*Official Draft Public Notice Version **March 11, 2016***
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FACT SHEET AND STATEMENT OF BASIS
SPANISH FORK WASTEWATER TREATMENT PLANT
RENEWAL PERMIT: DISCHARGE, BIOSOLIDS & STORM WATER
UPDES PERMIT NUMBER: UT0020109
UPDES BIOSOLIDS PERMIT NUMBER: UTL0020109
UPDES MULTI-SECTOR STORM WATER GENERAL PERMIT NUMBER: UTR020109
MAJOR MUNICIPAL

FACILITY CONTACTS

Person Name:	Dennis R. Sorensen
Position:	POTW Manager
Person Name:	Ben Wimm
Position:	Assistant POTW Manager
Person Name:	Chris Thompson
Position:	Public Works Director
Facility Name:	Spanish Fork Wastewater Treatment Plant
Mailing Address:	40 South Main Street Spanish Fork, Utah 84660
Telephone:	(801) 798-5000
Actual Address:	2160 North 150 East

DESCRIPTION OF FACILITY

The Spanish Fork Wastewater Treatment Plant (Spanish Fork) is located at 2160 North 150 East, Spanish Fork, Utah and serves the City of Spanish Fork with the outfall located at latitude 40°08'43" and longitude 11°35'54". The State of Utah Database Storet number is 499602. The design flow of the facility is 5.0 MGD average daily flow with a peak flow of 10 MGD.

The influent enters the plant through a rectangular channel and is monitored by a Flowdar flow meter. The headwork's building separates the influent flow into two 4' channels equipped with two step screens. Both screens have two pressure washers, compactors and an automatic bag system.

Following the headwork's building are two aerated grit chambers with a volume totaling 3200 ft^3. The detention time in the grit chambers at a flow of 5 MGD equals 3.45 minutes. Approximately 10 ft^3/day is removed from the grit chambers. Aeration is provided by two 20 HP, 200 cfm positive displacement air blowers. Following the grit chambers, the flow enters three primary clarifiers. Two of the primary clarifier dimensions are 60 ft with a 7 ft sidewall depth and the other clarifier is 75 ft with a 12 ft sidewall. At the above mentioned flow, the detention time in the primary clarifiers equals 2.6 hours. The effluent from the primary clarifiers then enters the Intermediate Pumping Station that has two 60" screw pumps each equipped with a pumping capacity of 7000 gpm.

The flow enters a wet well for the trickling filter pumps where there the flow is split between aerotors and a plastic media trickling filter. The plastic media filter is 80 ft in diameter with a total media volume of 80,000 ft^3. The aerotors are in 4 basins each approximately 266,000 gallons, combining to 1,066,000 gallons total. The effluent leaving the trickling filter and aerotors then enters the final clarifiers.

The two final clarifiers have a diameter of 90 ft with a sidewall depth of 14 ft. The detention time in the two clarifiers is 6.4 hours at the above mentioned flow rate. The flow then enters the Chlorine Contact Basin where chlorine is injected by a Chlor-A-Vac. The chlorine introduced to the system is controlled by Capital Control Rotometers and Stranco ORP equipment with a capacity of 200 pounds per day (ppd) of chlorine. The Chlorine Contact Basin has a detention time of 60 minutes at 5 MGD and 30 minutes at peak flows of 10 MGD. The Chemical Control Building stores one ton containers of chlorine along with the control equipment. The effluent flows approximately 300 ft east and 3300 ft north to the discharge point.

Spanish Fork has four anaerobic digesters. The two fixed lid primary digesters are 50 ft in diameter with a total volume of 102,100 ft^3 and two 40 ft diameter floating lid secondary digesters with a combined total volume of 25,130 ft^3. The detention time of the primary digester is 60 days. One of the secondary digesters is heated to help digestion and water removal. The remaining digesters primary responsibility is settling. The sludge from the two primary clarifiers is pumped to the primary digester by two positive displacement pumps at regular intervals. The pumping rate is controlled by adjusting the time that the pumps are to pump each hour. Spanish Fork contains two boilers that produce 60,000,000 BTU/hr and two heat exchangers with a sludge rate and hot water rate of 250 gpm. The total detention time is approximately 75 days for all four digesters combined.

Spanish Fork has six drying beds with a capacity of 26 lbs dry solids/ ft^2 / year. During the winter months a two meter belt press is used to de-water the bio-solids. The bio-solids are removed from the drying beds and are either sent to a land fill or used for agriculture land application. Approximately 200 metric tons of dry bio-solids are produced each year by the facility.

The Utah Water Quality Board revised the bacteriological criteria in the Standards of Quality for Waters of the State effective June 1, 2005. Based, in part, on a long-standing recommendation from the Environmental Protection Agency, numeric criteria for E. coli bacteria were added to the standards. The new E. coli criteria is 126 (no.)/100 mL (30-day geometric mean) and 158 (no.)/100 mL (7-day geometric mean), which is considered equivalent to 200 (no.)/100 mL and 250 (no.)/100 mL fecal coliforms (*UAC R317-1-3.2*), respectively.

In January 2004, the Water Quality Board adopted new standards that significantly affect ammonia limits. Other parameters affected are dissolved oxygen (DO), ammonia and total residual chlorine (TRC). Metals testing was increased to quarterly during a permit modification in 2005 as part of a Settlement Agreement.

SUMMARY OF CHANGES FROM PREVIOUS PERMIT

There were no changes to the Spanish Fork facility process or operations during the previous permit cycle. However, use of a new model, new rule implementation, etc. resulted in changes in the permit from the last permit cycle. These are outlined below.

A new model is used by Water Quality to develop a waste load allocation (WLA) for dischargers to Waters of the State. In preparing for using this model for Spanish Fork, Water Quality determined that the receiving stream should have a synoptic study completed on it to improve the understanding of the waterway and improve the WLA. This study was conducted during the summer of 2012. The study contributed to a larger data set for use in running the model. The study was also used to calibrate the model to more closely reflect the ammonia decay conditions in Dry Creek and Provo Bay. After the completion of the study, the WLA was completed.

Upon review of the WLA the facility noted a few items that they believed needed further evaluation. They completed and submitted their own study to Water Quality. The report is titled "Waste-Load Parameters

for Wastewater Discharge Permit" (DWQ-2014-012161) and is included as an attachment to the FSSOB. As a result of the findings in the report, Water Quality modified the WLA as below:

1. Added the irrigation canal return flow as a tributary in the QUAL2Kw model. The flow is estimated to be 1.55 cfs and the quality will be based on the sampling event conducted by DWQ in July 2013.
2. Applied a TRC decay rate of 21.34 and 29.86 /d at 20 deg C.
3. Included travel time from the plant to the outfall in calculating TRC decay.

The WLA was re-calculated with no mixing zone granted for Provo Bay and the flow being in compliance at the Provo bay – Dry Creek boundary. The WLA is included as an attachment to the FSSOB. (DWQ-2013-045153)

The recalculated limits did not change the acute ammonia limit, but did result in a lower chronic limit for ammonia. DWQ also started including flow limits in all UPDES permits. These changes are included in the table below.

Parameter	Previous Limit		New Limit	
Ammonia, mg/l	Monthly Ave	Daily Max	Monthly Ave	Daily Max
Summer (Jul-Sept)	NA	18	7	18
Fall (Oct-Dec)	NA	18	9	18
Winter (Jan-Mar)	NA	18	9	18
Spring (Apr-Jun)	NA	18	9	18
	Monthly Ave	Daily Min	Monthly Ave	Daily Min
Flow, MGD	NA	NA	5.0	10

A review of Whole Effluent Toxicity (WET) results showed that Spanish Fork has not had a failure in the last fifteen (15) years, and they have requested a reduction and elimination of WET testing. The Elimination or reduction in frequency and/or species is allowed in a permit if a pattern of passing can be shown. Water Quality has been working to add or include Chronic WET in permits. To balance these two concepts a compromise has been struck. The Acute WET will be eliminated completely. Spanish Fork will start monitoring for Chronic WET on a Quarterly basis. The permit will only require Spanish Fork to monitor WET and report the results on a quarterly basis; no limit will be associated with the monitoring. Spanish Fork will also have the option to choose which species they will test each quarter.

Water Quality adopted UAC R317-1-3.3, Technology-Based Phosphorus Effluent Limit (TBPEL) Rule in 2014. The TBPEL rule as it relates to "non-lagoon" wastewater treatment plants establishes new regulations for the discharge of phosphorus to surface waters and is self-implementing. The TBPEL rule includes the following requirements for non-lagoon wastewater treatment plants:

The TBPEL requires that all non-lagoon wastewater treatment works discharging wastewater to surface waters of the state shall provide treatment processes which will produce effluent less than or equal to an annual mean of 1.0 mg/L for total phosphorus. This TBPEL shall be achieved by January 1, 2020.

The TBPEL discharging treatment works are required to implement, at a minimum, monthly monitoring of the following beginning July 1, 2015:

R317-1-3.3, D, 1 Influent for total phosphorus (as P) and total Kjeldahl nitrogen (as N) concentrations;

R317-1-3.3, D, 2. Effluent for total phosphorus and orthophosphate (as P), ammonia, nitrate-nitrite and total Kjeldahl nitrogen (an N);

In R317-1-3.3, D, 3 the rule states that all monitoring shall be based on 24-hour composite samples by use of an automatic sampler or a minimum of four grab samples collected a minimum of two hours apart.

Recent rule and anticipated future standards changes have lead Spanish Fork to look into a total upgrade of the facility's treatment process in order to meet future requirements. An upgrade to the facility will be costly and take some time, but would result in a facility that is able to treat the effluent to meet the anticipated stringent future effluent limits. Currently, they are unsure how well the facility can remain compliant with the limits in their permit. Therefore, time is needed to study the optimization potential of the existing facility until a facility upgrade can be developed and completed.

Based on past performance, the Spanish Fork facility anticipates not being able to consistently meet the monthly average effluent limit for Ammonia in the Winter Months (Jan - Mar) of 7 mg/L indicated in the WLA. Previous WLAs and permits have not included a monthly average effluent limit for Ammonia. Compliance with this effluent limit will likely require upgrades, improvements and optimization of the facility. To allow the facility time to complete the planning and optimization process, the facility will not be required to comply with the chronic ammonia limit indicated in the WLA until December 31, 2023. At which time, more information will be available that will better predict what is needed for the facility and how long it will take to complete work needed to come into compliance. The permit will also be kept to the previous renewal cycle with an expiration date of December 31, 2017.

To complete the optimization and upgrades process, a compliance schedule is included in the renewal permit. This will require that the facility submit an annual report on the optimization efforts detailing the overall progress and any upsets/setbacks that occurred and the steps taken to return to compliance with the effluent limits. It will also contain a summary of the upgrade planning actions and progress from the previous year and an updated schedule/time line for future activity. This will assist in the Division being up to date on the progress and activity.

The Compliance Schedule is included below;

Compliance Schedule for Spanish Fork Nutrient Optimization.

Month 30, 2016	Submit report detailing plan for optimization of facility, and set up initial schedule for facility upgrades. A progress update is due the same time each year. Until optimization and/or facility upgrades are completed.
July 1, 2017	UPDES Permit Renewal Application Submitted.
September 30, 2017	Submit Optimization Plan Progress and Update Report.

DISCHARGE

DESCRIPTION OF DISCHARGE

The Spanish Fork has been reporting self-monitoring results on Discharge Monitoring Reports on a monthly basis. A summary of the last 3 years of data is attached and there were no significant violations.

Outfall	Description of Discharge Point
001	Located at latitude 40°08'43" and longitude 111°35'54". The discharge is through a gravity flow concrete pipe leading from the chlorine contact basin to Dry Creek which flows to the Provo Bay area of Utah Lake.

RECEIVING WATERS AND STREAM CLASSIFICATION

The discharge flows into Dry Creek, which then flows into Utah Lake (Provo Bay). Dry Creek is classified as 2B, 3E, 4, and Utah Lake is classified as 2B, 3B, 3D, 4 according to *Utah Administrative Code (UAC) R317-2-13*.

Dry Creek

Class 2B	-Protected for secondary contact recreation such as boating, wading, or similar uses.
Class 3E	-Severely habitat-limited waters. Narrative standards will be applied to protect these waters for aquatic wildlife.
Class 4	-Protected for agricultural uses including irrigation of crops and stock watering.

Utah Lake

Class 3B	- Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.
Class 3D	- Protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain.

EPA Region VIII completed the Triennial Review (Review) on January 6, 2004. The Review reassessed the stream classification on Dry Creek and determined the class to be 3E replacing the original classification of 2B, 3C and 4. Class 3E is defined as severely habitat-limited waters.

BASIS FOR EFFLUENT LIMITATIONS

Limitations on total suspended solids (TSS), biochemical oxygen demand (BOD_5), E-Coli coliform, pH and percent removal for BOD_5 and TSS are based on current Utah Secondary Treatment Standards, *UAC R317-1-3.2*. The dissolved oxygen (DO), ammonia, and total residual chlorine (TRC) are based on the attached wasteload analysis. The oil and grease is based on best professional judgment (BPJ). The permit limitations are:

Parameter	Effluent Limitations			
	Maximum Monthly Average	Maximum Weekly Average	Daily Minimum	Daily Maximum
Total Flow, MGD	5	-	-	10
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	-
Ammonia, mg/l				
July – September	7 *j	-	-	18
October – December	9 *j	-	-	18
January – March	9 *j	-	-	18
April – June	9 *j	-	-	18
E. Coli, no./100mL	126	158	-	-
TRC, mg/L	-	-	-	2.0
Oil & Grease, mg/L	-	-	-	10
pH, Standard Units	-	-	6.5	9.0

NA – Not Applicable.
*j The monthly average effluent limit for this parameter will become effective on December 31, 2023.

SELF-MONITORING AND REPORTING REQUIREMENTS

The following self-monitoring frequency requirements have increased since the previous permit. The permit will require reports to be submitted monthly and quarterly, as applicable, on Discharge Monitoring Report (DMR) forms due 28 days after the end of the monitoring period. Lab sheets for biomonitoring must be attached to the biomonitoring DMR.

Self-Monitoring and Reporting Requirements *a			
Parameter	Frequency	Sample Type	Units
Total Flow *b, *c	Continuous/	Recorder	MGD
BOD_5, Influent *d Effluent	2 x Weekly 2 x Weekly	Composite Composite	mg/L mg/L
TSS, Influent *d Effluent	2 x Weekly 2 x Weekly	Composite Composite	mg/L mg/L
E. Coli	2 x Weekly	Grab	No./100mL
pH	2 x Weekly	Grab	SU
Ammonia	2 x Weekly	Grab	mg/L
DO	2 x Weekly	Grab	mg/L
WET – Biomonitoring *h Ceriodaphnia - Chronic Fathead Minnows - Chronic	 Quarterly Variable Species	 Composite Composite	 Pass/Fail Pass/Fail
TRC, mg/L, *e,	Daily	Grab	mg/L
Oil & Grease *f	Monthly	Grab	mg/L
Total Ammonia, (as N) *k	Monthly	Composite	mg/L
Orthophosphate, (as P) *k Effluent	Monthly	Composite	mg/L
Phosphorus, Total *k Influent Effluent	Monthly Monthly	Composite Composite	mg/L mg/L
Total Kjeldahl Nitrogen, (TKN as N) *k Influent Effluent	Monthly Monthly	Composite Composite	mg/L mg/L
Nitrate, NO3 *k	Monthly	Composite	mg/L
Nitrite, NO2 *k	Monthly	Composite	mg/L
Metals, Influent *i Effluent	Quarterly Quarterly	Composite Composite	mg/L mg/L
Organic Toxics *i	Yearly	Grab	mg/L

*a See Definitions, *Part VIII*, for definition of terms.

*b Flow measurements of influent/effluent volume shall be made in such a manner that the permittee can affirmatively demonstrate that representative values are being obtained.

*c If the rate of discharge is controlled, the rate and duration of discharge shall be reported.

*d In addition to monitoring the final discharge, influent samples shall be taken and analyzed for this constituent at the same frequency as required for this constituent in the discharge.

*e Analytical results less than 0.06 mg/l will not be considered out of compliance with the permit. For purposes of calculating averages and reporting on the Discharge Monitoring Report form, the following will apply:

1) analytical values less than 0.02 mg/L shall be considered zero; and
2) analytical values less than 0.06 mg/L and equal to or greater than 0.02 mg/L will be recorded as measured.

*f Oil & Grease sampled when sheen is present or visible. If no sheen is present or visible, report NA.

*h Spanish Fork will monitor for Chronic WET with an $IC_{25} > 82$ %, but will not have a limit associated with it in the permit. Spanish Fork will also have the option to choose which species it wishes to test each quarter. If the species is not tested in a quarter it is reported as NA.

*i See table in *Part II.H.1* (Influent and Effluent Monitoring and Reporting Requirements) of the Permit for target minimum detection limits (MDL) requirements. The Organic Toxics report is due the same day as the Pretreatment Report (Part II,C, of the permit).

*j The monthly average effluent limit for this parameter will not become effective until December 31, 2023.

*k These reflect monitoring changes required with the adoption of UCA R317-1-3.3, Technology-based Phosphorus Effluent Limits rule.

Reasonable Potential Analysis

Water Quality has worked to improve our reasonable potential analysis (RP) for the inclusion of limits for parameters in the permit by using an EPA provided model. As a result of the model, more parameters may be included in a renewal permit. An initial check for metals showed that the full model needed to be run on Cyanide, Cadmium, Copper, Selenium, and Mercury for this facility.

The results of the RP Model indicate that Cadmium, Copper, Selenium, and Mercury do not present a reasonable potential for inclusion of limits in this renewal permit. The data does indicate that there are issues with consistent and/or sensitive enough reporting limits for the metals. Spanish Fork will need to work to comply with the sampling requirements in the permit under PART II.H..

Cyanide does require further RP investigation by DWQ. The results for the Cyanide analysis were frequently reported as non-detect and those detection levels varied over the five year period evaluated. Improving the consistency of the analytical detection level for Cyanide could reduce the RP for Cyanide and eliminate the need for a permit limit.

To address the issues above, Water Quality requests that the facility has the samples analyzed in a way to ensure that the laboratory is attaining the lowest method detection level as consistently as possible. Currently the values for some parameters listed in Part II.H of the permit are below current MDL's, and there is no evidence that the levels are impairing downstream water quality. In these cases, the parameters will not be added to the permit as limits, but will remain as parameters requiring monitoring.

BIOMONITORING REQUIREMENTS

A nationwide effort to control toxic discharges where effluent toxicity is an existing or potential concern is regulated in accordance with the *State of Utah Permitting and Enforcement Guidance Document for Whole Effluent Toxicity Control (biomonitoring)*. Authority to require effluent biomonitoring is provided in *Permit Conditions, UAC R317-8-4.2, Permit Provisions, UAC R317-8-5.3* and *Water Quality Standards, UAC R317-2-5* and *R317 -2-7.2*.

The receiving water low flow dilution is less than 20 to one and this facility has passed acute toxicity testing over the last ten years. Since we know acute toxicity is not present, based on past acute testing results, and the dilution is less than twenty to one chronic toxicity testing will be required and acute testing will be dropped from the renewal permit. Chronic toxicity will be required quarterly with

alternation of species[1]. The standard chronic toxicity language will be incorporated into the permit, along with appropriate reopener language.

The WLA did indicate possible seasonal IC_{25} % WET Limits. These are indicated in the table below. No limit is being included in the permit but the Chronic WET IC_{25} monitoring value is the worst case scenario ($IC_{25} \geq 82$ %), and is more conservative than seasonal limits would be. In the event of a chronic test failure in any season other than summer, the seasonal values from this WLA will be used for evaluating the results of the test.

Seasonal Chronic WET Limits as Taken From Table 2 in The WLA	
Season	Chronic WET IC25 % Eff.
Summer	>82
Fall	>40
Winter	>43
Spring	>43

TOTAL MAXIMUM DAILY LOAD REQUIREMENTS

Spanish Fork discharges wastewater into Utah Lake, which has been identified as impaired for total dissolved solids (TDS) and total phosphorus (TP) based on the 1998, 303(d) assessment process as defined in the Clean Water Act. As required under federal regulation a total maximum daily load (TMDL) will be developed for all impaired waters. The TMDL will focus on developing limitations for those parameters of concern (POC) that were identified during the 305(b) and 303(d) assessment process. POC's are parameters that are in violation of water quality standards or that contribute to impairment of a beneficial use (a major component of the water quality standards).

Currently, a TMDL evaluation is underway for the Utah Lake. If the results of the TMDL process establish effluent limits for any of the POC's, then it is required by 40 CFR Part 130 to include the effluent limits in the UPDES permit. Therefore, it is strongly recommended that the facility staff participate in the TMDL development process. The staff at the Division of Water Quality will be responsible for scheduling and notifying appropriate facility personnel regarding TMDL meetings. Please contact your UPDES permit writer for information on scheduled TMDL meetings.

PRETREATMENT REQUIREMENTS

The pretreatment requirements remain the same as in the current permit with the permittee administering an approved pretreatment program. Any substantial changes to the program must be submitted for approval to the Division of Water Quality. Authority to require a pretreatment program is provided for in *19-5-108 UCA, 1953 ann.* and *UAC R317-8-8.*

The permittee will be required to perform an annual evaluation of the need to revise or develop technically based local limits to implement the general and specific prohibitions of *40 CFR, Part 403.5(a)* and *Part 403.5(b)*. This evaluation may indicate that present local limits are sufficiently protective, or that they must be revised. As part of this evaluation, the permit requires quarterly influent and effluent monitoring for metals and yearly organic toxics listed in *R317-8-7.5* and sludge monitoring for potential pollutants listed in *40 CFR 503.*

Per the requirements of the Pretreatment Audit on October 16, 2012, Spanish Fork will have 6 months

[1] Composite sample volumes are collected and sent off to the lab on Monday, Wednesday and Friday

following the issuance of the UPDES permit to submit draft local limits. The draft local limits must include technical based local limits with the calculations of how the local limits were derived and the summary of how the local limits were developed.

BIOSOLIDS

For clarification purposes, sewage sludge is considered solids, until treatment or testing shows that the solids are safe, and meet beneficial use standards. After the solids are tested or treated, the solids are then known as biosolids. Class A biosolids, may be used for high public contact sites, such as home lawns and gardens, parks, or playing fields, etc. Class B biosolids may be used for low public contact sites, such as farms, rangeland, or reclamation sites, etc.

SUBSTANTIAL BIOSOLIDS TREATMENT CHANGES

Spanish Fork has completed the addition of new 50 foot digesters with mixers. This will improve the biosolids quality.

DESCRIPTION OF TREATMENT AND DISPOSAL

Biosolids at Spanish Fork are stabilized in three anaerobic digesters to meet Class B standards and dewatered with a belt press, up to twenty percent solids. Spanish Fork has beneficially used all of their biosolids during the last five years for crop production, or pasture land for grazing and plans to do the same for the life of this permit. The only thing that may change is where the biosolids are land applied for crop production and grazing.

The Permittee submitted their 2014 annual biosolids report on February 10, 2015. The report states the Permittee produced 719 dry metric tons (DMT) of solids. Of which 290 DMT were land applied for crop production and pasture grazing. The remaining 429 DMT was transferred to Southern Utah Solid Waste District (Permit #ULT-025585, Bayview Landfill) for composting by that facility.

The solids are stabilized through anaerobic digesters that have a minimum retention time of 15 days at 95° F (35° C) or 60 days at 68° F (20°C). This process stabilizes the solids through a minimum 38% reduction in volatile solids. After stabilization, the solids are dewatered by belt presses to about 15 percent solids.

The last inspection conducted at the facility was September 30, 2015. The inspection showed that Spanish Fork was in compliance with all aspects of the biosolids management program.

SELF-MONITORING REQUIREMENTS

Under *40 CFR 503.16(a)(1),* the self-monitoring requirements are based upon the amount of biosolids disposed per year and shall be monitored according to the chart below.

Minimum Frequency of Monitoring [40 CFR 503.16(1)(a).]		
Amount of Biosolids Disposed Per Year		Monitoring Frequency
Dry US Tons	Dry Metric Tons	Per Year or Batch
> 0 to < 320	> 0 to < 290	Once Per Year or Batch
> 320 to < 1650	> 290 to < 1,500	Once a Quarter or Four Times
> 1,650 to < 16,500	> 1,500 to < 15,000	Bi-Monthly or Six Times
> 16,500	> 15,000	Monthly or Twelve Times

In 2014, Spanish fork disposed of 719 DMT of biosolids, therefore they need to sample at least four times a year.

Landfill Monitoring

Under *40 CFR 258,* the landfill monitoring requirements include a paint filter test. If the biosolids do not pass a paint filter test, the biosolids cannot be disposed in the sanitary landfill *(40 CFR 258.28(c)(1).* No biosolids were landfilled in 2014, They were transferred for composting at a landfill facility who then distributed the biosolids to cities and public. Therefore a paint filter test was not required.

BIOSOLIDS LIMITATIONS

Heavy Metals

Class A Biosolids for Home Lawn and Garden Use
The intent of the heavy metals regulations of Table 3, *40 CFR 503.13* is to ensure the heavy metals do not build up in the soil in home lawn and gardens to the point where the heavy metals become phytotoxic to plants. The permittee will be required to produce an information sheet (see *Part III. C.* of the permit) to made available to all people who are receiving and land applying Class A biosolids to their lawns and gardens. If the instructions of the information sheet are followed to any reasonable degree, the Class A biosolids will be able to be land applied year after year, to the same lawns and garden plots without any deleterious effects to the environment. The information sheet must be provided to the public, because the permittee is not required, nor able to track the quantity of Class A biosolids that are land applied to home lawns and gardens.

Class A Requirements With Regards to Heavy Metals
If the biosolids are to be applied to a lawn or home garden, the biosolids shall not exceed the maximum heavy metals in Table 1 and the monthly average pollutant concentrations in Table 3 (see Table 1 and Table 3 below). If the biosolids do not meet these requirements, the biosolids cannot be sold or given away for applications to home lawns and gardens.

Class B Requirements for Agriculture and Reclamation Sites
The intent of the heavy metals regulations of Tables 1, 2 and 3, of *40 CFR 503.13* is to ensure that heavy metals do not build up in the soil at farms, forest land, and land reclamation sites to the point where the heavy metals become phytotoxic to plants. The permittee will be required to produce an information sheet (see *Part III. C.* of the permit) to be handed out to all people who are receiving and land applying Class B biosolids to farms, ranches, and land reclamation sites (if biosolids are only applied to land owned by the permittee, the information sheet requirements are waived). If the biosolids are land applied according to the regulations of *40 CFR 503.13*, to any reasonable degree, the Class B biosolids will be able to be land applied year after year, to the same farms, ranches, and land reclamation sites without any deleterious effects to the environment.

Class B Requirements With Regards to Heavy Metals
If the biosolids are to be land applied to agricultural land, forest land, a public contact site or a reclamation site it must meet at all times:

> The maximum heavy metals listed in Table 1 and the heavy metals loading rates in Table 2; or
>
> The maximum heavy metals in Table 1 and the monthly heavy metals concentrations in Table 3.

Tables 1, 2, and 3 of Heavy Metal Limitations

Pollutant Limits, (40 CFR Part 503.13(b)) Dry Weight Basis				
Heavy Metals	Table 1	Table 2	Table 3	Table 4
	Ceiling Conc. Limits, (mg/kg)	CPLR[2], (mg/ha)	Pollutant Conc. Limits, (mg/kg)	APLR[3], (mg/ha-yr)
Total Arsenic	75	41	41	41
Total Cadmium	85	39	39	39
Total Copper	4300	1500	1500	1500
Total Lead	840	300	300	300
Total Mercury	57	17	17	17
Total Molybdenum	75	N/A	N/A	N/A
Total Nickel	420	420	420	420
Total Selenium	100	100	100	100
Total Zinc	7500	2800	2800	2800

Any violation of these limitations shall be reported in accordance with the requirements of *Part III.F.1.* of the permit. If the biosolids do not meet these requirements they cannot be land applied.

Pathogens

A Pathogen Control class method listed in the table below must be met;

Pathogen Control Class	
Class A	Class B
B Salmonella species –less than three (3) MPN[4] per four (4) grams total solids (or less than 1,000 fecal coliforms per gram total solids)	Fecal Coliforms –less than 2,000,000 colony forming units (CFU) per gram total solids
Enteric viruses –less than one (1) MPN (or plaque forming unit) per four (4) grams total solids	
Viable helminth ova –less than one (1) MPN per four (4) grams total solids	

Class A Requirements for Home Lawn and Garden Use

If biosolids are land applied to home lawns and gardens, the biosolids need to be treated by a specific process to further reduce pathogens (PFRP), and meet a microbiological limit of less than less than 3 most probable number (MPN) of *Salmonella* per 4 grams of total solids (or less than 1,000 most probable number (MPN/g) of fecal coliform per gram of total solids) to be considered Class A biosolids. Spanish Fork transfers the biosolids to the Southern Utah Solid Waste District (Permit #ULT-025585) for further processing to Class A through composting prior to distribution to the public.

[2] CPLR -- Cumulative Pollutant Loading Rate
[3] APLR – Annual Pollutant Loading Rate
[4] MPN –Most Probable Number

The practice of sale or giveaway to the public is an acceptable use of biosolids of this quality as long as the biosolids continue to meet Class A standards with respect to pathogens. If the biosolids do not meet Class A pathogen standards the biosolids cannot be sold or given away to the public, and the permittee will need find another method of beneficial use or disposal.

Pathogens Class B

If biosolids are to be land applied for agriculture or land reclamation the solids need to be treated by a specific process to significantly reduce pathogens (PSRP). The PSRP for Spanish Fork will be accomplished through Anaerobic Digesters:

1. Under *40 CFR 503.32 (b)(3)Appendix (B)(3),* The PSRP may be accomplished through anaerobic digesters that have a minimum retention time of 15 days at 95° F (35° C) or 60 days at 68° F (20°C).

Vector Attraction Reduction (VAR)

If the biosolids are land applied Spanish Fork will be required to meet VAR through the use of a method of listed under *40 CFR 503.33.* Spanish Fork intends to meet the vector attraction reduction requirements through one of the methods listed below.

1. Under *40 CFR 503.33(b)(1),* the solids need to be treated through anaerobic digestion for at least 15 days at a temperature of a least 35° C (95° F) with a 38% reduction of volatile solids.

2. Spanish Fork transfers solids to another facility (Southern Utah Solid Waste District) where they are stabilized through composting to Class A, and distributed to the public and cities.

If the biosolids do not meet a method of VAR, the biosolids cannot be land applied.

If the permittee intends to use another one of the listed alternatives in *40 CFR 503.33*, the Director and the EPA must be informed at least thirty (30) days prior to its use. This change may be made without additional public notice

Landfill Monitoring

Under *40 CFR 258,* the landfill monitoring requirements include a paint filter test to determine if the biosolids exhibit free liquid. If the biosolids do not pass a paint filter test, the biosolids cannot be disposed in the sanitary landfill *(40 CFR 258.28(c)(1).*

Record Keeping

The record keeping requirements from *40 CFR 503.17* are included under *Part III.G.* of the permit. The amount of time the records must be maintained are dependent on the quality of the biosolids in regards to the metals concentrations. If the biosolids continue to meet the metals limits of *Table 3* of *40 CFR 503.13*, and are sold or given away the records must be retained for a minimum of five years. If the biosolids are disposed in a landfill the records must retained for a minimum of five years.

Reporting

Spanish Fork must report annually as required in *40 CFR 503.18*. This report is to include the results of all monitoring performed in accordance with *Part II.C* of the permit, information on management practices, biosolids treatment, and certifications. This report is due no later than February 19 of each year. Each report is for the previous calendar year.

MONITORING DATA

METALS MONITORING DATA

Spanish Fork was required to sample for metals at least four times in 2014. Spanish Fork sampled the Class B biosolids four times. All biosolids land applied in 2014 met *Table 3* of *40 CFR 503.13,* therefore Spanish Fork biosolids qualify as EQ with regards to metals. The monitoring data is below.

Spanish Fork Metals Monitoring Data 2014

PERMITTEE Metals Monitoring Data, 2014 (Land Application)			
Parameter	Table 3, mg/kg (Exceptional Quality)	Average, mg/kg	Maximum, mg/kg
Arsenic	41.0	9.44	13.1
Cadmium	39.0	1.2	21.4
Copper	1,500.0	400.75	435
Lead	300.0	19	23.7
Mercury	17.0	1.35	1.65
Molybdenum	75.0	18.25	21.5
Nickel	400.0	18.18	21.5
Selenium	36.0	15.63	1020
Zinc	2,800.0	854	

PATHOGEN MONITORING DATA (Anaerobic Cake)

The **Permittee** was not required to monitor the anaerobic biosolids (sludge cake) for pathogens. Therefore, there is not any monitoring data for the Class B biosolids. All biosolids land applied in 2014 met the Class B pathogen standards through anaerobic digestion.

STORM WATER

STORMWATER REQUIREMENTS

Storm water provisions are included in this combined UPDES permit.

The storm water requirements are based on the UPDES Multi-Sector General Permit for Storm Water Discharges for Industrial Activity, General Permit No. UTR000000 (MSGP). All sections of the MSGP that pertain to discharges from wastewater treatment plants have been included and sections which are redundant or do not pertain have been deleted.

The permit requires the preparation and implementation of a storm water pollution prevention plan for all areas within the confines of the plant. Elements of this plan are required to include:

1. The development of a pollution prevention team:
2. Development of drainage maps and materials stockpiles:
3. An inventory of exposed materials:
4. Spill reporting and response procedures:
5. A preventative maintenance program:
6. Employee training:
7. Certification that storm water discharges are not mixed with non-storm water discharges:
8. Compliance site evaluations and potential pollutant source identification, and:
9. Visual examinations of storm water discharges.

Spanish Fork is currently covered under the UPDES Multi Sector General Permit for Industrial Activities.

PERMIT DURATION

It is recommended that this permit be effective for a duration no greater than two (2) years.

Drafted by
Dan Griffin P.E., Discharge
Dan Griffin P.E., Biosolids
Mike George, Storm Water
Jennifer Robinson, Pretreatment
Utah Division of Water Quality

ADDENDUM TO FSSOB

A public notice for the draft permit will be published in The Daily Herald on Month Day, 2016. The comment period ended on Month Day, 2016. During finalization of the Permit certain dates, spelling edits and minor language corrections may be completed. Due to the nature of these types of changes they would not be considered Major and the permit may not require re Public Noticing.

Responsiveness Summary

During finalization of the Permit certain dates, spelling edits and minor language corrections were completed. Due to the nature of these changes they were not considered Major and the permit is not required to be re Public Noticed.

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ATTACHMENT 1

Waste-Load Parameters for Wastewater Discharge Permit

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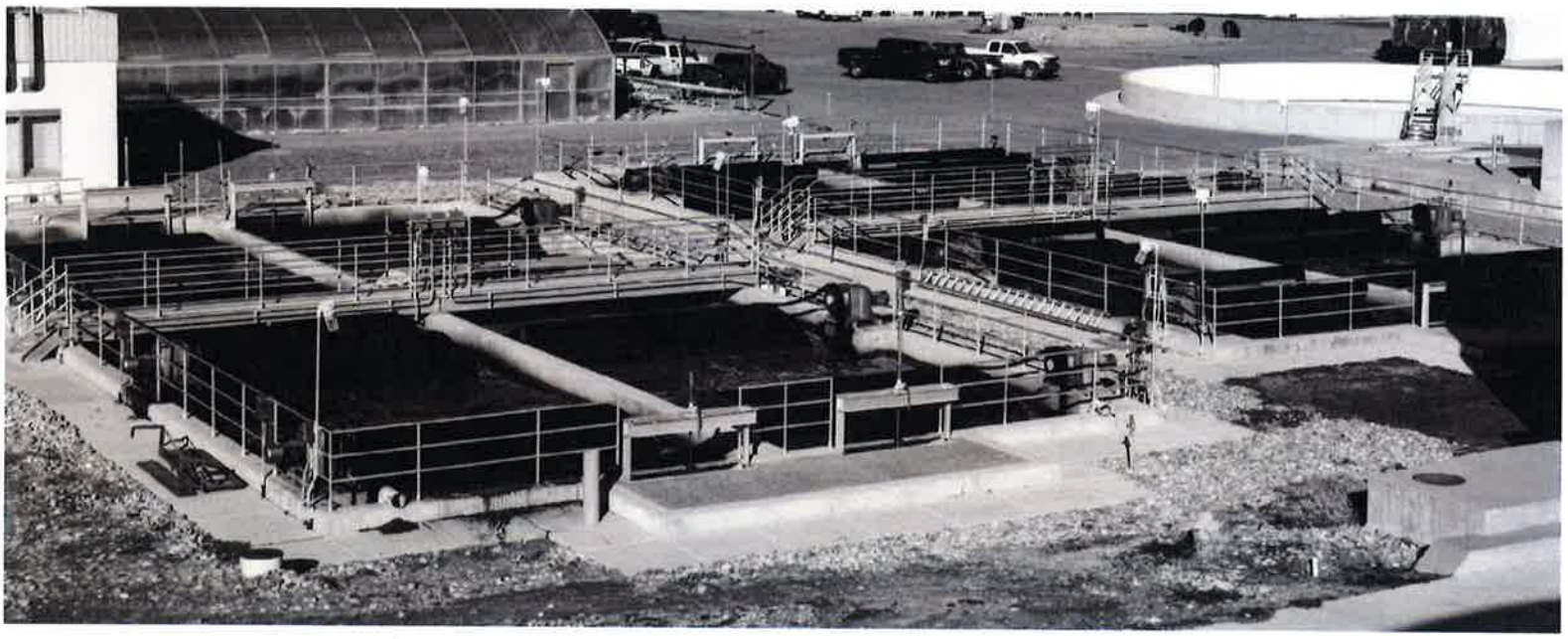
Spanish Fork City

Waste-Load Parameters for Wastewater Discharge Permit

February 2014



AQUA ENGINEERING

PHONE (801) 299-1327 FAX (801) 299-0153
533 W 2600 S Suite 275 Bountiful, UT 84010
www.aquaeng.com

Table of Contents

List of Figure

List of Table

List of Equation

Introduction

This report is intended to address several different parameters used to determine the waste load allocation for the Spanish Fork City Wastewater Treatment Facility. There are two constituents that are changing substantially from the previous permit. The constituents that are changing are Total Residual Chlorine (TRC) and Ammonia.

Several discharge permit cycles ago some of this information was gathered on the receiving water Dry Creek, and at that time the data was used to determine the waste load allocation for the discharge permit. However, the data was given to DWA and it appears that most of that information is no longer available. A new model is being used to establish the waste load allocation and it is important to use the best data possible to calibrate the model.

This report will provide the information gathered by the City which should be used in the waste load allocation for the Spanish Fork Discharge Permit. TRC and ammonia are the primary parameters of concern because they are being proposed to change in the new discharge permit. The City staff was used to sample Dry Creek and the sampling data was used to determine decay rates for each of the two parameters.

Total Residual Chlorine

The Total Residual Chlorine (TRC) permit requirement is recommended to be substantially lowered. The City staff collected TRC concentrations on several locations of Dry Creek as shown in Figure 1. The TRC was measured on several days in June 2013. The purpose of the sampling was to determine the first order decay rate for chlorine in Dry Creek. The travel times were based on the model developed for the waste load allocation. The sampling data is along with the first order decay rate is contained in Appendix A. A summary of the decay rates are shown in Table 1.

The water temperatures were not recorded as part of the sampling effort for TRC. The temperature used to normalize the decay rate to 20 deg C was based on the average value of the river temperature (16.9 deg C) taken during Ammonia sampling on four days between June 5th, 2013 and June 11th, 2013.

Table 1

Date	Decay Rate (1/day)	Decay Rate @20 deg C (1/day)
6/4/2013	19.43	24.00
6/6/2013	17.27	21.34
6/7/2013	25.01	30.90
6/8/2013	17.24	21.30
6/11/2013	32.47	40.11
6/12/2013	32.21	39.79
Min	17.24	21.30
Max	32.47	40.11
Average	24.17	29.86
20th Percentile	17.27	21.34

Decay rate was normalized to 20 degrees C using the modified van't Hoff Arrhenius equation as follows;

$K_2=K_1 * \Theta^{(T_2-T_1)}$ **Equation 1**

Where;

K_2: Normalized Decay Rate at 20 deg C

K_1:Decay Rate at River Temp

Θ: Temperature Coefficient (1.07)
(Typical value range from 1.02 to 1.10)

T_2: Temperature (20 deg C)

T_1: Temperature (Measured)

The Temperature Coefficient used by Qual2Kw appears to be 1.07 and that is what was used to adjust the decay rate to a normalized 20 deg C rate. However, the literature values range from 1.02 to 1.10.

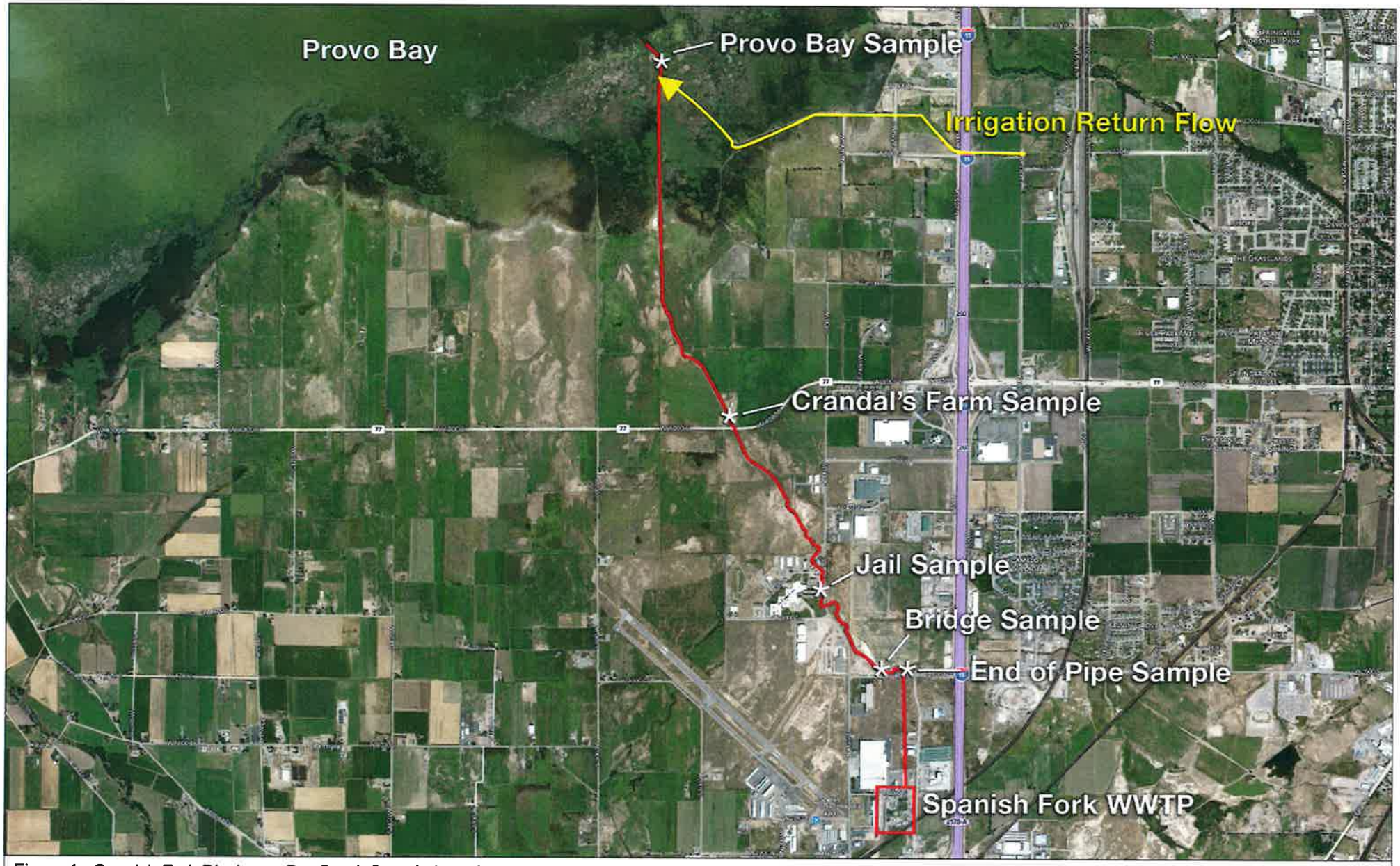


Figure 1 - Spanish Fork Discharge Dry Creek Sample Locations

The normalized decay rates vary depending on the temperature coefficient used in the equation. The lowest (θ value of 1.02) average decay rate based on the TRC measurement would be25.71/day. The highest (θ value of 1.10) average decay rate would be 32.55/day. The TRC concentration at the Provo Bay Sample site never had a concentration that could be measured. The Crandal's Farm Sample site only had a single sample that was above detectable capability of the TRC sampling equipment.

Based on the travel time assumptions the normalized decay rate varied from 21.30/day to 40.11/day. The average was 29.86/day and the 20th percentile was 21.34/day. It would be best to run the model using both the average decay rate and the 20th percentile to see what each one would do to the discharge permit.

Flow

One of the major components of the model is the flow. The summer flow is substantially lower because most of the flow is diverted upstream from the discharge of the treatment facility. However, a portion of the diverted flow returns to the creek prior to entering Provo Bay. The location of the drainage ditch is shown in Figure 1. This flow should be included in the model. The City estimated the flow to be about 1 MGD.

Ammonia

The water quality standard for ammonia is determined by water temperature, and pH. In addition to the sampling done to verify the decay rate used for ammonia the pH and water temperature were gathered to better determine the water quality limit on ammonia. Dry Creek should not have an ammonia standard because of the classification of 3E. The ammonia standard is critical as Dry Creek reaches Provo Bay because this is the concentration that will determine the permit limits for the wastewater facility.

The City staff sampled ammonia at several locations along Dry Creek as shown in Figure 1. A summary of the data is contained in Appendix B-Ammonia Decay Rates. The data is summarized and a first order decay rate is calculated for each day of sampling. The lab data from the sampling is shown in Appendix C- Ammonia Sampling.

The normalized decay rates vary depending on the temperature coefficient used in the equation. The lowest (θ value of 1.02) average decay rate based on the ammonia measurement was 3.72/day and the highest (θ value of 1.10) average decay rate was 4.59/day.

Normalized decay rate was calculated using the modified van't Hoff Arrhenius equation explained in Equation 1 using the measured river temperature at the time of ammonia sampling. The normalized decay rates varied from 1.73/day to 6.112/day. The average decay rate was 4.20/day with a 20th percentile of 2.16/day as shown in Table 2. It would be best to run the model using both the average and the 20th percentile to see how the difference would change the discharge permit limit.

Table 2

Date	temp (deg C)	Decay Rate (1/day)	Normalized Decay Rate @20 C (1/day)
6/5/2013	16	2.95	3.87
6/6/2013	15.5	1.28	1.73
6/10/2013	20	5.64	5.64
6/11/2013	16	4.66	6.11
Min		1.28	1.73
Max		5.64	6.11
Average		3.57	4.20
20th Percentile		1.61	2.16

Historical temperature and pH information was evaluated from the sample sites shown in Figure 2. Storet stations 4995970 and 4996000 were both in similar locations on Dry Creek. The data was combined in the two stations to evaluate both Temperature and pH.

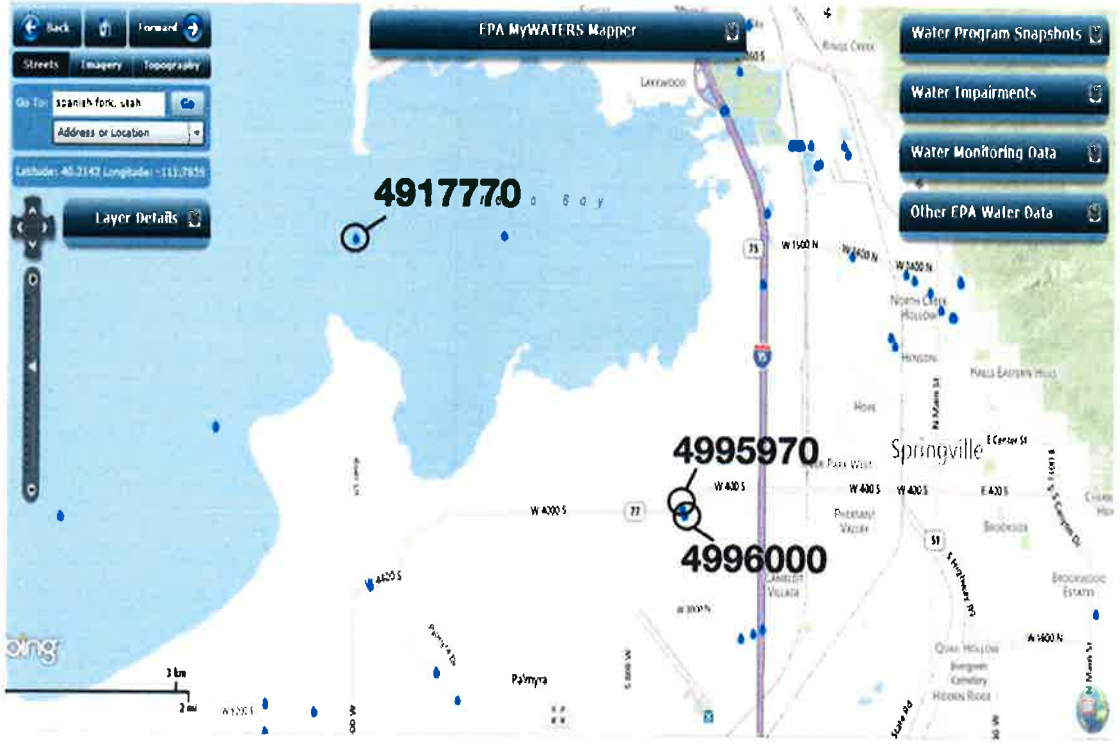


Figure 2

Table 3 is a summary of the data sampled at the Storet sites on Dry Creek. The data was sorted seasonally to reflect the breakdown in the model.

Table 3

Dry Creek pH Summary			
Winter pH		Summer pH	
Min	7.2	Min	6.8
Max	8.6	Max	8.5
Average	8.0	Average	7.8
80th Percentile	8.2	80th Percentile	8.1
Spring pH		Fall pH	
Min	6.7	Min	6.5
Max	8.7	Max	8.3
Average	7.8	Average	7.9
80th Percentile	8.3	80th Percentile	8.1

The temperature summary is shown in Table 4.

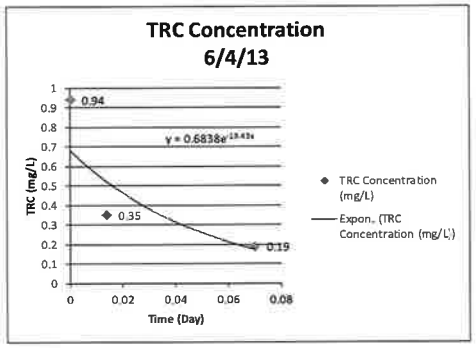
Table 4

Dry Creek Temperature Summary			
Winter Temperature		Summer Temperature	
Min	3.6	Min	15.6
Max	11.1	Max	22.7
Average	7.2	Average	18.9
80th Percentile	8.3	80th Percentile	20.2
Spring Temperature		Fall Temperature	
Min	7.9	Min	8.3
Max	21.1	Max	15.0
Average	13.5	Average	11.1
80th Percentile	16.8	80th Percentile	12.3

Appendix A – TRC Sampling

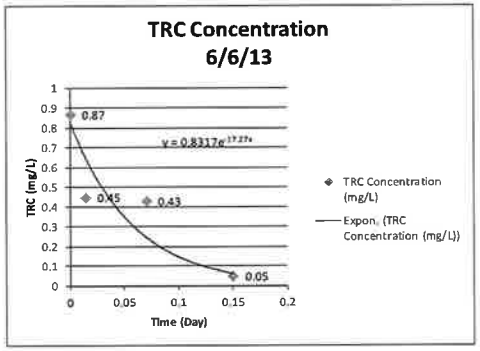
6/4/2013 10:05

Location Description	Location Station	Travel Time (Day)	TRC Concentration (mg/L)	Ph
End of Pipe	5.08	0	0.94	7.7
Bridge	4.88	0.014	0.35	7.9
Jail	4.1	0.07	0.19	7.7
Crandal's Farm	2.7	0.15		
Provo Bay	0.1	0.3		



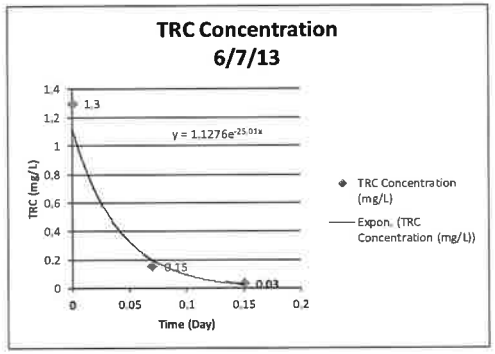
6/6/2013 9:05

Location Description	Location Station	Travel Time (Day)	TRC Concentration (mg/L)	Ph
End of Pipe	5.08	0	0.87	8.05
Bridge	4.88	0.014	0.45	8.12
Jail	4.1	0.07	0.43	8.32
Crandal's Farm	2.7	0.15	0.05	8.11
Provo Bay	0.1	0.3	0	7.97



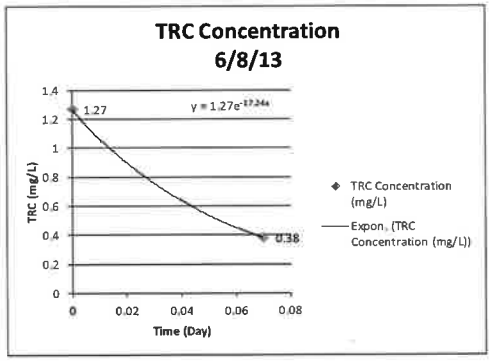
6/7/2013 7:10

Location Description	Location Station	Travel Time (Day)	TRC Concentration (mg/L)	Ph
End of Pipe	5.08	0	1.3	8.05
Jail	4.1	0.07	0.15	8.32
Crandal's Farm	2.7	0.15	0.03	8.11
Provo Bay	0.1	0.3	0	7.97



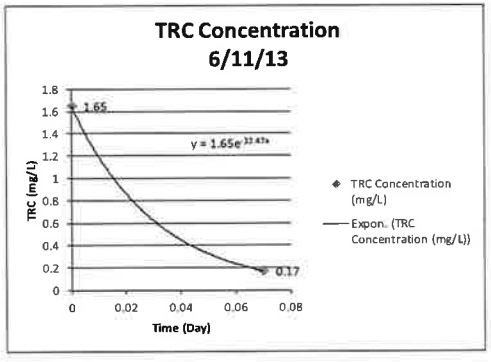
6/8/2013 9:35

Location Description	Location Station	Travel Time (Day)	TRC Concentration (mg/L)	Ph
End of Pipe	5.08	0	1.27	7.72
Jail	4.1	0.07	0.38	7.93
Crandal's Farm	2.7	0.15	0	8.07
Provo Bay	0.1	0.3	0	8.03



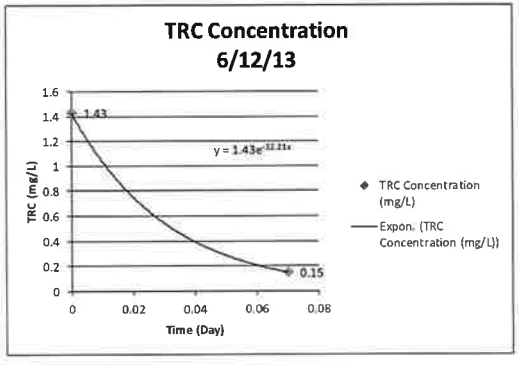
6/11/2013 7:35

Location Description	Location Station	Travel Time (Day)	TRC Concentration (mg/L)	Ph
End of Pipe	5.08	0	1.65	7.94
Jail	4.1	0.07	0.17	7.78
Crandal's Farm	2.7	0.15	0	7.88
Provo Bay	0.1	0.3	0	7.95



6/12/2013 7:20

Location Description	Location Station	Travel Time (Day)	TRC Concentration (mg/L)	Ph
End of Pipe	5.08	0	1.43	7.94
Jail	4.1	0.07	0.15	7.78
Crandal's Farm	2.7	0.15	0	7.88
Provo Bay	0.1	0.3	0	7.95



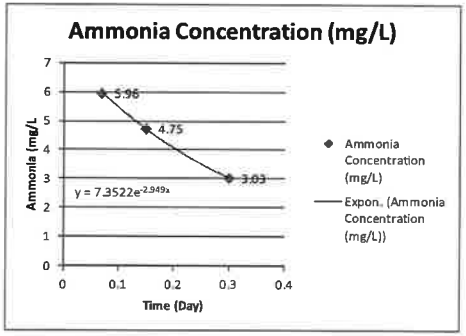
Summary TRC Decay

Date	Measured Decay Rate (1/day)	Decay Rate @20 deg C (1/day)		
		Θ: Temperature Coefficient		
		1.07	1.02	1.1
6/4/2013	19.43	24.00	20.67	26.17
6/6/2013	17.27	21.34	18.37	23.26
6/7/2013	25.01	30.90	26.61	33.69
6/8/2013	17.24	21.30	18.34	23.22
6/11/2013	32.47	40.11	34.54	43.74
6/12/2013	32.21	39.79	34.27	43.39
Min	17.24	21.30	18.34	23.22
Max	32.47	40.11	34.54	43.74
Average	24.17	29.86	25.71	32.55
20th Percentile	17.27	21.34	18.37	23.26

Appendix B-Ammonia Decay Rates

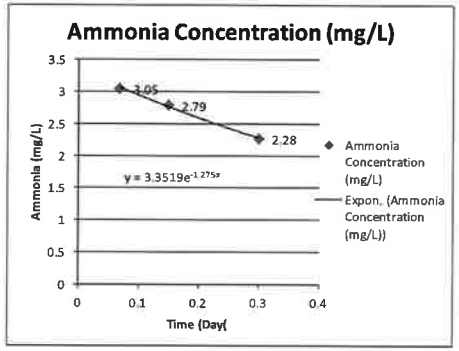
6/5/2013

Location Description	Location Station	Travel Time (Day)	Ammonia Concentration (mg/L)	pH	Temp (°C)
End of Pipe	5.08	0	9.85	8.05	16
Jail	4.1	0.07	5.96	8.32	16
Crandal's Farm	2.7	0.15	4.75	8.11	16
Provo Bay	0.1	0.3	3.03	7.79	16



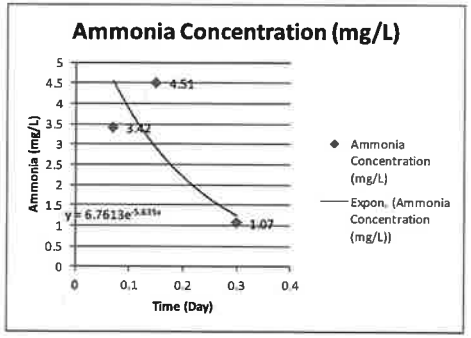
6/6/2013

Location Description	Location Station	Travel Time (Day)	Ammonia Concentration (mg/L)	pH	Temp (°C)
End of Pipe	5.08	0	10.1	7.59	16
Jail	4.1	0.07	3.05	7.95	15
Crandal's Farm	2.7	0.15	2.79	7.98	14
Provo Bay	0.1	0.3	2.28	7.97	16



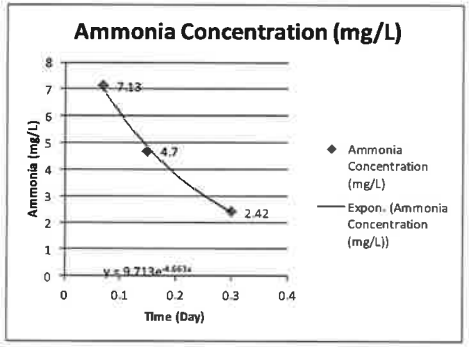
6/10/2013

Location Description	Location Station	Travel Time (Day)	Ammonia Concentration (mg/L)	pH	Temp (°C)
End of Pipe	5.08	0	9.95	7.94	20
Jail	4.1	0.07	3.42	7.78	20
Crandal's Farm	2.7	0.15	4.51	7.88	20
Provo Bay	0.1	0.3	1.07	7.95	20



6/11/2013

Location Description	Location Station	Travel Time (Day)	Ammonia Concentration (mg/L)	pH	Temp (°C)
End of Pipe	5.08	0	10.8	7.67	16
Jail	4.1	0.07	7.13	7.89	16
Crandal's Farm	2.7	0.15	4.7	7.84	16
Provo Bay	0.1	0.3	2.42	7.9	16



Summary Ammonia Decay

Date	temp (deg C)	Measured Decay Rate (1/day)	Decay Rate @20 C (1/day)		
			Θ=1.07	Θ=1.02	Θ=1.1
6/5/2013	16	2.949	3.866	3.192	4.318
6/6/2013	15.5	1.275	1.729	1.394	1.958
6/10/2013	20	5.635	5.635	5.635	5.635
6/11/2013	16	4.663	6.112	5.047	6.827
Min		1.275	1.729	1.39	1.96
Max		5.635	6.112	5.64	6.83
Average		3.572	4.197	3.72	4.59
20th Percentile		1.610	2.156	1.75	2.43

Appendix C- Ammonia Sampling

Timpview Analytical Laboratories

1165 North 1600 West, Orem, Utah, 84057 (801) 229-2282

Certificate of Analysis

Spanish Fork City (WW)
Dennis Sorensen
40 South Main
Sp. Fork, UT 84660
Fax: 801-804-4521
DW System # :

Work Order #: 56704
PO# / Project Name:
Date / Time Received: 6/6/13 13:13
Batch Temp °C: 6.8 Rec'd on Ice
Date Reported: 6/7/13

Sample Name: #1 End of Pipe
Collected: 6/5/13 9:45 **Matrix:** Wastewater **Collected By:**

Parameter	Lab ID #	Method	Analysis Date / Time	Result	Units	MRL	Flags
Ammonia (NH3-N), Direct ISE	F306-252A	4500(NH3)D	6/7/13 12:00	9.85	mg/L	0.5	

Sample Name: #2 Jail
Collected: 6/5/13 9:55 **Matrix:** Wastewater **Collected By:**

Parameter	Lab ID #	Method	Analysis Date / Time	Result	Units	MRL	Flags
Ammonia (NH3-N), Direct ISE	F306-253A	4500(NH3)D	6/7/13 12:00	5.96	mg/L	0.5	

Sample Name: #3 Crandal's Farm
Collected: 6/5/13 10:05 **Matrix:** Wastewater **Collected By:**

Parameter	Lab ID #	Method	Analysis Date / Time	Result	Units	MRL	Flags
Ammonia (NH3-N), Direct ISE	F306-254A	4500(NH3)D	6/7/13 12:00	4.75	mg/L	0.5	

Sample Name: #4 Provo Bay
Collected: 6/5/13 14:00 **Matrix:** Wastewater **Collected By:**

Parameter	Lab ID #	Method	Analysis Date / Time	Result	Units	MRL	Flags
Ammonia (NH3-N), Direct ISE	F306-255A	4500(NH3)D	6/7/13 12:00	3.03	mg/L	0.5	

Comments:

Reviewed by: Ryan Freeman, Technical Director

Flag Legend

P- Sample not properly preserved (preservative added upon receipt) C- Sample not submitted in proper container type B- Batch Blank contains detectable level of analyte D- Batch Duplicate outside QC limits M- Matrix Spike recovery outside QC limits L- Lab Control Standard outside QC limits H- Sample hold time exceeded S- Analysis performed by a certified subcontract laboratory N- Laboratory does not carry NELAP certification for this parameter B2- BOD dilution water blank DO uptake greater than 0.2 Jhi- Estimated Value. Result may be biased slightly high. Spike or Surrogate recovery above QC limits. Jlo- Estimated Value. Result may be biased slightly low. Spike or Surrogate recovery below QC limits. UJ- Spike or Surrogate recovery below QC limits, but no analyte detected. O- BOD oxygen uptake not in ideal range.

Timpview Analytical Laboratories

1165 North 1600 West, Orem, Utah, 84057 (801) 229-2282

Certificate of Analysis

Spanish Fork City (WW)
Dennis Sorensen
40 South Main
Sp. Fork, UT 84660
Fax: 801-804-4521
DW System # :

Work Order #: 56707
PO# / Project Name:
Date / Time Received: 6/6/13 13:13
Batch Temp °C: 6.8 Rec'd on Ice
Date Reported: 6/7/13

Sample Name: #1 End of Pipe
Collected: 6/6/13 7:10 **Matrix:** Wastewater **Collected By:**

Parameter	Lab ID #	Method	Analysis Date / Time	Result	Units	MRL	Flags
Ammonia (NH3-N), Direct ISE	F306-258A	4500(NH3)D	6/7/13 12:00	10.1	mg/L	0.5	

Sample Name: #2 Jail
Collected: 6/6/13 7:30 **Matrix:** Wastewater **Collected By:**

Parameter	Lab ID #	Method	Analysis Date / Time	Result	Units	MRL	Flags
Ammonia (NH3-N), Direct ISE	F306-259A	4500(NH3)D	6/7/13 12:00	3.05	mg/L	0.5	

Sample Name: #3 Crandal's Farm
Collected: 6/6/13 7:45 **Matrix:** Wastewater **Collected By:**

Parameter	Lab ID #	Method	Analysis Date / Time	Result	Units	MRL	Flags
Ammonia (NH3-N), Direct ISE	F306-260A	4500(NH3)D	6/7/13 12:00	2.79	mg/L	0.5	

Sample Name: #4 Provo Bay
Collected: 6/6/13 8:20 **Matrix:** Wastewater **Collected By:**

Parameter	Lab ID #	Method	Analysis Date / Time	Result	Units	MRL	Flags
Ammonia (NH3-N), Direct ISE	F306-261A	4500(NH3)D	6/7/13 12:00	2.28	mg/L	0.5	

Comments:

Reviewed by: Ryan Freeman, Technical Director

Flag Legend

P- Sample not properly preserved (preservative added upon receipt) C- Sample not submitted in proper container type B- Batch Blank contains detectable level of analyte D- Batch Duplicate outside QC limits M- Matrix Spike recovery outside QC limits L- Lab Control Standard outside QC limits H- Sample hold time exceeded S- Analysis performed by a certified subcontract laboratory N- Laboratory does not carry NELAP certification for this parameter B2- BOD dilution water blank DO uptake greater than 0.2 Jhi- Estimated Value. Result may be biased slightly high. Spike or Surrogate recovery above QC limits. Jlo- Estimated Value. Result may be biased slightly low. Spike or Surrogate recovery below QC limits. UJ- Spike or Surrogate recovery below QC limits, but no analyte detected. O- BOD oxygen uptake not in ideal range.

Timpview Analytical Laboratories

1165 North 1600 West, Orem, Utah, 84057 (801) 229-2282

Certificate of Analysis

Spanish Fork City (WW)
Dennis Sorensen
40 South Main
Sp. Fork, UT 84660
Fax: 801-804-4521
DW System # :

Work Order #: 56758
PO# / Project Name:
Date / Time Received: 6/11/13 12:17
Batch Temp °C: 6 Rec'd on Ice
Date Reported: 6/13/13

Sample Name: End of Pipe
Collected: 6/10/13 9:10 **Matrix:** Wastewater **Collected By:**

Parameter	Lab ID #	Method	Analysis Date / Time	Result	Units	MRL	Flags
Ammonia (NH3-N), Direct ISE	F311-401A	4500(NH3)D	6/13/13 10:50	9.95	mg/L	0.5	

Sample Name: Jail
Collected: 6/10/13 9:45 **Matrix:** Wastewater **Collected By:**

Parameter	Lab ID #	Method	Analysis Date / Time	Result	Units	MRL	Flags
Ammonia (NH3-N), Direct ISE	F311-402A	4500(NH3)D	6/13/13 10:50	3.42	mg/L	0.5	

Sample Name: Crandal's Farm
Collected: 6/10/13 9:57 **Matrix:** Wastewater **Collected By:**

Parameter	Lab ID #	Method	Analysis Date / Time	Result	Units	MRL	Flags
Ammonia (NH3-N), Direct ISE	F311-403A	4500(NH3)D	6/13/13 10:50	4.51	mg/L	0.5	

Sample Name: Provo Bay
Collected: 6/10/13 10:20 **Matrix:** Wastewater **Collected By:**

Parameter	Lab ID #	Method	Analysis Date / Time	Result	Units	MRL	Flags
Ammonia (NH3-N), Direct ISE	F311-404A	4500(NH3)D	6/13/13 10:50	1.07	mg/L	0.5	

Comments:

Reviewed by: Ryan Freeman, Technical Director

Flag Legend

P- Sample not properly preserved (preservative added upon receipt) C- Sample not submitted in proper container type B- Batch Blank contains detectable level of analyte D- Batch Duplicate outside QC limits M- Matrix Spike recovery outside QC limits L- Lab Control Standard outside QC limits H- Sample hold time exceeded S- Analysis performed by a certified subcontract laboratory N- Laboratory does not carry NELAP certification for this parameter B2- BOD dilution water blank DO uptake greater than 0.2 Jhi- Estimated Value. Result may be biased slightly high. Spike or Surrogate recovery above QC limits. Jlo- Estimated Value. Result may be biased slightly low. Spike or Surrogate recovery below QC limits. UJ- Spike or Surrogate recovery below QC limits, but no analyte detected. O- BOD oxygen uptake not in ideal range.

Timpview Analytical Laboratories

1165 North 1600 West, Orem, Utah, 84057 (801) 229-2282

Certificate of Analysis

Spanish Fork City (WW)
Dennis Sorensen
40 South Main
Sp. Fork, UT 84660
Fax: 801-804-4521
DW System # :

Work Order #: 56759
PO# / Project Name:
Date / Time Received: 6/11/13 12:17
Batch Temp °C: 6 Rec'd on Ice
Date Reported: 6/14/13

Sample Name: End of Pipe
Collected: 6/11/13 7:35 **Matrix:** Wastewater **Collected By:**

Parameter	Lab ID #	Method	Analysis Date / Time	Result	Units	MRL	Flags
Ammonia (NH3-N), Direct ISE	F311-405A	4500(NH3)D	6/14/13 10:40	10.8	mg/L	0.5	

Sample Name: Jail
Collected: 6/11/13 7:50 **Matrix:** Wastewater **Collected By:**

Parameter	Lab ID #	Method	Analysis Date / Time	Result	Units	MRL	Flags
Ammonia (NH3-N), Direct ISE	F311-406A	4500(NH3)D	6/14/13 10:40	7.13	mg/L	0.5	

Sample Name: Crandal's Farm
Collected: 6/11/13 8:02 **Matrix:** Wastewater **Collected By:**

Parameter	Lab ID #	Method	Analysis Date / Time	Result	Units	MRL	Flags
Ammonia (NH3-N), Direct ISE	F311-407A	4500(NH3)D	6/14/13 10:40	4.70	mg/L	0.5	

Sample Name: Provo Bay
Collected: 6/11/13 8:37 **Matrix:** Wastewater **Collected By:**

Parameter	Lab ID #	Method	Analysis Date / Time	Result	Units	MRL	Flags
Ammonia (NH3-N), Direct ISE	F311-408A	4500(NH3)D	6/14/13 10:40	2.42	mg/L	0.5	

Comments:

Reviewed by: Ryan Freeman, Technical Director

Flag Legend

P- Sample not properly preserved (preservative added upon receipt) C- Sample not submitted in proper container type B- Batch Blank contains detectable level of analyte D- Batch Duplicate outside QC limits M- Matrix Spike recovery outside QC limits L- Lab Control Standard outside QC limits H- Sample hold time exceeded S- Analysis performed by a certified subcontract laboratory N- Laboratory does not carry NELAP certification for this parameter B2- BOD dilution water blank DO uptake greater than 0.2 Jhi- Estimated Value. Result may be biased slightly high. Spike or Surrogate recovery above QC limits. Jlo- Estimated Value. Result may be biased slightly low. Spike or Surrogate recovery below QC limits. UJ- Spike or Surrogate recovery below QC limits, but no analyte detected. O- BOD oxygen uptake not in ideal range.

ATTACHMENT 2

Wasteload Analysis

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

Date:	**April 7, 2014**
Prepared by:	**Nicholas von Stackelberg, P.E.** **Water Quality Management Section**
Facility:	**Spanish Fork Wastewater Treatment Plant** **UPDES No. UT0021741**
Receiving water:	**Dry Creek (2B, 3E, 4)** **Provo Bay/Utah Lake (2B, 3B, 3D, 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: Dry Creek

The maximum daily design discharge is 10.0 MGD and the maximum monthly design discharge is 5.0 MGD for the facility.

Receiving Water
The receiving water for Outfall 001 is Dry Creek, which is tributary to Utah Lake (Provo Bay).

Per UAC R317-2-13.5.c, the designated beneficial uses for Dry Creek and tributaries from Utah Lake (Provo Bay) to Highway-US are 2B, 3E, 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 3E -- Severely habitat-limited waters. Narrative standards will be applied to protect these waters for aquatic wildlife.*
- *Class 4 - Protected for agricultural uses including irrigation of crops and stock watering.*

Since the aquatic life use class for Dry Creek (3E) only has narrative standards, the numeric standards for Utah Lake (Provo Bay) were used to determine the WQBELs for this discharge. Per UAC R317-2-13.12.x, the designated beneficial uses for Utah Lake are 2B, 3B, 3D, and 4.

- *Class 3B -- Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.*
- *Class 3D -- Protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain.*

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 Dry Creek, the 20th percentile of flow measurements from water quality monitoring above the facility outfall was calculated to estimate seasonal critical flow in the receiving water (Table 1). The assumed flows for an unnamed irrigation canal that discharges into Dry Creek near the outlet to Provo Bay is also shown in Table 1.

Table 1: Seasonal critical low flow

Season	Dry Creek (cfs)	Irrigation Canal Return Flow (cfs)
Summer	1.7	1.55
Fall	11.4	0
Winter	10.1	0
Spring	10.2	0

TMDL

Dry Creek is not listed as impaired for any parameters according to the 2010 303(d) list. Utah Lake is listed as impaired for Total Phosphorus and Total Dissolved Solids.

Mixing Zone

The discharge is considered instantaneously fully mixed in the summer since the discharge is more than twice the background receiving water flow. For the remainder of the year, the discharge is assumed to be fully mixed in Dry Creek by the time it enters Provo Bay, which is the compliance point for numeric aquatic life criteria.

Parameters of Concern

The potential parameters of concern identified for the discharge/receiving water were total suspended solids (TSS), dissolved oxygen (DO), BOD_5, total phosphorus (TP), total nitrogen (TN), total ammonia (TAM), E. coli, pH, and total residual chlorine (TRC) as determined in consultation with the UPDES Permit Writer.

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	82%
Fall	40%
Winter	43%
Spring	43%

Water Quality Modeling

A QUAL2Kw model of the receiving water was built and calibrated under contract by Utah State University (USU) (Neilson et al. 2012). The model was calibrated to synoptic survey data collected in the summer of 2010 by USU and DWQ. The model extends from immediately above the plant discharge to upstream of the crossing at North Main Street (approximately 0.85 km).

The QUAL2Kw model of Dry Creek was extended to Provo Bay based on physiographic information from Google Earth and site data collected by DWQ staff (approximately 5.15 km total). To validate the model parameterization, an additional synoptic survey was conducted by DWQ staff in October 2012 using standard operating procedures (DWQ 2012a). Both the calibrated and validated QUAL2Kw models are available for review by request.

A wasteload QUAL2Kw model was built based on the calibrated model and using seasonal flow and water quality data for the receiving water. Receiving water quality data was obtained from monitoring site 4996030 Dry Creek above Spanish Fork WWTP. The average seasonal value was calculated for each constituent with available data in the receiving water. The wasteload model is available for review by request.

The QUAL2Kw model was used for determining the WQBELs related to eutrophication and low dissolved oxygen, including ammonia. 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. QUAL2Kw rates, input and output are summarized in Appendix A.

A mass balance mixing analysis was conducted for conservative constituents such as dissolved metals. The WQBELs determined using the simple mixing analysis are summarized in Appendix B.

The limits for total residual chlorine were dependent on travel time and decay rate. The travel time was determined by adding the travel time in the outlet pipe (2,700 linear feet) to the travel time in Dry Creek prior to discharge to Provo Bay (per travel time in QUAL2Kw). Based on field sampling conducted by AQUA Engineering (2014), an average decay rate of 29.9 /day was used for determining chlorine decay through the outlet pipe and Dry Creek. The analysis for TRC is summarized in Appendix C.

Effluent Limits

The effect of the effluent on the DO in the receiving water was evaluated using the QUAL2Kw model. A large amount of filamentous benthic algae growth was observed and predicted in the model downstream of the treatment plant discharge, resulting in a DO sag and high diel range. Other factors contributing to the low minimum DO include low reaeration rate due to the flat gradient of Dry Creek, decay of BOD in the effluent, and sediment oxygen demand (SOD) resulting from decomposition of organic matter. The DO sag recovered somewhat within the model extents; however, in order to meet the minimum DO standard at the mouth of Dry Creek at Provo Bay, ammonia had to be limited during the summer (Table 3).

Table 3: Water Quality Based Effluent Limits Summary

Effluent Constituent	Acute			Chronic		
	Standard[a]	Limit	Averaging Period	Standard[a]	Limit	Averaging Period
Flow (MGD)		10.0	1 day		5.0	30 days
Min. Dissolved Oxygen (mg/L)	3.0	4.0	Instantaneous	5.0	4.0	30 days
BOD_5 (mg/L)[d]	None	35	7 days	None	25	30 days
Ammonia (mg/L)						
Summer	Varies	18[c]	1 hour	Varies	7[b]	30 days
Fall/Winter/Spring		18[c]			9	
Total Residual Chlorine (mg/L)						
Summer		48.2			212.1	
Fall	0.019	7.0	1 hour	0.011	12.6	4 days
Winter		2.1			3.1	
Spring		5.1			8.7	

a: Applicable standard in Provo Bay.
b: Limit due to minimum DO. All other seasonal ammonia limits due to toxicity criteria.
c: Limit from previous permit – meets water quality standards for this analysis.
d: Limits based on Utah Secondary Treatment Standards (*UAC R317-1-3.2*).

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 not required for this discharge since the pollutant concentration and load are not increasing beyond the design capacity of the facility.

Documents:

WLA Document: *spanish_fork_potw_wla_2014_final.docx*
QUAL2Kw Wasteload Model: *spanish_fork_wla_2014.xlsm*

References:

AQUA Engineering. 2014. *Spanish Fork City Waste-Load Parameters for Wastewater Discharge Permit.* City of Spanish Fork.

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 Department of Environmental Quality, Division of Water Quality.

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

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

WASTELOAD ANALYSIS [WLA] Date: 2/13/2014
Appendix A: QUAL2Kw Analysis for Eutrophication

Discharging Facility:	Spanish Fork WWTP		
UPDES No:	UT-0021741		
Permit Flow [MGD]:	5.00	Maximum Monthly Flow	
	10.00	Maximum Daily Flow	
Receiving Water:	Dry Creek		
Stream Classification:	2B, 3E, 4		
Stream Flows [cfs]:	1.70	Summer (July-Sept)	Critical Low Flow
	11.40	Fall (Oct-Dec)	
	10.10	Winter (Jan-Mar)	
	10.20	Spring (Apr-June)	
Acute River Width:	100.0%		
Chronic River Width:	100.0%		

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)	1.7	11.4	10.1	10.2
Temperature (deg C)	20.1	9.6	11.0	4.0
Specific Conductance (µmhos)	950	950	950	950
Inorganic Suspended Solids (mg/L)	46.0	56.6	43.4	79.1
Dissolved Oxygen (mg/L)	8.4	10.5	10.3	10.7
$CBOD_5$ (mg/L)	2.1	1.9	2.5	2.7
Organic Nitrogen (mg/L)	0.185	0.185	0.185	0.185
NH4-Nitrogen (mg/L)	0.045	0.090	0.082	0.268
NO3-Nitrogen (mg/L)	2.585	3.461	2.122	3.191
Organic Phosphorus (mg/L)	0.075	0.047	0.032	0.068
Inorganic Ortho-Phosphorus (mg/L)	0.124	0.051	0.081	0.059
Phytoplankton (µg/L)	3.7	3.7	3.7	3.7
Detritus [POM] (mg/L)	5.1	6.3	4.8	8.8
Alkalinity (mg/L)	296	296	296	296
pH	8.2	8.3	8.2	8.3

Discharge Information

Chronic	Summer	Fall	Winter	Spring
Flow (cfs)	5.0	5.0	5.0	5.0
Temperature (deg C)	21.1	15.9	10.6	14.8
Inorganic Suspended Solids (mg/L)	13.6	12.7	9.8	11.1
Organic Nitrogen (mg/L)	5.000	5.000	5.000	5.000
NO3-Nitrogen (mg/L)	6.943	7.144	5.843	8.242
Organic Phosphorus (mg/L)	1.000	1.000	1.000	1.000
Inorganic Phosphorus (mg/L)	4.000	4.000	4.000	4.000
Alkalinity (mg/L)	275	275	275	275
pH	7.5	7.6	7.6	7.5

Acute	Summer	Fall	Winter	Spring
Flow (cfs)	10.0	10.0	10.0	10.0
Temperature (deg C)	21.1	15.9	10.6	14.8
Inorganic Suspended Solids (mg/L)	13.6	12.7	9.8	11.1
Organic Nitrogen (mg/L)	10.000	10.000	10.000	10.000
NO3-Nitrogen (mg/L)	6.943	7.144	5.843	8.242
Organic Phosphorus (mg/L)	2.000	2.000	2.000	2.000
Inorganic Phosphorus (mg/L)	8.000	8.000	8.000	8.000
Alkalinity (mg/L)	275	275	275	275
pH	7.8	8.1	8.1	8.0

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 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	5.0	5.0	5.0	5.0
NH4-Nitrogen (mg/L)	Varies	7.0	9.0	9.0	9.0
$CBOD_5$ (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 (cfs)	N/A	10.0	10.0	10.0	10.0
NH4-Nitrogen (mg/L)	Varies	18.0	18.0	18.0	18.0
$CBOD_5$ (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	0.2	m/d
Oxygen:		
Reaeration model	USGS(channel-control)	
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	0.25219	/d
Temp correction	1.07	
Settling velocity	0.072248	m/d
Ammonium:		
Nitrification	3.840973	/d
Temp correction	1.07	
Nitrate:		
Denitrification	0.440663	/d
Temp correction	1.07	
Sed denitrification transfer coeff	0.89485	m/d
Temp correction	1.07	
Organic P:		
Hydrolysis	0.11173	/d
Temp correction	1.07	
Settling velocity	0.153214	m/d
Inorganic P:		
Settling velocity	1.49684	m/d
Sed P oxygen attenuation half sat constant	1.22794	mgO2/L

Phytoplankton:		
Max Growth rate	2.817285	/d
Temp correction	1.07	
Respiration rate	0.183875	/d
Temp correction	1.07	
Death rate	0.75246	/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	16.22865	ugN/L
Settling velocity	0.217562	m/d
Bottom Plants:		
Growth model	Zero-order	
Max Growth rate	39.236835	gD/m2/d or /d
Temp correction	1.07	
First-order model carrying capacity	100	gD/m2
Basal respiration rate	0.196733	/d
Photo-respiration rate parameter	0.01	unitless
Temp correction	1.07	
Excretion rate	0.002735	/d
Temp correction	1.07	
Death rate	0.00755	/d
Temp correction	1.07	
External nitrogen half sat constant	464.684	ugN/L
External phosphorus half sat constant	56.1985	ugP/L
Inorganic carbon half sat constant	7.79E-05	moles/L
Bottom algae use HCO3- as substrate	Yes	
Light model	Smith	
Light constant	47.8192	mgO^2/L
Ammonia preference	23.29875	ugN/L
Subsistence quota for nitrogen	0.8422416	mgN/gD
Subsistence quota for phosphorus	0.1719125	mgP/gD
Maximum uptake rate for nitrogen	956.625	mgN/gD/d
Maximum uptake rate for phosphorus	98.1245	mgP/gD/d
Internal nitrogen half sat ratio	3.5499945	
Internal phosphorus half sat ratio	3.8810835	
Nitrogen uptake water column fraction	1	
Phosphorus uptake water column fraction	1	
Detritus (POM):		
Dissolution rate	1.071086	/d
Temp correction	1.07	
Settling velocity	0.4923905	m/d
pH:		
Partial pressure of carbon dioxide	370	ppm

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	100%
Bottom SOD Coverage	100%
Prescribed SOD, $gO_2/m^2/day$	0

WASTELOAD ANALYSIS [WLA] Date: 2/13/2014

Appendix B: Mass Balance Mixing Analysis for Conservative Constituents

Discharging Facility:	Spanish Fork WWTP		
UPDES No:	UT-0021741		
Permit Flow [MGD]:	5.00	Maximum Monthly Flow	
	10.00	Maximum Daily Flow	
Receiving Water:	Dry Creek		
Stream Classification:	2B, 3E, 4		
Stream Flows [cfs]:	1.70	Summer (July-Sept)	Critical Low Flow
	11.40	Fall (Oct-Dec)	
	10.10	Winter (Jan-Mar)	
	10.20	Spring (Apr-June)	
Acute River Width:	100.0%		
Chronic River Width:	100.0%		

Modeling Information

A simple mixing analysis 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

	7Q10 Flow
	cfs
Summer	1.7
Fall	11.4
Winter	10.1
Spring	10.2

Discharge Information

	Flow
	MGD
Maximum Daily	10.0
Maximum Monthly	5.0

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 for Protection of Recreation (Class 2B Waters)

Parameter	Maximum Concentration
Physical	
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 3D Waters)

Parameter	Maximum Concentration				
Physical					
Inorganics	**Chronic Standard (4 Day Average)**			**Acute Standard (1 Hour Average)**	
	Standard		**Limit**	**Standard**	**Limit**
Phenol				0.010	0.010 mg/L
Hydrogen Sulfide (Undissociated)				0.002	0.002 mg/L

Total Recoverable Metals

	Chronic Standard (4 Day Average)			**Acute Standard (1 Hour Average)**		
Parameter (µg/L)	**Standard**	**Background**	**Limit**	**Standard**	**Background**	**Limit**
Aluminum	87.0	43.5	101.8	750.0	43.5	870.1
Arsenic	150.0	75.0	175.5	340.0	75.0	385.1
Cadmium	0.7	0.3	0.8	7.4	0.3	8.6
Chromium VI	11.0	5.5	12.9	16.0	5.5	17.8
Chromium III	233.7	116.8	273.4	4888.7	116.8	5699.9
Copper	26.4	13.2	30.9	44.1	13.2	49.4
Cyanide	22.0	11.0	25.7	5.2	11.0	4.2
Iron				1000.0	500.0	1085.0
Lead	15.0	7.5	17.5	384.8	7.5	448.9
Mercury	0.012	0.006	0.014	2.4	0.0	2.8
Nickel	146.2	73.1	171.0	1314.6	73.1	1525.7
Selenium	4.6	2.3	5.4	18.4	2.3	21.1
Silver				30.7	15.4	33.4
Tributylin	0.072	0.036	0.084	0.46	0.04	0.53
Zinc	336.3	168.1	393.4	336.3	168.1	364.8

Based upon a Hardness of 338 mg/l as CaCO3

Organics [Pesticides]

	Chronic Standard (4 Day Average)			Acute Standard (1 Hour Average)		
Parameter (µg/L)	**Standard**	**Background**	**Limit**	**Standard**	**Background**	**Limit**
Aldrin				1.500	0.750	1.628
Chlordane	0.0043	0.00215	0.0050	1.200	0.600	1.302
DDT, DDE	0.001	0.0005	0.0012	0.550	0.275	0.597
Diazinon	0.17	0.085	0.199	0.17	0.085	0.184
Dieldrin	0.0056	0.0028	0.0066	0.240	0.120	0.260
Endosulfan, a & b	0.056	0.028	0.066	0.110	0.055	0.119
Endrin	0.036	0.018	0.042	0.086	0.043	0.093
Heptachlor & H. epoxide	0.0038	0.0019	0.0044	0.260	0.130	0.282
Lindane	0.08	0.04	0.09	1.000	0.500	1.085
Methoxychlor				0.030	0.015	0.033
Mirex				0.001	0.001	0.001
Nonylphenol	6.6	3.3	7.7	28.0	14.0	30.4
Parathion	0.0130	0.0065	0.0152	0.066	0.033	0.072
PCB's	0.014	0.007	0.016			
Pentachlorophenol	15.00	7.5	17.6	19.000	9.500	20.615
Toxephene	0.0002	0.0001	0.000234	0.730	0.365	0.792

Radiological

Parameter	**Maximum Concentration**
Gross Alpha	15 pCi/L

Effluent Limitation for Protection of Agriculture (Class 4 Waters)

	Maximum Concentration		
Parameter	**Standard**	**Background**	**Limit**
Total Dissolved Solids (mg/L)	1200	637	1296
Boron (µg/L)	75	37.5	81.4
Arsenic (µg/L)	100	50	109
Cadmium (µg/L)	10	5	10.9
Chromium (µg/L)	100	50	109
Copper (µg/L)	200	100	217
Lead (µg/L)	100	50	109
Selenium (µg/L)	50	25	54.3
Gross Alpha (pCi/L)	15	7.5	16.3

WASTELOAD ANALYSIS [WLA]
Appendix C: Total Residual Chlorine

Date: 4/7/2014

Discharging Facility: Spanish Fork WWTP
UPDES No: UT-0021741

CHRONIC

	Season	Receiving Water	Standard	Total Effluent	Mixing Zone Boundary	Effluent Limit Without Decay	Temperature (°C)	Decay Rate (/day) @ 20 deg C	Decay Rate (/day) @ T deg C	Travel Time (min)	Decay Coefficient	Effluent Limit
Discharge (cfs)	Summer	1.7		7.7	9.4							
	Fall	11.4		7.7	19.1							
	Winter	10.1		7.7	17.8							
	Spring	10.2		7.7	17.9							
TRC (mg/L)	Summer	0.000	0.011			0.013	21.1	29.86	31.4	443	0.0001	212.061
	Fall	0.000	0.011			0.027	15.9	29.86	24.8	357	0.0022	12.611
	Winter	0.000	0.011			0.025	10.6	29.86	19.4	357	0.0082	3.100
	Spring	0.000	0.011			0.026	14.8	29.86	23.5	357	0.0029	8.700

ACUTE

	Season	Receiving Water	Standard	Total Effluent	Mixing Zone Boundary	Effluent Limit Without Decay	Temperature (°C)	Decay Rate (/day) @ 20 °C	Decay Rate (/day) @ T °C	Travel Time (min)	Decay Coefficient	Effluent Limit
Discharge (cfs)	Summer	1.7		15.5	17.2							
	Fall	11.4		15.5	26.9							
	Winter	10.1		15.5	25.6							
	Spring	10.2		15.5	25.7							
TRC (mg/L)	Summer	0.000	0.019			0.021	21.1	29.86	31.4	355	0.0004	48.202
	Fall	0.000	0.019			0.033	15.9	29.86	24.8	311	0.0047	6.998
	Winter	0.000	0.019			0.031	10.6	29.86	19.4	311	0.0151	2.081
	Spring	0.000	0.019			0.032	14.8	29.86	23.5	311	0.0062	5.116

ATTACHMENT 3

Industrial Waste Survey

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Industrial Pretreatment Wastewater Survey

Do you periodically experience any of the following treatment works problems:

foam, floaties or unusual colors
plugged collection lines caused by grease, sand, flour, etc.
discharging excessive suspended solids, even in the winter
smells unusually bad
waste treatment facility doesn't seem to be treating the waste right

Perhaps the solution to a problem like one of these may lie in investigating the types and amounts of wastewater entering the sewer system from industrial users.

An industrial user (IU) is defined as a non-domestic user discharging to the waste treatment facility which meets 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.)**

   Examples: Food processor, dairy, slaughterhouse, industrial laundry.

2. **is subject to Federal Categorical Pretreatment Standards**;

   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,

3. **is a concern to the POTW.**

   Examples: septage hauler, restaurant and food service, car wash, hospital, photo lab, carpet cleaner, commercial laundry.

All users of the water treatment facility are **prohibited** from making the following types of discharges:

1. A discharge which creates a fire or explosion hazard in the collection system.
2. A discharge which creates toxic gases, vapor or fumes in the collection system.
3. A discharge of solids or thick liquids which creates flow obstructions in the collection system.
4. An acidic discharge (low pH) which causes corrosive damage to the collection system.
5. 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.
6. Waste haulers are prohibited from discharging without permission. (No midnight dumping!)

When the solution to a sewer system problem may be found by investigating the types and amounts of wastewater entering the sewer system discharged from IUs, it's appropriate to conduct an Industrial Waste Survey.

An Industrial Waste Survey consists of:

Step 1: Identify Industrial Users

Make a list of all the commercial and industrial sewer connections.

Sources for the list:

business license, building permits, water and wastewater billing, Chamber of Commerce, newspaper, telephone book, yellow pages.

Split the list into two groups:

domestic wastewater only--no further information needed
everyone else (IUs)

Step 2: Preliminary Inspection

Go visit each IU identified on the "everybody else" list.

Fill out the **Preliminary Inspection Form** during the site visit.

Step 3: Informing the State

Please fax or send a copy of the Preliminary inspection form (both sides) to:

Jennifer Robinson

Division of Water Quality
288 North 1460 West
P.O. Box 144870
Salt Lake City, UT 84114-4870

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

PRELIMINARY INSPECTION FORM

INSPECTION DATE ___ / ____ /

Name of Business **Person Contacted** _____
Address _____ **Phone Number** _____
_____

Description of Business _____

Principal product or service: _____

Raw Materials used: _____
_____

Production process is: [ ] Batch [ ] Continuous [ ] Both

Is production subject to seasonal variation? [ ] yes [ ] no
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):

[ ] Sanitary sewer **[ ] Storm sewer**
[ ] Surface water **[ ] Ground water**
[ ] Waste haulers **[ ] Evaporation**
[ ] Other (describe)
Name of waste hauler(s), if used

_____

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

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:

[ ] Adhesives
[ ] Aluminum Forming
[ ] Battery Manufacturing
[ ] Copper Forming
[ ] Electric & Electronic Components
[ ] Explosives Manufacturing
[ ] Foundries
[ ] Inorganic Chemicals Mfg. or Packaging
[ ] Industrial Porcelain Ceramic Manufacturing
[ ] Iron & Steel
[ ] 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
[ ] Plastics Manufacturing
[ ] Rubber Manufacturing
[ ] Soaps & Detergents Manufacturing
[ ] Steam Electric Generation
[ ] Tanning Animal Skins
[ ] Textile Mills

[ ] Car Wash
[ ] Carpet Cleaner
[ ] Dairy
[ ] Food Processor
[ ] Hospital
[ ] Laundries
[ ] Photo Lab
[ ] Restaurant & Food Service
[ ] Septage Hauler
[ ] Slaughter House

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

_____
Waste Treatment Facility

Please send a copy of the preliminary inspection form (both sides) to:

Jennifer Robinson
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

	Industrial User	Jurisdiction	SIC Codes	Categorical Standard Number	Total Average Process Flow (gpd)	Total Average Facility Flow (gpd)	Facility Description
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							

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ATTACHMENT 4

Reasonable Potential Analysis Model Output

Effluent, Metals, mg/L

Metal		CN	As	Cd	Cr	Cu	Pb	Ni	Ag	Zn	Mo	Se	Hg
ARP Val		0.0042	0.385	0.0086	0.0178	0.0494	0.4489	1.5257	0.0334	0.3648	1	0.0211	0.0028
CRP Val		0.0257	0.1755	0.0008	0.0129	0.0309	0.0175	0.171	1	0.3934	1	0.0054	0.000014
2009	Fall	0.008	0.0027	ND	0.003	0.0081	ND	0.0087	ND	0.03	0.0046	0.0023	ND
2010	Win	ND	0.0028	ND	0.003	0.0085	ND	0.0074	ND	0.03	0.0126	0.0019	ND
	Spr	ND	0.004	ND	0.002	0.0076	ND	0.0077	ND	0.04	0.0088	0.0026	0.00000011
	Sum	ND	0.0028	ND	0.001	0.0008	ND	0.0057	0.001	0.03	0.0075	0.0028	ND
	Fall	ND	0.0029	ND	0.001	0.0092	ND	0.0058	ND	0.03	0.0073	0.0021	ND
2011	Win	ND	0.0048	ND	0.0042	0.0227	0.0011	0.007	0.001	0.08	0.0065	0.0033	0.00000313
	Spr	ND	0.0042	ND	0.0023	0.0062	ND	0.0073	0.0005	0.03	0.0121	0.0029	ND
	Sum	ND	0.0035	ND	0.0013	0.007	ND	0.0071	ND	0.03	0.0136	0.0027	0.0000032
	Fall	0.007	0.0028	ND	0.0033	0.0074	ND	0.007	ND	0.03	0.0106	0.0028	0.0000038
2012	Win	0.005	0.0042	ND	0.0012	0.0087	ND	0.0068	ND	0.04	0.0149	0.0036	0.0000029
	Spr	0.005	0.0047	ND	0.0017	0.0091	0.0006	0.0042	0.002	0.06	0.0217	0.0038	0.0000049
	Sum	0.004	0.0036	ND	0.0021	0.0077	0.0005	0.0048	0.002	0.03	0.0068	0.003	0.0000029
	Fall	0.004	0.0046	0.0002	0.0016	0.0067	ND	0.0106	0.0008	0.04	0.0233	0.0042	0.0000044
2013	Win	ND	0.0056	ND	0.008	0.0079	ND	0.0055	ND	0.059	0.088	0.0042	ND
	Spr	ND	0.0046	ND	0.014	0.011	ND	0.0082	ND	0.068	0.0079	0.0033	ND
	Sum	0.004	0.0036	ND	0.0021	0.0077	ND	0.0048	0.002	0.03	0.0068	ND	0.0000029
	Fall	ND	0.0048	ND	0.0084	0.0074	ND	0.0038	ND	0.041	0.0064	ND	ND
2014	Win	ND	0.005	ND	ND	0.0054	ND	ND	ND	ND	0.028	ND	ND
	Spr	ND	0.004	ND	ND	0.006	ND	0.0022	ND	ND	0.015	0.0034	ND
	Sum	ND	0.004	ND	ND	0.0067	ND	0.0041	0.00051	0.059	0.016	0.0021	ND
ND Value		0.005	0.0005	0.0005	0.005	0.001	0.0005	0.0005	0.0005	0.05	0.005	0.0002	0.0001
Max		0.008	0.0056	0.0005	0.014	0.0227	0.0011	0.0106	0.002	0.08	0.088	0.0042	0.0001
Run A RP?		YES	No	No	YES	No	No	No	No	No	No	No	No
Run C RP?		No	No	YES	YES	YES	No	No	No	No	No	YES	YES

	Flow, MGD		E. coli		DO	pH		O&G	BOD5, mg/L		TSS, mg/L		Ammonia	TRC
Month	Ave	Max	Ave	Max	Min	Min	Max	Max	Ave	Max	Ave	Max	Max	MAX
Limit	5	10	126	157	4	6.5	9	10	25	35	25	35	18	2
Jan-11	5	7	46	117	4.0	7.3	7.5	0	7	10	7	18	7.1	1.7
Feb-11	5	7	10	30	4.5	7.3	7.7	0	8	10	8	10	10.1	1.8
Mar-11	5	737	10	124	4.0	7.6	7.8	0	8	10	7	8	16.0	1.7
Apr-11	5	8	19	523	4.0	7.6	7.9	0	8	10	7	9	16.0	2.0
May-11	5	8	19	523	4.0	7.6	7.9	0	8	10	7	9	16.0	2.0
Jun-11	5	7	1	3	4.0	7.4	7.8	0	11	15	7	8	9.3	1.9
Jul-11	5	8	2	5	4.0	7.6	7.7	0	7	9	6	8	9.0	1.9
Aug-11	5	7	2	9	4.0	7.2	7.5	0	9	12	7	8	10.0	1.7
Sep-11	5	8	9	25	4.0	7.2	7.6	0	7	8	5	6	6.8	1.7
Oct-11	5	10	14	100	4.0	7.2	7.5	0	6	7	4	5	8.5	1.9
Nov-11	4	7	13	38	4.0	7.2	7.5	0	6	8	6	8	8.8	1.7
Dec-11	4	4	9	38	4.0	7.4	7.5	0	8	9	5	5	13.8	2.0
Jan-12	4	5	5	54	4.5	7.3	7.5	0	8	6	9	6	14.4	2.0
Feb-12	4	5	10	50	4.5	7.4	7.6	0	9	13	6	16	14.0	2.0
Mar-12	4	4	10	25	4.2	7.4	7.7	0	11	15	6	6	12.6	1.9
Apr-12	4	4	13	73	4.5	7.6	7.8	0	10	12	9	12	13.7	1.7
May-12	4	5	6	44	4.3	7.5	7.7	0	9	10	10	13	9.7	2.0
Jun-12	4	5	14	40	4.3	7.5	7.7	0	9	12	9	13	5.5	1.9
Jul-12	4	5	5	18	4.0	7.5	7.7	0	10	11	8	8	7.2	1.9
Aug-12	4	5	5	66	4.0	7.4	7.5	0	10	12	7	9	6.7	1.9
Sep-12	4	5	9	66	4.3	7.4	7.6	0	8	12	6	7	8.3	2.0
Oct-12	4	5	6	12	4.0	7.4	7.6	0	9	12	6	10	9.0	1.9
Nov-12	4.2	4.7	6	36	4	7.3	7.6	0	10	13	8	10	8.7	1.4
Dec-12	4.2	4.9	7	126	4.5	7.4	7.6	0	9	11	9	11	13.5	1.5
Jan-13	4.1	4.6	13	121	5.25	6.4	7.5	0	7	10	8	10	10	1.7
Feb-13	4.6	4.5	17	96	5.25	6.7	7.2	0	9	12	11	18	12.1	1.9
Mar-13	4.3	4.5	13	53	5	6.9	7.0	0	12	14	10	17	10.5	2.0
Apr-13	4.3	4.7	2	15	4.5	6.7	7.3	0	10	12	9	19	12.9	2.0
May-13	4.7	7.1	4	36	4	7.3	7.4	0	9	12	5	6	12.1	1.6
Jun-13	4.6	6.8	1	4	4	7.5	7.8	0	12	16	6	7	12.9	2.0
Jul-13	4.6	4.6	5	5.3	4	7.6	7.7	0	8	11	8	11	20.7	1.3
Aug-13	4.6	7.8	3	4	4	7.4	7.9	0	7	8	6	9	7.55	1.7
Sep-13	4.7	6.4	6	8	4	7.5	7.8	0	9	11	10	15	13.5	1.6
Oct-13	3.9	5.5	9	12.6	4	7.6	7.8	0	9	12	10	12	12	1.4
Nov-13	3.4	4.3	5	130	4.5	7.4	7.8	0	7	9	8	10	14.1	2.0
Dec-13	3.4	8	5	130	4	7.5	7.8	0	9	12	6	8	19.2	2.0
Jan-14	3.2	4.3	1	1	4.5	7.6	7.7	0	7	9	8	16	17.9	2.0
Feb-14	3.6	5.1	1	1	4.25	7.6	7.7	0	10	13	6	10	18.9	2.0
Mar-14	3.4	4.5	1	3	4.5	7.5	7.7	0	8	9	5	5	17.6	1.6
Apr-14	3.9	4.4	5	126	4	7.4	7.7	0	10	11	7	9	10.9	1.6
May-14	4.4	4.8	30	1039	4	7.5	7.8	0	11	19	10	23	18.5	2.0
Jun-14	4.2	4.9	7	7	4.25	7.5	7.7	0	10	11	12	18	12.9	2.0
Jul-14	4.4	4.8	2	2	4	7.1	7.6	0	10	12	10	12	7.4	1.4
Aug-14	4.5	6.4	3	18.9	4	7.6	7.7	0	7	13	6	8	6.79	1.0
Sep-14	4.8	6.3	3	6	4.5	7.1	7.8	0	14	26	6	7	9.01	1.6

RP Procedure Output			Effluent Data	
Facility Name:	Spanish Fork		#	
Permit Number:	UT0020109		1	0.008
Outfall Number:	OO1		2	ND
Parameter	Cyanide (Total)		3	ND
Distribution	Normal		4	ND
Data Units	mg/L		5	ND
Reporting Limit	0.002		6	ND
Significant Figures	2		7	ND
Confidence Interval	99		8	ND
			9	0.007
Maximum Reported Effluent Conc.	0.008	mg/L	10	0.005
Coefficient of Variation (CV)	0.3		11	0.005
RP Multiplier	1.7		12	0.004
Projected Maximum Effluent Conc. (MEC)	0.014	mg/L	13	0.004
Facility Flow	10	MGD	14	ND
Acute Dilution Factor	1		15	ND
Acute Low Flow	2.64	MGD	16	ND
Background Pollutant Conc. (acute)	0.0023	mg/L	17	ND
Acute Receiving Water Conc. (RWCa)	0.014	mg/L	18	ND
Acute Criterion	0.0042	mg/L	19	ND
Chronic Dilution Factor	1		20	ND
Chronic Low Flow	2.64	MGD		
Background Pollutant Conc. (chronic)	0.0023	mg/L		
Chronic Receiving Water Conc. (RWCc)	0.014	0		
Chronic Criterion	0.0257	mg/L		
RP for Acute?	YES			
RP for Chronic?	NO			

RP Procedure Output			Effluent Data	
Facility Name:	Spanish Fork		#	
Permit Number:	UT0020109		1	0.0005
Outfall Number:	OO1		2	0.0005
Parameter	Cadmium		3	0.0005
Distribution	Normal		4	0.0005
Data Units	mg/L		5	0.0005
Reporting Limit	0.0005		6	0.0005
Significant Figures	2		7	0.0005
Confidence Interval	95		8	0.0005
			9	0.0005
Maximum Reported Effluent Conc.	0.0002	mg/L	10	0.0005
Coefficient of Variation (CV)	0.47		11	0.0005
RP Multiplier	2.8		12	0.0002
Projected Maximum Effluent Conc. (MEC)	0.00055	mg/L	13	0.0002
Facility Flow	0	MGD	14	0.0005
Acute Dilution Factor	1		15	0.0005
Acute Low Flow	0	MGD	16	0.0002
Background Pollutant Conc. (acute)	0	mg/L	17	0.0005
Acute Receiving Water Conc. (RWCa)	0.00055	mg/L	18	0.0005
Acute Criterion	0.0086	mg/L	19	0.0005
Chronic Dilution Factor	1		20	0.0005
Chronic Low Flow	0	MGD		
Background Pollutant Conc. (chronic)	0	mg/L		
Chronic Receiving Water Conc. (RWCc)	0.00055	0		
Chronic Criterion	0.0008	mg/L		
RP for Acute?	NO			
RP for Chronic?	NO			

RP Procedure Output			Effluent Data	
Facility Name:	Spanish Fork		#	
Permit Number:	UT0020109		1	0.0081
Outfall Number:	OO1		2	0.0085
Parameter	Copper		3	0.0076
Distribution	Normal		4	0.0008
Data Units	mg/L		5	0.0092
Reporting Limit	0.0005		6	0.0227
Significant Figures	2		7	0.0062
Confidence Interval	95		8	0.007
			9	0.0074
Maximum Reported Effluent Conc.	0.0227	mg/L	10	0.0087
Coefficient of Variation (CV)	0.56		11	0.0091
RP Multiplier	1.2		12	0.0077
Projected Maximum Effluent Conc. (MEC)	0.027	mg/L	13	0.0067
Facility Flow	0	MGD	14	0.0079
Acute Dilution Factor	1		15	0.011
Acute Low Flow	0	MGD	16	0.0077
Background Pollutant Conc. (acute)	0	mg/L	17	0.0074
Acute Receiving Water Conc. (RWCa)	0.027	mg/L	18	0.0054
Acute Criterion	0.0494	mg/L	19	0.006
Chronic Dilution Factor	1		20	0.0067
Chronic Low Flow	0	MGD		
Background Pollutant Conc. (chronic)	0	mg/L		
Chronic Receiving Water Conc. (RWCc)	0.027	0		
Chronic Criterion	0.0309	mg/L		
RP for Acute?	NO			
RP for Chronic?	NO			

RP Procedure Output			Effluent Data	
Facility Name:	Spanish Fork		#	
Permit Number:	UT0020109		1	0.0023
Outfall Number:	OO1		2	0.0019
Parameter	Selenium		3	0.0026
Distribution	Normal		4	0.0028
Data Units	mg/L		5	0.0021
Reporting Limit	0.002		6	0.0033
Significant Figures	2		7	0.0029
Confidence Interval	95		8	0.0027
			9	0.0028
Maximum Reported Effluent Conc.	0.0042	mg/L	10	0.0036
Coefficient of Variation (CV)	0.33		11	0.0038
RP Multiplier	1.1		12	0.003
Projected Maximum Effluent Conc. (MEC)	0.0048	mg/L	13	0.0042
Facility Flow	0	MGD	14	0.0042
Acute Dilution Factor	1		15	0.0033
Acute Low Flow	0	MGD	16	0.003
Background Pollutant Conc. (acute)	0	mg/L	17	0.0002
Acute Receiving Water Conc. (RWCa)	0.0048	mg/L	18	0.002
Acute Criterion	0.0211	mg/L	19	0.0034
Chronic Dilution Factor	1		20	0.0021
Chronic Low Flow	0	MGD		
Background Pollutant Conc. (chronic)	0	mg/L		
Chronic Receiving Water Conc. (RWCc)	0.0048	0		
Chronic Criterion	0.0054	mg/L		
RP for Acute?	NO			
RP for Chronic?	NO			

RP Procedure Output			Effluent Data	
Facility Name:	Spanish Fork		#	
Permit Number:	UT0020109		1	ND
Outfall Number:	OO1		2	ND
Parameter	Mercury		3	0.00000011
Distribution	Normal		4	ND
Data Units	mg/L		5	ND
Reporting Limit	0.0001		6	0.00000313
Significant Figures	2		7	ND
Confidence Interval	95		8	0.0000032
			9	0.0000038
Maximum Reported Effluent Conc.	0.0000049	mg/L	10	0.0000029
Coefficient of Variation (CV)	0.43		11	0.0000049
RP Multiplier	1.4		12	0.0000029
Projected Maximum Effluent Conc. (MEC)	0.0000067	mg/L	13	0.0000044
Facility Flow	0	MGD	14	ND
Acute Dilution Factor	1		15	ND
Acute Low Flow	0	MGD	16	0.0000029
Background Pollutant Conc. (acute)	0	mg/L	17	ND
Acute Receiving Water Conc. (RWCa)	0.0000067	mg/L	18	ND
Acute Criterion	0.0028	mg/L	19	ND
Chronic Dilution Factor	1		20	ND
Chronic Low Flow	0	MGD		
Background Pollutant Conc. (chronic)	0	mg/L		
Chronic Receiving Water Conc. (RWCc)	0.0000067	0		
Chronic Criterion	0.000014	mg/L		
RP for Acute?	NO			
RP for Chronic?	NO			