

**STATEMENT OF BASIS
BRIGHAM CITY CORPORTATION
RENEWAL PERMIT: DISCHARGE, BIOSOLIDS & STORM WATER
UPDES PERMIT NUMBER: UT0022365
UPDES BIOSOLIDS PERMIT NUMBER: UTL-022365
UPDES MULTI-SECTOR STORM WATER GENERAL PERMIT NUMBER: UTR000000
MAJOR MUNICIPAL**

FACILITY CONTACTS

Person Name:	Raymond Poulson	Person Name:	(Name)
Position:	General Manager	Position:	Storm Water Coordinator
Person Name:	(Name)	Person Name:	Rich Michelson
Position:	Plant Superintendent	Position:	Laboratory Director
Person Name:	(Name)	Person Name:	Rich Michelson
Position:	Biosolids Coordinator	Position:	Pretreatment

Facility Name: Brigham City Wastewater Treatment Plant

Mailing Address: 20 North Main
PO BOX 1005
Brigham City, Utah 84302

Telephone: (435) 723-3146

Actual Address: 600 North 1200 West
Brigham City, Utah

DESCRIPTION OF FACILITY

Brigham City uses an activated sludge treatment process with ultra violet (UV) disinfection. The physical plant consists of; 2 aerated grit chambers; 2 carousel oxidation ditches; 3 final clarifiers operated in parallel; 1 aerobic digester; 4 UV disinfection units in series; a post aeration chamber; and 18 sludge drying beds. In addition to the drying beds the facility now has two screw presses. The facility was placed in service in 1987 replacing a 3.0 million gallons per day (MGD) trickling filter plant. The existing facility has a design capacity of 6.0 MGD. The facility is designed for a population equivalent of 29,000 and influent organic loadings of 490 milligrams per liter (mg/l) biochemical oxygen demand (BOD5) and 240 mg/l total suspended solids (TSS). The area population serviced by the plant is estimated at 17,665 including the town of Brigham City (17,000) and Mantua (665). The facility is located at 600 North 1200 West, Brigham City, Box Elder County. The sludge generated from the ditches is dried and composted onsite, then utilized for landscape and gardening purposes.

SUMMARY OF CHANGES FROM PREVIOUS PERMIT

The limits for flow, ammonia, chronic and acute WET, dissolved oxygen and summer BOD₅ have changed due to a new waste load analysis. Flow will be added to the permit to ensure the limit of the wasteload analysis is met. The limit for ammonia is more stringent than the previous permit and will have seasonal variations. Chronic biomonitoring for WET has been added to the permit and will have seasonal variations. Acute biomonitoring will not be required due to the facility's continual WET testing compliance and the fact that acute biomonitoring will be detected in the chronic biomonitoring test, the facility will only have to test for chronic toxicity during this permit cycle. The limit for dissolved oxygen has increased and will have seasonal variations. The limit for the summer BOD₅ limit is more stringent than the previous permit and will have seasonal variations.

The self-monitoring requirements have increased from twice a week to three times a week due to the increase in flow at the facility. The increase will impact the following parameters: BOD, TSS, eColi, ammonia, pH and dissolved oxygen. This is consistent with the monitoring guidelines that are used to determine monitoring requirements for discharging facilities.

Pretreatment requirements have changed in the Brigham City permit due to the increase in flow and a significant industrial user discharging to the wastewater treatment plant.

DISCHARGE

DESCRIPTION OF DISCHARGE

The Brigham City Wastewater Treatment Plant has been reporting self-monitoring results on Discharge Monitoring Reports on a monthly basis.

<u>Outfall</u>	<u>Description of Discharge Point</u>
001	Located at latitude 41°31'22" and longitude 112°02'33". The discharge is through a pipe to the old Box Elder Creek bed.

RECEIVING WATERS AND STREAM CLASSIFICATION

The discharge is through a pipe to the abandoned Box Elder Creek bed, which rejoins the realigned Box Elder Creek ½ mile down, and continues on to Blacks Slough (not classified). Class 2B, 3C, and 4 definitions are provided below

- Class 2B -Protected for secondary contact recreation such as boating, wading, or similar uses.
- Class 3C -Protected for nongame fish and other aquatic life, including the necessary aquatic organisms in their food chain.
- Class 4 -Protected for agricultural uses including irrigation of crops and stock watering.

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BASIS FOR EFFLUENT LIMITATIONS

Limitations on total suspended solids (TSS), biochemical oxygen demand (BOD₅) for winter spring and fall, E-Coli, pH and percent removal for BOD₅ and TSS are based on current Utah Secondary Treatment Standards, *UAC R317-1-3.2*. The oil and grease is based on best professional judgment (BPJ). The other parameters are based on the wasteload analysis dated October 25, 2012. The permit limitations are listed in the Effluent Limitations Table.

Parameter	Effluent Limitations a/			
	Maximum Monthly Avg	Maximum Weekly Avg	Daily Minimum	Daily Maximum
Flow, MGD	6	NA	NA	NA
BOD ₅ , mg/L				
Summer	15	25	NA	NA
Fall, Winter and Spring	25	35	NA	NA
BOD ₅ Min. % Removal	85	NA	NA	NA
TSS, mg/L	25	35	NA	NA
TSS Min. % Removal	85	NA	NA	NA
E-Coli, No./100mL	126	157	NA	NA
Ammonia, mg/L				
Summer	1	NA	NA	2.5
Fall	4.5	NA	NA	6.0
Winter	5	NA	NA	10.0
Spring	5	NA	NA	8.0
WET, Chronic Biomonitoring				
Summer	NA	NA	NA	IC ₂₅ > 98% effluent
Fall, Winter and Spring	NA	NA	NA	IC ₂₅ > 62% effluent
Oil & Grease, mg/L	NA	NA	NA	10
pH, Standard Units	NA	NA	6.5	9.0
Dissolved Oxygen				
Summer	NA	NA	7.0	NA
Fall, Winter and Spring	NA	NA	5.0	NA

NA – Not Applicable.

SELF-MONITORING AND REPORTING REQUIREMENTS

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.

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Self-Monitoring and Reporting Requirements <i>a/</i>			
Parameter	Frequency	Sample Type	Units
Total Flow <i>b/ c/</i>	Continuous	Recorder	MGD
BOD ₅ , Influent <i>d/</i> Effluent	3 X Weekly	Composite	mg/L
	3 X Weekly	Composite	mg/L
TSS, Influent <i>d/</i> Effluent	3 X Weekly	Composite	mg/L
	3 X Weekly	Composite	mg/L
E. Coli	3 X Weekly	Grab	No./100mL
Ammonia	3 X Weekly	Grab	mg/L
WET, Chronic Biomonitoring	Quarterly	Composite	Pass/Fail
Oil & Grease	Monthly	Grab	mg/L
pH	3 X Weekly	Grab	SU
Dissolved Oxygen	3 X Weekly	Grab	mg/L
Metals, Influent Effluent	Quarterly	Composite	mg/L
	Quarterly	Composite	mg/L
Organic Toxics	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.

BIOSOLIDS

DESCRIPTION OF TREATMENT AND DISPOSAL

The solids (sewage sludge) at the Brigham City Water Reclamation Facility are stabilized in an oxidation ditch with a mean cell residence time of about 55 days. The solids are then pumped from the oxidation ditch to an aerobic digester with an additional mean cell residence time of 60 days at an average temperature of 10°C (50 °F). After stabilization the solids are dewatered with a pair of screw presses to about 18% solids and stored in drying beds for further drying. After drying, the biosolids are mixed with green waste and wood chips and formed into windrows for composting and the “process to further reduce pathogens” (PFRP) is begun. In 2012 Brigham City produced 309 dry metric tons (DMT) of compost which met Class A standards. Of that, 235 DMT were sold or given away to the public, with an additional 74 DMT in storage, to be sold or given away at a later date.

Future Disposal Methods

Brigham City intends to continue composting biosolids to meet Class A requirements for sale or giveaway, or dispose of the biosolids at the county landfill for the life of this permit (5 years). If Brigham City needs, or wants to change their disposal methods, Brigham City will need to notify the Division of Water Quality, at least 180 days in advance of the change.

BIOSOLIDS LIMITATIONS AND 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	
Dry Metric Tons (DMT) of Biosolids Disposed Per Year	Monitoring Frequency
> 0 to < 290, DMT	Once per year
> 290 to < 1,500, DMT	Four times per year

Since Brigham City sold or gave away 235 DMT in 2012, they only needed to sample once. However, In the future, if they exceed 290 DMT of compost for sale or giveaway in a calendar year, they will need to sample 4 times for the parameters listed below.

MONITORING REQUIREMENTS

Landfill Monitoring

Prior to disposal in a landfill all biosolids must pass a paint filter test (to determine if the biosolids exhibit free liquid). If the solids do not pass a paint filter test, the biosolids cannot be disposed of in the landfill.

Heavy Metals Monitoring

Brigham City is required to sample for heavy metals prior to the time the biosolids are sold or given away, and pass the testing requirements if the biosolids are to be used at the landfill for daily cover or land application for land reclamation purposes.

Pathogen Monitoring for Class A Biosolids

The biosolids must meet a “process to further reduce pathogens” (PFRP), and be sampled for either *salmonella* or *fecal* coliform and pass the testing requirements. If the biosolids have not met a PFRP, and passed the testing requirements, the biosolids cannot be sold or given away to the public.

Vector Attraction Reduction Monitoring

The biosolids must be monitored to meet vector attraction reduction (VAR) requirements for time and temperature. If the biosolids do not meet the VAR requirements, the biosolids cannot be used for daily cover, or cannot be used for final cover for landfill reclamation, and must be disposed in the landfill.

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MONITORING DATA (Pathogens)

<i>Brigham City Fecal Coliform Monitoring Data, 2012</i>	
Geo-mean of six samples, Most Probable Number Per Gram	Maximum of six samples, Most Probable Number Per Gram
126.0 Most Probable Number Per Gram	141.0 Most Probable Number Per Gram
All samples must be less than 1000 most probable number per gram of total solids	

MONITORING DATA (Heavy Metals)

Heavy Metals	Brigham City 2012, Yearly Average mg/kg	Brigham City 2012, Yearly Maximum mg/kg	40 CFR 503.13, Table 3, Exceptional Quality Biosolids Table mg/kg
Total Arsenic	9.81	10.87	41.0
Total Cadmium	0.649	0.718	39.0
Total Copper	548.0	683.0	1500.0
Total Lead	18.8	22.3	300.0
Total Mercury	01.49	2.46	17.0
Total Molybdenum	5.9	6.38	75.0
Total Nickel	11.2	12.0	420.0
Total Selenium	10.9	15.0	100.0
Total Zinc	603.0	767.0	2800.0

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 I.D. of the permit) to be handed out to all people who are receiving and land applying Class

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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 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 land application to home lawns and gardens.

40 CFR 503.13, Tables 1, 2, and 3 of Heavy Metal Limitations

Heavy Metals	Table 1	Table 3
All heavy metals concentrations shall be measured and reported	Daily Maximum mg/Kg <u>a/b/c/</u>	Monthly Average Concentration mg/Kg <u>a/b/c/d/</u>
Total Arsenic	75	41
Total Cadmium	85	39
Total Copper	4300	1500
Total Lead	840	300
Total Mercury	57	17
Total Molybdenum	75	N/A
Total Nickel	420	420
Total Selenium	100	100
Total Zinc	7500	2800

a/ See Part VIII. of the permit for definition of terms.

b/ The limitations represent the maximum allowable levels of heavy metals in any biosolids intended for land application.

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- c/ Any violation of these limitations shall be reported in accordance with the requirements of Part III. of the permit.
- d/ These limitations represent the maximum allowable levels of heavy metals based on an average of all samples taken during a 30-day period.

Pathogens

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. The PFRP will be accomplished through the windrow method of composting. *(Using the windrow method of composting, the temperature needs to be maintained at 55 °C (131 °F) or higher for fifteen days, with a minimum of five turnings during those fifteen days. (40 CFR 503.32(a)(8)(ii), Appendix B, B, 1.* 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 BRIGHAM CITY will need dispose of the biosolids in the landfill.

Vector Attraction Reduction

Brigham City intends to meet a vector attraction reduction requirement by the method listed below.

Under *40 CFR 503.33(b)(5)*, Aerobic treatment of the solids for at least 14 days at over 40° C (104° F) with an average temperature of over 45° C (113° F).

Record Keeping

The record keeping requirements from *40 CFR 503.17* are included under Part III. of the permit. The amount of time the records need to be retained is dependent upon the quality of the biosolids with regard to the metals concentrations. If the biosolids exceed Table 3 values for any parameter that are land applied to a site, that site thereafter is subject to the heavy metals loading rates in Table 2. Records for those sites are to be retained in perpetuity.

Reporting

Brigham City will be required to report annually as required in *40 CFR 503.18*. This report is to include the results of all monitoring performed in accordance with Part III. of the permit, information on management practices, land application sites, and certifications will be due no later than February 19 of each year. Each report is for the previous calendar year.

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.

Brigham City is currently covered under the UPDES Multi Sector General Permit for Industrial Activities.

PRETREATMENT REQUIREMENTS

The pretreatment requirements have been included in the current permit with the permittee administering an approved pretreatment program. The pretreatment program was approved by the Division Director on May 3, 2012.

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*.

BIOMONITORING REQUIREMENTS

A nationwide effort to control toxic discharges where effluent toxicity is an existing or potential

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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*.

As taken from “Permitting and Enforcement Guidance Document for Whole Effluent Toxicity Control (Biomonitoring)”, February 1991, since the permittee is a major municipal discharger with an approved pretreatment program, the renewal permit will require chronic whole effluent toxicity (WET) limits and testing. The chronic toxicity test will also indicate if there is acute toxicity present.

The permit will contain the standard requirements for an additional test upon failure of a chronic WET test and completion of a Toxicity Reduction Evaluation if required by the Division Director. The permit will contain a toxicity limitation re-opener provision that allows for modification of the permit should additional information indicate such modification is necessary.

PERMIT DURATION

It is recommended that this permit be effective for a duration of five (5) years.

Drafted by
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Mike George, Storm Water
Utah Division of Water Quality