

**DEPARTMENT OF ENVIRONMENTAL QUALITY  
WATER QUALITY DIVISION  
MONTANA POLLUTANT DISCHARGE ELIMINATION SYSTEM**

**Fact Sheet**

Permittee:	Town of Sunburst
Permit No.:	MT0021679
Receiving Water:	Unnamed Ephemeral Lake
Facility Information:	Sunburst Wastewater Treatment Facility
Mailing Address:	P.O. Box 245 Sunburst, MT 59482
Contact:	Scott Wilhelm, Operator
Telephone:	(406) 450-1390
Fee Information:	
Type:	Minor Publicly Owned Treatment Works
Number of Outfalls:	1 (for fee determination purposes)
Type of Outfall:	001 – Facility Discharge

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**I. Permit Status**

The Montana Pollutant Discharge Elimination System (MPDES) permit for the Town of Sunburst (Sunburst or Town) Wastewater Treatment Facility (WWTF) was issued on September 28, 2012, became effective on November 1, 2012, and had an expiration date of October 31, 2017. The Department of Environmental Quality (DEQ) received a complete permit renewal application from the Town on June 13, 2017, and administratively extended the permit by letter dated June 27, 2017. The administratively extended permit is referenced in this Fact Sheet (FS) as the 2012-issued permit.

## II. Facility Information

### Current Facilities:

The Sunburst WWTF serves the Town of Sunburst, with a current population of approximately 375 people. The existing WWTF is a three-cell facultative lagoon with a total surface area of 9.4 acres and volume of 14.1 million gallons (MG) constructed in 1980. The WWTF does not have the capability to disinfect the effluent. The design flow of the facility is 0.05 million gallons per day (mgd).

Discharge from the facility is controlled and periodic, typically once or twice per year over a period of four to seven days. Discharges typically occur during the period of May through October, although discharge has occurred in months outside of the normal discharge period. The discharge flow rate is measured by a V-notch weir and varies from 0.033 mgd to 0.282 mgd, based on data reported on monthly discharge monitoring reports (DMRs). Effluent is discharged from a pipe, Outfall 001, to an unnamed ephemeral lake at approximately 48°52'05" N latitude, 111°53'48" W longitude via a short manmade ditch.

Table 1: Current Design Criteria Summary* – Town of Sunburst WWTF	
Facility Description: Three-cell Facultative Lagoon	
Construction Date: 1980	Modification Date: NA
Design Population: 765	Current Population: 375
Design Flow, Average: 0.0514 mgd	Detention Time @ Design Flow: 260 days
Design BOD Load: 112 lb/day	Design TSS Load: 112 lb/day
Disinfection: No	Discharge Method: Intermittent

\*Information from Thomas, Dean & Hoskins, 1984; SOB dated April 28, 2005.

Effluent data are summarized in Table 2. These data are based on the discharge monitoring reports (DMRs) submitted by the Town for the period of record (POR) January 2014 through December 2017. During the POR of 48 months, the WWTF discharged through Outfall 001 once in October of 2014 for seven days and once in December of 2016 for seven days. No discharge was reported in either 2015 or 2017. Historically, the WWTF discharges for 4 to 7 continuous days in the spring and fall of each year. The WWTF operator indicated that the lack of need to discharge in the historical manner is due to the years 2015 through 2017 being very “dry” years, i.e. very little precipitation occurred in the Sunburst area during this period (personal communication with Phil Iverson, Operator, on 2/20/2018).

In 2014 and 2016, the WWTF discharges exceeded the monthly average effluent concentration and load limits for total suspended solids (TSS), and violated the minimum percent removal requirement. In the 2016 discharge, the minimum percent removal requirement for five-day biochemical oxygen demand (BOD<sub>5</sub>) was also violated.

Although compliance with permit limits has been a problem with the periodic batch discharges, it does appear that compliance is possible with proper operation of the discharge, particularly with respect to monitoring of the final lagoon cell prior to discharge to assure limits can be met and using care to discharge at an acceptable flow rate, i.e. at the design flow rate of 0.0514 mgd or less to be safe. Since the discharge from this WWTF is at the discretion of the operator, the WWTF should be able to comply with the effluent limits of the 2012-issued permit for both BOD<sub>5</sub> and TSS.

The effluent limits for pH were not exceeded during the POR.

Table 2: Outfall 001 Effluent Characteristics for the Period January 2014 through December 2017						
Parameter	Units	Previous Permit Limits	Minimum	Maximum	Average	Number of Samples
Flow, Daily Average <sup>(1)</sup>	mgd	-	0.033	0.282	0.158	2
5-Day Biochemical Oxygen Demand <sup>(2)</sup>	mg/L	30/45	28	34	31	4
	lbs/day	13/19	-	-	-	-
Total Suspended Solids <sup>(2)</sup>	mg/L	100/135	51	102	71	4
	lbs/day	19/28	28	143	97	4
pH	s.u.	6.0 – 9.0	7.0	9.0	-	2
<i>Escherichia coli</i> <sup>(3)</sup>	cfu/100ml	-	118	118	118	1
Total Ammonia, as N	mg/L	-	0.03	0.72	0.38	2
Kjeldahl Nitrogen, as N	mg/L	-	8.7	11.3	10.0	2
Nitrate + Nitrite, as N	mg/L	-	0.06	0.40	0.23	2
Total Nitrogen, as N	mg/L	-	9.2	11.4	10.3	2
Total Phosphorus, as P	mg/L	-	2.16	2.85	2.50	2
Oil & Grease	mg/L	-	(4)	(4)	(4)	(4)

Footnotes:  
 1. Average flow is average of the reported discharge flow rate for the 2 discharges reported. Each discharge period was 7 days in duration.  
 2. 30-day average/7-day average. Ave from the 3 values reported of the 4 samples taken.  
 3. Sample for *E. coli* taken only during the 2016 discharge.  
 4. Did not sample for Oil & Grease.

Over the POR the permittee has been issued 13 letters of violation. Nine of the violation letters related to failure to submit DMRs in a timely fashion and/or missing data on DMRs. Two of the violation letters related to violation of the 30-day average concentration and load effluent limits during discharges that occurred in December 2016 and October 2014. Two violation letters related to reported noncompliance sanitary sewer system overflows (lift station pump failure in November 2014 and plugged sewer line in March 2014). No explanation was provided by the permittee for the permit limit excursions that occurred in October 2014 but the excursions in December 2016 were reportedly caused by an excessive discharge rate.

### III. Technology-based Effluent Limits

#### a. Applicability to Technology-based Limits

The Montana Board of Environmental Review, in Administrative Rules of Montana (ARM) 17.30.1203, adopted by reference 40 Code of Federal Regulations (CFR) 133 which defines minimum treatment requirements for secondary treatment, or the equivalent, for publicly owned treatment works (POTW). Secondary treatment is defined in terms of effluent quality as measured by BOD<sub>5</sub>, TSS, percent removal of BOD<sub>5</sub> and TSS, and pH.

These requirements may be modified on a case-by-case basis for facilities that are eligible for treatment equivalent to secondary treatment (TES) or alternative state requirements (ASR) for TSS. To determine if a facility is eligible for TES the facility must meet the requirements summarized as follows:

- 1) The BOD<sub>5</sub> and TSS effluent concentrations consistently achievable through proper operation and maintenance of the treatment works exceed the minimum effluent quality described for secondary treatment,
- 2) The treatment works utilize a trickling filter or waste stabilization pond, and
- 3) The treatment works utilize biological treatment that consistently achieves a 30-day average of at least 65% removal.

The technology-based effluent limits (TBELs) in the 2012-issued permit are based on the national secondary treatment standards (NSS) for BOD<sub>5</sub> and pH, and ASR for TSS. The 2012-issued permit limits are for effluent concentrations and mass limitations on BOD<sub>5</sub> and TSS, and 85% removal of BOD<sub>5</sub> and 65% removal of TSS.

Proposed TBEL-based effluent limits are shown on Table 3. The BOD<sub>5</sub> and pH limits remain NSS, including 85% removal of BOD<sub>5</sub>. The TSS limit will remain ASR for lagoons in Montana, including 65% removal. Mass limits for both BOD<sub>5</sub> and TSS are included in accordance with ARM 17.30.1345(8)(a) and are based on design flow.

#### Mass Limit Calculations:

Load (lb/day) = Design Flow (mgd) x Concentration Limit (mg/L) x 8.34 lb/gal

BOD<sub>5</sub>:            30-day Ave:    Load = (0.0514)(30)(8.34) = 12.9 = 13 lb/day  
                      7-day Ave:     Load = (0.0514)(45)(8.34) = 19.3 = 19 lb/day

TSS:              30-day Ave:    Load = (0.0514)(100)(8.34) = 42.9 = 43 lb/day  
                      7-day Ave:     Load = (0.0514)(135)(8.34) = 57.9 = 58 lb/day

Although the effluent limits for TSS concentration in the 2012-issued permit were ASR, the mass limits in the permit were based on TES, which are 19 lb/day for the 30-day average and 28 lb/day for the 7-day average (same as the load limits in the permit issued July 12, 2005). As stated earlier, the WWTF can meet the mass limits for TSS with proper operation of the batch

discharge. Proper operation includes sampling of the final lagoon cell prior to commencing discharge to assure compliance with the permit limits and limiting the discharge rate to the design flow or less during discharge.

As in the 2012-issued permit, monitoring for influent BOD<sub>5</sub> and TSS will be required.

Parameter	Units	30-Day Average	7-Day Average	Rationale
BOD <sub>5</sub>	mg/L	30	45	40 CFR 133.105(a)
	lb/day	13	19	
	% removal	85 %	-	
TSS	mg/L	100	135	40 CFR 133.105(d)
	lb/day	19	28	
	% removal	65 %	-	
pH	s.u.	6.0-9.0 (instantaneous)		40 CFR 133.102 (c)

b. Nondegradation Allocated Loads

Nondegradation allocated loads for the Sunburst WWTF were determined for BOD<sub>5</sub> and TSS under a previous permitting action and documented in Statement of Bases (SOBs) dated March 1995 and April 2005. The SOB for the permit renewed on July 12, 2005 referenced and contained the nondegradation loads calculated in 1995.

Table 4 summarizes the nondegradation allocated loads and the actual calculated average loads discharged from the facility for 2014 through 2017. The data indicate that the facility did not exceed the nondegradation allocated loads for either BOD<sub>5</sub> or TSS.

Parameter	Allocated Load*	Actual Load** (lb/day)			
	(lb/day)	2014	2015	2016	2017
BOD <sub>5</sub>	13	0.2	0	1.4	0
TSS	43	0.6	0	2.3	0

\*Original allocated loads from SOB dated March 6, 1995 & referenced in SOB dated April 28, 2005.

\*\*Actual loads are calculated from the flow & monthly concentration reported on DMRs for the short duration discharges each year, i.e. one 7-day discharge in each 2014 & 2016. The total load discharged over each 7-day discharge period was averaged over 365 days to calculate actual lb/day average load for the year.

#### IV. Water Quality-based Effluent Limits

##### a. Scope and Authority

Permits are required to include water quality-based effluent limits (WQBELs) when TBELs are not adequate to prevent excursions of state water quality standards (40 CFR 122.44 and ARM 17.30.1344). ARM 17.30.637(2) states that no wastes may be discharged that can reasonably be expected to violate any state water quality standards. Montana water quality standards (ARM 17.30.601, *et.seq.*) define both water use classifications for all state waters and numeric and narrative standards that protect those designated uses.

##### b. Receiving Water

The Sunburst WWTF intermittently discharges treated effluent to an unnamed ephemeral lake through Outfall 001. The ephemeral lake does not discharge to any perennial, intermittent or ephemeral waterbody, but is located in the Marias River watershed. The Marias River watershed is identified as United States Geological Service (USGS) Hydrological Unit Code (HUC) 10030203. While the unnamed ephemeral lake is located within the boundaries of HUC 10030203, it does not discharge to the Marias River or any of its tributaries and, therefore, is not located in a Montana Stream Segment.

The Marias River drainage is classified as B-2 according to Montana Water Use Classifications [ARM 17.30.610(1)(d)]. Waters classified B-2 are to be maintained suitable for drinking, culinary and food processing purposes, after conventional treatment; bathing, swimming, and recreation; growth and marginal propagation of salmonid fishes and associated aquatic life, waterfowl, and furbearers; and agricultural and industrial water supply [ARM 17.30.624(1)]. No water quality or quantity information are available for the ephemeral lake. The lake has not been listed as impaired on Montana's 303(d) lists of impaired waterbodies.

##### c. Water Quality Standards

Discharges to surface waters classified B-2 are subject to the specific water quality standards of ARM 17.30.624, Circular DEQ-7, and the general provisions of ARM 17.30.635 through 637. Discharges are also subject to ARM 17.30 Subchapter 5 (Mixing Zones), Subchapter 7 (Nondegradation of Water Quality), and Circular DEQ-12A (Montana Base Numeric Nutrient Standards).

##### d. Mixing Zone

A mixing zone is an area where effluent mixes with the receiving water and certain water quality standards may be exceeded. A mixing zone is not applicable to discharges to ephemeral waterbodies and effluent limits will apply at end-of-pipe.

The discharge must comply with the general prohibitions of ARM 17.30.637(1) which will require that state waters, including mixing zones, must be free from substances which will:

- (a) settle to form objectionable sludge deposits or emulsions beneath the surface of the water or upon adjoining shorelines;
- (b) create floating debris, scum, a visible oil film (or be present in concentrations at or in excess of 10 milligrams per liter) or globules of grease or other floating materials;
- (c) produce odors, colors, or other conditions as to which create a nuisance or render undesirable tastes to fish flesh or make fish inedible;
- (d) create concentrations or combinations of materials which are toxic or harmful to human, animal, plant or aquatic life; and
- (e) create conditions which produce undesirable aquatic life.

e. Basis for WQBELs (Reasonable Potential and Calculations)

Permits are required to include WQBELs when TBELs are not adequate to protect water quality standards and no wastes may be discharged that can reasonably be expected to violate any standard. Discharges to ephemeral waterbodies are not subject to the specific water quality standards of ARM 17.30.620 through 629; but are subject to the General Prohibitions of ARM 17.30.637(1).

Pollutants typically present in treated effluent from municipal wastewater treatment facilities include conventional pollutants such as biological material (measured by BOD<sub>5</sub>), TSS, oil & grease, *Escherichia coli* (*E. coli*) bacteria and pH; non-conventional pollutants such as total residual chlorine, ammonia, nitrate/nitrite, total nitrogen (TN) and total phosphorus (TP).

Since the receiving water is an ephemeral lake, fishes are presumed to be absent during periods when there is standing water in the lake bed as well as when the lake bed is dry. The lake bed, when dry, is commonly referred to as an “alkali lakebed” or “alkali flat” by area residents.

1. Conventional Pollutants

TSS, BOD<sub>5</sub>, and pH – The WWTF will provide a significant reduction in biological material and solids through NSS for BOD<sub>5</sub>, and pH and ASR for TSS. No additional WQBELs will be necessary for these parameters. In order to assure that monitoring captures the true quality of the effluent intermittently discharged, monitoring for effluent BOD<sub>5</sub> and TSS will be three samples taken on separate days during the periods of discharge. Monthly monitoring of influent BOD<sub>5</sub> and TSS will be required during any month during which a batch discharge occurs. In addition, monitoring of effluent pH will be required monthly.

Oil and Grease (O & G) – The 2012-issued permit did not have a numerical limit for O & G but did have a requirement to monitor for O & G on an annual basis. O & G was not sampled in either the 2014 or 2016 discharge events. This pollutant was limited by a narrative requirement that prohibited a discharge that causes a visible oil sheen in the receiving stream. Given the detention time in the lagoon system and the method of discharge, it is unlikely that the effluent would ever have a level of O & G that would result in a visible oil sheen in the receiving water. Accordingly, the requirement to monitor the discharge for O & G will not be included in the renewed permit and the general narrative requirement prohibiting causing a visible oil sheen will apply to any discharge.

*E. coli* – The 2012-issued permit contained no effluent limits for *E. coli*, although monitoring of the effluent for *E. coli* was required. One sample was taken for *E. coli*, from the 2016 discharge, and a relatively low level of 118 cfu/100 ml was reported. The Sunburst WWTF is a properly designed, operated and maintained facultative lagoon system with a detention time of 260 days at design flow and an actual detention time of about one year at present wastewater flows. Properly operated and maintained facultative lagoon systems that provide a detention time of at least 180 days are assumed to achieve adequate pathogen kill. Effluent monitoring for the pathogen indicator species fecal coliform bacteria in discharges that occurred from 2008 through June 2012 showed a geometric mean of 13 colonies per 100 mL, with only one of four samples exceeding 25 colonies per 100 mL. It appears that the Sunburst WWTF is providing sufficient treatment and effluent limits on pathogen indicator species such as *E. coli* are not necessary. Further, the receiving water is an ephemeral lake referenced at times as an “alkali lakebed” with minor potential for human contact or exposure. The requirement for monitoring for *E. coli* will be continued for periods of discharge.

## 2. Non-conventional Pollutants

Total Residual Chlorine (TRC) – The facility does not chlorinate and the 2012-issued permit contained no TRC limits. No limits are needed in this permit.

Total Ammonia-N – There are no ammonia limits in the 2012-issued permit. Total ammonia-N limits are developed based on instream water quality standards and are not required for discharges to ephemeral waterbodies.

Nitrate plus Nitrite Nitrogen (NO<sub>3</sub>/NO<sub>2</sub>) – There are no NO<sub>3</sub>/NO<sub>2</sub> limits in the 2012-issued permit. The ephemeral lake receiving water is absolutely no candidate for a drinking water source. As stated earlier, the receiving water is referenced as an “alkali lakebed”. No NO<sub>3</sub>/NO<sub>2</sub> limits will be applied in the renewed permit.

Nutrients (TN and TP) – There are no nutrient limits in the 2012-issued permit. Numeric water quality standards for TN and TP have been adopted in Circular DEQ-12A (DEQ-12A) for the Marias River drainage in the Sunburst area, which is in the Level III Northwestern Glaciated Plains and Level IV Milk River Pothole Upland Ecoregions. The numeric water quality standards for TN and TP are 560 µg/L and 80 µg/L, respectively, both effective July 1 to September 30. Critical stream-flow for application of the standards is the seasonal (July-October) 14Q5 low flow. However, the base nutrient standards adopted in DEQ-12A apply to flowing waters only, and do not apply to the ephemeral lake that is the receiving water for the discharge from the Sunburst WWTF.



**V. Final Effluent Limits**

Beginning on the effective date of the permit and lasting through the term of the permit, the quality of effluent discharged by the facility through Outfall 001 shall, as a minimum, meet the limits as set forth below:

Table 5: Final Effluent Limits				
Parameter	Units	Average Monthly Limit <sup>1</sup>	Average Weekly Limit <sup>1</sup>	Maximum Daily Limit
Biochemical Oxygen Demand (BOD <sub>5</sub> )	mg/L	30	45	--
	lbs/day	13	19	--
BOD <sub>5</sub> , Removal	%	85	--	--
Total Suspended Solids (TSS)	mg/L	100	135	--
	lbs/day	19	28	--
TSS, Removal	%	65	--	--
pH	s.u.	6.0-9.0 (instantaneous)		
Footnotes:				
1. See Part I.C of permit and Definition section at end of permit for explanation of terms.				
2. For compliance purposes, any single analyses and/or measurement beyond this limit shall be considered a Violation of the conditions of this permit.				

There shall be no discharge of floating solids or visible foam in other than trace amounts and there shall be no discharge which causes visible oil sheen in the receiving water.

**VI. Self-Monitoring & Other Requirements**

a. Self-Monitoring

Samples shall reflect the nature and volume of the discharge. Effluent samples for all parameters must be obtained from the discharge structure, at the outlet V-notch weir.

To ensure that BOD<sub>5</sub>, TSS and pH are within effluent limits, the permittee shall conduct pre-discharge monitoring. Pre-discharge monitoring for BOD<sub>5</sub>, TSS and pH must be collected from the final lagoon cell between the hours of 11 AM and 4 PM in order to minimize pH variations due to photosynthesis. After receiving analysis results, the permittee must review the analytical results and authorize the discharge, as long as the concentrations meet the permit conditions. If the concentrations do not meet the permit limits, the permittee must document efforts to lower the concentration(s) to meet effluent limits before discharging. The permittee is not required to notify the Department, but must maintain records of the pre-discharge sample results. The duration of each discharge event, in days, shall be reported.

Influent samples for BOD<sub>5</sub> and TSS are to be taken from the influent structure to the lagoons.

Table 6: Monitoring Requirements						
Parameter	Unit	Sample Location	Sample Frequency	Sample Type <sup>1</sup>	Reporting Requirements	ML <sup>5</sup>
Flow	mgd	Effluent	<sup>3</sup>	Instantaneous	Ave Day & Max Month	0.001
Flow, Duration	days	Effluent	NA	NA	No. of Days	1
Biochemical Oxygen Demand (BOD <sub>5</sub> )	mg/L	Influent	1/Month <sup>4</sup>	Composite	Ave Month	10
	mg/L	Effluent	<sup>3</sup>	Grab	Ave Month	2
	% Removal <sup>2</sup>	NA	1/Month	Calculated	Ave Month	0.1
	lb/day	Effluent	1/Month	Calculated	Ave Month	0.1
Total Suspended Solids (TSS)	mg/L	Influent	1/Month <sup>4</sup>	Composite	Ave Month	10
	mg/L	Effluent	<sup>3</sup>	Grab	Ave Month	10
	% Removal <sup>2</sup>	NA	1/Month	Calculated	Ave Month	0.1
	lb/day	Effluent	1/Month	Calculated	Ave Month	1
pH	s.u.	Effluent	<sup>3</sup>	Instantaneous	Min & Max	0.1
<i>Escherichia coli</i>	#/100ml	Effluent	1/Week	Grab	Geo Mean & Max Week	1

Footnotes:  
 1. See Definition section at end of permit for explanation of terms.  
 2. See narrative discussion in permit for additional details.  
 3. Must be sampled three times during any batch discharge, on the first day, a day representing mid-discharge and the final day.  
 4. Influent sampling required only during months during which there is an effluent discharge.  
 5. ML is the minimum detection level. Analyses for all parameters must be to the ML listed in the permit for the parameter.

**b. Sludge Requirements**

This permit will contain standard conditions requiring compliance with 40 CFR 503 for any use or disposal of sewage sludge.

**c. Pretreatment Program**

The facility is not currently operating under the EPA Pretreatment Program. The permit will include standard language restricting introducing certain pollutants to the Sunburst WWTF and requiring the facility to provide adequate notice to DEQ if a new source, volume or character of industrial pollutant is introduced to the system.

**VII. Nonsignificance Determination**

The facility must meet the 2012-issued permit limits for BOD<sub>5</sub>, TSS and pH. The discharge does not constitute a new or increased source of pollutants pursuant to ARM 17.30.702(17). Therefore, a nonsignificance analysis is not required [ARM 17.30.705(1)].

## VIII. Compliance Schedules

None

## IX. Information Sources

- a. Federal Water Pollution Control Act (Clean Water Act), 33 U.S.C. §§ 1251-1387, October 18, 1972, as amended 1973-1983, 1987, 1988, 1990-1992, 1994, 1995 and 1996.
- b. US Code of Federal Regulations, 40 CFR Parts 122-125, 130-133, & 136.
- c. Montana Code Annotated (MCA), Title 75-5-101, *et seq.*, "Montana Water Quality Act," 2011.
- d. Administrative Rules of Montana Title 17 Chapter 30 - Water Quality
  - Subchapter 2 - Water Quality Permit and Application Fees.
  - Subchapter 5 - Mixing Zones in Surface and Ground Water.
  - Subchapter 6 - Montana Surface Water Quality Standards and Procedures.
  - Subchapter 7 - Nondegradation of Water Quality.
  - Subchapter 12 - Montana Pollutant Discharge Elimination System (MPDES) Standards.
  - Subchapter 13 - MPDES Permits.
- e. Montana Department of Environmental Quality Circular DEQ-7, Montana Numeric Water Quality Standards, October 2012.
- f. Integrated 303(d)/305(b) Water Quality Report for Montana (2016).
- g. McCarthy, P.M., 2016, Streamflow Characteristics Based On Data Through Water Year 2009 For Selected Streamflow Gaging Stations In Or Near Montana: U.S. Geological Survey Scientific Investigations Report 2015-5019-E, XX.
- h. US EPA Technical Support Document for Water Quality-Based Toxics Control, EPA/505/2-90-001, March 1991.
- i. US EPA National Pollutant Discharge Elimination System (NPDES) Permit Writers' Manual, EPA 833-K-10-001, September 2010.
- j. MPDES Permit Number MT0021679:
  1. Administrative Record.
  2. Renewal Application DEQ Form 1 and MPDES Form 2A, received May & June 2017.

Prepared by: James F. Brown, March 2018