instead of 50 years. The advantage of deferring is having more house to help pay, but the disadvantage is a shortened period of time. With growth, the City needs the water. It will have to be addressed in the future.

Travis Jockumsen would like to look at this in the 2023-2024 budget and go up incrementally.

Dave Tuckett noted the Council amended the water ordinance about a year ago. The City has remnant water available, but developers who don't have water are required to purchase CUP water.

Councilmember Christensen stated the CUP water may counteract other expenditures the City may be looking at with irrigation ponds, which can be used as holding tanks.

Travis Jockumsen clarified the City can't really count on the canyon water anymore. If adopted tonight, the Council can decide the effective date of April 1 prior to the pressurized irrigation water coming on line. The Utah Legislature voted to make meters mandatory by 2040, but new connections all require a meter. Currently, it's difficult getting meters because of COVID. The Highline Canal Company Board voted to give Payson its full allocation this year.

Councilmember Christensen stated he appreciates the efforts and keeping the costs neutral. The tools are in place for residents to look at their meter/water usage. The City put forth the effort. Benefit if conserving water.

Councilmember Hiatt wants to make sure the City covers its costs if the water costs go up.

Councilmember Hulet would like to see information on the city website on water conservation and the rate changes.

Dave Tuckett stated staff will put information out on the city website, social media, and in the Chronicle. Next, staff is proposing an increase to the salmon supper from $16 to $18.50.

Councilmember Hulet suggested raising the price more to slow down the number of people. He suggested $25.

Councilmember Hiatt suggested $22. Salmon is more expensive and the priced may need to be checked.

Janeen Dean suggested $20. She proposes offering tickets to Payson residents first and then opening it up to others.

Councilmember Christensen suggested putting the salmon in a separate clam shell to distribute easily.

Councilmember Provstgaard is in favor of $22.

MOTION: Councilmember Provstgaard – To amend the fee schedule (resolution) for the pressurized irrigation that was presented this evening and raise the salmon supper fee to $22. Motion seconded by Councilmember Christensen.

Further discussion.
Councilmember Hulet feels $22 is too high and may vote against it for that reason.

Discussion to go up to $22 based on the cost of salmon.

AMENDED MOTION: Councilmember Provstgaard – To amend the motion to up to $22 and staff makes the final recommendation after checking the market price for the products. Motion seconded by Councilmember Christensen. A roll call vote was taken as follows and the motion carried.

Yes	-	Linda Carter
Yes	-	Brett Christensen
Yes	-	Taresa Hiatt
Yes	-	Brian Hulet
Yes	-	Bob Provstgaard

MOTION: Councilmember Provstgaard – To suspend the agenda and let the Mayor move at his discretion. Motion seconded by Councilmember Carter. Those voting yes: Linda Carter, Brett Christensen, Taresa Hiatt, Brian Hulet, Bob Provstgaard. The motion carried.

H. WORK SESSION (7:24 p.m.)
1. Wastewater Treatment Plant Upgrade

Staff Presentation:
Travis Jockumsen stated the contractor is on board helping with the design. There have been a lot of unanticipated issues.

Jason Broome stated the projected goals included the best long-term solution at the best cost, meet the expected growth demands, convert the process to biological nutrient removal, design for easier future expansion, provide type II reuse water with space for type I, meet future low nutrient limits for Utah Lake with minimal charges, reduce odors, improve staff safety, leverage existing assets (buildings, space, land), and reduce ongoing maintenance costs. The preliminary cost estimate is $50 to $55 million. He will discuss how this compares with neighboring cities, why the costs are higher, and how we are minimizing impact of higher costs. Cost comparisons include Payson at $13.00 per gallon, Salem at $13.33 per gallon, Spanish Fork at $17.42 per gallon, and Provo $11.30 per gallon. Cost increases are because of construction cost escalation, underestimation of original scope, and vision of the project has evolved (goals). Construction costs are up 6% to 8% because of a high volume of local construction work, labor shortages, material supply problems, and COVID. Construction costs will continue to rise. Facility plan evolution includes the blower building should be 2 times larger and the basin should be 5 to 10 times larger. The dewatering building upgrades are $720,000, and the headworks upgrades are $182,000. New major structures include headworks, secondary clarifier, RAS/WAS pump station, sludge dewatering building, sludge tanks blower building, reuse tank and pump station, odor control, and water department building.

Council Discussion:

Councilmember Provstgaard voiced a concern with processing 4 million gallons per day with roughly 40,000 people. He questioned if it's enough with what the City has on the drawing board. The intake line from the west is over capacity. He would like to get another $5 million to upgrade this line. Development is coming faster than we realize.

Jason Broome noted the target population was around 55,000. Four million gallons is the average over a year. Then they target a max day and a max month and a peak hour. On a worse day, it can treat over 8 million gallons per day. To process an additional million would cost $15 to $20 million.

Chris Thunhorst explained the project is based on projection to 2045. Additional future structures are planned to take the facility to 6 million gallons per day. This is preparing for the future by building to give enough capacity for growth but not overbuild.

Travis Jockumsen clarified Hansen, Allen, & Luce is working on the sewer model so he will know soon where the City stands on the west intake line.

Dave Tuckett stated the City was awarded $11.5 million from the state, and staff will be asking for more. Then the City will have to go out on market for balance. Once the design is 100% complete, it can go out for bid.

Travis Jockumsen clarified this was not included in the 2020 impact fee because there wasn't a price, but now the impact fees can be updated. The impact fee cannot include for redundancy.

Councilmember Hulet agrees with Councilmember Provstgaard on the impact fee because every new house is not paying the increase.

Jason Broome continued. Financing and rates considerations include a 30-year loan using excess funds to pay off early, funds from the State, impact fee increase, and rate increase. The state affordability limit is $53.67. The rate comparison with the increase puts Payson at the high end, but other cities are increasing their fees as well. What's next is to obtain additional funding from the state, close this state loan earlier, finalize full funding package, and move forward with the design to be under construction by fall 2022. The deadline to complete construction is fall 2024. Rates can be bumped up over time.

Dave Tuckett stated staff will bring resolutions through Zions and Gilmore Bell in February to start the process, get the loan package closed, and start purchasing some of the needed items.

D. ACTION ITEMS (Continued)
   7. Resolution – Utah Main Street Program (8:00 p.m.)

Staff Presentation:
Dave Tuckett stated staff is looking at a grant for the Main Street Program that is due by end of month, and a resolution is needed. Staff found that the City wasn't registered; but with this resolution, the City will be ready for the next round of funding in the summer. He is hoping for some matching grants for the businesses to spruce up the backs of the buildings.

MOTION: Councilmember Hulet – To approve the resolution for the Utah Main Street Program. Motion seconded by Councilmember Provstgaard. A roll call vote was taken as follows and the motion carried.

Yes - Linda Carter
Yes - Brett Christensen
Yes - Taresa Hiatt
Yes - Brian Hulet
Yes - Bob Provstgaard

E. ADJOURN TO REDEVELOPMENT AGENCY

MOTION: Councilmember Christensen – To adjourn to Redevelopment Agency. Motion seconded by Councilmember Carter. Those voting yes: Linda Carter, Brett Christensen, Taresa Hiatt, Brian Hulet, Bob Provstgaard. The motion carried.

1. Public Hearing/Resolution – Amendments to the Fiscal Year 2021-2022 RDA Budget

Dave Tuckett stated the only budget item is the $12,900 to do the trail along the frontage that is being developed.

MOTION: Director Provstgaard – To open the public hearing. Motion seconded by Director Christensen. Those voting yes: Linda Carter, Brett Christensen, Taresa Hiatt, Brian Hulet, Bob Provstgaard. The motion carried.

Public Comment:
No public comments.

MOTION: Director Provstgaard – To close the public hearing. Motion seconded by Director Christensen. Those voting yes: Linda Carter, Brett Christensen, Taresa Hiatt, Brian Hulet, Bob Provstgaard. The motion carried.

MOTION: Director Provstgaard – To approve (resolution) the amended fiscal year 2021-2022 RDA budget in the amount of $12,900. Motion seconded by Director Carter. A roll call vote was taken as follows and the motion carried.

Yes - Linda Carter
Yes - Brett Christensen
Yes - Taresa Hiatt
Yes - Brian Hulet
Yes - Bob Provstgaard

Councilmember Hulet would like to see funds for monument signs for business park.

Dave Tuckett said he will include this in the new budget.

F. ADJOURNMENT OF REDEVELOPMENT AGENCY

MOTION: Director Provstgaard – To adjourn from the Redevelopment Agency. Motion seconded by Director Christensen. Those voting yes: Linda Carter, Brett Christensen, Taresa Hiatt, Brian Hulet, Bob Provstgaard. The motion carried.

G. OTHER

1. Annual Training - Open and Public Meetings Act and Municipal Officers' and Employee Ethics Act (8:05 p.m.)

Staff Presentation:
Jason Sant reviewed the Open and Public Meetings Act. The purpose is to act in an open meeting and deliberate in an open meeting. A meeting includes two or more together with an exclusion such as watching a movie and not discussing city matters. A quorum is three members excluding the mayor, and a vote must be unanimous with only three. A closed meeting can address the character, competence, or health of an individual, pending or imminent litigation, or certain matters regarding acquisition or sale of real property. Emergency meetings do not require a 24-hour notice but a quorum most approve the meeting. Electronic meetings can be held with an anchor location. Electronic message transmissions such as text messages can be done when not in a public meeting. Penalties include a final action being voided and a class B misdemeanor for violation of closed meeting provisions. The Municipal Officers' and Employee Ethics Act bottom line is air on the side of disclosure. Please let staff know of any question so disclosure can be addressed. Your office may not be used for personal benefit. Gifts are okay if $50 or less, awards publicly presented for recognition of public service, any bona fide loan made in the ordinary course of business, and a political campaign contribution. Disclosure is required. Personal interest or investment creating a conflict of interest with duties is the big one. Failure to disclose includes loss of position or job, criminal penalties, and rescission of prohibited transaction.

I. ADJOURN TO CLOSED SESSION

Item not addressed.

1. Purchase, exchange, sale, or lease of real property

J. ADJOURN FROM CLOSED SESSION

K. ADJOURNMENT

MOTION: Councilmember Carter – To adjourn. Motion seconded by Councilmember Christensen. Those voting yes: Linda Carter, Brett Christensen, Taresa Hiatt, Brian Hulet, Bob Provstgaard. The motion carried.

The meeting adjourned at 8:16 p.m.

/s/ Kim E. Holindrake
Kim E. Holindrake, City Recorder

APPENDIX D

ENVIRONMENTAL INFORMATION DOCUMENT
CONTACT LIST

Cultural Resources

Chris Hansen (Concurrence letter)
300 Rio Grande
Salt Lake City, Utah 84101-1182
(801) 533-3555 (NOT A WORKING #)

Prime and Unique Farmlands

Mr. Kent Sutcliffe (Email response from Bir Thapa)
State Soil Scientist
USDA Soil Conservation Service
125 S. State, Room 4402
SLC, Utah 84138
(801) 524-4574 (385)-285-3120
kent.sutcliffe@usda.gov

Endangered Species

Yvette Converse, Field office supervisor (Email response)
U.S. Fish and Wildlife Service
2369 W. Orton Circle, Suite 50
West Valley City, Utah 84119
(801) 975-3330
utahfieldoffice_esa@fws.gov
Yvette_converse@fws.gov

Wetlands

Jason Gipson, Chief (Email from Hollis)
Corps of Engineers
Utah Regulatory Office
533 West 2600 South, Suite 150
Bountiful, Utah 84010
(801) 295-8380
jason.a.gipson@usace.army.mil

Aquatic & Terrestrial Wildlife Concerns

Paige Wiren, Assistant Director (Response from Nicole)
Nicole Nielson
Utah Wildlife Resources
P.O. Box 146301
Salt Lake City, Utah 84114-6301
(801) 538-4700
pwiren@utah.gov
nicolenielson@utah.gov

Air Quality Issues

Joel Karmazyn, Environmental Scientist (email response)
Utah Division of Air Quality
P.O. Box 144820
Salt Lake City, Utah 84114-4820
(801) 536-4435
jkarmazyn@utah.gov

Floodplain Maps*

Kathy Holder (email from Travis Jockumsen)
State Floodplain Manager
Utah Division of Emergency Services and Homeland Security
1110 State Office Building
Salt Lake City, Utah 84114
(801) 538-3332 (NOT A WORKING #)
kcholder@utah.gov

or

Dan Carlson
Flood Plain Manager
Federal Emergency Management Agency
Federal Center, Bldg. 710
P.O. Box 25267
Denver, Colorado 80225-0267
(303) 235-4830

- If maps are not available locally

Applicable American Indian Tribes, and Adjoining Property Owners

Spencer J. Cox
Governor

Deidre M. Henderson
Lieutenant Governor

Jill Remington Love
Executive Director
Department of
Heritage & Arts

Utah Division of
State History

Christopher Merritt
State Historic Preservation Officer

Kevin Fayles
Interim Director

May 10, 2021

Robert Gardel, EIT
Project Engineer
Forsgren Associates, Inc

RE: Payson Wastewater Plant

For future correspondence, please reference Case No. 21-1028

Dear Mr. Gardel,

The Utah State Historic Preservation Office received your submission and request for our comment on May 07, 2021. Based on the information provided to our office, we concur with a determination that no historic properties will be adversely affected by the proposed undertaking.

This information is provided to assist with Section 106 responsibilities as per §36CFR800 and state law under UCA 9-8-404. If you have questions, please contact me at (801) 245-7239 or by email at clhansen@utah.gov.

Sincerely,

Christopher Hansen
Preservation Planner/Utah SHPO

GeoStrata

Geotechnical Investigation – Updated May 10, 2021

Payson Wastewater Treatment Plant

3200 West Bamberger Road
Payson, Utah

May 10, 2021

Prepared For:

Forsgren Associates, Inc.
Attention: Jason Broome, P.E., ENV SP
370 East 500 South, Suite 200
Salt Lake City, Utah 84111

GeoStrata Job No. 1048-014

Office - 14425 South Center Point Way Bluffdale, Utah 84065
Phone (801) 501-0583 | info@geostrata-llc.com

GeoStrata 14425 South Center Point Way Bluffdale, Utah 84065
T: (801) 501-0583 ~ info@geostrata-llc.com

Prepared for:

Forsgren Associates, Inc.
Attn: Mr. Jason Broome, P.E., ENV SP
370 East 500 South, Suite 200
Salt Lake City, Utah 84111

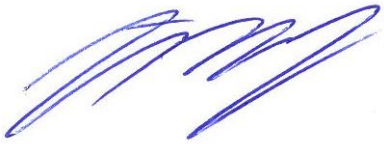
Geotechnical Investigation
Payson Wastewater Treatment Plant
3200 West Bamberger Road
Payosn, Utah

GeoStrata Job No. 1048-014

Bryce Jackson, E.I.T.
Staff Engineer

Caleb R. Allred, P.E.
Project Geotechnical Engineer

Reviewed by:



J. Scott Seal, P.E.
Associate Principal

GeoStrata
14425 South Center Point Way
Bluffdale, UT 84065
(801) 501-0583

May 10, 2021

TABLE OF CONTENTS

APPENDICES

1.0 EXECUTIVE SUMMARY

This report presents the results of a geotechnical investigation that has been updated with the addition of three boreholes from the original geotechnical investigation conducted for the proposed upgrade to the Payson Wastewater Treatment Plant. The project will consist of a updates and additional structures constructed on the treatment plant facility at 3200 West Bamberger Road in Payson, Utah. Subsurface soil conditions were explored by completing 7 boreholes within the area of the proposed treatment plant location.

Based on the subsurface conditions encountered at the site, it is our opinion that the property observed are suitable for the proposed treatment plant and pipeline alignment improvements provided the recommendations contained in this report are complied with.

The soils encountered in the borings at the site of the proposed treatment plant consisted of the site overlain by a combination of asphalt, undocumented fill, topsoil. Borings B-1, B-2, B-6, and B-7 were overlain by 3 to 4 inches of asphalt with 4 to 6 inches of a Silty SAND (SM) road base. Boring B-3 and B-5 was overlain with 1 foot of clayey topsoil with miner organics throughout. Boring B-4 was overlain with undocumented fill, consisting of a combination of Poorly Graded GRAVEL with silt and sand. Underlying the topsoil, fill, and road base we encountered native upper Pleistocene aged silt and clay deposits associated with the transgressive phase of the Lake Bonneville cycle (Solomon, 2007) These deposits consisted for the entire length of our investigation.

Groundwater was encountered in each of the boreholes advanced as part of this investigation. Underlying the treatment plant location, groundwater as encountered at during our investigation at the surface to 3 feet below site grades. Each of the boreholes was left open for 24 hours and ground water elevations were read the following day with results ranging from 5 to 7 feet below the existing site grade. Based on the anticipated depths of the proposed construction, it is likely that any excavations will require a dewatering system. It should be noted that buoyancy of the pipe may be an issue where shallow groundwater is encountered. The contractor should be aware of these conditions and plan accordingly.

Shallow foundations for the proposed structures may consist of conventional strip and/or spread footings founded on a minimum of 36 inches of structural fill. Foundations for deeper structures (buried more than 8 feet) may also consist of conventional footings founded on a minimum of 24 inches of structural fill. We anticipate that the bottom of the excavations will require soft soil stabilization prior to the placement of the supporting structural fill. Conventional strip footings founded entirely on a minimum of 24 inches of properly placed and compacted structural fill may be proportioned for a maximum net allowable bearing capacity of 1,500 psf.

Liquefaction settlement is expected to be up to 4 inches. To mitigate this settlement of the loose sand soil encountered, the loose sand soil can be removed and replaced or densified. The densification of the loose sand soils can be completed by the installation of a stone column system that extends to underlying clayey soils.

Recommendations for general site grading designs of foundations, slabs-on-grade, moisture protection as well as other aspects of construction are included within this report.

IMPORTANT INFORMATION ABOUT THIS GEOTECHNICAL-ENGIEERING REPORT:

Do not rely on the executive summary. The executive summary omits a number of details, any one of which could be crucial. Read and refer to the report in full. Do not rely on this report if this report was prepared for a different client, different project, different purpose, different site, and/or before important events occurred at the site or adjacent to it. All recommendations in this report are confirmation dependent. A two-page document prepared by GBA explains these items with greater detail and can be found in Appendix D (Plates D-1 and D-2).

2.0 INTRODUCTION

2.1 PURPOSE AND SCOPE OF WORK

This report presents the results of an update of the geotechnical investigation conducted for the proposed improvements to the existing Payson Wastewater Treatment Plant (WWTP) located at approximately 3200 West Bamberger Road in Payson, Utah. This updated geotechnical investigation was completed to further augment the information obtained during our original geotechnical investigation completed on March 26, 2021 for the proposed Oxidation Ditch, Anaerobic Tank, and Chemical Storage Building. These updated investigations were completed to better define the soil conditions within the area of the proposed improvements after varying soil conditions encountered in our original geotechnical investigation.

The scope of work completed for this study included a site reconnaissance, subsurface exploration, soil sampling, engineering analyses, and preparation of this report. Our services were performed in accordance with our proposal and your signed authorization, dated February 3, 2021 and in accordance with our proposal and you signed authorization, dated April 15, 2021. The recommendations contained in this report are subject to the limitations presented in the "Limitations" section of this report (Section 7.1).

2.2 PROJECT DESCRIPTION

Based on conversations, we understand that the proposed project will consist of improvements to the existing wastewater treatment plant. The client provided at plan of the proposed construction, and this plan is included as the base map for the Exploration Location Map on Plate A-2. From the information provided we understand that the construction at the plant site will include several new tank and tank upgrades, new buildings and building additions, adding two screw presses, replacing influent fume and sewer piping, expanding screenings building, adding a second screen, and relocating electrical gear. The depth of footings, foundations, and mat slabs depend on the structure type and will varying between 3 and 15 feet below the existing grade.

3.0 METHOD OF STUDY

3.1 SUBSURFACE INVESTIGATION

The existing treatment plant is located just south of 3200 West Bamberger Road in Payson, Utah (See Plate A-1, Site Vicinity Map). As a part of our original investigation, subsurface soil conditions were explored on March 2, 2021 by completing 4 borings (B-1, B-2, B-3, B-4) within the treatment plant. The boreholes were completed with a truck-mounted CME-55 using a casing advancer and extended to depths of 21½ to 51½ feet below existing site grade.

Our updated investigation was completed on April 27, 2021 by completing 3 boreholes (B-5, B-6, B-7) within the treatment plant. These boreholes were completed with a truck-mounted Mobile B-80 using a hollow stem auger system and extended to depths of 21½ to 31½ feet below existing site grade. The approximate locations of all the boreholes are shown on the Exploration Location Map, Plates A-2. Subsurface soil conditions as encountered in the explorations were logged at the time of our investigation by a qualified geotechnical engineer and are presented on the enclosed Borehole Logs, Plates B-1 to B-8 in Appendix B. A *Soil Symbols Description Key* is presented on Plate B-12.

To assist in the description of the soil conditions as encountered during our field investigations, fence diagrams of the subsurface profile have been prepared to show the location of certain soil conditions. These fence diagrams have been prepared based on the equal spaced form east to west, 2-D spacing from east to west, spatial locations of the boreholes, these figures are included in Appendix B on Plates B-9 to B-11.

Both relatively undisturbed and bulk samples were obtained from each borehole location. Disturbed samples were obtained through split-spoon samples. Relatively undisturbed soil samples were obtained through the collection 2.5-inch diameter California Sampler tubes and Shelby Tubes. Bulk soil samples were collected using buckets and bags. Samples were obtained by driving the samplers with a 140-pound hammer that drop 30 inches, each fall of the hammer is consisted a blow, and the number of blows is recorded to drive the sampler every 6 inches for a total of 18 inches. All samples were transported to our laboratory for testing to evaluate engineering properties of the various earth materials observed. The soils were classified according to the *Unified Soil Classification System* (USCS) by the Geotechnical Engineer. Classifications for the individual soil units are shown on the attached borehole logs.

3.2 LABORATORY TESTING

Geotechnical laboratory tests were conducted on selected 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:

- Grain Size Distribution Analysis (ASTM D422)
- Materials Finer than No.200 (ASTM C-117)
- Atterberg Limits Test (ASTM D4318)
- 1-D Consolidation Test (ASTM D2435)
- Unconfined Compressive Strength (ASTM D2166)
- Water-soluble sulfate concentration for cement type recommendations
- Resistivity and pH to evaluate corrosion potential of ferrous metals in contact with site soils.

The results of laboratory tests are presented on the Borehole Logs in Appendix B (Plates B-1 to B-8), the Laboratory Summary Table, and the test result plates presented in Appendix C (Plates C-1 through C-12).

3.3 ENGINEERING ANALYSIS

Engineering analyses were performed using soil data obtained from the field observations. Appropriate factors of safety were applied to the results consistent with industry standards and the accepted standard of care.

Excavation stability was evaluated based on the field conditions encountered and soil type. Occupational Safety and Health (OSHA) minimum requirements are typically prescribed unless conditions warrant further flattening of excavation walls.

4.0 GENERALIZED SITE CONDITIONS

4.1 SURFACE CONDITIONS

At the time of our subsurface investigations, the property existed as the operational Payson Wastewater Treatment Plant which included various industrial buildings, clarifiers, and holding tanks. The area was partially paved intermixed with grassy landscapes. The site of the proposed treatment plant is relatively flat, having a maximum topographic relief of approximately 5 feet.

4.2 SUBSURFACE CONDITIONS

As previously discussed, the subsurface soil conditions were explored at the site by completing 7 borings (total) within the treatment plant. The borings ranged in depth from approximately 21½ to approximately 51½ feet below existing site grade. The subsurface soil conditions were logged at the time of the investigation and are included in the Borehole Logs in Appendix B (Plates B-1 to B-8). A *Key to Soil Symbols and Terminology* is presented on Plate B-12. The subsurface conditions encountered during our investigation are discussed below.

4.2.1 Soils

Based on our observations and geologic literature review, the subject site is overlain by a combination of asphalt, undocumented fill, topsoil. Borings B-1 and B-2 were overlain by 3 to 4 inches of asphalt and then with 4 to 6 inches of a Silty SAND (SM) road base. Boring B-3 was overlain with 1 foot of clayey topsoil with minor organics throughout. Boring B-4 was overlain with approximately 5 feet of undocumented fill, consisting of a combination of Poorly Graded GRAVEL with silt and sand. Underlying the topsoil, fill, and road base we encountered native upper Pleistocene aged silt and clay deposits associated with the transgressive phase of the Lake Bonneville cycle (Solomon, 2007) These deposits consisted for the entire length of our investigation. Descriptions of the soil units encountered are provided below:

Undocumented Fill: Generally, consists of moist, brown Poorly Graded GRAVEL with silt and sand (GP), and moist, Lean CLAY (CL).

Topsoil: Were observed topsoil consisted of moist, dark brown Lean CLAY (CL).

Road base: Consisted of red brown, moist Silty SAND (SM) with gravel.

Upper Pleistocene Fine-grained Lacustrine Silt and Clay (Qlmp): Where observed, these deposits consisted of clay, silt and sand. Fine-grained soils were generally brown to grey-brown, very soft to stiff, moist to wet Lean CLAY (CL), Elastic SILT (MH), and Fat CLAY (CH) with varying amounts of sand. Coarse-grained soils generally consisted of very loose to medium dense, medium brown to dark grey, wet, Silty GRAVEL (GM), Clayey SAND (SC), Silty SAND (SM), and Poorly Graded SAND (SP).

4.2.2 Groundwater Conditions

Groundwater was encountered in each of the boreholes advanced as part of this investigation. Underlying the treatment plant location groundwater was encountered at the surface to 3 feet below site grade. Each of the boreholes were left open for 24 hours and groundwater elevations were read the following day with results ranging from 5 to 7 feet below the existing site grade, results of our reading are presented in the table below.

Boring	Water as Encountered (ft)	Water Elevation after 24-hour (ft)
B-1	Artesian (0)	6.5
B-2	3	7
B-3	2	5
B-4	2	5
B-5	2	5
B-6	2	5
B-7	2	5

Seasonal fluctuations in precipitation, surface runoff from adjacent properties, or other on or offsite sources may increase moisture conditions; groundwater conditions can be expected to rise several feet seasonally depending on the time of year. Based on the anticipated depths of the proposed pipeline, it is likely that any excavations will require a dewatering system.

5.0 GEOLOGIC CONDITIONS

5.1 GEOLOGIC SETTING

The site is located at an elevation ranging from 4,555 to 4,562 feet above mean sea level within Utah Valley is a deep, sediment-filled structural basin of Cenozoic age flanked by the Wasatch Range to the east and the Lake Mountains, East Tintic Mountains, and the West Hills to the West (Hintze, 1980). The Wasatch Range is the easternmost expression of pronounced Basin and Range extension in north-central Utah.

The near-surface geology of the Utah Valley is dominated by sediments deposited within the last 30,000 years by Lake Bonneville (Scott and others, 1983). As the lake receded, streams began to incise large deltas formed at the mouths of major canyons along the Wasatch Range, and the eroded material was deposited in shallow lakes and marshes in the basin and in a series of recessional deltas and alluvial fans. Sediments toward the center of the valleys are predominately deep-water deposits of clay, silt and fine sand. However, these deep-water deposits are in places covered by a thin post-Bonneville alluvial cover. Surface sediments at the project site are mapped as Holocene- to Upper-Pleistocene alluvial fan deposits (Machette, 1992), although it is possible that our borings encountered a Pleistocene-aged silt and clay deposits associated with the transgressive phase of the Lake Bonneville cycle (Solomon, 2007) at depth.

5.2 SEISMICITY AND FAULTING

The site lies within the north-south trending belt of seismicity known as the Intermountain Seismic Belt (ISB) (Hecker, 1993). The ISB extends from northwestern Montana through southwestern Utah. An active fault is defined as a fault that has had activity within the Holocene (<11ka). The Nephi segment of the Wasatch fault zone is mapped as being located approximately 213 feet southwest of the southwestern most corner of the facility. The Nephi segment is considered active and has a length of approximately 27 miles and overlaps with the Provo segment at the Payson salient. This segment is thought to have a recurrence interval of 2,500 years, with the latest rupture occurring between 1,600 to 3,300 years ago. It is important to note that this proposed development is located within the Watch Fault Special Study areas but is outside the scope of the completed investigation. A geologic hazard analysis may be required for further site analysis. The site is also located approximately 4½ miles west of the site of the nearest mapped location of the Provo Segment of the Wasatch Fault Zone. The Provo segment is one of the longest sections of the Wasatch Fault Zone (Hecker, 1993) and is estimated to be

approximately 43 miles long with a reported rupture length of 37 miles and a maximum potential to produce earthquakes up to magnitude (M_s) 7.5 to 7.7 (Black et al, 2003). Finally, the site is also located approximately 8¼ miles southeast of the nearest mapped location of the Utah Lake Faults and Folds (ULFF). The ULFF consists of several northeast to northwest trending faults and folds located beneath Utah Lake and are reported to have been active in the past 15 k.a. (Black et al, 2003). However, since the ULFF is at the bottom of a large lake these faults are poorly understood – as such, the USGS does not include ULFF in their fault database for seismic hazard analysis. 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 Wasatch Front region. Each of the faults listed above show evidence of Holocene-aged movement and is therefore considered active.

Seismic hazard maps depicting probabilistic ground motions and spectral response have been 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, 2015). Spectral responses for the Risk-Targeted Maximum Considered Earthquake (MCE_R) are shown in the table below. These values generally correspond to a one percent probability of structure collapse in 50 years for a "firm rock" site. To account for site effects, site coefficients which vary with the magnitude of spectral acceleration are used. Based on our field exploration to 21½ feet, it is our opinion that this location is best described as a Site Class D (default). The spectral accelerations are calculated based on the site's approximate latitude and longitude of 40.061° and -111.732° respectively and the Seismic Design Maps web-based application at https://seismicmaps.org/.

Description	Value
Site Class	D (default)
S_s - MCE_R ground motion (period – 0.2s)	1.665
S_1 - MCE_R ground motion (period – 1.0s)	0.613
F_a - Site amplification factor at 1.0s	1.200
F_v - Site amplification factor at 1.0s	1.70
PGA - MCE_G peak ground acceleration	0.757
PGA_M – Site modified peak ground acceleration	0.908

It should be noted that our investigation did not include a site-specific ground motion hazard analysis and a Site Class D (default) has been used to determine the seismic parameters presented above. The seismic parameters presented herein may be used for design of the proposed structures provided that structural design allows for the ground motion hazard analysis exception in ASCE 7-16 Section 11.4.8. Alternatively, GeoStrata may be contacted to complete a ground motion hazard analysis in accordance with ASCE 7-16 Chapter 21.

5.3 LIQUEFACTION

Certain areas within the intermountain region possess a potential for liquefaction during seismic events. Liquefaction is a phenomenon whereby loose, saturated, granular soil deposits lose a significant portion of their shear strength due to excess pore water pressure buildup resulting from dynamic loading, such as that caused by an earthquake. Among other effects, liquefaction can result in densification of such deposits causing settlements of overlying layers after an earthquake as excess pore water pressures are dissipated. The primary factors affecting liquefaction potential of a soil deposit are: (1) level and duration of seismic ground motions; (2) soil type and consistency; and (3) depth to groundwater.

Based on our review of the "Liquefaction Special Study Areas, Wasatch Front and Nearby Areas, Utah" (Christenson and Shaw, 2008), the majority of the site is in an area currently designated as having a "High" liquefaction potential. "High" liquefaction potential indicates that there is greater than a 50% probability of having an earthquake within a 100-year period that will be strong enough to cause liquefaction. Furthermore, shallow groundwater was encountered during our subsurface exploration. Therefore, we evaluated the potential for liquefaction at the site based on procedures presented at the 1996 NCEER and the 1998 NCEER/NSF liquefaction workshops (Youd et al., 2001) and in general accordance with *Guidelines for Analyzing and Mitigating Liquefaction Hazards in California* published by the Southern California Earthquake Center (SCEC) (Martin and Lew, 1999). Our analysis considered the MCE as the design-level seismic event (an event with a 2 percent probability of occurrence in 50 years, or an event having a 2,475-year average return period). This is a slight deviation from the Martin and Lew 1999 recommendations, which recommends that the 10 percent in 50 years ground motion (10PE50/ARP 475 years) or *Design Basis Earthquake* (DBE) should be used for analysis. The MCE seismic event is estimated to produce a PGA of 0.757g (see Section 5.2). Our analysis also considered the deaggregated moment magnitude for the site (the earthquake magnitude having the greatest contribution to the hazard), which is estimated to be 7.1 Mw.

Based on our analysis, the near surface loose sand soil observed in Boring B-2, B-3, and B-6 could experience liquefaction settlement as much as 4 inches. As a result, the potential for the site to be impacted by liquefaction is considered to be “high”. Recommendations for mitigation are included in Section 6.0 of this report.

6.0 ENGINEERING ANALYSIS AND RECOMMENDATIONS

6.1 GENERAL

Based on the subsurface conditions encountered at the site, it is our opinion that the proposed treatment plant and alignment for the areas investigated are suitable for the proposed treatment plant and site improvements provided the recommendations contained in this report are complied with. Supporting data upon which the following recommendations are based have been presented in the previous sections of this report. The recommendations presented herein are governed by the physical properties of the soils encountered in the exploratory borings and the anticipated design data for the project. If subsurface conditions other than those described herein are encountered in conjunction with construction, and/or if design and layout changes are initiated, GeoStrata must be informed so that our recommendations can be reviewed and revised as changes or conditions may require.

The following sub-sections present our recommendations for general site grading, backfill around the pipe/culvert zone, design of foundations, slabs-on-grade, lateral earth pressures, moisture protection, and global stability.

6.2 EARTHWORK

It is generally anticipated that site grading work will be minimal except for at specific building or tank locations. In these areas, general site grading is recommended to provide proper support for pipelines or other ancillary facilities. Site grading is also recommended to provide proper drainage and moisture control to aid in preventing differential movement under the structures or utilities foundation soils resulting from variations in moisture conditions.

6.2.1 General Site Preparation and Grading

Below any buildings, vaults, or other ancillary facilities requiring a foundation, below areas of mass grading, and below any structural fill placed, any existing vegetation, debris, topsoil, and fill soils should be removed. Any loose or disturbed soils beneath these areas should also be removed. Following the removal of vegetation, unsuitable soils, and loose or disturbed soils, as described above, site grading may be conducted to bring the site to design elevations. If over-excavation is required, the excavation should extend a minimum of one foot laterally for every foot of depth of over-excavation. Excavations should extend laterally at least two feet beyond

flatwork, pavements, and slabs-on-grade. If materials are encountered that are not represented in the test pit logs or may present a concern, GeoStrata should be notified so observations and further recommendations as required can be made.

A GeoStrata representative should observe the site preparation and grading operations to assess that the recommendations presented in this report are complied with.

6.2.2 Soft Soil Stabilization

Soft or pumping soils are likely expected to be exposed in excavations for the proposed plant facilities. All subgrade surfaces beneath proposed structure, pavements, and flat work concrete should be proof rolled with a piece of heavy wheeled-construction equipment. If soft or pumping soils are encountered, these soils should be stabilized prior to construction of footings. Stabilization of the subgrade soils can be accomplished using a clean, coarse angular material worked into the soft subgrade. We recommend the material be greater than 2-inch diameter, but less than 6 inches. A locally available pit-run gravel may be suitable but should contain a high percentage of particles larger than 2 inches and have less than 7 percent fines (material passing the No. 200 sieve). A pit-run gravel may not be as effective as a coarse, angular material in stabilizing the soft soils and may require more material and greater effort. The stabilization material should be worked (pushed) into the soft subgrade soils until a firm relatively unyielding surface is established. Once a firm, relatively unyielding surface is achieved, the area may be brought to final design grade using structural fill.

In large areas of soft subgrade soils, stabilization of the subgrade may not be practical using the method outlined above. In these areas it may be more economical to place a woven geotextile fabric against the soft soils covered by 18 inches of coarse, sub-rounded to rounded material over the woven geotextile. An inexpensive non-woven geotextile “filter” fabric should also be placed over the top of the coarse, sub-rounded to rounded fill prior to placing structural fill or pavement section soils to reduce infiltration of fines from above. The woven geotextile should consist of TenCate Mirafi® RSi-Series or prior approved equivalent. The filter fabric should consist of TenCate Mirafi® N-Series or prior approved equivalent.

6.2.3 Excavation Stability

Based on Occupational Safety and Health Administration (OSHA) guidelines for excavation safety, trenches with vertical walls up to 5 feet in depth may be occupied, however, the presence of fill soils, loose soils, or wet soils may require that the walls be flattened to maintain safe working conditions. These conditions should be anticipated at both the plant site and along the pipeline alignment. When the trench is deeper than 5 feet, we recommend a trench-shield or shoring be used to protect workers in the trench. Based on our soil observations, laboratory testing, and OSHA guidelines, native soils at the site classify as Type C soils. OSHA regulations recommend trench slopes in Type C soils be graded no steeper than one and one-half horizontal to one vertical (1.5H:1V). Wet conditions should be anticipated and dewatering and shoring most to all excavations will likely be required. The contractor is ultimately responsible for trench and site safety. Pertinent OSHA requirements should be met to provide a safe work environment. If site specific conditions arise that require engineering analysis in accordance with OSHA regulations, GeoStrata can respond and provide recommendations as needed.

We recommend that a GeoStrata representative be on-site during all excavations to assess the exposed foundation soils. We also recommend that the Geotechnical Engineer be allowed to review the grading plans when they are prepared in order to evaluate their compatibility with these recommendations.

6.2.4 Structural Fill and Compaction

All fill placed for the support of structures, concrete flatwork or pavements should consist of structural fill. We anticipate that the majority of the onsite native soils will be saturated and unusable in this condition to be used as structural fill. It is recommended that an imported fill meeting the specifications below may be used. Imported structural fill should be a relatively well graded granular soil with a maximum of 50 percent passing the No. 4 mesh sieve and a maximum fines content (minus No.200 mesh sieve) of 25 percent. Clay and silt particles in imported structural fill should have a liquid limit less than 35 and a plasticity index less than 15 based on the Atterberg Limit's test (ASTM D-4318). Regardless of if the structural fill is imported or native, it should be free of vegetation, debris or frozen material, and should contain no inert materials larger than 4 inches nominal size. All structural fill soils should be approved by the Geotechnical Engineer prior to placement. Soils not meeting the aforementioned criteria may be suitable for use as structural fill. These soils should be evaluated on a case-by-case basis and should be approved by the Geotechnical Engineer prior to use. Local regulating agencies

may have more stringent requirements for structural fill. The Owner and Contractor should be aware of these requirements and use structural fill that meets the regulating entities requirements. The contractor should anticipate testing all soils used as structural fill frequently to assess the maximum dry density, fines content, and moisture content, etc.

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. We recommend that all structural fill be compacted on a horizontal plane, unless otherwise approved by the geotechnical engineer. Structural fill should be compacted to at least 95% of the MDD, as determined by ASTM D-1557. The moisture content should be at or slightly above the OMC at the time of placement and compaction. Also, prior to placing any fill, the excavations should be observed by the geotechnical engineer to observe that any unsuitable materials or loose soils 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 (Section 6.2.1).

We anticipate that filling of the site will be fairly minimal as a part of the site grading. If however fill embankments larger than 3 feet in height are planned GeoStrata should be notified to assess the settlement associated with these fills. Fill soils placed for subgrade below exterior flat work and pavements, should be within 3% of the OMC when placed and compacted to at least 95% of the MDD as determined by ASTM D-1557. All utility trenches backfilled below the proposed structure, pavements, and flatwork concrete, should be backfilled with structural fill that is within 3% of the OMC when placed and compacted to at least 95% of the MDD as determined by ASTM D-1557. All other trenches, in landscape areas, should be backfilled and compacted to at least 90% of the MDD (ASTM D-1557).

The gradation, placement, moisture, and compaction recommendations contained in this section meet our minimum requirements but may not meet the requirements of other governing agencies such as city, county, or state entities. If their requirements exceed our recommendations, their specifications should override those presented in this report.

6.2.5 Temporary Construction Dewatering/Permanent Groundwater Conditions

As noted earlier in the report, shallow groundwater was encountered at the site. The contractor will likely be required to develop a specific temporary dewatering plan for each of the proposed

work areas. Implementation of effective dewatering measures is the contractor's responsibility. Common local practice consists of sloping excavations to appropriately spaced sumps equipped with pumps to discharge water to acceptable disposal areas. The contractor should satisfy himself as to the soil and groundwater conditions to be encountered and the means to accomplish effective dewatering of the work areas.

Several deep (greater than 10 feet) vaults/basins will be constructed in a regime of shallow groundwater. It is imperative that the design engineers consider the buoyancy of these structures for long term permanent groundwater conditions. We anticipate that buoyancy will not be an issue during the construction dewatering activities; however, buoyancy may become an issue once the vaults are constructed and empty and the construction dewatering system is stopped.

6.3 FOUNDATIONS

6.3.1 Shallow Foundations

Shallow foundations for the proposed structures may consist of conventional strip and/or spread footings founded on a minimum of 36 inches of structural fill. Strip and spread footings should be a minimum of 20 and 36 inches wide, respectively, and exterior shallow footings should be embedded at least 30-inches below final grade for frost protection and confinement. Interior footings not subject to frost should be embedded at least 18 inches below final grade to provide confinement.

Foundations for deeper structures (buried more than 8 feet) may also consist of conventional footings founded on a minimum of 24 inches of structural fill. We anticipate that the bottom of the excavations will require soft soil stabilization prior to the placement of the supporting structural fill.

Conventional strip footings founded entirely on a minimum of 24 inches of properly placed and compacted structural fill may be proportioned for a maximum net allowable bearing capacity of **1,500 psf**. The net allowable bearing capacity may be increased (typically by one-third) for temporary loading conditions such as transient wind and seismic loads. All footing excavations should be observed by the Geotechnical Engineer prior to footing placement.

6.3.2 Mat Foundations

Based on our understanding, the buried portion of some structures are to be supported by a mat foundation. The mat foundation should be established on a minimum of 24 inches of structural fill. The structural fill should meet recommendations presented in Section 6.2.4. The mat foundation may be designed with a net modulus of subgrade reaction of **2.72 pounds per cubic inch (pci)** for clays**,** or **42.16 pounds per cubic inch (pci)** for sand. This value is based on a Young's Modulus of 313 ksf and a Poisson's Ratio of 0.5 for the soft to very soft clay soils or the loose sand observed at the proposed mat foundation elevation of 5 to 15 feet. This modulus of subgrade reaction is provided for a mat foundation that has a width or diameter of 60 to 100 feet.

6.3.2 Settlement

Settlements of properly designed and constructed conventional footings, founded as described above, are anticipated to be less than 1 inch. Differential settlements should be on the order of half the total settlement over 30 feet.

The recommendations provided should not be applied to any structure that imposes large loads over a broad area such as surface tanks and mat foundations. Large loads over broad areas may experience excessive settlements if conventional foundations systems are used. These structures may likely require a deep foundation system and GeoStrata should be contacted to provide recommendations for these structures if they exist.

In the liquefaction section of this report estimates that dynamic settlement to be up to 4 inches as shown in the table below:

Boring Location	Amount of Liquefaction
B-2	2-¾ inches
B-3	4 inches
B-6	1-¼ inches

As shown on the fence diagrams included on the Appendix B Plates B-9 to B-11 the liquefiable sand layer is between 5 and 15 feet below the site grade for Boring B-3 and B-6, but the liquefiable soil is deeper at B-2 where it starts at 15 feet and extends to the bottom of the borehole to approximately 21½ feet. The liquefiable layer does not appear to be a continual layer

across the site because the liquefiable sand layer was not observed in the Borings B-1, B-5, or B-7 and the pseudo-static settlement will vary throughout the site. Based on these observations we have created an estimated map of the liquefiable soil layer and that is included in Appendix A, Plate A-3 *Estimated Map of the Liquefiable Sand Layer*. Based on the elevation of the structure's foundations, the liquefiable soils may be removed and therefore mitigate the hazard. But if the sand layer extends below the foundation mitigation will be required.

To mitigate the varying amount of pseudo-static settlement of the loose sand soil encountered, the loose sand soil can be removed and replaced or densified. The densification of the loose sand soils can be completed by the installation of a stone column system that extends to underlying clayey soils. The installation of the stone columns would alter the soil conditions and reduce the liquefaction potential up to a total of 50 to 75 percent (depending on the stone column's length, diameter, and spacing). These columns would also serve to increase the bearing capacity of the soils if needed. Engineering observation during construction may be required to determine the location of the extend of the liquefiable soils at the site.

6.4 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 subgrade. In determining the frictional resistance, a coefficient of friction of 0.43 should be used for structural fill, drain gravel, or coarse-grained native soils against concrete. A coefficient of friction of 0.35 should be used for native, fine-grained soils against concrete.

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 the following table:

Condition	Lateral Pressure Coefficient	Equivalent Fluid Density (pounds per cubic foot)
Active[1]	0.25	31
At-rest[2]	0.43	52
Passive[1]	22.97	2825
Seismic Active[3]	0.40	49
Seismic Passive[4]	-19.60	-2411

[1]Based on Coulomb's equation

[2]Based on Jaky

[3]Based on Lew et al. (2010)

[4]Based on Mononobe-Okabe Equation

These coefficients and densities assume level, granular backfill with no buildup of hydrostatic pressures. The force of the water should be added to the presented values if hydrostatic pressures are anticipated. If sloping backfill is present, we recommend the geotechnical engineer be consulted to provide more accurate lateral pressure parameters once the design geometry is established.

Ultimate lateral earth pressures from *fine grained soil* backfill acting against retaining walls and buried structures may be computed from the lateral pressure coefficients or equivalent fluid densities presented in the following table:

Condition	Lateral Pressure Coefficient	Equivalent Fluid Density (pounds per cubic foot)
Active[1]	0.31	36
At-rest[2]	0.52	59
Passive[1]	12.75	1466
Seismic Active[3]	0.40	46
Seismic Passive[4]	-10.16	-1169

[1]Based on Coulomb's equation
[2]Based on Jaky
[3]Based on Lew et al. (2010)
[4]Based on Mononobe-Okabe Equation

These coefficients and densities assume level, granular backfill with no buildup of hydrostatic pressures. The force of the water should be added to the presented values if hydrostatic pressures are anticipated. If sloping backfill is present, we recommend the geotechnical engineer be consulted to provide more accurate lateral pressure parameters once the design geometry is established.

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 ½.

For seismic analyses, the *active* and *passive* earth pressure coefficient provided in the table is based on Lew et al (2010) and Mononobe-Okabe respectively and only accounts for the dynamic horizontal thrust produced by ground motion. Hence, the resulting dynamic thrust pressure should be added to the static pressure to determine the total pressure on the wall. The pressure

distribution of the dynamic horizontal thrust may be closely approximated as an inverted triangle with stress decreasing with depth and the resultant acting at a distance approximately 0.6 times the loaded height of the structure, measured upward from the bottom of the structure.

The coefficients shown assume a vertical wall face. Hydrostatic and surcharge loadings, if any, should be added. Over-compaction behind walls should be avoided. Resisting passive earth pressure from soils subject to frost or heave, or otherwise above prescribed minimum depths of embedment, should usually be neglected in design.

6.5 CONCRETE SLAB-ON-GRADE CONSTRUCTION

Concrete slabs-on-grade should be constructed over at least 4 inches of compacted gravel overlying native soils or a zone of structural fill that is at least 12 inches thick. Disturbed native soils should be compacted to at least 95% of the MDD as determined by ASTM D-1557 (modified proctor) prior to placement of gravel. The gravel should consist of road base or clean drain rock with a ¾-inch maximum particle size and no more than 12 percent fines passing the No. 200 mesh sieve. The gravel layer should be compacted to at least 95 percent of the MDD of modified proctor or until tight and relatively unyielding if the material is non-proctorable. All concrete slabs should be designed to minimize cracking as a result of shrinkage. Consideration should be given to reinforcing the slab with welded wire, re-bar, or fiber mesh.

6.6 MOISTURE PROTECTION AND SURFACE DRAINAGE

Precautions should be taken during and after construction to eliminate saturation of foundation soils. Overwetting the soils prior to or during construction may result in increased softening and pumping, causing equipment mobility problems and difficulty in achieving compaction.

Moisture should not be allowed to infiltrate the soils in the vicinity of, or upslope from, the structures. We recommend that roof runoff devices be installed to direct all runoff a minimum of 10 feet away from structures. The grade within 10 feet of the structures should be sloped a minimum of 5% away from the structure.

6.7 SOIL CORROSION

Two representative soil sample was tested for soluble sulfate content. Laboratory test results indicate that near surface native soils have a soluble sulfate content of 69.4 and 101 ppm. Based on this result, the near-surface site soils are expected to exhibit a negligible potential for sulfate

attack when in contact with concrete elements, and we anticipate that conventional Type I/II cement can be used for all of the concrete.

To evaluate the corrosion potential of ferrous metal in contact with onsite native soil, one representative soil sample was tested in our soils laboratory for resistivity (AASHTO T288) and pH. The tests indicated that the onsite soils tested have resistivity values ranging from 570 and 640 OHM-cm and pH values of 8.09 and 8.31. Based on these results, the onsite native soil is expected to be *very corrosive* to ferrous metal. A qualified corrosion engineer should be consulted to provide an assessment of any metal that may be in contact with soils at the site.

6.8 SPECIAL CONSTRUCTION CONSIDERATIONS

The contractor should be aware of specific site conditions that could impact on construction at the site. These include relatively shallow groundwater, which will require that dewatering plans be developed to maintain safe excavations. Based on our field exploration, much of the site will likely encounter soft soils that will require stabilization. GeoStrata personnel should be on site during all excavations and site grading activities to aid and assess the need for soil stabilization prior to construction. The contractor should be prepared to provide trench boxes, sheet piles or other excavation support for deeper excavations.

7.0 CLOSURE

7.1 LIMITATIONS

The recommendations contained 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 and beyond 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, GeoStrata 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, GeoStrata 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. GeoStrata 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/loose soils over-excavation.
- Observation of temporary excavations and shoring.
- Consultation as may be required during construction.
- Quality control and observation of concrete placement.

We also recommend that project plans and specifications be reviewed by GeoStrata 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) 501-0583.

8.0 REFERENCES CITED

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APPENDIX A

GeoStrata

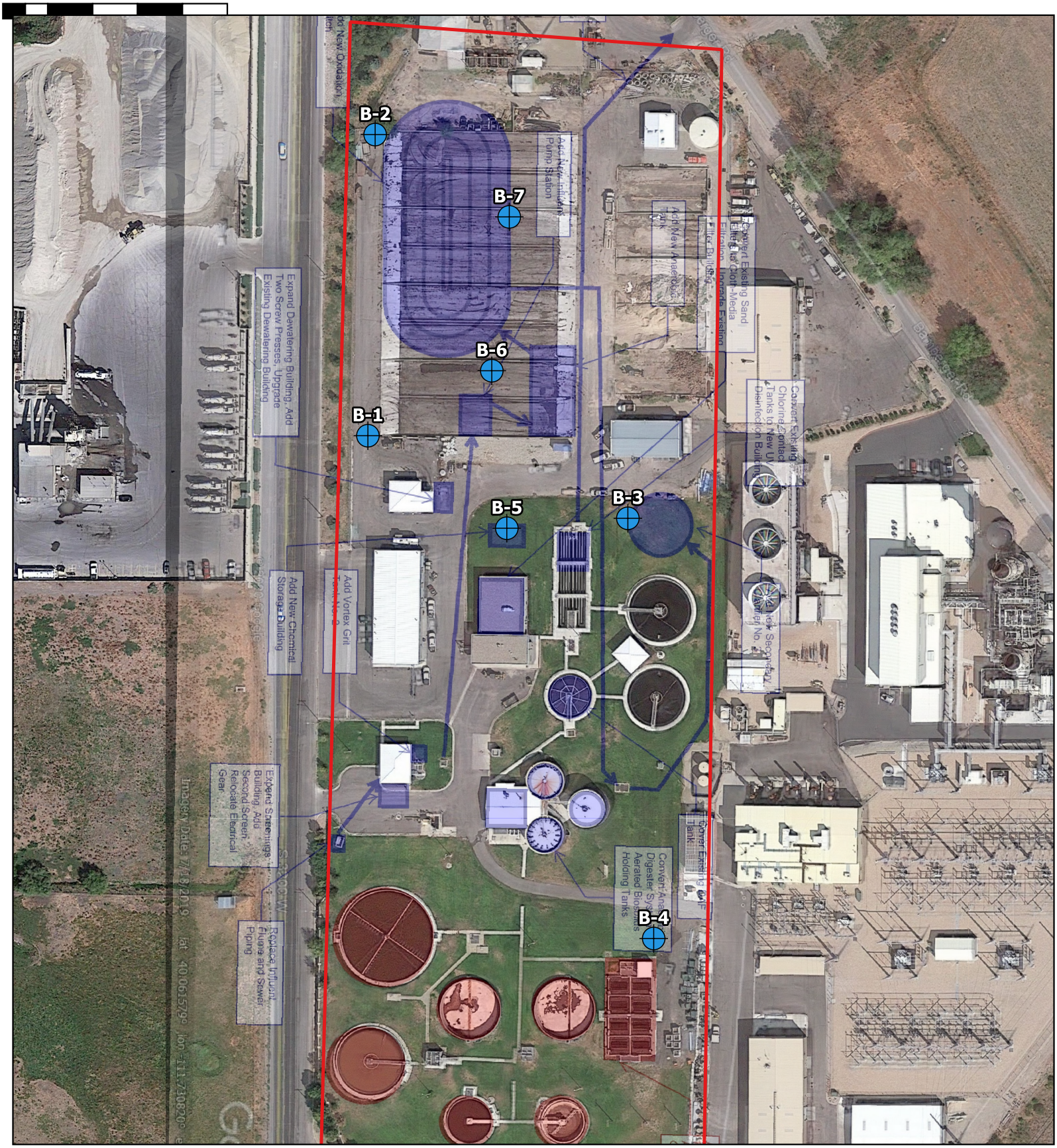
Legend

Approximate SIte Boundary

Forsgren Associate, Inc.
Payson WWTP
Payson, Utah
Project Number 1048-014

Site Vicinity Map

Plate A-1



80 0 80 160 240 320 ft

1:1700

N

GeoStrata

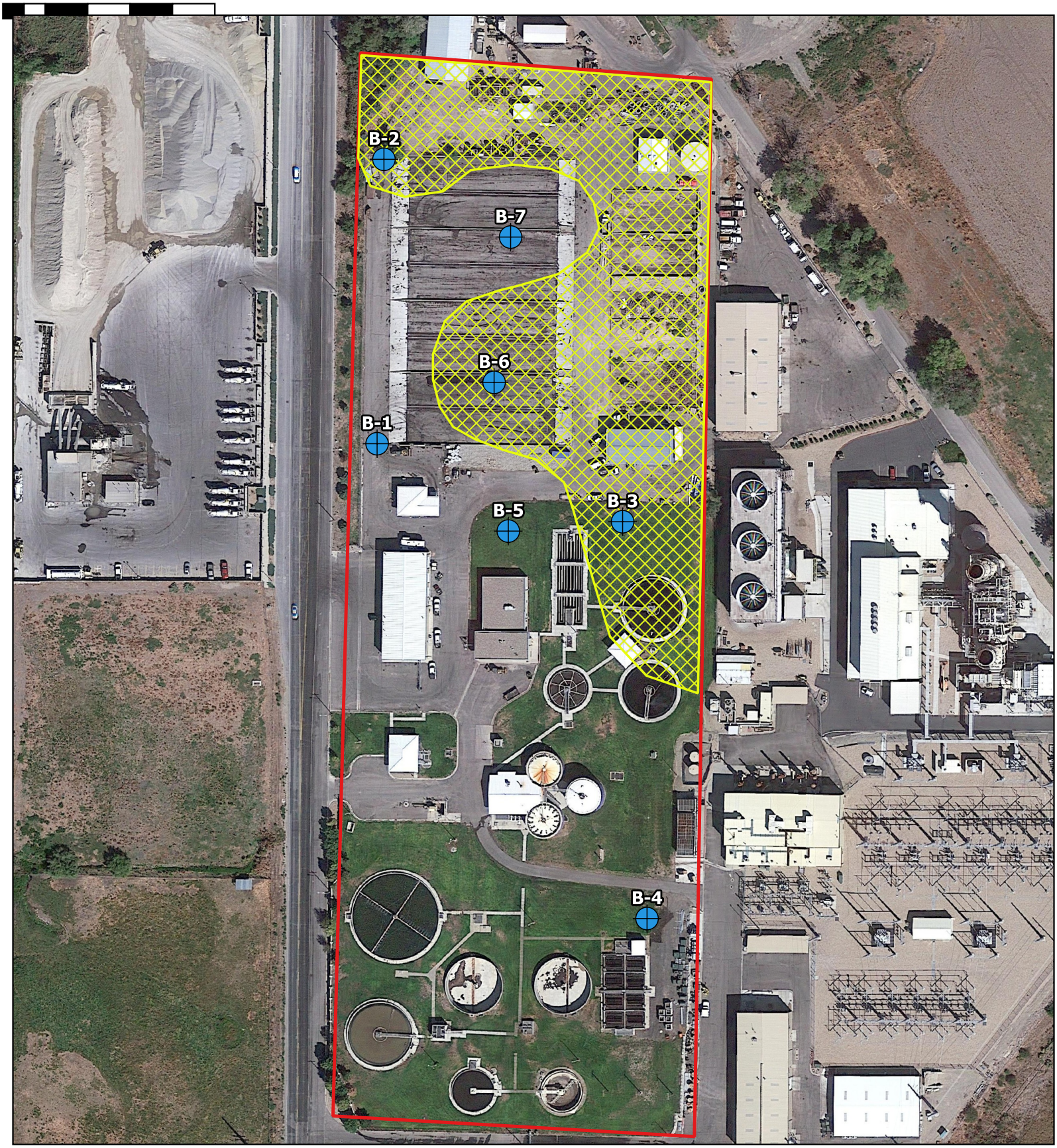
Legend

- Approximate Boring Location
- Approximate SIte Boundary

Forsgren Associate, Inc.
Payson WWTP
Payson, Utah
Project Number 1048-014

Exploration Location Map

Plate A-2



80 0 80 160 240 320 ft

1:1800

N

GeoStrata

Legend

- Approximate Boring Location
- Approximate Location of the Liquefiable Sand Layer
- Approximate SIte Boundary

Forsgren Associate, Inc.
Payson WWTP
Payson, Utah
Project Number 1048-014

Estimated Map of the Liquefiable Sand Layer

Plate A-3

APPENDIX B

DATE
STARTED: 3/2/21
COMPLETED: 3/2/21
BACKFILLED: 3/2/21

Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number 1048-014

GeoStrata Rep: A. Peay
Rig Type: CME 55
Boring Type: C.A.S

BORING NO: B-1
Sheet 1 of 1

LOCATION
STATION 4,434,903.00 OFFSET 437,579.00 ELEVATION 4,561.00

DEPTH METERS	DEPTH FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	N	N*	SPT BLOW COUNT 10 20 30 40 50 60 70 80 90	Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits: Plastic Limit / Moisture Content / Liquid Limit 10 20 30 40 50 60 70 80 90
0	0					ASPHALT - 4"									
						FILL - Silty SAND with gravel, medium dense, moist, brown									
						Sandy Lean CLAY - stiff, moist to wet, grey to dark grey									
1					CL		10	17			39.4	79.3			
	5						10	16							
2						Sandy Elastic SILT - very soft, wet, grey	0	0			58.9	57.5	53	18	
3	10				MH										
						Sandy Lean CLAY - very soft to soft, wet, grey to dark grey	1	1							
4															
	15				CL		2	3							
5															
6	20				SC	Clayey SAND - loose, wet, grey	6	10			33.7	26.9			
						Bottom of Boring @ 21.5 Feet									
7															
	25														
8															
9	30														
10															

N - OBSERVED UNCORRECTED BLOW COUNT

N* - CORRECTED N1(60) EQUIVALENT SPT BLOW COUNT

GeoStrata

SAMPLE TYPE
- 2" O.D./1.38" I.D. SPLIT SPOON SAMPLER
- 3" O.D./2.48" I.D. SAMPLER
- 3" O.D. THIN-WALLED SHELBY SAMPLER
- GRAB SAMPLE
- Modified California Sampler

NOTES:

WATER LEVEL
- MEASURED - ESTIMATED

Plate
B - 1

2020 LOG OF BORING - PLATE (B) 2020 GINT UPDATE TEMPLATE.GPJ GEOSTRATA.GDT 5/7/21

DATE
STARTED: 3/2/21
COMPLETED: 3/2/21
BACKFILLED: 3/2/21

Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number 1048-014

GeoStrata Rep: A. Peay
Rig Type: CME 55
Boring Type: C.A.S

BORING NO: B-2
Sheet 1 of 1

LOCATION
STATION 4,435,014.10 OFFSET 437,587.40 ELEVATION 4,558.00

DEPTH: METERS / FEET
SAMPLES | WATER LEVEL | GRAPHICAL LOG | UNIFIED SOIL CLASSIFICATION

MATERIAL DESCRIPTION	N	N*	USCS
ASPHALT - 3"			
FILL - Silty SAND with gravel, medium dense, moist, brown			
Fat CLAY - stiff to very soft, moist to wet, grey to dark grey	6	10	CH
	9	9	
	1	1	
	1	1	
Poorly Graded SAND with gravel - medium dense to very loose, wet, dark grey, sand is coarse grained	13	19	SP
	4	6	
Bottom of Boring @ 21.5 Feet			

SPT BLOW COUNT 10 20 30 40 50 60 70 80 90

Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index
	47.2	85.4	52	26
	11.6	1.7		

Moisture Content and Atterberg Limits
Plastic Limit | Moisture Content | Liquid Limit
10 20 30 40 50 60 70 80 90

N - OBSERVED UNCORRECTED BLOW COUNT
N* - CORRECTED N1(60) EQUIVALENT SPT BLOW COUNT

GeoStrata

SAMPLE TYPE
- 2" O.D./1.38" I.D. SPLIT SPOON SAMPLER
- 3" O.D./2.48" I.D. SAMPLER
- 3" O.D. THIN-WALLED SHELBY SAMPLER
- GRAB SAMPLE
- Modified California Sampler

NOTES:

WATER LEVEL
▼ - MEASURED ▽ - ESTIMATED

Plate
B - 2

2020 LOG OF BORING - PLATE (B) 2020 GINT UPDATE TEMPLATE.GPJ GEOSTRATA.GDT 5/7/21

DATE
STARTED: 3/2/21
COMPLETED: 3/2/21
BACKFILLED: 3/2/21

Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number 1048-014

GeoStrata Rep: A. Peay
Rig Type: CME 55
Boring Type: C.A.S

BORING NO: B-3
Sheet 1 of 2

LOCATION
STATION 4,434,876.80 OFFSET 437,669.40 ELEVATION 4,560.00

DEPTH METERS	DEPTH FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	N	N*	SPT BLOW COUNT 10 20 30 40 50 60 70 80 90	Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits: Plastic Limit / Moisture Content / Liquid Limit 10 20 30 40 50 60 70 80 90
0	0					TOPSOIL - Lean CLAY with sand, moist, dark brown									
						Lean CLAY - medium stiff to very soft, moist to wet, dark brown to red-brown									
1					CL		5	8							
	5						5	5		82.8	38.5				
2						Silty SAND - very loose, wet, brown, sand is fine grained									
							0	0			47.5	19.8	NP	NP	
3	10				SM		3	4							
4															
	15					Lean CLAY - soft, wet, brown to dark grey	4	6							
5															
6	20				CL		5	8			34.3	97.5	44	18	
7															
	25					Fat CLAY - soft to stiff, wet, brown to dark grey									
8							2	3							
9															
	30				CH		1	1							
10															

N - OBSERVED UNCORRECTED BLOW COUNT

N* - CORRECTED N1(60) EQUIVALENT SPT BLOW COUNT

GeoStrata

SAMPLE TYPE
- 2" O.D./1.38" I.D. SPLIT SPOON SAMPLER
- 3" O.D./2.48" I.D. SAMPLER
- 3" O.D. THIN-WALLED SHELBY SAMPLER
- GRAB SAMPLE
- Modified California Sampler

NOTES:

WATER LEVEL
▼ - MEASURED ▽ - ESTIMATED

Plate
B - 3

2020 LOG OF BORING - PLATE (B) 2020 GINT UPDATE TEMPLATE.GPJ GEOSTRATA.GDT 5/7/21

DATE
STARTED: 3/2/21
COMPLETED: 3/2/21
BACKFILLED: 3/2/21

Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number 1048-014

GeoStrata Rep: A. Peay
Rig Type: CME 55
Boring Type: C.A.S

BORING NO: B-3
Sheet 2 of 2

LOCATION
STATION 4,434,876.80 OFFSET 437,669.40 ELEVATION 4,560.00

DEPTH METERS	DEPTH FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	N	N*	SPT BLOW COUNT 10 20 30 40 50 60 70 80 90	Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits: Plastic Limit / Moisture Content / Liquid Limit 10 20 30 40 50 60 70 80 90
11	35				CH		20	27			51.7	96.4	52	28	
12	40				SP	Poorly Graded SAND - dense, wet, dark grey	7	9							
13					CL	Lean CLAY - medium stiff, wet, dark grey									
14	45				GM	Silty GRAVEL - dense to medium dense, wet, dark grey	42	50							
15	50						15	17				41.0	53	23	
16						Bottom of Boring @ 51.5 Feet									
17	55														
18															
19	60														
20															
21	65														

N - OBSERVED UNCORRECTED BLOW COUNT

N* - CORRECTED N1(60) EQUIVALENT SPT BLOW COUNT

2020 LOG OF BORING - PLATE (B) 2020 GINT UPDATE TEMPLATE.GPJ GEOSTRATA.GDT 5/7/21

GeoStrata

SAMPLE TYPE
- 2" O.D./1.38" I.D. SPLIT SPOON SAMPLER
- 3" O.D./2.48" I.D. SAMPLER
- 3" O.D. THIN-WALLED SHELBY SAMPLER
- GRAB SAMPLE
- Modified California Sampler

NOTES:

WATER LEVEL
▼ - MEASURED ▽ - ESTIMATED

Plate
B - 4

DATE
STARTED: 3/2/21
COMPLETED: 3/2/21
BACKFILLED: 3/2/21

Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number 1048-014

GeoStrata Rep: A. Peay
Rig Type: CME 55
Boring Type: C.A.S

BORING NO: B-4
Sheet 1 of 1

LOCATION
STATION 4,434,733.80 OFFSET 437,675.90 ELEVATION 4,564.00

DEPTH METERS	DEPTH FEET	MATERIAL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	N	N*	Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index
0	0	UNDOCUMENTED FILL; Poorly Graded GRAVEL with silt and sand - brown, moist								
		UNDOCUMENTED FILL; Lean CLAY - moist, brown		6	10					
1	5	Lean CLAY - medium stiff to soft, moist to wet, red brown to dark grey	CL	4	6					
2				5	8					
3	10	Fat CLAY with sand - medium stiff, wet, brown	CH			84.4	32.0	76.1	52	25
4										
5	15	Sandy Fat CLAY - medium stiff, wet, brown to dark gray	CH			81.2	34.6	66.1	61	33
6	20			5	8					
7		Bottom of Boring @ 21.5 Feet								
	25									
8										
9	30									
10										

SPT BLOW COUNT: 10 20 30 40 50 60 70 80 90

Moisture Content and Atterberg Limits
Plastic Limit | Moisture Content | Liquid Limit
10 20 30 40 50 60 70 80 90

N - OBSERVED UNCORRECTED BLOW COUNT

N* - CORRECTED N1(60) EQUIVALENT SPT BLOW COUNT

2020 LOG OF BORING - PLATE (B) 2020 GINT UPDATE TEMPLATE.GPJ GEOSTRATA.GDT 5/7/21

GeoStrata

SAMPLE TYPE
- 2" O.D./1.38" I.D. SPLIT SPOON SAMPLER
- 3" O.D./2.48" I.D. SAMPLER
- 3" O.D. THIN-WALLED SHELBY SAMPLER
- GRAB SAMPLE
- Modified California Sampler

NOTES:

WATER LEVEL
▼ - MEASURED ▽ - ESTIMATED

Plate
B - 5

DATE
STARTED: 4/27/21
COMPLETED: 4/27/21
BACKFILLED: 4/27/21

Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number 1048-014

GeoStrata Rep: B. Jackson
Rig Type: Mobile B-80
Boring Type: H.S.A.

BORING NO: B-5
Sheet 1 of 1

LOCATION
STATION 4,434,873.50 OFFSET 437,625.70 ELEVATION 4,560.00

DEPTH METERS	DEPTH FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	N	N*	SPT BLOW COUNT 10 20 30 40 50 60 70 80 90	Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits: Plastic Limit / Moisture Content / Liquid Limit 10 20 30 40 50 60 70 80 90
0	0					TOPSOIL - Lean CLAY with sand, moist, dark brown, sod extended approximately 3 inches									
						Lean CLAY - stiff to soft, moist to wet, brown to light brown	11	18							
1	5				CL		12	12							
2							4	6							
3	10					Lean CLAY with sand - medium stiff to stiff, wet, light brown to dark brown	8	8		77.5	39.7	73.3			
4															
5	15				CL		8	12			43.5	82.0			
6	20						10	15							
7						Bottom of Boring @ 21.5 Feet									
	25														
8															
9	30														
10															

N - OBSERVED UNCORRECTED BLOW COUNT

N* - CORRECTED N1(60) EQUIVALENT SPT BLOW COUNT

GeoStrata

SAMPLE TYPE
- 2" O.D./1.38" I.D. SPLIT SPOON SAMPLER
- 3" O.D./2.48" I.D. SAMPLER
- 3" O.D. THIN-WALLED SHELBY SAMPLER
- GRAB SAMPLE
- Modified California Sampler

NOTES:

WATER LEVEL
▼ - MEASURED ▽ - ESTIMATED

Plate
B - 6

2020 LOG OF BORING - PLATE (B) 2020 GINT UPDATE TEMPLATE.GPJ GEOSTRATA.GDT 5/7/21

DATE
STARTED: 4/27/21
COMPLETED: 4/27/21
BACKFILLED: 4/27/21

Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number 1048-014

GeoStrata Rep: B. Jackson
Rig Type: Mobile B-80
Boring Type: H.S.A.

BORING NO: B-6
Sheet 1 of 1

LOCATION
STATION 4,434,926.90 OFFSET 437,620.60 ELEVATION 4,559.00

DEPTH METERS	DEPTH FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	N	N*	SPT BLOW COUNT 10 20 30 40 50 60 70 80 90	Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits: Plastic Limit / Moisture Content / Liquid Limit 10 20 30 40 50 60 70 80 90
0	0					ASPHALT - 3"									
						FILL - Silty SAND with gravel, medium dense, moist, brown									
						Lean CLAY - stiff to soft, moist to wet, dark brown									
1					CL		11	12							
	5						4	6							
2						Sandy SILT - medium stiff, wet, blue-gray	6	6					21	NP	
					ML										
3	10					Silty SAND - very loose, wet, blue-gray, the sand is fine grained	4	6			32.6	33.4			
4					SM										
	15					Lean CLAY with sand - stiff, wet, blue-gray	22	22		87.8	30.8	72.6			
5															
6	20				CL		13	20							
						Bottom of Boring @ 21.5 Feet									
7															
	25														
8															
9	30														
10															

N - OBSERVED UNCORRECTED BLOW COUNT

N* - CORRECTED N1(60) EQUIVALENT SPT BLOW COUNT

2020 LOG OF BORING - PLATE (B) 2020 GINT UPDATE TEMPLATE.GPJ GEOSTRATA.GDT 5/7/21

GeoStrata

SAMPLE TYPE
- 2" O.D./1.38" I.D. SPLIT SPOON SAMPLER
- 3" O.D./2.48" I.D. SAMPLER
- 3" O.D. THIN-WALLED SHELBY SAMPLER
- GRAB SAMPLE
- Modified California Sampler

NOTES:

WATER LEVEL
▼ - MEASURED ▽ - ESTIMATED

Plate
B - 7

DATE
STARTED: 4/27/21
COMPLETED: 4/27/21
BACKFILLED: 4/27/21

Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number 1048-014

GeoStrata Rep: B. Jackson
Rig Type: Mobile B-80
Boring Type: H.S.A.

BORING NO: B-7
Sheet 1 of 1

LOCATION
STATION 4,434,986.60 OFFSET 437,621.70 ELEVATION 4,557.00

DEPTH METERS	DEPTH FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	N	N*	SPT BLOW COUNT 10 20 30 40 50 60 70 80 90	Dry Density (pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits: Plastic Limit / Moisture Content / Liquid Limit 10 20 30 40 50 60 70 80 90
0	0					ASPHALT - 3"									
						FILL - Silty SAND with gravel, medium dense, moist, brown									
						Lean CLAY - soft to stiff, moist to wet, grey	6	10							
1	5				CL		10	10							
2							3	4							
3	10					Sandy Lean CLAY - medium stiff to very stiff, wet, gray	6	6			44.9	65.1	39	16	
4															
	15				CL		14	21			29.9	98.0			
5															
6	20					Lean CLAY with sand - medium stiff, wet, gray	16	16		91.3	39.0	82.4	42	18	
7															
	25				CL		7	10							
8															
9	30						7	9			54.8	88.2			
10						Bottom of Boring @ 31.5 Feet									

N - OBSERVED UNCORRECTED BLOW COUNT

N* - CORRECTED N1(60) EQUIVALENT SPT BLOW COUNT

2020 LOG OF BORING - PLATE (B) 2020 GINT UPDATE TEMPLATE.GPJ GEOSTRATA.GDT 5/7/21

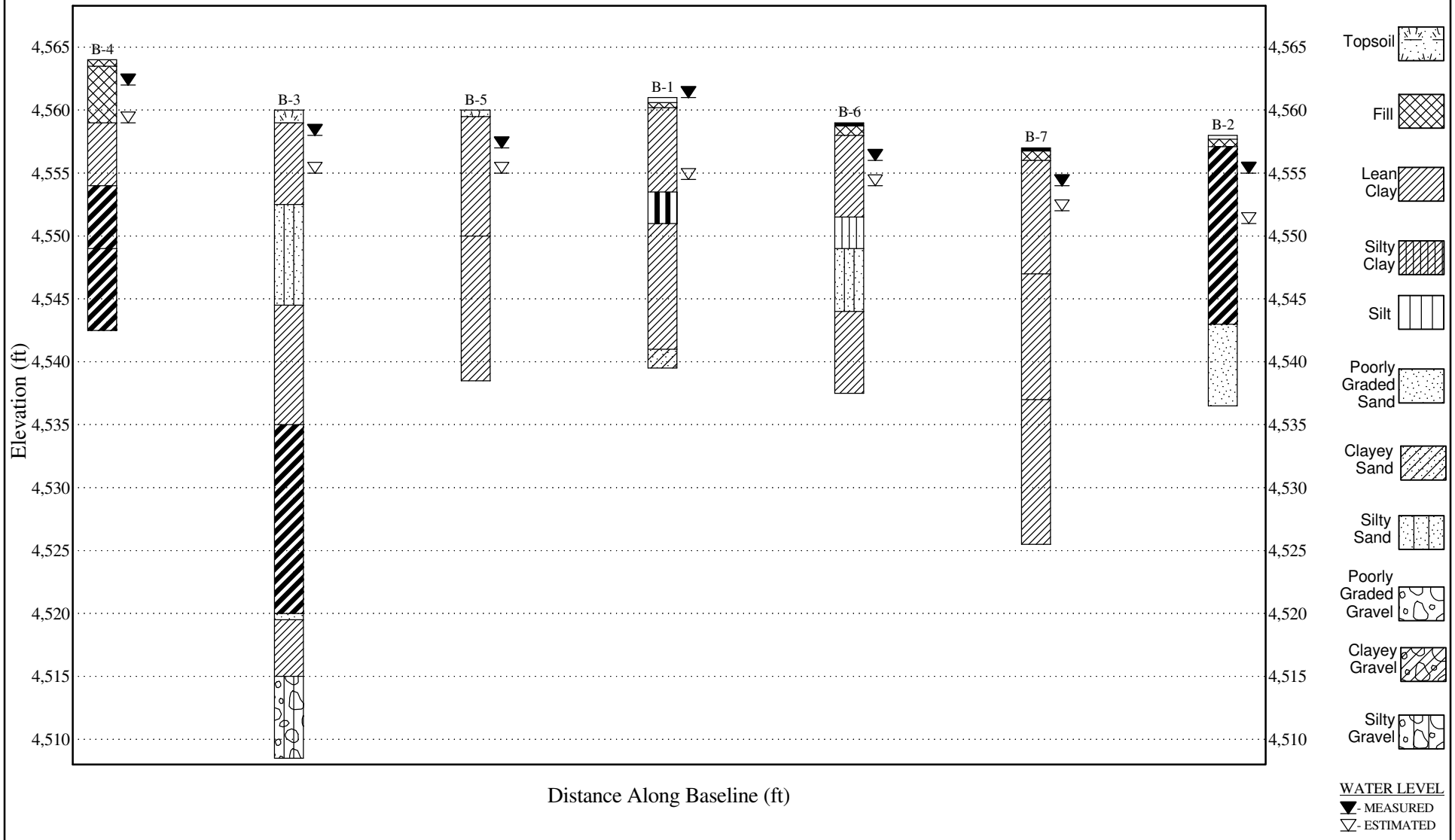
GeoStrata

SAMPLE TYPE
- 2" O.D./1.38" I.D. SPLIT SPOON SAMPLER
- 3" O.D./2.48" I.D. SAMPLER
- 3" O.D. THIN-WALLED SHELBY SAMPLER
- GRAB SAMPLE
- Modified California Sampler

NOTES:

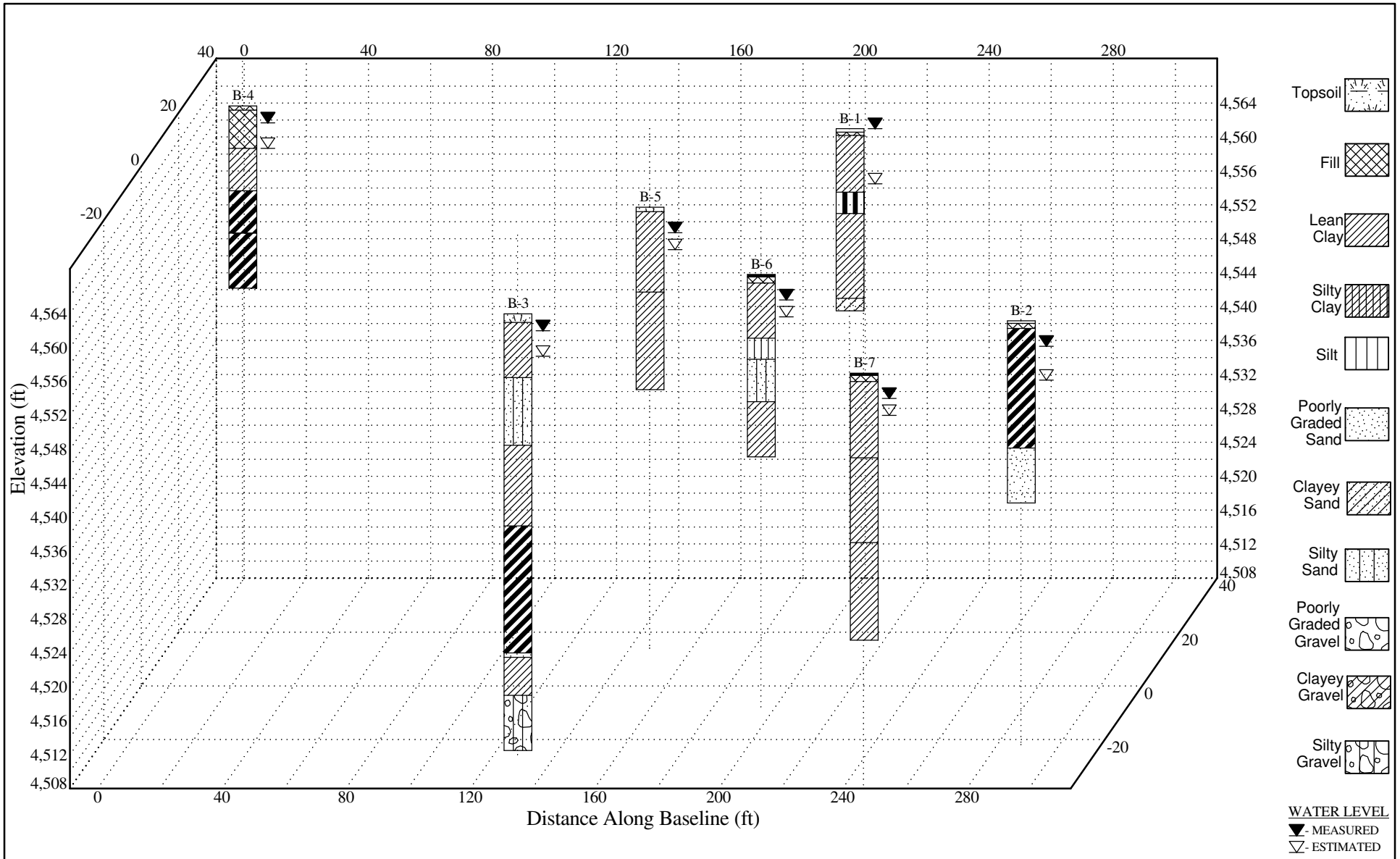
WATER LEVEL
▼ - MEASURED ▽ - ESTIMATED

Plate
B - 8



Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number: 1048-014

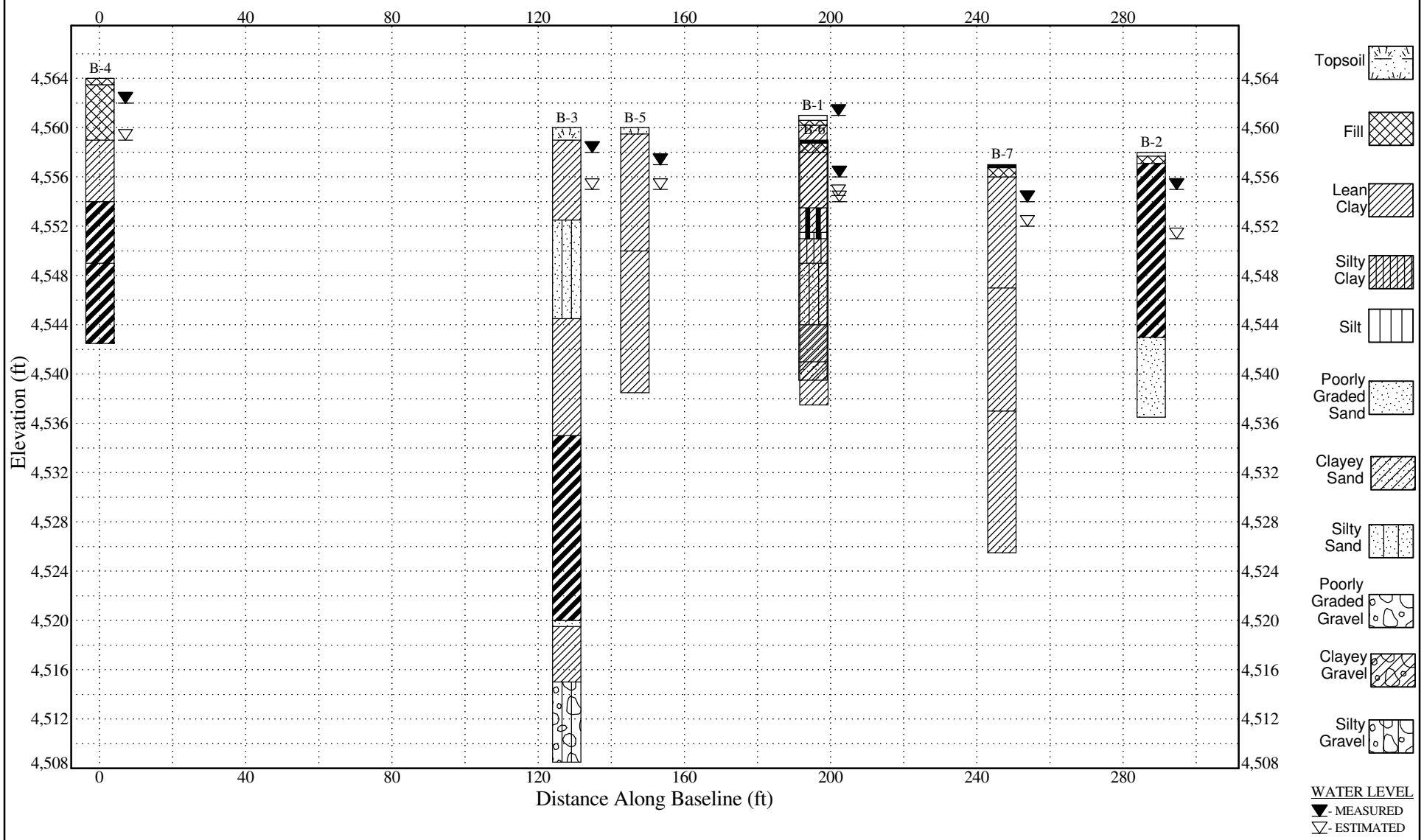
Plate
B-8



GeoStrata

Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number: 1048-014

Plate
B-10



Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number: 1048-014

Plate
B-9

Unified Soil Classification Per ASTM D 2488

Primary Divisions			Group Symbol	Group Name
COARSE-GRAINED SOILS more than 50% retained on the No. 200 Sieve	GRAVEL More than half of the coarse fraction is larger than the #4 sieve	Clean Gravel	GW	Well Graded GRAVEL
			GP	Poorly Graded GRAVEL
		Gravel with Duel Classifications	GW-GM	Well Graded GRAVEL with silt
			GP-GM	Poorly Graded GRAVEL with silt
			GW-GC	Well Graded GRAVEL with clay
			GP-GC	Poorly Graded GRAVEL with clay
		Gravel with Fines	GM	Silty GRAVEL
			GC	Clayey GRAVEL
			GC-GM	Silty, Clayey GRAVEL
	SAND More than half of the coarse fraction is smaller than the #4 sieve	Clean Sand	SW	Well Graded SAND
			SP	Poorly Graded SAND
		Sand with Dual Classifications	SW-SM	Well Graded SAND with silt
			SP-SM	Poorly Graded SAND with silt
			SW-SC	Well Graded SAND with clay
			SP-SC	Well Graded SAND with clay
		Sand with Fines	SM	Silty SAND
			SC	Clayey SAND
			SC-SM	Silty, Clayey SAND
FINE-GRAINED SOILS 50% or more passes No. 200 Sieve	SILTY & CLAY less than 50%	Inorganic	CL	Lean CLAY
			ML	SILT
			CL-ML	Silty CLAY
		Organic	OL	Organic CLAY or Organic SILT
	SILTY & CLAY LL 50% or more	Inorganic	CH	Fat CLAY
			MH	Elastic SILT
		Organic	OH	Organic CLAY or Organic SILT
	Highly Organic Soils		PT	Peat

Exploration Log Key

Sample Symbols	Ground Water Symbol
Auger Cuttings	Measured Groundwater Elevation
California Sampler	Estimated Groundwater Elevation
Rock Core	
Bag or Block Sample	
Modified California Sampler	
No Recovery	
Split Spoon	
Shelby Tube	
Dames and More Sampler	

Relative Density	SPT N (blows/ft)
Very Loose	0 to 4
Loose	5 to 10
Med. Dense	11 to 30
Dense	31 to 50
Very Dense	>51

Consistency	SPT N (blows/ft)
Very Soft	0 to 1
Soft	2 to 4
Med. Stiff	5 to 8
Stiff	9 to 15
Very Stiff	16 to 30
Hard	31 to 60
Very Hard	>61

Modifiers	
Description	Percentage
Trace	less than 5
Some	5 to 12
With	more than 12

GeoStrata

Soil Symbols and Description Key

Forsgren Associates, Inc.
Payson WWTP
Payson, Utah
Project Number: 1048-013

Plate B-12

APPENDIX C

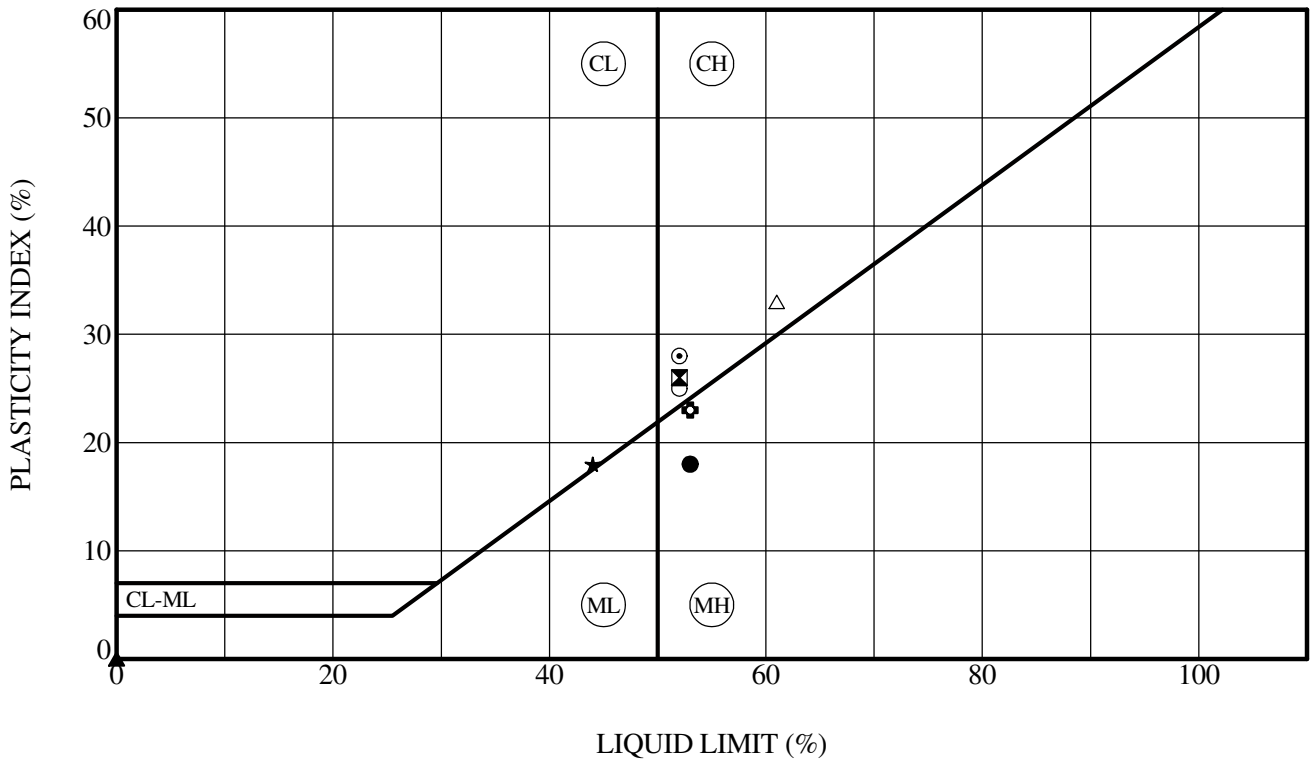
Boring No.	Sample Depth (feet)	USCS Soil Classification	Natural Moisture Content (%)	Natural Dry Density (pcf)	Optimum Moisture Content (%)	Maximum Dry Density (pcf)	Gradation			Atterberg		Consolidation			Sulfate Content (ppm)	Resistivity (Ω-cm)	pH
							Gravel (%)	Sand (%)	Fines (%)	LL	PI	Cc	Cr	OCR			
B-1	2.5	CL	39.4						79.3								
B-1	7.5	MH	58.9						57.5	53	18						
B-1	20	SC	33.7						26.9								
B-2	7.5	CH	47.2						85.4	52	26						
B-2	20	SP	11.6				31.2	67.1	1.7								
B-3	2.5	CL													69.4	570	8.09
B-3	5	CL	38.5	82.8								0.105	0.014	1.4			
B-3	7.5	SM	47.5				0.9	79.3	19.8	NP	NP						
B-3	20	CL	34.3				0.3	2.2	97.5	44	18						
B-3	35	CH	51.7				0.0	3.6	96.4	52	28						
B-3	50	GM					42.5	16.5	41.0	53	23						
B-4	10	CH	32	84.4			0.0	23.9	76.1	52	25	0.152	0.03	2.2			
B-4	15	CH	34.6	81.2			0.0	33.9	66.1	61	33	0.173	0.023	1.2			
B-5	10	CL	39.7	77.5					73.3			0.13	0.02	2.7			
B-5	15		43.5						82.0								
B-6	2.5	CL													101	640	8.31
B-6	7.5	ML								21	NP						
B-6	10		32.6						33.4								
B-6	15	CL	30.8	87.8					72.6			0.086	0.023	1.5			
B-7	10	CL	44.9						65.1	39	16						
B-7	15		29.9						98.0								
B-7	20	CL	39	91.3					82.4	42	18	0.106	0.022	1.3			
B-7	30		54.8						88.2								

GeoStrata

Lab Summary Report

Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number: 1048-014

Plate C - 1



Sample Location		Depth (ft)	LL (%)	PL (%)	PI (%)	Fines (%)	Classification
●	**B-1**	**7.5**	**53**	**35**	**18**	**57.5**	**Sandy Elastic SILT**
⊠	**B-2**	**7.5**	**52**	**26**	**26**	**85.4**	**Fat CLAY**
▲	**B-3**	**7.5**	**NP**	**NP**	**NP**	**19.8**	**Silty SAND**
★	**B-3**	**20.0**	**44**	**26**	**18**	**97.5**	**Lean CLAY**
⊙	**B-3**	**35.0**	**52**	**24**	**28**	**96.4**	**Fat CLAY**
✿	**B-3**	**50.0**	**53**	**30**	**23**	**41.0**	**Silty GRAVEL**
○	**B-4**	**10.0**	**52**	**27**	**25**	**76.1**	**Fat CLAY with sand**
△	**B-4**	**15.0**	**61**	**28**	**33**	**66.1**	**Sandy Fat CLAY**

ATTERBERG LIMITS' RESULTS - ASTM D 4318

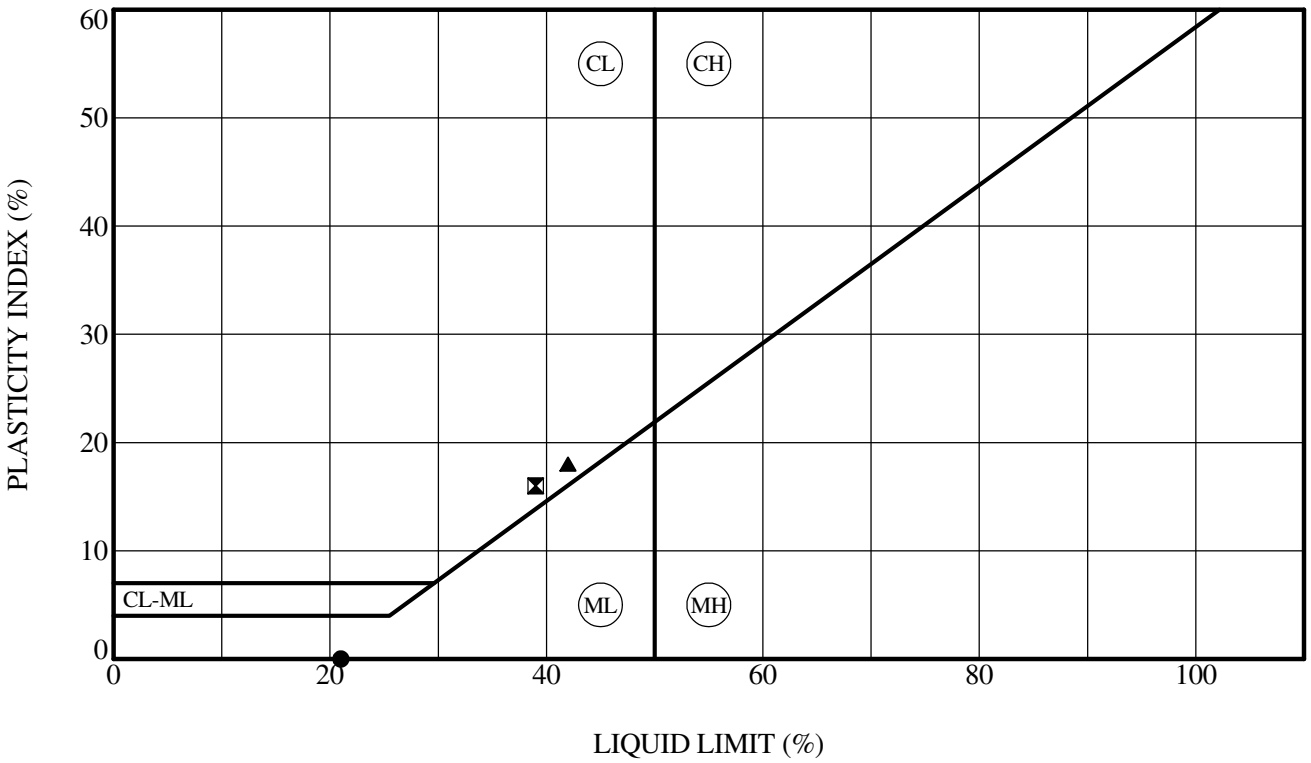
GeoStrata

Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number: 1048-014

Plate

C - 2

C_ATTERBERG 2020 GINT UPDATE TEMPLATE.GPJ GEOSTRATA.GDT 5/6/21



Sample Location		Depth (ft)	LL (%)	PL (%)	PI (%)	Fines (%)	Classification
●	**B-6**	**7.5**	**21**	**21**	**NP**		**Sandy SILT**
⊠	**B-7**	**10.0**	**39**	**23**	**16**	**65.1**	**Sandy Lean CLAY**
▲	**B-7**	**20.0**	**42**	**24**	**18**	**82.4**	**Lean CLAY with sand**

ATTERBERG LIMITS' RESULTS - ASTM D 4318

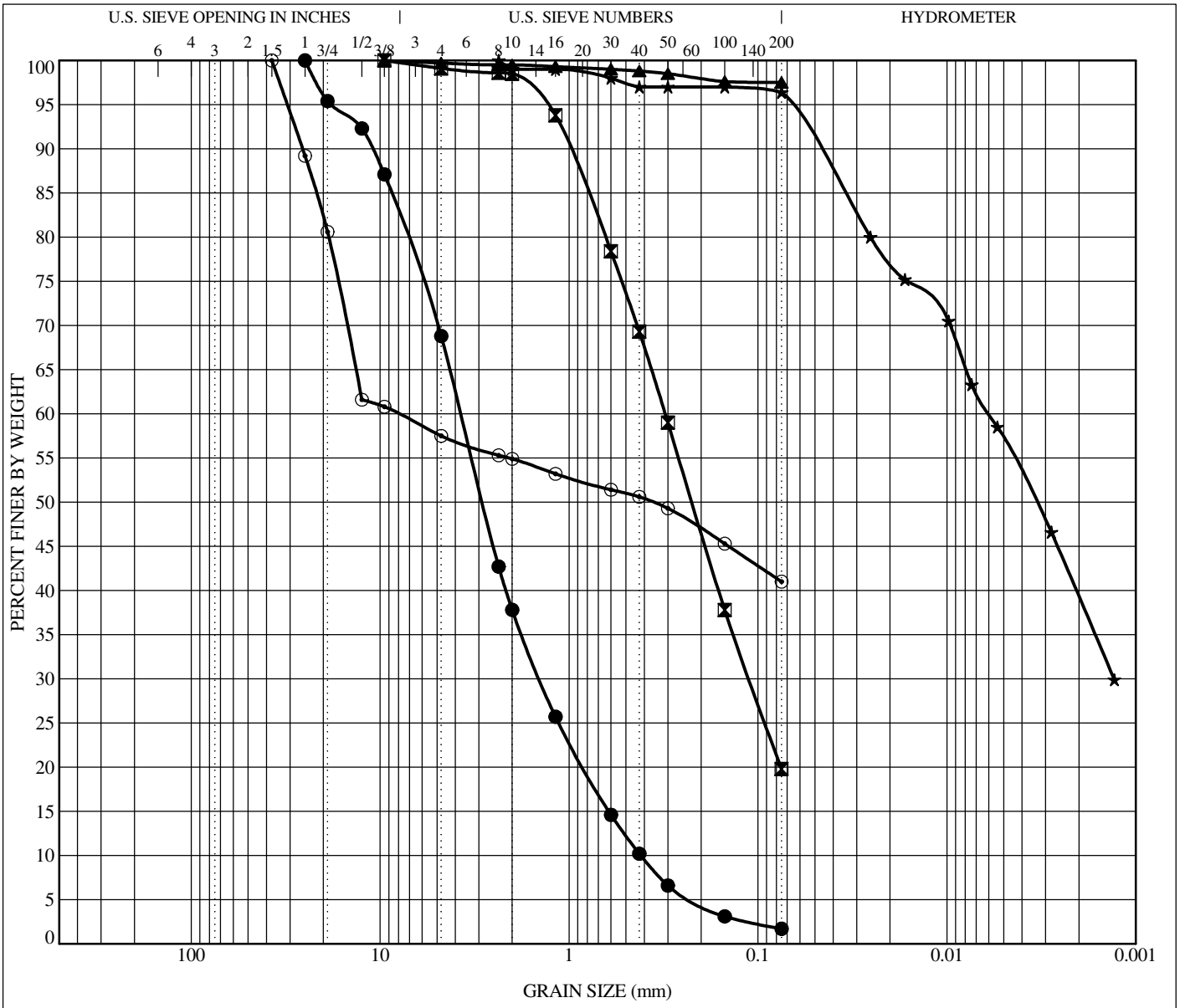
GeoStrata

Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number: 1048-014

Plate

C - 3

C_ATTERBERG 2020 GINT UPDATE TEMPLATE.GPJ GEOSTRATA.GDT 5/6/21



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample Location		Depth	Classification	LL	PL	PI	Cc	Cu
●	B-2	20.0	Poorly Graded SAND with gravel				1.30	9.00
⊠	B-3	7.5	Silty SAND	NP	NP	NP		
▲	B-3	20.0	Lean CLAY	44	26	18		
★	B-3	35.0	Fat CLAY	52	24	28		
⊙	B-3	50.0	Silty GRAVEL	53	30	23		

Sample Loctaion		Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-2	20.0	25	3.752	1.423	0.417	31.2	67.1	1.7	
⊠	B-3	7.5	9.5	0.31	0.111		0.9	79.3	19.8	
▲	B-3	20.0	9.5				0.3	2.2	97.5	
★	B-3	35.0	2.36	0.006	0.001		0.0	3.6	57.1	39.3
⊙	B-3	50.0	37.5	8.031			42.5	16.5	41.0	

GeoStrata

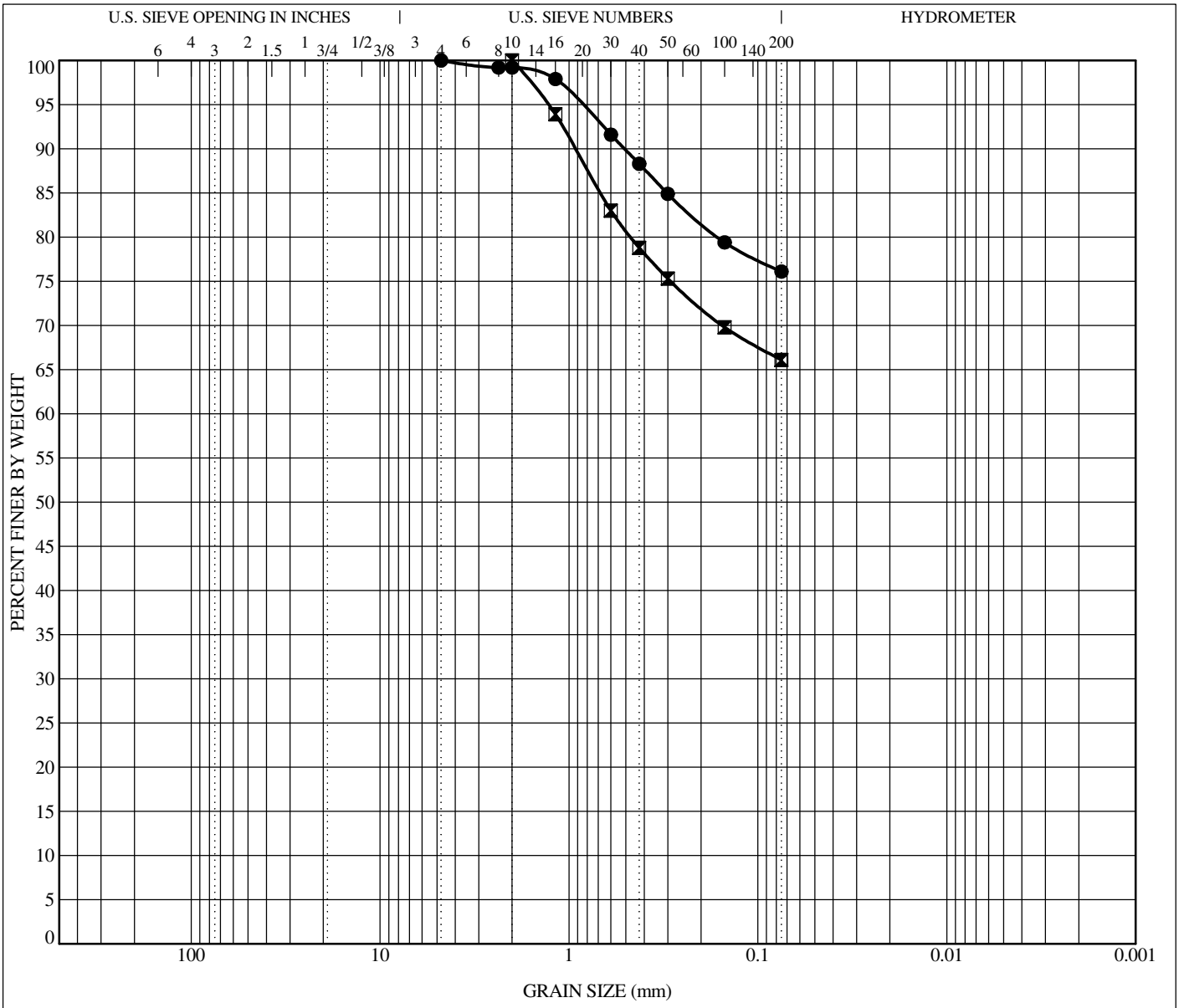
GRAIN SIZE DISTRIBUTION - ASTM D422

Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number: 1048-014

Plate

C - 4

C_GSD 2020 GINT UPDATE TEMPLATE.GPJ GEOSTRATA.GDT 5/6/21



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Location	Depth	Classification	LL	PL	PI	Cc	Cu
●	**B-4**	**10.0**	**Fat CLAY with sand**	**52**	**27**	**25**		
⊠	**B-4**	**15.0**	**Sandy Fat CLAY**	**61**	**28**	**33**		

	Sample Loctaion	Depth	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-4**	**10.0**	**4.75**				**0.0**	**23.9**	**76.1**	
⊠	**B-4**	**15.0**	**2**				**0.0**	**33.9**	**66.1**	

GeoStrata

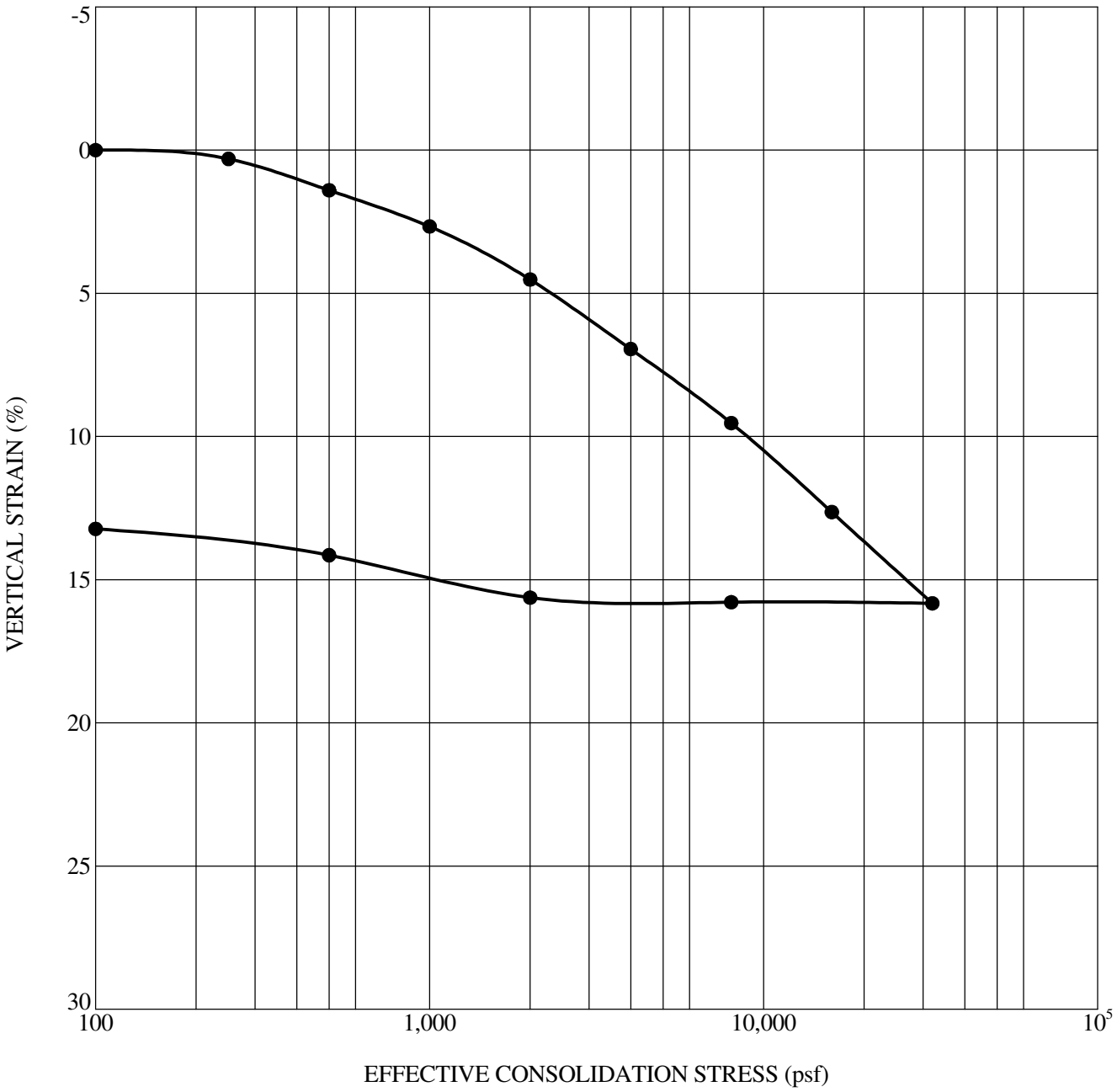
GRAIN SIZE DISTRIBUTION - ASTM D422

Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number: 1048-014

Plate

C - 5

C_GSD 2020 GINT UPDATE TEMPLATE.GPJ GEOSTRATA.GDT 5/6/21



Sample Location	Depth (ft)	Classification	γ_d (pcf)	MC (%)	C'_c	C'_r	OCR
● **B-3**	**5.0**	**Lean CLAY**	**83**	**39**	**0.105**	**0.014**	**1.4**

1-D CONSOLIDATION TEST - ASTM D 2435

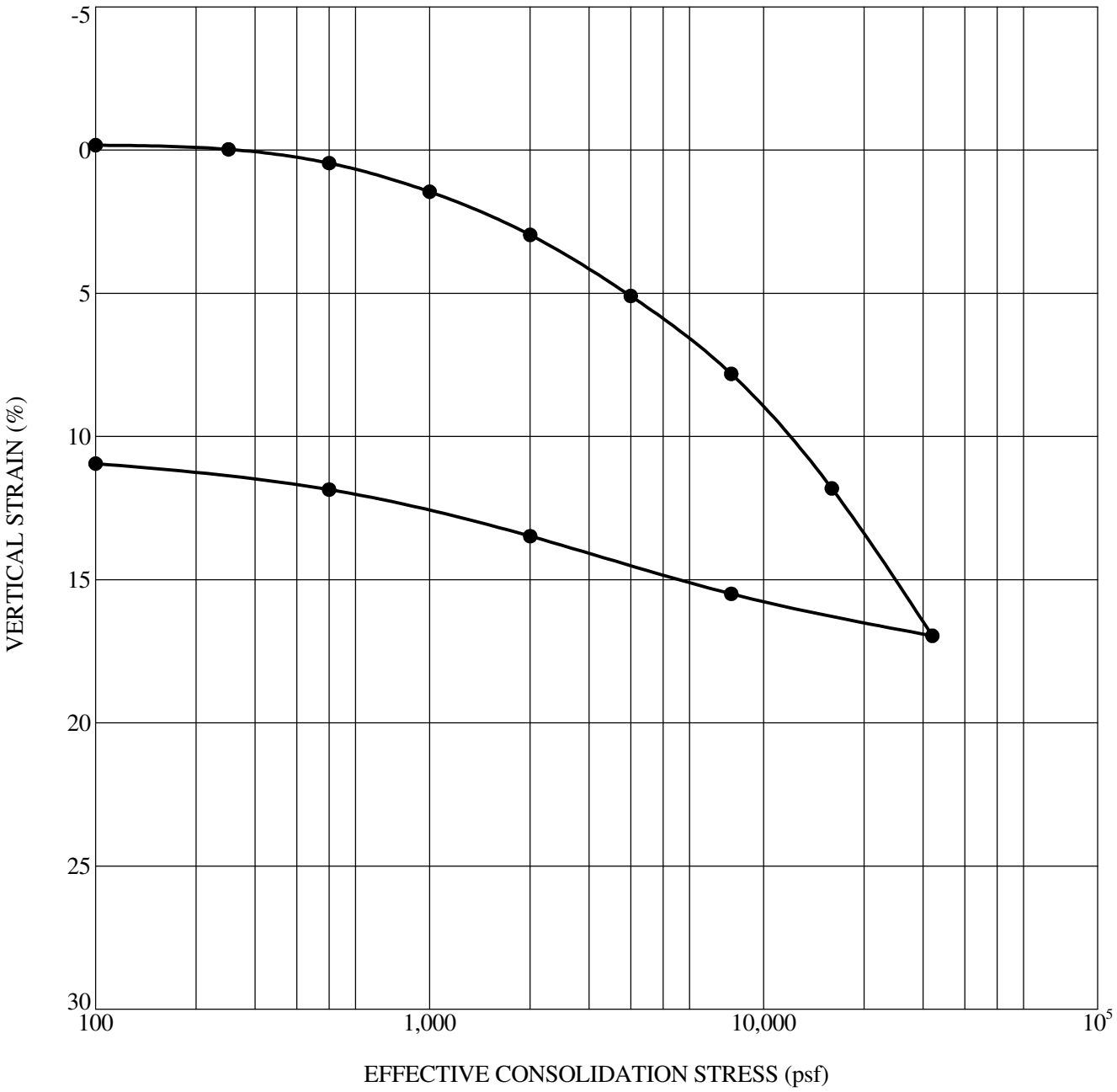
GeoStrata

Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number: 1048-014

Plate

C - 6

C_CONSOL 2020 GINT UPDATE TEMPLATE.GPJ GEOSTRATA.GDT 5/6/21



Sample Location	Depth (ft)	Classification	γ_d (pcf)	MC (%)	C'_c	C'_r	OCR
● **B-4**	**10.0**	**Fat CLAY with sand**	**86**	**29**	**0.152**	**0.030**	**2.2**

GeoStrata

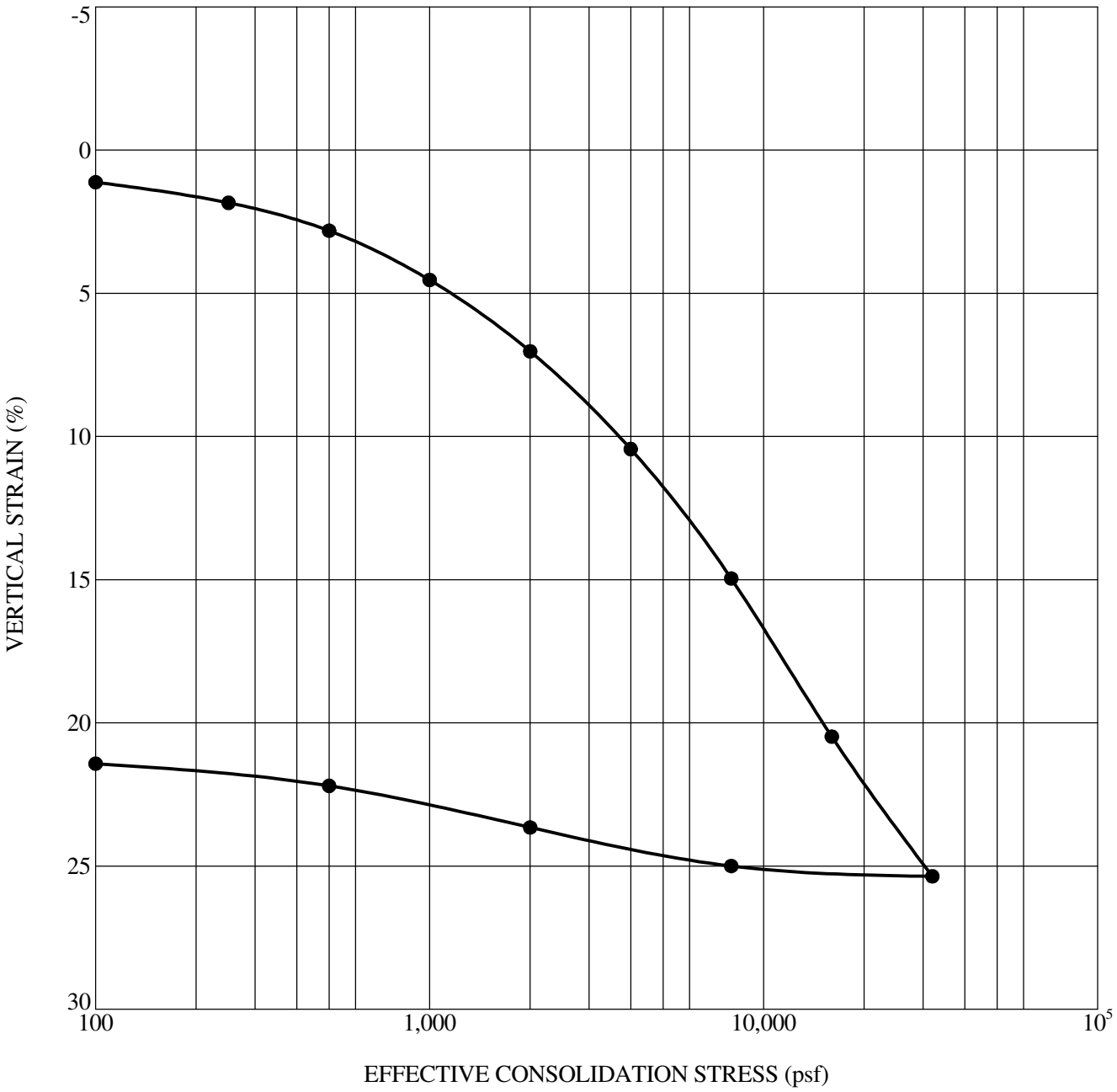
1-D CONSOLIDATION TEST - ASTM D 2435

Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number: 1048-014

Plate

C - 7

C_CONSOL 2020 GINT UPDATE TEMPLATE.GPJ GEOSTRATA.GDT 5/6/21



Sample Location	Depth (ft)	Classification	γ_d (pcf)	MC (%)	C'$_c$	C'$_r$	OCR
● **B-4**	**15.0**	**Sandy Fat CLAY**	**81**	**35**	**0.173**	**0.023**	**1.2**

GeoStrata

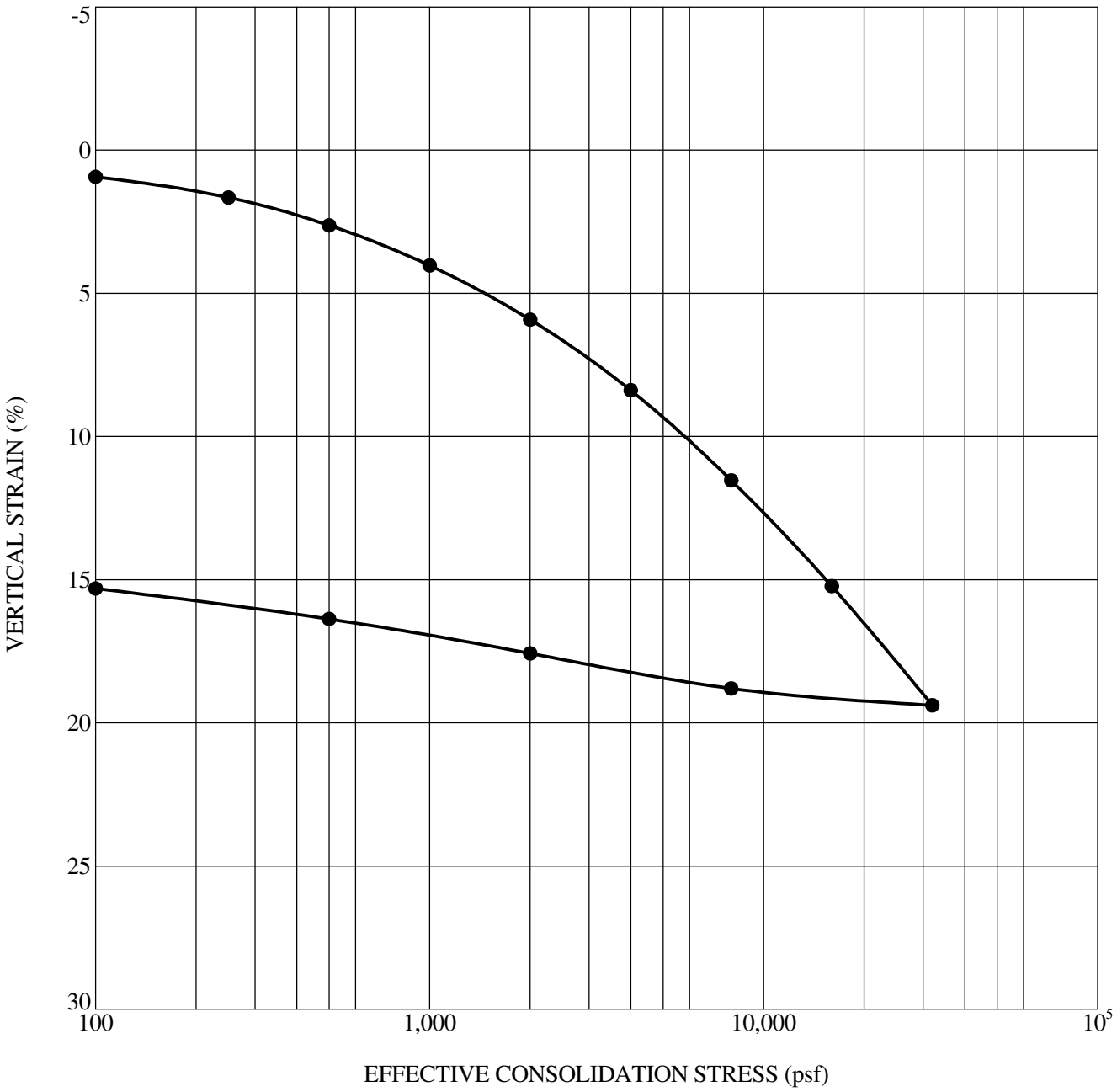
1-D CONSOLIDATION TEST - ASTM D 2435

Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number: 1048-014

Plate

C - 8

C_CONSOL 2020 GINT UPDATE TEMPLATE.GPJ GEOSTRATA.GDT 5/6/21



Sample Location	Depth (ft)	Classification	γ_d (pcf)	MC (%)	C'$_c$	C'$_r$	OCR
● **B-5**	**10.0**	**Lean CLAY with sand**	**77**	**44**	**0.130**	**0.020**	**2.7**

GeoStrata

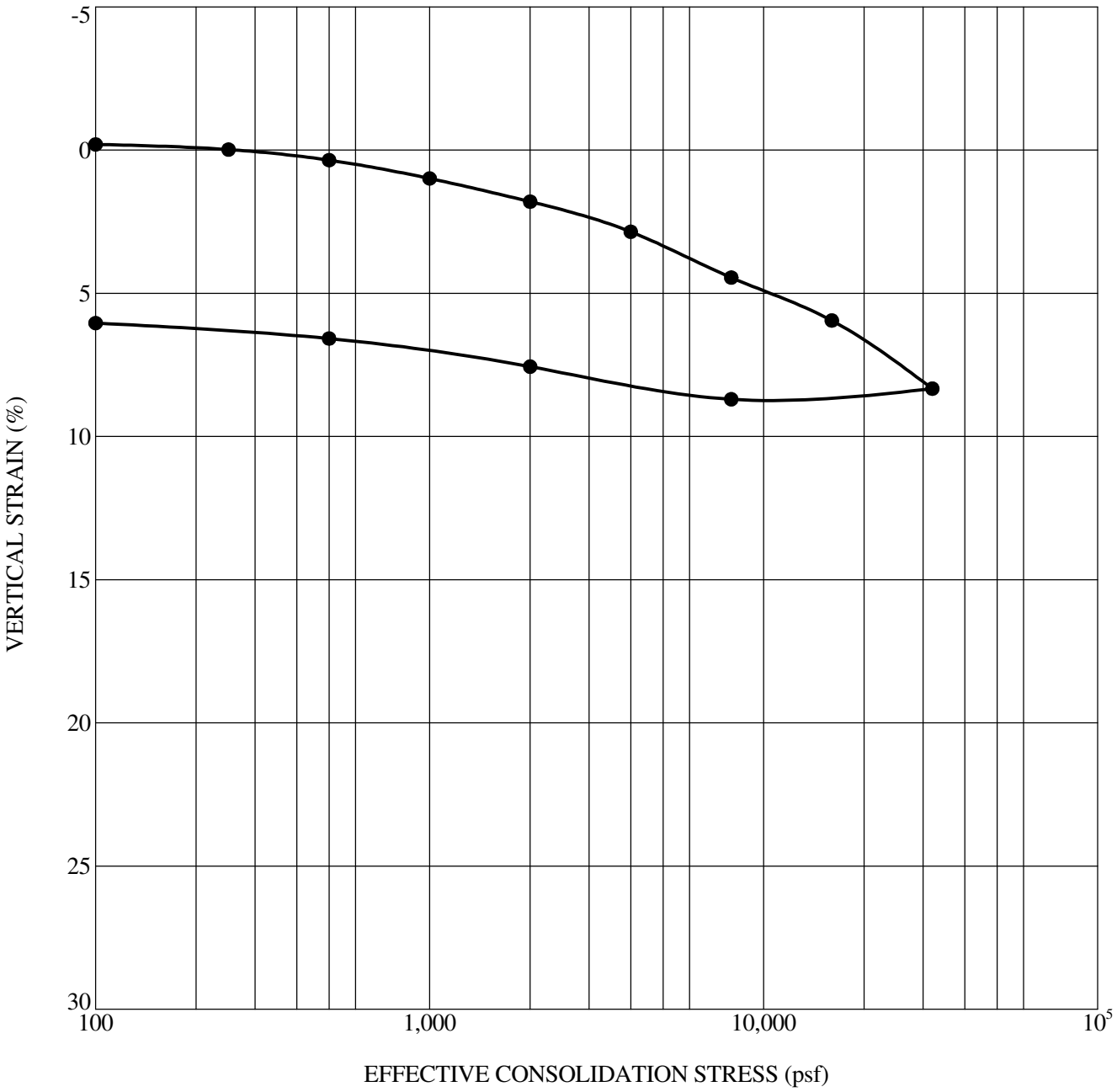
1-D CONSOLIDATION TEST - ASTM D 2435

Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number: 1048-014

Plate

C - 9

C_CONSOL 2020 GINT UPDATE TEMPLATE.GPJ GEOSTRATA.GDT 5/6/21



Sample Location	Depth (ft)	Classification	γ_d (pcf)	MC (%)	C'$_c$	C'$_r$	OCR
● **B-6**	**15.0**	**Lean CLAY with sand**	**88**	**30**	**0.086**	**0.023**	**1.5**

GeoStrata

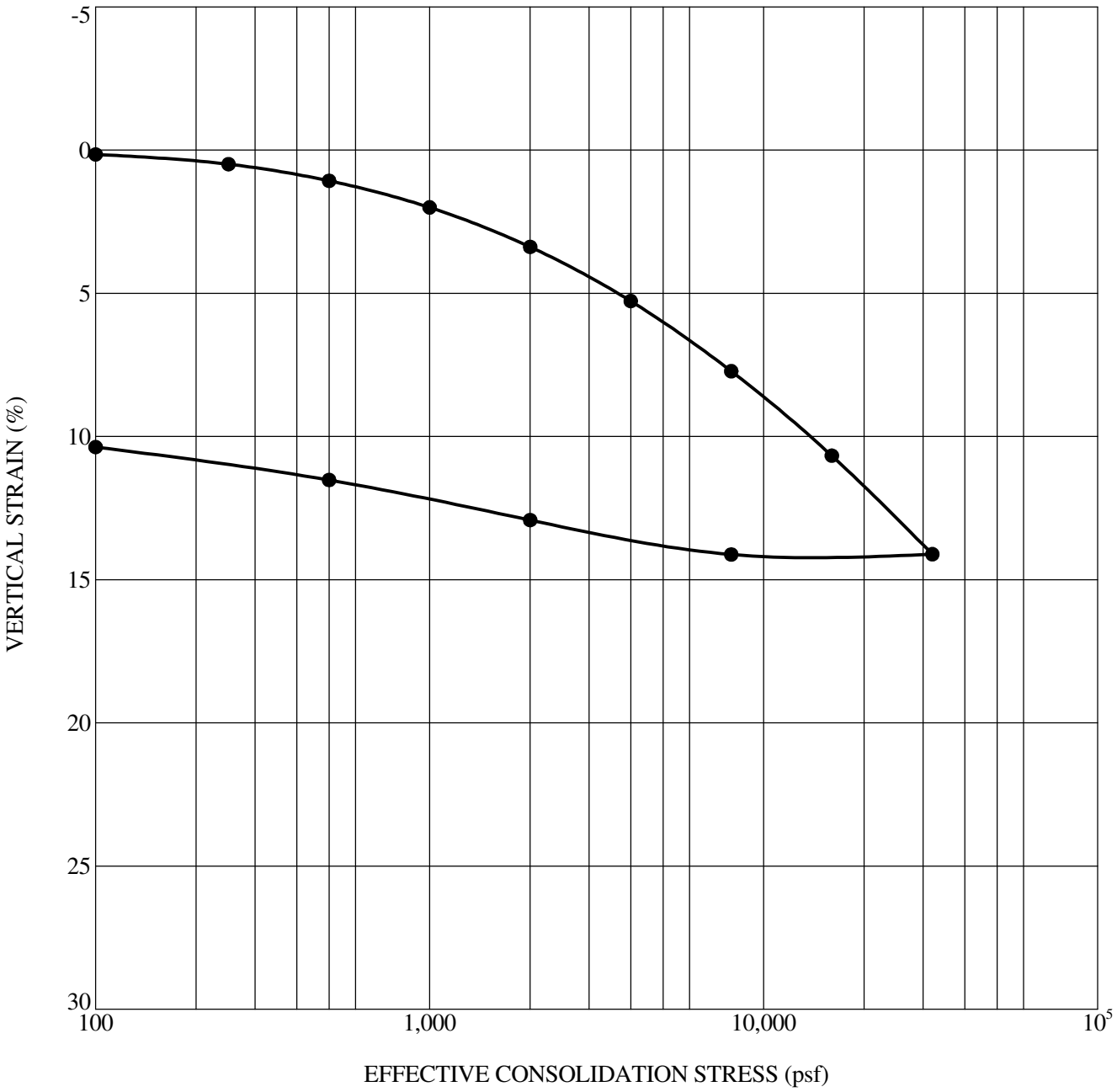
1-D CONSOLIDATION TEST - ASTM D 2435

Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number: 1048-014

Plate

C - 10

C_CONSOL 2020 GINT UPDATE TEMPLATE.GPJ GEOSTRATA.GDT 5/6/21



Sample Location	Depth (ft)	Classification	γ_d (pcf)	MC (%)	C'_c	C'_r	OCR
● **B-7**	**20.0**	**Lean CLAY with sand**	**91**	**28**	**0.106**	**0.022**	**1.3**

GeoStrata

1-D CONSOLIDATION TEST - ASTM D 2435

Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number: 1048-014

Plate

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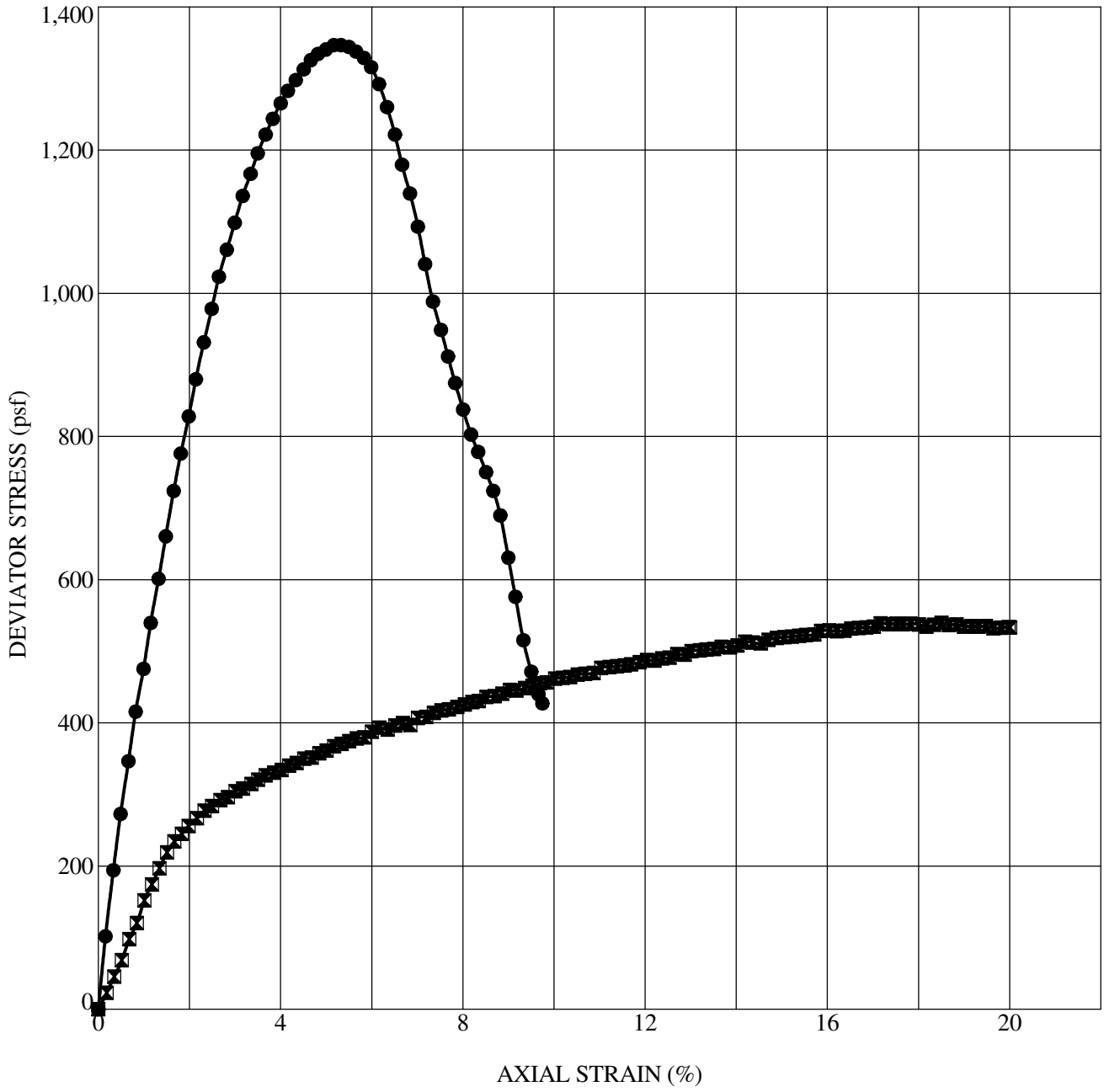
C_CONSOL 2020 GINT UPDATE TEMPLATE.GPJ GEOSTRATA.GDT 5/6/21



*SHEAR STRESS is equal to one half of the DEVIATOR STRESS

	Sample Location	Depth (ft)	Classification	γ_d (pcf)	MC (%)	Max. Shear Stress (psf)	
●	**B-4**	**10.0**	**Fat CLAY with sand**	**84**	**32**	**673.5**	
⊠	**B-4**	**15.0**	**Sandy Fat CLAY**	**81**	**35**	**259.5**	

GeoStrata

UNCONFINED COMPRESSION TEST

Forsgren Associates, Inc
Payson WWTP
Payson, Utah
Project Number: 1048-014

Plate

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APPENDIX D

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

GeoStrata

Information about this Geotechnical-Engineering Report

Forsgren Associates, Inc.
Payson WWTP
Payson, Utah
Project Number: 1048-014

Plate D-1

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for information purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, *proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration* by including building-envelope or mold specialists on the design team. *Geotechnical engineers are not building-envelope or mold specialists.*

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

From: Robert Gardel
Sent: Wednesday, May 12, 2021 9:49 AM
To: Travis Jockumsen
Subject: RE: Environmental Review for Payson WWTP

Nothing needed at this time, Thanks!

Robert Gardel
E.I.T.
370 East 500 South, Ste. 200
Salt Lake City, UT 84111
801.258.8298 / 508.308.5724 Cell

FORSGREN Associates Inc.

From: Travis Jockumsen <travisj@payson.org>
Sent: Wednesday, May 12, 2021 9:47 AM
To: Robert Gardel <rgardel@forsgren.com>
Subject: RE: Environmental Review for Payson WWTP

EXTERNAL MESSAGE

Robert,

It looks fine to me. Do you need anything else from us?

Thanks,

Travis Jockumsen, P.E.
Payson City
Payson City Public Works Director, & City Engineer
439 West Utah Avenue
Payson, UT 84651
travisj@payson.org
801-465-5235

From: Robert Gardel <rgardel@forsgren.com>
Sent: Monday, May 10, 2021 12:06 PM
To: Travis Jockumsen <travisj@payson.org>
Subject: Environmental Review for Payson WWTP

Hi Travis,

This is Robert Gardel at Forsgren Associates. I am sending this letter in regards to the updated waste water treatment plant for the city of Payson. Please let me know if you have any questions or concerns.

Thanks,

Robert Gardel
E.I.T.
370 East 500 South, Ste. 200
Salt Lake City, UT 84111
801.258.8298 / 508.308.5724 Cell

FORSGREN Associates Inc.

From: Robert Gardel
Sent: Friday, May 7, 2021 3:17 PM
To: Jencks, Hollis G CIV (USA)
Subject: RE: Environmental Review for Payson WWTP
Attachments: Payson WWTP Site Plan Sketch v7.pdf

Hi Hollis,

Just wanted to send you a copy of the site plan exhibit. I was unaware we had this when you asked earlier, sorry for the confusion.

Thanks,

Robert Gardel
E.I.T.
370 East 500 South, Ste. 200
Salt Lake City, UT 84111
801.258.8298 / 508.308.5724 Cell

FORSGREN Associates Inc.

From: Jencks, Hollis G CIV (USA) <Hollis.G.Jencks@usace.army.mil>
Sent: Friday, April 30, 2021 11:48 AM
To: Robert Gardel <rgardel@forsgren.com>
Subject: RE: Environmental Review for Payson WWTP

EXTERNAL MESSAGE

The letter referred to an exhibit, so I though I was missing something. It can wait until we start the permitting process.

Thanks and have a good weekend,

Hollis Jencks

Regulatory Project Manager
United States Army Corps of Engineers
533 West 2600 South, Suite 150
Bountiful, UT 84010-7744
Ph: 801-295-8380 x 8318

Customer Service Hours: 9am - 3pm

In response to COVID-19, Regulatory Division staff are teleworking from home or other approved location. We will do our best to administer the Regulatory Program in an effective and efficient manner. Priority will be given to health and safety activities and essential infrastructure. Action on your permit application or other request may be delayed during this emergency. We appreciate your patience over the next several weeks.

From: Robert Gardel <rgardel@forsgren.com>
Sent: Friday, April 30, 2021 11:23 AM
To: Jencks, Hollis G CIV (USA) <Hollis.G.Jencks@usace.army.mil>
Subject: [Non-DoD Source] RE: Environmental Review for Payson WWTP

Hi Hollis,

We don't have an exhibit at the moment, it is still in the early development stages. The new WWTP will be in the same location as the old one, so we won't be converting any new lands. What exactly are you looking for and maybe I can draw it up quick?

Thanks

Robert Gardel
E.I.T.
370 East 500 South, Ste. 200
Salt Lake City, UT 84111
801.258.8298 / 508.308.5724 Cell

FORSGREN Associates Inc.

From: Jencks, Hollis G CIV (USA) <Hollis.G.Jencks@usace.army.mil>
Sent: Friday, April 30, 2021 10:52 AM
To: Robert Gardel <rgardel@forsgren.com>
Subject: FW: Environmental Review for Payson WWTP

EXTERNAL MESSAGE

Hi Robert,

Jason forwarded me the scoping letter and I will be the contact for this project. The letter we received did not have the exhibit. Could you please email me a copy?

Thanks,

Hollis Jencks

Regulatory Project Manager
United States Army Corps of Engineers
533 West 2600 South, Suite 150
Bountiful, UT 84010-7744
Ph: 801-295-8380 x 8318

Customer Service Hours: 9am - 3pm

In response to COVID-19, Regulatory Division staff are teleworking from home or other approved location. We will do our best to administer the Regulatory Program in an effective and efficient manner. Priority will be given to health and safety activities and essential infrastructure. Action on your permit application or other request may be delayed during this emergency. We appreciate your patience over the next several weeks.

From: Gipson, Jason A CIV USARMY CESPK (USA) <Jason.A.Gipson@usace.army.mil>
Sent: Friday, April 30, 2021 10:17 AM
To: Jencks, Hollis G CIV (USA) <Hollis.G.Jencks@usace.army.mil>
Subject: FW: Environmental Review for Payson WWTP

For you

Let us know how we're doing. Please complete the survey at:
https://regulatory.ops.usace.army.mil/customer-service-survey/

Jason Gipson
Chief, Nevada-Utah Regulatory Section
533 West 2600 South, Suite 150
Bountiful, Utah 84010

Ph: 801-295-8380 x 8314
Cell: 801-725-1275

In response to COVID-19, Regulatory Division staff are teleworking from home or other approved location. We will do our best to administer the Regulatory Program in an effective and efficient manner. Priority will be given to health and safety activities and essential infrastructure. Action on your permit application or other request may be delayed during this emergency. We appreciate your patience over the next several weeks.

From: Robert Gardel <rgardel@forsgren.com>
Sent: Friday, April 30, 2021 9:37 AM
To: Gipson, Jason A CIV USARMY CESPK (USA) <Jason.A.Gipson@usace.army.mil>
Subject: [Non-DoD Source] Environmental Review for Payson WWTP

Hi Jason,

This is Robert Gardel at Forsgren Associates. I am sending this letter in regards to the updated waste water treatment plant for the city of Payson. Please let me know if you have any questions or concerns.

Thanks,
Robert Gardel
E.I.T.
370 East 500 South, Ste. 200
Salt Lake City, UT 84111
801.258.8298 / 508.308.5724 Cell

FORSGREN Associates Inc.

From: Thapa, Bir - NRCS, Salt Lake City, UT <Bir.Thapa@usda.gov>
Sent: Tuesday, May 4, 2021 10:39 AM
To: Robert Gardel
Subject: RE: Payson City Wastewater Treatment Plant Upgrade

EXTERNAL MESSAGE

If that is the case, no land will be converted right? So FPPA does not apply to you.
Thanks,
Bir

From: Robert Gardel <rgardel@forsgren.com>
Sent: Friday, April 30, 2021 4:09 PM
To: Thapa, Bir - NRCS, Salt Lake City, UT <Bir.Thapa@usda.gov>
Subject: RE: Payson City Wastewater Treatment Plant Upgrade

Hi Bir,

Just want to confirm before I start filling out the form and making maps. This is an upgrade to an existing waste water treatment plant, it will be on the same site and no other land is going to be converted. Do you still wish for form AD-1006?

Thanks,

Robert Gardel
E.I.T.
370 East 500 South, Ste. 200
Salt Lake City, UT 84111
801.258.8298 / 508.308.5724 Cell

FORSGREN Associates Inc.

From: Thapa, Bir - NRCS, Salt Lake City, UT <Bir.Thapa@usda.gov>
Sent: Friday, April 30, 2021 3:39 PM
To: Robert Gardel <rgardel@forsgren.com>
Subject: Payson City Wastewater Treatment Plant Upgrade

EXTERNAL MESSAGE

Robert,
Good afternoon!

Regarding your wastewater treatment plant upgrade project, I am attaching form AD-1006. This form is used to evaluate whether Farm Protection Policy Act (FPPA) applies. I always advise to study and fill out the form Ad-1006. FPPA applies if any one of the following three activities meets the condition:

1. Federal funds are involved
2. Irreversible conversion of prime, unique important farmland to non-agricultural use
3. None of the following exemptions to FPPA apply

   It seems that your project does involve Federal Funds. If that is the case, then FPPA process need to be followed.

Exemptions (land)
• Land not considered “farmland” under FPPA
– Land already “developed” or already irreversibly converted
• US Census urban areas maps
• Existing “footprint” including rights-of-way
– Land already committed to urban development
– Land committed to water storage

Please fill out Parts I and III of form AD-1006 (attached) and submit appropriately scaled maps indicating the location of the project site. Also describe activities you are proposing.
Then I will decide what to do next.

Thank you,

USDA

BIR THAPA, PH. D.

NRCS Utah State Office

State Soil Scientist

125 S. State Street. Suite 4010
Salt Lake City, UT 84138
Work: 801-524-4573
Bir.Thapa@USDA.gov

From: Converse, Yvette <yvette_converse@fws.gov>
Sent: Tuesday, July 20, 2021 11:08 AM
To: Robert Gardel
Subject: Re: [EXTERNAL] RE: Environmental Review for Payson WWTP

EXTERNAL MESSAGE
got it. thank you.

Yvette K. Converse
Field Supervisor

Utah Ecological Services Field Office
U.S. Fish and Wildlife Service
2369 W. Orton Circle, West Valley City, UT 84119
cell phone: 406-600-5142
Yvette_Converse@fws.gov
(she/her)

From: Robert Gardel <rgardel@forsgren.com>
Sent: Tuesday, July 20, 2021 10:08 AM
To: Converse, Yvette <yvette_converse@fws.gov>
Subject: [EXTERNAL] RE: Environmental Review for Payson WWTP

I forgot to include the site plan map, my apologies.

From: Robert Gardel
Sent: Tuesday, July 20, 2021 9:52 AM
To: Yvette_Converse@fws.gov
Subject: Environmental Review for Payson WWTP

Hi Yvette,

This is Robert Gardel at Forsgren Associates. I am sending this letter in regards to the updated waste water treatment plant for the city of Payson. Please let me know if you have any questions or concerns.

Thanks,

Robert Gardel
E.I.T.
370 East 500 South, Ste. 200
Salt Lake City, UT 84111
801.258.8298 / 508.308.5724 Cell

FORSGREN Associates Inc.

State of Utah

SPENCER J. COX
Governor

DEIDRE M. HENDERSON
Lieutenant Governor

Department of Natural Resources

BRIAN C. STEED
Executive Director

Division of Wildlife Resources

J. RORY REYNOLDS
Division Director

August 16, 2021

Submitted electronically via email to rgarel@forsgren.com

Robert Gardel, E.I.T
Project Engineer
Forsgren Associates Inc.
370 East 500 South Ste. 200
Salt Lake City, Utah 84111

RE: Payson City Wastewater Treatment Plant Upgrade Scoping Letter

Dear Mr. Gardel,

The Utah Division of Wildlife Resources (DWR) is grateful for the extended opportunity to review and comment on the Payson City Wastewater Treatment Plant Upgrade. After a review of the proposed upgrade on the wastewater treatment plant, we have no comments regarding potential impacts to wildlife or wildlife habitat from this project as outlined in the scoping letter. If adjustment to the design are needed, we would appreciate the opportunity to review the proposed changes at that time.

We appreciate this opportunity to review your proposed action. If you have any questions, please contact Shane Hill, Habitat Biologist in our Springville office at 385-985-7526.

Sincerely,

Ashley D. Green
Ashley D. Green (Aug 16, 2021 09:55 MDT)

Ashley D. Green

Assistant Director

AG/sh

UTAH DNR WILDLIFE RESOURCES

From: Joel Karmazyn <jkarmazyn@utah.gov>
Sent: Monday, May 3, 2021 7:02 AM
To: Robert Gardel
Subject: Re: Environmental Review for Payson WWTP

EXTERNAL MESSAGE

Thank you for your notice.

On Fri, Apr 30, 2021 at 9:41 AM Robert Gardel <rgardel@forsgren.com> wrote:

> Hi Joel,
>
> This is Robert Gardel at Forsgren Associates. I am sending this letter in regards to the updated waste water treatment plant for the city of Payson. Please let me know if you have any questions or concerns.
>
> Thanks,
>
> **Robert Gardel**
>
> **E.I.T.**
>
> **370 East 500 South, Ste. 200**
>
> **Salt Lake City, UT 84111**
>
> 801.258.8298 / 508.308.5724 Cell
>
> FORSGREN Associates Inc.

--

Joel Karmazyn
Environmental Scientist
Utah Div of Air Quality
(385) 258-4957