

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION



MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law (Chapter 644 RSMo, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No. MO-0115061

Owner: Tyson Poultry, Inc.
Address: 2200 Don Tyson Parkway, Springdale, AR 72765

Continuing Authority: Same as above
Address: Same as above

Facility Name: Tyson Poultry, Inc. – Sedalia Processing Plant
Facility Address: 19571 Whitfield Road, Sedalia, MO 65301

Legal Description: See following pages; Pettis Co.
UTM Coordinates: See following pages

Receiving Stream: See following pages
First Classified Stream and ID: See following pages
USGS Basin & Sub-watershed No.: Little Muddy Creek 10300103-0404 & Coon Creek – Muddy Creek 10300103-0405

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION


Poultry processing; SIC # 2015, 2077; NAICS # 311615, 311613. Major/Categorical. This facility does not require a certified wastewater operator per 10 CSR 20-9.030 as this facility is privately owned. This facility utilizes secondary wastewater treatment and land application methods. A new earthen cooling basin has been approved for use, although installation is not complete at the time of renewal permitting.

This permit authorizes only wastewater and stormwater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas.

February 1, 2021
Effective Date


Edward B. Galbraith, Director, Division of Environmental Quality

September 30, 2025
Expiration Date


Chris Wieberg, Director, Water Protection Program

FACILITY DESCRIPTION (CONTINUED)

WASTEWATER OUTFALLS

OUTFALL #001 – Poultry Processing Wastewater and Domestic Wastewater Treatment Plant

Poultry processing wastewater includes wastewater from the following activities: processing plant, hatchery, rendering plant, feed mill, and contaminated stormwater from diesel tank secondary containment areas. 1.3 million chickens processed per week; applicable to 40 CFR 432 Subpart L. The truck service center domestic package plant has been switched to a subsurface domestic septic system under a Health Department authorization in 2017, for less than 3000 gpd.

Dissolved air flotation, equalization, anaerobic lagoons, anoxic reactor, complete mix activated sludge, chlorination, dechlorination, sludge storage basin, and sludge is land applied. This outfall also discharges stormwater intermittently and treated stormwater from outfalls #003 (max 0.25 MGD) and #008 (max 0.05 MGD). Sludge not land applied will be disposed of in an accepting landfill under a special waste profile.

Design population equivalent:	53,040
Design sludge production:	1,800 dry tons/year
Actual sludge production:	1,800 dry tons/year
Legal Description:	W¼, NW¼, Sec. 23, T46N, R22W, Pettis County
UTM Coordinates:	X= 472533, Y= 4289606
Receiving Stream:	Tributary to Tributary to Tributary to Little Muddy Creek
First Classified Stream and ID:	100K Extent-Remaining Stream (C) WBID# 3960
Second Classified Stream and ID:	Tributary to Little Muddy Creek (C) WBID# 3490; 2006 303(d) List, chloride (AQL) TMDL, temperature, 1/11/2001
Third Classified Stream and ID:	Little Muddy Creek (C) WBID# 0856; TMDL, temperature, 1/11/2001
USGS Basin & Sub-watershed No.:	Little Muddy Creek 10300103-0404
Design Flow:	2.5 million gallons per day (MGD)
Average Flow:	2.42 MGD

OUTFALL #01A

Retention basin for thermal compliance; option to use passive treatment, or mixing, or aeration; or any combination to meet thermal limits. Discharges from outfall #001 pass through outfall #01A as a final treatment step only for temperature.

UTM Coordinates:	X = 472695, Y = 4289704
Design Flow:	2.5 MGD
Actual Flow:	unknown, new feature

STORMWATER OUTFALLS

OUTFALL #002

Stormwater; southeast of poultry processing plant; 13 acres; vegetated and paved. BMPs: inspections, erosion control, preventative measures, spill prevention/response, and management of runoff.

Legal Description:	NE¼, SE¼, Sec. 22, T46N, R22W, Pettis County
UTM Coordinates:	X = 472268, Y = 4289058
Receiving Stream:	100K Extent Remaining Stream
First Classified Stream and ID:	100K Extent Remaining Stream (C) WBID# 3960
Second Classified Stream and ID:	Muddy Creek (P) WBID #0853; 303(d) List, <i>E. coli</i>
USGS Basin & Sub-watershed No.:	Coon Creek – Muddy Creek 10300103-0405

OUTFALL #003

Stormwater; southeast of poultry processing plant; 6 acres, paved. BMPs: inspections, erosion control, preventative measures, spill prevention/response, and management of runoff.

Legal Description:	NE ¼, SE ¼, Sec. 22, T46N, R22W, Pettis County
UTM Coordinates:	X = 472212, Y = 4289027
Receiving Stream:	100K Extent Remaining Stream
First Classified Stream and ID:	100K Extent Remaining Stream (C) WBID# 3960
Second Classified Stream and ID:	Muddy Creek (P) WBID #0853; 303(d) List, <i>E. coli</i>
USGS Basin & Sub-watershed No.:	Coon Creek – Muddy Creek 10300103-0405

FACILITY DESCRIPTION (CONTINUED)

OUTFALL #004

Stormwater from poultry processing plant parking lot and roof; 17 acres paved, vegetated and roof runoff. BMPs: inspections, erosion control, preventative measures, spill prevention/response, and management of runoff.

Legal Description: SW ¼, SE ¼, Sec. 22, T46N, R22W, Pettis County
UTM Coordinates: X = 472019, Y = 4288889
Receiving Stream: 100K Extent Remaining Stream
First Classified Stream and ID: 100K Extent Remaining Stream (C) WBID# 3960
Second Classified Stream and ID: Muddy Creek (P) WBID #0853; 303(d) List, *E. coli*
USGS Basin & Sub-watershed No.: Coon Creek – Muddy Creek 10300103-0405

OUTFALL #005 – outfall eliminated 10/1/2003. Stormwater runoff no longer discharges at this location, and is not authorized to discharge at this location.

OUTFALL #006 – eliminated in 2018 modification; stormwater determined to be not regulated per 10 CSR 20-6.200(1)(B)2. This outfall serves only employee parking lots which is not regulated.

OUTFALL #007 – eliminated in 2018 modification; stormwater determined to be not regulated per 10 CSR 20-6.200(1)(B)2. This outfall serves only employee parking lots which is not regulated.

OUTFALL #008

Stormwater from River Valley Animal Foods Plant Rendering north of plant; part of Tyson facility. SIC #2077
Rendering plant at the outfall of the stormwater collection basin. 2.5 acres paved. BMPs: inspections, erosion control, preventative measures, spill prevention/response, and management of runoff.

Legal Description: SE ¼, NE ¼, Sec. 22, T46N, R22W, Pettis County
UTM Coordinates: X = 472346, Y = 4289360
Receiving Stream: 100K Extent Remaining Stream
First Classified Stream and ID: 100K Extent Remaining Stream (C) WBID# 3960
Second Classified Stream and ID: Muddy Creek (P) WBID #0853; 303(d) List, *E. coli*
USGS Basin & Sub-watershed No.: Coon Creek – Muddy Creek 10300103-0405

IN-STREAM MONITORING

Permitted Feature #SM1

Stream monitoring location #1, formerly permitted feature #009 – background ambient temperature measurement point: in-stream monitoring of temperature shall be taken on Little Muddy Creek just upstream of the confluence of the tributary.

Legal Description: SE ¼, SW ¼, Sec. 12, T46N, R22W, Pettis County
UTM Coordinates: X = 474696, Y = 4291671
Stream and ID: Little Muddy Creek (C) WBID# 0856
USGS Basin & Sub-watershed No.: Little Muddy Creek 10300103-0404

Permitted Feature #SM2

Stream monitoring location #2, formerly permitted feature #010 – downstream temperature compliance point; in-stream monitoring of temperature shall be taken on Little Muddy Creek just downstream of the confluence of the tributary.

Legal Description: NE ¼, NW ¼, Sec. 13, T46N, R22W, Pettis County
UTM Coordinates: X = 474721, Y = 4291627
Stream and ID: Little Muddy Creek (C) WBID# 0856
USGS Basin & Sub-watershed No.: Little Muddy Creek 10300103-0404

Instream sampling shall not occur during conditions that will put facility personnel in harm of injury or loss of life, such as severe weather or flooding. Instream sampling is not required during conditions that result in no upstream flow in the Little Muddy Creek. If sampling does not occur on any given day, such conditions must be reported in place of numeric data.

FACILITY DESCRIPTION (CONTINUED)

LAND APPLICATION

Industrial & Domestic Sludge Land Application – SIC #2015

Three storage devices (one earthen basin and two steel tanks). Land application of sludge to row crops on farm fields. Screened wastewater is collected in a flow equalization basin (0.322 MG) before it is pre-treated through two dissolved air floatation units (1200 gpm). A portion of the sludge is skimmed and ran through a tricanter centrifuge to extract the oils. The remaining sludge is stored in two above ground tanks (0.28 MG) for reprocessing through the tricanter or for land application. Effluent from the DAF units flow into a series of four anaerobic lagoons (11 MG, 6 MG, 6 MG, and 4 MG) and then are pumped to the anoxic basin (1.8 MG). The anoxic basin constantly recirculates with the CMAS nitrification reactor (2.3 MG). The effluent from the CMAS nitrification reactor is mixed with alum and a coagulant added before sent to the final clarifier (1.8 MG). Water then flows from the clarifier into a chlorination/dechlorination basin (0.48 MG) then discharged to outfall #001. Waste activated sludge (WAS) is stored in the lagoon and land applied as necessary.

USGS Basin & Sub-watershed Nos.:	10300103-0404 & 10300103-0405
Design annual sludge production:	6,562,750 gallons per year (821 dry tons per year).
Design Human Population Equivalent:	306,618 gallons per year
Actual annual sludge production:	5,259,596 gallons per year (658 dry tons per year)
Receiving Stream Watershed:	gaining stream setting
Timeframe:	January through December
Total Irrigation Max/Design:	821 dry ton/year at design loading (including 1-in-10 year flows)
Total Irrigation Actual:	690 dry ton/year
Irrigation areas:	733.5 total acres available (883.5 ac total – 150.0 ac setbacks)
Annual Loading:	approximate rate of 2.44 dry ton/year,
Average per Application:	1.7 dry ton/application
Field Slopes:	all less than 5 percent
Vegetation:	Row Crop
Application rate is based on:	Plant Available Nitrogen (PAN) loading rate
Public Access:	none

Minimum Setback Distances for All Application Areas:

Minimum Distance to Permanent Stream:	50 feet
Minimum Distance to Losing Stream:	300 feet
Minimum Distance to Intermittent Stream:	50 feet
Minimum Distance to Lake/Pond:	50 feet
Minimum Distance to Property Boundary:	50 feet
Minimum Distance to Dwellings:	150 feet
Minimum Distance to Water Supply Well:	300 feet

PERMITTED FEATURE #011

Earthen storage basin (also listed as WAS pond)

Legal Description:	SW¼, NW¼, Sec. 23, T46N, R22W, Pettis County
UTM Coordinates:	X = 472503, Y = 4289672
Receiving Stream:	Tributary to Tributary to Little Muddy Creek
First Classified Stream and ID:	100K Extent-Remaining Stream (C) WBID# 3960
USGS Basin & Sub-watershed No.:	Little Muddy Creek 10300103-0404
Storage Basin Freeboard:	2 feet below spillway or overflow is the upper operating level
Safety Volume:	3 feet below spillway or overflow is the volume of 25 year 24 hour storm (total 1 foot)
Maximum Operating Level	3 feet below spillway and 15 feet from bottom of basin
Minimum Operating Level	2 feet above bottom to preserve basin integrity
Total Depth:	18 feet
Storage volume:	1,675,000 gallons (minimum to maximum water levels)
Storage Capacity Design:	210 days for dry weather flows

FACILITY DESCRIPTION (CONTINUED)

PERMITTED FEATURE #012 – eliminated in 2018 permit modification. Tanks not exposed to stormwater. Discharge from tanks is not authorized.

PERMITTED FEATURE #013 – eliminated in 2018 permit modification. Tanks not exposed to stormwater. Discharge from tanks is not authorized.

LAND APPLICATION FIELDS:

PERMITTED FEATURE #014 – land application field #1; 26.9 ac; 20.7 setback ac

Legal Description: SE¼, NE¼, Sec. 22, T46N, R22W, Pettis County
UTM Coordinates (Centroid): X = 472159, Y = 4289553
First Classified Stream and ID: 100K Extent-Remaining Stream (C) WBID# 3960 & Muddy Creek (P) WBID# 0853
USGS Basin & Sub-watershed No.: Little Muddy Creek 10300103-0404 & Coon Creek – Muddy Creek 10300103-0405

PERMITTED FEATURE #015 – land application field #2; 33.1 ac; 26.7 setback ac

Legal Description: NW¼, SW¼, Sec. 23, T46N, R22W, Pettis County
UTM Coordinates (Centroid): X = 472518, Y = 4289373
First Classified Stream and ID: 100K Extent-Remaining Stream (C) WBID# 3960 & Muddy Creek (P) WBID# 0853
USGS Basin & Sub-watershed No.: Little Muddy Creek 10300103-0404 & Coon Creek – Muddy Creek 10300103-0405

PERMITTED FEATURE #016 – land application field #3; 25.5 ac; 20.3 setback ac

Legal Description: SW¼, NW¼, Sec. 23, T46N, R22W, Pettis County
UTM Coordinates (Centroid): X = 472544, Y = 4289835
First Classified Stream and ID: 100K Extent-Remaining Stream (C) WBID# 3960
USGS Basin & Sub-watershed No.: Little Muddy Creek 10300103-0404

PERMITTED FEATURE #017 – land application field #4; 24.8 ac; 18.9 setback ac

Legal Description: NE¼, SW¼, Sec. 23, T46N, R22W, Pettis County
UTM Coordinates: X = 472954, Y = 4289149
First Classified Stream and ID: Muddy Creek (P) WBID# 0853
USGS Basin & Sub-watershed No.: Coon Creek – Muddy Creek 10300103-0405

PERMITTED FEATURE #018 – land application field #5; 68.7 ac; 59.0 setback ac

Legal Description: SE¼, NW¼, Sec. 23, T46N, R22W, Pettis County
UTM Coordinates (Centroid): X = 472935, Y = 4289790
First Classified Stream and ID: 100K Extent-Remaining Stream (C) WBID# 3960 & Muddy Creek (P) WBID# 0853
USGS Basin & Sub-watershed No.: Little Muddy Creek 10300103-0404 & Coon Creek – Muddy Creek 10300103-0405

PERMITTED FEATURE #019 – land application field #6; 38.3 ac; 28.2 setback ac

Legal Description: SW¼, NW¼, NE¼, Sec. 23, T46N, R22W, Pettis County
UTM Coordinates (Centroid): X = 473474, Y = 4289854
First Classified Stream and ID: 100K Extent-Remaining Stream (C) WBID# 3960 & Muddy Creek (P) WBID# 0853
USGS Basin & Sub-watershed No.: Little Muddy Creek 10300103-0404 & Coon Creek – Muddy Creek 10300103-0405

PERMITTED FEATURE #020 – land application field #7; 53.7 ac; 45.1 setback ac

Legal Description: SE¼, SW¼, Sec. 14, T46N, R22W, Pettis County
UTM Coordinates (Centroid): X = 473176, Y = 4290269
First Classified Stream and ID: 100K Extent-Remaining Stream (C) WBID# 3960
USGS Basin & Sub-watershed No.: Little Muddy Creek 10300103-0404

PERMITTED FEATURE #021 – land application field #8; 162.1 ac; 143.9 setback ac

Legal Description: SW¼, SW¼, Sec. 14, T46N, R22W, Pettis County
UTM Coordinates (Centroid): X = 472491, Y = 4290326
First Classified Stream and ID: 100K Extent-Remaining Stream (C) WBID# 3960
USGS Basin & Sub-watershed No.: Little Muddy Creek 10300103-0404

PERMITTED FEATURE #022 – eliminated in 2018 permit modification; field #9 not in service due to small size and setback requirements. Land application to this field is not authorized.

FACILITY DESCRIPTION (CONTINUED)

PERMITTED FEATURE #023 – land application field #10; 46.2 ac; 38.0 setback ac

Legal Description: SE¼, NW¼, Sec. 14, T46N, R22W, Pettis County
UTM Coordinates (Centroid): X = 473164, Y = 4291062
First Classified Stream and ID: 100K Extent-Remaining Stream (C) WBID# 3960
USGS Basin & Sub-watershed No.: Little Muddy Creek 10300103-0404

PERMITTED FEATURE #024 – land application field #11; 103.4 ac; 85.0 setback ac

Legal Description: SW¼, NW¼, Sec. 14, T46N, R22W, Pettis County
UTM Coordinates (Centroid): X = 472586, Y = 4291043
First Classified Stream and ID: 100K Extent-Remaining Stream (C) WBID# 3960
USGS Basin & Sub-watershed No.: Little Muddy Creek 10300103-0404

PERMITTED FEATURE #025 – land application field #12; 19.6 ac; 14.9 setback ac

Legal Description: W½, SE¼, NE¼, Sec. 15, T46N, R22W, Pettis County
UTM Coordinates (Centroid): X = 472243, Y = 4291157
First Classified Stream and ID: 100K Extent-Remaining Stream (C) WBID# 3960
USGS Basin & Sub-watershed No.: Little Muddy Creek 10300103-0404

PERMITTED FEATURE #026 – land application field #13; 88.0 ac; 72.3 setback ac

Legal Description: NW¼, SE¼, Sec. 15, T46N, R22W, Pettis County
UTM Coordinates (Centroid): X = 471957, Y = 4290624
First Classified Stream and ID: 100K Extent-Remaining Stream (C) WBID# 3960
USGS Basin & Sub-watershed No.: Little Muddy Creek 10300103-0404

PERMITTED FEATURE #027 – land application field #14; 34.9 ac; 30.4 setback ac

Legal Description: NW¼, NE¼, Sec. 22, T46N, R22W, Pettis County
UTM Coordinates (Centroid): X = 471964, Y = 4289849
First Classified Stream and ID: 100K Extent-Remaining Stream (C) WBID# 3960
USGS Basin & Sub-watershed No.: Little Muddy Creek 10300103-0404

PERMITTED FEATURE #028 – land application field #15; 85.2 ac; 71.8 setback ac

Legal Description: NE¼, NW¼, Sec. 22, T46N, R22W, Pettis County
UTM Coordinates (Centroid): X = 471583, Y = 4290091
First Classified Stream and ID: 100K Extent-Remaining Stream (C) WBID# 3960
USGS Basin & Sub-watershed No.: Little Muddy Creek 10300103-0404

PERMITTED FEATURE #029 – land application field #16; 38.6 ac; 31.8 setback ac

Legal Description: SE¼, NW¼, Sec. 22, T46N, R22W, Pettis County
UTM Coordinates (Centroid): X = 471424, Y = 4289507
First Classified Stream and ID: 100K Extent-Remaining Stream (C) WBID# 3960
USGS Basin & Sub-watershed No.: Little Muddy Creek 10300103-0404

PERMITTED FEATURE #030 – land application field #17; 34.5 ac; 26.5 setback ac

Legal Description: SW¼, NE¼, Sec. 22, T46N, R22W, Pettis County
UTM Coordinates (Centroid): X = 471856, Y = 4289488
First Classified Stream and ID: 100K Extent-Remaining Stream (C) WBID# 3960 & Muddy Creek (P) WBID# 0853
USGS Basin & Sub-watershed No.: Little Muddy Creek 10300103-0404 & Coon Creek – Muddy Creek 10300103-0405

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

OUTFALL #001 <i>main outfall</i>	TABLE A-1 INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					
The facility is authorized to discharge from outfall(s) as specified. In accordance with 10 CSR 20-7.031, the final effluent limitations outlined in Tables A-2 and A-3 must be achieved as soon as possible but no later than August 1, 2021 and February 1, 2031 respectively. These interim effluent limitations are effective beginning February 1, 2021 and remain in effect through July 31, 2021 and January 31, 2031 respectively or as soon as possible. Discharges shall be controlled, limited, and monitored by the facility as specified below:						
EFFLUENT PARAMETERS	UNITS	INTERIM EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
LIMIT SET: M						
PHYSICAL						
Flow	MGD	*		*	daily	24 hr. total
Temperature at end of pipe at #01A	°F	*		*	daily	measured
Upstream Temp at #SM1	°F	*		*	daily	measured
Downstream Temp at #SM2	°F	*		*	daily	measured
Temperature Difference SM2-SM1	± °F	*		*	daily	measured
CONVENTIONAL						
Biochemical Oxygen Demand, 5 day	mg/L	26		16	twice/week	composite ††
Chlorine, Total Residual ‡	µg/L	18.1 (ML130)		9.0 (ML130)	twice/week	grab
<i>E. coli</i> †	#/100 ml	1030		206	twice/week	grab
Fecal Coliform	#/100 ml	400		*	twice/week	grab
Oil & Grease	mg/L	14		8.0	twice/week	grab
Oxygen, Dissolved at #01A :	mg/L	* min		*	twice/week	grab
pH †	SU	6.5 to 9.0		6.5 to 9.0	twice/week	grab
Total Suspended Solids	mg/L	30		20	twice/week	grab
NUTRIENTS						
Ammonia as N – Oct to April	mg/L	8.0		4.0	twice/week	grab
Ammonia as N – May	mg/L	8.0		3.5	twice/week	grab
Ammonia as N – June	mg/L	8.0		2.7	twice/week	grab
Ammonia as N – July	mg/L	8.0		2.3	twice/week	grab
Ammonia as N – August	mg/L	8.0		2.4	twice/week	grab
Ammonia as N – September	mg/L	8.0		3.1	twice/week	grab
Kjeldahl Nitrogen, Total (TKN)	mg/L	*		*	once/month	composite ††
Nitrate plus Nitrite as N	mg/L	*		*	once/month	composite ††
Nitrogen, Total as N	mg/L	147		103	twice/week	composite ††
Phosphorus, Total (TP)	mg/L	*		*	once/month	grab
OTHER						
Chloride	mg/L	*		*	once/month	composite ††
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>MARCH 28, 2021</u> . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
LIMIT SET: WC						
OTHER						
Whole Effluent Toxicity, Chronic See Special Condition #1	TU _c	*			once/year	composite ††
MONITORING REPORTS SHALL BE SUBMITTED <u>ANNUALLY</u> ; THE FIRST REPORT IS DUE <u>JANUARY 28, 2022</u> .						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

OUTFALL #001 main outfall		TABLE A-3 FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS				
The facility is authorized to discharge from outfall(s) as specified. The final effluent limitations shall become effective on February 1, 2031 and remain in effect until expiration of the permit. Discharges shall be controlled, limited, and monitored by the facility as specified below:						
EFFLUENT PARAMETERS	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
LIMIT SET: M						
PHYSICAL						
Flow	MGD	*		*	daily	24 hr. total
Temperature at end of pipe at #01A	°F	90		*	daily	measured
Upstream Temp at #SM1	°F	*		*	daily	measured
Downstream Temp at #SM2	°F	*		*	daily	measured
Temperature Difference SM2-SM1	± °F	*		*	daily	measured
CONVENTIONAL						
Biochemical Oxygen Demand, 5 day	mg/L	26		16	twice/week	composite ††
Chlorine, Total Residual ‡	µg/L	18.1 (ML130)		9.0 (ML130)	twice/week	grab
<i>E. coli</i> †	#/100 ml	1030		206	twice/week	grab
Fecal Coliform	#/100 ml	400		*	twice/week	grab
Oil & Grease	mg/L	14		8.0	twice/week	grab
Oxygen, Dissolved at #01A :	mg/L	5 min		*	twice/week	grab
pH †	SU	6.5 to 9.0		6.5 to 9.0	twice/week	grab
Total Suspended Solids	mg/L	30		20	twice/week	grab
NUTRIENTS						
Ammonia as N – Oct to April	mg/L	8.0		4.0	twice/week	grab
Ammonia as N – May	mg/L	8.0		3.5	twice/week	grab
Ammonia as N – June	mg/L	8.0		2.7	twice/week	grab
Ammonia as N – July	mg/L	8.0		2.3	twice/week	grab
Ammonia as N – August	mg/L	8.0		2.4	twice/week	grab
Ammonia as N – September	mg/L	8.0		3.1	twice/week	grab
Kjeldahl Nitrogen, Total (TKN)	mg/L	*		*	once/month	composite ††
Nitrate plus Nitrite as N	mg/L	*		*	once/month	composite ††
Nitrogen, Total as N	mg/L	147		103	twice/week	composite ††
Phosphorus, Total (TP)	mg/L	*		*	once/month	grab
OTHER						
Chloride	mg/L	266.2		219.9	once/month	composite ††
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>MARCH 28, 2031</u> . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
LIMIT SET: WC						
OTHER						
Whole Effluent Toxicity, Chronic See Special Condition #1	TU _c	*			once/year	composite ††
MONITORING REPORTS SHALL BE SUBMITTED <u>ANNUALLY</u> ; THE FIRST REPORT IS DUE <u>JANUARY 28, 2032</u> .						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

OUTFALL #002, #003, #004, AND #008 <i>Stormwater Only</i>	TABLE A-4 FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					
The facility is authorized to discharge from outfall(s) as specified. The final effluent limitations shall become effective on February 1, 2021 and remain in effect until expiration of the permit. Discharges shall be controlled, limited and monitored by the facility as specified below:						
EFFLUENT PARAMETERS	UNITS	FINAL LIMITATIONS		BENCH- MARKS	MONITORING REQUIREMENTS	
		DAILY MAXIMUM	MONTHLY AVERAGE		MEASUREMENT FREQUENCY	SAMPLE TYPE
LIMIT SET: Q						
PHYSICAL						
Flow	MGD	*		-	once/quarter ◇	24 Hr Est.
CONVENTIONAL						
Biochemical Oxygen Demand	mg/L	**		30	once/quarter ◇	grab
Chemical Oxygen Demand	mg/L	**		120	once/quarter ◇	grab
<i>E. coli</i>	#/100 mL	**		1030	once/quarter ◇	grab
Oil & Grease	mg/L	**		10	once/quarter ◇	grab
pH †	SU	**		6.0 to 9.0	once/quarter ◇	grab
Settleable Solids	mL/L/hr	**		1.5	once/quarter ◇	grab
Total Suspended Solids	mg/L	**		100	once/quarter ◇	grab
MONITORING REPORTS SHALL BE SUBMITTED QUARTERLY; THE FIRST REPORT IS DUE APRIL 28, 2021. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

PERMITTED FEATURE #011 <i>no discharge wastewater & sludge basin</i>	TABLE A-5 NO DISCHARGE: FINAL MONITORING REQUIREMENTS					
The facility is not authorized to discharge from this feature. The final requirements shall become effective on February 1, 2021 and remain in effect until expiration of the permit. This feature shall be monitored and operationally controlled by the facility as specified below:						
MONITORING PARAMETERS	UNITS	MONITORING REQUIREMENTS				
		MEASUREMENT		MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
LIMIT SET: OM (OPERATIONAL MONITORING)						
Freeboard; minimum	feet	2		*	once/month	measured
Precipitation; maximum	in	*		*	daily	record or measured
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>MARCH 28, 2021</u> .						
LIMIT SET: QS (QUARTERLY SLUDGE SAMPLING)						
PHYSICAL				QUARTERLY AVERAGE		
Percent Solids	%	*		*	once/quarter ◇	composite ††
pH †	SU	*		-	once/quarter ◇	composite ††
NUTRIENTS						
Ammonia as N	mg/kg - dry	*		*	once/quarter ◇	composite ††
Organic Nitrogen as N	mg/kg - dry	*		*	once/quarter ◇	calculation
Kjeldahl Nitrogen, Total as N	mg/kg - dry	*		*	once/quarter ◇	composite ††
Nitrate as N	mg/kg - dry	*		*	once/quarter ◇	composite ††
Nitrite as N	mg/kg - dry	*		*	once/quarter ◇	composite ††
Nitrogen, Total (TN)	mg/kg - dry	*		*	once/quarter ◇	calculation
(Plant) Available Nitrogen (PAN)	mg/kg - dry	*		*	once/quarter ◇	calculation
Phosphorus, Total (TP)	mg/kg - dry	*		*	once/quarter ◇	composite ††
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE <u>APRIL 28, 2021</u> .						
LIMIT SET: TS (ONE SAMPLE FOR EVERY 100 TONS APPLIED)						
Aluminum	mg/kg - dry	*			one/ 100 Ton	composite ††
Arsenic	mg/kg - dry	*			one/ 100 Ton	composite ††
Beryllium	mg/kg - dry	*			one/ 100 Ton	composite ††
Boron	mg/kg - dry	*			one/ 100 Ton	composite ††
Cadmium	mg/kg - dry	*			one/ 100 Ton	composite ††
Chloride	mg/kg - dry	*			one/ 100 Ton	composite ††
Chromium	mg/kg - dry	*			one/ 100 Ton	composite ††
Copper	mg/kg - dry	*			one/ 100 Ton	composite ††
Fluoride	mg/kg - dry	*			one/ 100 Ton	composite ††
Lead	mg/kg - dry	*			one/ 100 Ton	composite ††
Mercury	mg/kg - dry	*			one/ 100 Ton	composite ††
Molybdenum	mg/kg - dry	*			one/ 100 Ton	composite ††
Nickel	mg/kg - dry	*			one/ 100 Ton	composite ††
Oil and Grease	mg/kg - dry	*			one/ 100 Ton	composite ††
Selenium	mg/kg - dry	*			one/ 100 Ton	composite ††
Sodium	mg/kg - dry	*			one/ 100 Ton	composite ††
Sodium Absorption Ratio (SAR)	mg/kg - dry	*			one/ 100 Ton	composite ††
Tin	mg/kg - dry	*			one/ 100 Ton	composite ††
Total Petroleum Hydrocarbons	mg/kg - dry	*			one/ 100 Ton	composite ††
Zinc	mg/kg - dry	*			one/ 100 Ton	composite ††
MONITORING REPORTS SHALL BE SUBMITTED <u>AS NEEDED FOR EVERY 100 TONS APPLIED</u> REPORTING IS NOT SCHEDULED BUT EACH REPORT SHALL BE SUBMITTED BY THE 28 TH DAY OF THE MONTH FOLLOWING SAMPLING.						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

LAND APPLICATION FIELDS PERMITTED FEATURES: #014, #015, #016, #017, #018, #019, #020, #021, #023, #024, #025, #026, #027, #028, #029, #030 <i>land application fields on-site & soil sampling</i>		TABLE A-6 FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS			
The facility is authorized to discharge from outfall(s) as specified. The final effluent limitations shall become effective on February 1, 2021 and remain in effect until expiration of the permit. Discharges shall be controlled, limited, and monitored by the facility as specified below:					
EFFLUENT PARAMETERS	UNITS	FINAL EFFLUENT LIMITATIONS		MONITORING REQUIREMENTS	
		DAILY MAXIMUM	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
LIMIT SET: OM					
Application Area	acres	*	*	DAILY ▲	measured/calculated
Application Rate	gal/acre	*	*	DAILY ▲	measured/calculated
Volume Applied (Irrigated) Total	gal	*	*(month total)	DAILY ▲	measured/calculated
Nitrate as N	mg/L	10	*	DAILY ▲	measured/calculated
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE MARCH 28, 2021. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.					
LIMIT SET: AP – ANNUAL POLLUTANT LOADING CALCULATIONS FOR SOIL SAMPLES					
Plant Available Nitrogen (PAN)	lbs/ac/year	**		annual total	calculation
Arsenic	lbs/ac/year	1.78		annual total	calculation
Cadmium	lbs/ac/year	1.70		annual total	calculation
Copper	lbs/ac/year	66.91		annual total	calculation
Lead	lbs/ac/year	13.38		annual total	calculation
Mercury	lbs/ac/year	0.76		annual total	calculation
Nickel	lbs/ac/year	18.74		annual total	calculation
Selenium	lbs/ac/year	4.46		annual total	calculation
Zinc	lbs/ac/year	124.91		annual total	calculation
MONITORING REPORTS SHALL BE SUBMITTED ANNUALLY FOR THE CALENDAR YEAR. THE FIRST REPORT IS DUE JANUARY 28, 2022.					

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS - NOTES

* Monitoring and reporting requirement only

** Monitoring and reporting requirement with benchmark. See Special Conditions for additional requirements.

†† Composite Sampling:

- For 24-hour composite wastewater samples, these are composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device.

- For sludge, the facility will determine the amount of aliquots appropriate and submit the mixture of the aliquots to the laboratory for analysis

- For soil, the facility will follow the most applicable guidance listed in the fact sheet.

‡ Chlorine, Total Residual. This permit contains a Total Residual Chlorine (TRC) limit.

(a) This effluent limit is below the minimum quantification level of the most sensitive EPA approved CLTRC methods. The Department has determined the current acceptable minimum level (ML) for total residual chlorine to be 130 µg/L when using the DPD Colorimetric Method #4500 – CL G. from Standard Methods for the Examination of Waters and Wastewater. The facility will conduct analyses in accordance with this method, or equivalent, and report actual analytical values. Measured values greater than or equal to the minimum quantification level of 130 µg/L will be considered violations of the permit and values less than the minimum quantification level of 130 µg/L will be considered to be in compliance with the permit limitation. The minimum quantification level does not authorize the discharge of chlorine in excess of the effluent limits stated in the permit.

(b) Disinfection is required year-round due to effluent limitation requirements for fecal coliform.

(c) Do not chemically dechlorinate if it is not needed to meet the limits in your permit. The facility must determine compliance with water quality standards using mass balance of chlorination and dechlorination.

‡ *E. coli*: final limitations and monitoring requirements are applicable only during the recreational season from April 1 through October 31. The Monthly Average Limit for *E. coli* is expressed as a geometric mean.

† pH: the facility will report the minimum and maximum values; pH is not to be averaged.

∴ Oxygen, Dissolved: is a minimum value. The facility will report the minimum value for the daily report. The facility will measure this parameter at #001 until the basin is constructed; then will measure this parameter at #01A.

▲ daily is only for days applied; monitoring is not required when not applying. Specific daily data is reported as an attachment in the eDMR system.

** 150 lbs/ac/year or in accordance with Land App E.6 which allows the facility to apply enough N to meet crop N need. Corn needs about 1.5 lb N/acre to produce 1 bu/acre according to EQ202.

◇ Quarterly sampling

MINIMUM QUARTERLY SAMPLING REQUIREMENTS			
QUARTER	MONTHS	STORMWATER	REPORT IS DUE
First	January, February, March	Sample any month of the quarter	April 28 th
Second	April, May, June	Sample any month of the quarter	July 28 th
Third	July, August, September	Sample any month of the quarter	October 28 th
Fourth	October, November, December	Sample any month of the quarter	January 28 th

B. SCHEDULE OF COMPLIANCE

Schedules of compliance are allowed per 40 CFR 122.47 and 10 CSR 20-7.031(11). The facility shall attain compliance with final effluent limitations established in this permit as soon as reasonably achievable:

1. Within six months of the effective date of this permit, the facility shall report progress made in attaining compliance with the final effluent limits.
2. The facility shall submit interim progress reports detailing progress made in attaining compliance with the final effluent limits every 12 months from effective date. The first report is due February 1, 2022.
3. By August 1, 2021, the facility shall attain compliance with temperature limitations at outfall #01A and dissolved oxygen at outfall #01A. Measurements of these parameters shall be completed at #001 until the basin is constructed then be measured at #01A
4. Within 10 years of the effective date of this permit, the facility shall attain compliance with the final effluent limits at outfall #001 for chloride.

C. STANDARD CONDITIONS

In addition to specified conditions stated herein, this permit is subject to the attached Part I and Part III standard conditions dated August 1, 2014 and August 1, 2019, respectively, and hereby incorporated as though fully set forth herein.

D. SPECIAL CONDITIONS

1. Chronic Whole Effluent Toxicity (WET) tests shall be conducted as follows:
 - (a) Freshwater Species and Test Methods: Species and short-term test methods for estimating the chronic toxicity of NPDES effluents are found in the most recent edition of *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (EPA/821/R-02/013; Table IA, 40 CFR Part 136). The permittee shall concurrently conduct 7-day, static renewal toxicity tests with the following species:
 - i. The fathead minnow, *Pimephales promelas* (Survival and Growth Test Method 1000.0).
 - ii. The daphnid, *Ceriodaphnia dubia* (Survival and Reproduction Test Method 1002.0).
 - (b) Chemical and physical analysis of the upstream control sample and effluent sample shall occur immediately upon being received by the laboratory, prior to any manipulation of the effluent sample beyond preservation methods consistent with federal guidelines for WET testing that are required to stabilize the sample during shipping. Where upstream receiving water is not available or known to be toxic, other approved control water may be used.
 - (c) Test conditions must meet all test acceptability criteria required by the EPA Method used in the analysis.
 - (d) The laboratory shall not chemically dechlorinate the sample.
 - (e) The laboratory shall not aerate the sample.
 - (f) The Allowable Effluent Concentration (AEC) is 100%, the dilution series is: 100%, 50%, 25%, 12.5%, and 6.25%.
 - (g) All chemical and physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% effluent concentration.
 - (h) The facility must submit a full laboratory report for all toxicity testing. The report must include a quantification of chronic toxic units ($TU_c = 100/IC_{25}$) reported according to the *Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* chapter on report preparation and test review. The 25 percent Inhibition Effect Concentration (IC_{25}) is the toxic or effluent concentration that would cause 25 percent reduction in mean young per female or in growth for the test populations.
2. Spills, Overflows, and Other Unauthorized Discharges.
 - (a) Any spill, overflow, or other discharge(s) not specifically authorized above are unauthorized discharges.
 - (b) Should an unauthorized discharge cause or permit any contaminants to discharge or enter waters of the state, the unauthorized discharge must be reported to the regional office as soon as practicable but no more than 24 hours after the discovery of the discharge. If the spill or overflow needs to be reported after normal business hours or on the weekend, the facility must call the Department's 24 hour spill line at 573-634-2436.
 - (c) If the unauthorized discharge was from an overflow from a no-discharge wastewater basin, the report must include all records confirming operation and maintenance records documenting proper maintenance in accordance with condition (d) below.
 - (d) The facility shall adhere to the following minimum Best Management Practices (BMPs) for no-discharge wastewater holding structures:
 - (1) To prevent unauthorized discharges, the no-discharge wastewater basin must be properly operated and maintained to contain all wastewater plus run-in and direct precipitation. During normal weather conditions, the liquid level in the storage structure shall be maintained below the upper operating level, so adequate storage capacity is available for use during adverse weather periods. The liquid level in the storage structure should be lowered on a routine schedule based on the design storage period. Typically this should be accomplished prior to expected seasonal wet and winter climate periods. Maintain liquid level in the no-discharge wastewater structure at least 2.0 feet from the bottom of the discharge pipe, top of the basin, or the bottom of the overflow canal, whichever is lower.
 - (2) Weekly inspection of no-discharge wastewater basins shall occur. Inspection notes will be kept at the facility and made available to the Department upon request.
 - (3) The inspections will note any issues with the no-discharge structure and will record the level of liquid as indicated by the depth marker.

D. SPECIAL CONDITIONS (CONTINUED)

3. Bypasses are not authorized at this facility unless they meet the criteria in 40 CFR 122.41(m). If a bypass occurs, the permittee shall report in accordance to 40 CFR 122.41(m)(3), and with Standard Condition Part I, Section B, subsection 2. Bypasses are to be reported to the Northeast Regional Office during normal business hours or by using the online Sanitary Sewer Overflow/Facility Bypass Application located at: <https://dnr.mo.gov/mogem/> or the Environmental Emergency Response spill-line at 573-634-2436 outside of normal business hours. Once an electronic reporting system compliant with 40 CFR Part 127, the National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, is available all bypasses must be reported electronically via the new system. Blending, which is the practice of combining a partially-treated wastewater process stream with a fully-treated wastewater process stream prior to discharge, is not considered a form of bypass and is not authorized under this permit. If the permittee wishes to utilize blending, the permittee shall file an application to modify this permit to facilitate the inclusion of appropriate monitoring conditions.
4. Electronic Discharge Monitoring Report (eDMR) Submission System
Per 40 CFR Part 127 National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, reporting of effluent monitoring data and any report required by the permit (unless specifically directed otherwise by the permit), shall be submitted via an electronic system to ensure timely, complete, accurate, and nationally consistent set of data about the NPDES program.
 - (a) eDMR Registration Requirements. The facility must register with the Department's eDMR system through the Missouri Gateway for Environmental Management (MoGEM) before the first report is due. Registration and other information regarding MoGEM can be found at <https://dnr.mo.gov/mogem/>. Information about the eDMR system can be found at <https://dnr.mo.gov/env/wpp/edmr.htm>. The first user shall register as an Organization Official and the association to the facility must be approved by the Department. Regarding Standard Conditions Part I, §B, #7, the eDMR system is currently the only Department approved reporting method for this permit unless a waiver is granted by the Department.
 - (b) Electronic Submissions. To access the eDMR system, use the following link in your web browser: <https://apps5.mo.gov/mogems/welcome.action> If you experience difficulties with using the eDMR system you may contact edmr@dnr.mo.gov or call 855-789-3889 or 573-526-2082 for assistance.
 - (c) Waivers from Electronic Reporting. The facility must electronically submit compliance monitoring data and reports unless a waiver is granted by the Department in compliance with 40 CFR Part 127. Only facilities with an approved waiver request may submit monitoring data and reports on paper to the Department for the period the approved electronic reporting waiver is effective. Facilities may obtain an electronic reporting waiver by first submitting an eDMR Waiver Request Form: <http://dnr.mo.gov/forms/780-2692-f.pdf>. The department will either approve or deny this electronic reporting waiver request within 120 calendar days.
5. Stormwater Pollution Prevention Plan (SWPPP).
The facility's SIC code or description is found in 40 CFR 122.26(b)(14) and/or 10 CSR 20-6.200(2) and hence shall implement a Stormwater Pollution Prevention Plan (SWPPP) which must be prepared and implemented upon permit effective date. The SWPPP must be kept on-site and should not be sent to the Department unless specifically requested. The SWPPP must be reviewed and updated annually or if site conditions affecting stormwater change. The facility shall select, install, use, operate, and maintain the Best Management Practices prescribed in the SWPPP in accordance with the concepts and methods described in: *Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators*, (EPA 833-B-09-002) published by the EPA in 2015 https://www.epa.gov/sites/production/files/2015-11/documents/swppp_guide_industrial_2015.pdf The purpose of the SWPPP and the Best Management Practices (BMPs) listed herein is the prevention of pollution of waters of the state. A deficiency of a BMP means it was ineffective at providing the necessary protections for which it was designed. Corrective action describes the steps the facility took to eliminate the deficiency.
The SWPPP must include:
 - (a) A listing of specific contaminants and their control measures (or BMPs) and a narrative explaining how BMPs are implemented to control and minimize the amount of contaminants potentially entering stormwater.
 - (b) A map with all outfalls and structural BMPs marked.
 - (c) A schedule for at least once per month site inspections and brief written reports. The inspection report must include precipitation information for the entire period since last inspection, as well as observations and evaluations of BMP effectiveness. Throughout coverage under this permit, the facility must perform ongoing SWPPP review and revision to incorporate any site condition changes.
 - (1) Operational deficiencies must be corrected within seven (7) calendar days.
 - (2) Minor structural deficiencies must be corrected within fourteen (14) calendar days.
 - (3) Major structural deficiencies (deficiencies projected to take longer than 14 days to correct) must be reported as an uploaded attachment through the eDMR system with the DMRs. The initial report shall consist of the deficiency noted, the proposed remedies, the interim or temporary remedies (including proposed timing of the placement of the interim measures), and an estimate of the timeframe needed to wholly complete the repairs or construction. If required by the Department, the facility shall work with the regional office to determine the best course of action. The facility should consider temporary structures to control stormwater runoff. The facility shall correct the major structural deficiency as soon as reasonably achievable.

D. SPECIAL CONDITIONS (CONTINUED)

- (4) All actions taken to correct the deficiencies shall be included with the written report, including photographs, and kept with the SWPPP. Additionally, corrective action of major structural deficiencies shall be reported as an uploaded attachment through the eDMR system with the DMRs.
 - (5) BMP failure causing discharge through an unregistered outfall is considered an illicit discharge and must be reported in accordance with Standard Conditions Part I.
 - (6) Inspection reports must be kept on site with the SWPPP and maintained for a period of five (5) years. These must be made available to Department personnel upon request. Electronic versions of the documents and photographs are acceptable.
 - (d) A provision for designating an individual to be responsible for environmental matters and a provision for providing training to all personnel involved in housekeeping, material handling (including but not limited to loading and unloading), storage, and staging of all operational, maintenance, storage, and cleaning areas. Proof of training shall be submitted upon request by the Department.
6. Site-wide minimum Best Management Practices (BMPs). At a minimum, the facility shall adhere to the following:
- (a) Prevent the spillage or loss of fluids, oil, grease, fuel, etc. from vehicle maintenance, equipment cleaning, warehouse activities, and other areas, and thereby prevent the contamination of stormwater from these substances.
 - (b) Ensure adequate provisions are provided to prevent surface water intrusion into the wastewater storage basins, to divert stormwater runoff around the wastewater storage basins, and to protect embankments from erosion.
 - (c) Provide collection facilities and arrange for proper disposal of waste products including but not limited to petroleum waste products, and solvents.
 - (d) Store all paint, solvents, petroleum products and petroleum waste products (except fuels), and storage containers (such as drums, cans, or cartons) so these materials are not exposed to stormwater or provide other prescribed BMPs such as plastic lids and/or portable spill pans to prevent the commingling of stormwater with container contents. Commingled water may not be discharged under this permit. Provide spill prevention control, and/or management sufficient to prevent any spills of these pollutants from entering waters of the state. Any containment system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall also prevent the contamination of groundwater. Spill records should be retained on-site.
 - (e) Provide good housekeeping practices on the site to keep trash from entry into waters of the state.
 - (f) Provide sediment and erosion control sufficient to prevent or control sediment loss off of the property.
 - (g) Remove sediment from stormwater sediment pond(s) no less than every ten years, or more frequently dependent on the amount of sediment received; sediment accumulated shall be no more than 20% total volume or as prescribed in the engineering design, whichever is less. Records must be retained since last cleanout.
7. Stormwater Benchmarks. This permit stipulates pollutant benchmarks applicable to your stormwater discharges.
- (a) The benchmarks do not constitute direct numeric effluent limitations; therefore, a benchmark exceedance alone is not a permit violation. Benchmark monitoring and visual inspections shall be used to determine the overall effectiveness of the SWPPP and to assist you in knowing when additional corrective action may be necessary to protect water quality. If a sample exceeds a benchmark concentration you must review your SWPPP and your BMPs to determine what improvements or additional controls are needed to reduce the pollutant in your stormwater discharge(s).
 - (b) Any time a benchmark exceedance occurs, a Corrective Action Report (CAR) must be completed. A CAR is a document recording the efforts undertaken by the facility to improve BMPs to meet benchmarks in future samples. CARs must be retained with the SWPPP and be available to the Department upon request. If the efforts taken by the facility are not sufficient and subsequent exceedances of a benchmark occur, the facility must contact the Department if a benchmark value cannot be achieved. Failure to take corrective action to address a benchmark exceedance and failure to make measureable progress towards achieving the benchmarks is a permit violation.
8. Petroleum Secondary Containment.
- Before releasing water accumulated in organic oil, oily waste, or petroleum secondary containment areas, it must be examined for hydrocarbon odor and presence of sheen to protect the general criteria found at 10 CSR 20-7.031(4).
- (a) If odor or sheen is found, the water shall not be discharged without treatment and shall be disposed of in accordance with legally approved methods, such as being sent to an accepting wastewater treatment facility.
 - (b) If the facility wishes to discharge the accumulated stormwater with hydrocarbon odor or presence of sheen, the water shall be treated using an appropriate removal method. Following treatment and before release, the water shall be tested for oil and grease, benzene, toluene, ethylbenzene, and xylene using 40 CFR part 136 methods. All pollutant levels must be below the most protective, applicable standards for the receiving stream, found in 10 CSR 20-7.031 Table A before discharge is authorized. Records of all testing and treatment of water accumulated in secondary containment shall be available on demand to the Department. Electronic records retention is acceptable.

D. SPECIAL CONDITIONS (CONTINUED)

9. The full implementation of this operating permit, which includes implementation of any applicable schedules of compliance, shall constitute compliance with all applicable federal and state statutes and regulations in accordance with 644.051.16 RSMo for permit shield, and the CWA §402(k) for toxic substances. This permit may be reopened and modified, or alternatively revoked and reissued to comply with any applicable effluent standard or limitation issued or approved under CWA §§301(b)(2)(C) and (D), §304(b)(2), and §307(a)(2), if the effluent standard or limitation so issued or approved contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or controls any pollutant not already limited in the permit. This permit may be modified, revoked and reissued, or terminated for cause, including determination new pollutants found in the discharge not identified in the application for the new or revised permit. The filing of a request by the facility for a permit modification, termination, notice of planned changes, or anticipated non-compliance does not stay any permit condition.
10. All outfalls and permitted features must be clearly marked in the field. Land application sites shall be noted on a legible map available to applicers and the Department.
11. Report no discharge when a discharge does not occur during the report period. It is a violation of this permit to report no-discharge when a discharge has occurred. Report no application when application does not occur.
12. The Department may require sampling and reporting as a result of illegal discharges from the site, compliance issues related to water quality concerns or BMP effectiveness, or evidence of off-site impacts from activities or discharges at the facility.
13. This permit does not apply to fertilizer products receiving a current exemption under the Missouri Clean Water Law and regulations in 10 CSR 20-6.015(3)(B)8, and are land applied in accordance with the exemption.
14. **Changes in Discharges of Toxic Pollutant.**
In addition to the reporting requirements under 40 CFR 122.41(1), all existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Director as soon as they know or have reason to believe:
 - (a) An activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following notification levels:
 - (1) One hundred micrograms per liter (100 µg/L);
 - (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile;
 - (3) Five hundred micrograms per liter (500 µg/L) for 2,4-dinitrophenol and for 2-methyl-4, 6-dinitrophenol;
 - (4) One milligram per liter (1 mg/L) for antimony;
 - (5) Five (5) times the maximum concentration value reported for the pollutant in the permit application in accordance with 40 CFR 122.21(g)(7); or
 - (6) The notification level established by the Department in accordance with 40 CFR 122.44(f).
 - (b) Any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following “notification levels”:
 - (1) Five hundred micrograms per liter (500 µg/L);
 - (2) One milligram per liter (1 mg/l) for antimony;
 - (3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR 122.21(g)(7).
 - (4) The level established by the Director in accordance with 40 CFR 122.44(f).
15. **Reporting of Non-Detects.**
 - (a) Compliance analysis conducted by the facility or any contracted laboratory shall be conducted in such a way the precision and accuracy of the analyzed result can be enumerated. See sufficiently sensitive test method requirements in Standard Conditions Part I, §A, No. 4 regarding proper testing and detection limits used for sample analysis. For the purposes of this permit, the definitions in 40 CFR 136 apply; method detection limit (MDL) and laboratory established reporting limit (RL) are used interchangeably in this permit.
 - (b) The facility shall not report a sample result as “non-detect” without also reporting the MDL. Reporting “non-detect” without also including the MDL will be considered failure to report, which is a violation of this permit.
 - (c) For the daily maximum, the facility shall report the highest value; if the highest value was a non-detect, use the less than “<” symbol and the laboratory’s highest method detection limit (MDL) or the highest reporting limit (RL); whichever is higher (e.g. <6).
 - (d) When calculating monthly averages, zero shall be used in place of any value(s) not detected. Where all data used in the average are below the MDL or RL, the highest MDL or RL shall be reported as “<#” for the average as indicated in item (c).
16. Failure to pay fees associated with this permit is a violation of the Missouri Clean Water Law (644.055 RSMo).

D. SPECIAL CONDITIONS (CONTINUED)

17. This permit does not cover land disturbance activities.
18. This permit does not authorize the placement of fill materials in flood plains, placement of solid materials into any waterway, the obstruction of stream flow, or changing the channel of a defined drainage course. The facility must contact the U.S. Army Corps of Engineers (Corps) to determine if a CWA §404 Department of Army permit or §401 water quality certification is required for the project.
19. All records required by this permit may be maintained electronically per 432.255 RSMo.
20. Renewal Application Requirements.
 - (a) This facility shall submit an appropriate and complete application to the Department no less than 180 days prior to the expiration date listed on page 1 of the permit.
 - (b) Application materials shall include complete Form A and Form C. If the form names have changed, then the facility should ensure they are submitting the correct forms as required by regulation.
 - (c) This facility must submit Form B for the domestic wastewater outfall.
 - (d) This facility must submit form R for the application of sludge or wastewater.
 - (e) The facility must sample the stormwater outfalls and provide analysis for every parameter contained in the permit at any outfall for at the site in accordance with 10 CSR 20-6.200(2)(C)1.E(I) and (II)
 - (f) The facility may use the electronic submission system to submit the application to the Program, if available.
 - (g) This facility must submit all corrective action reports completed for the last permit term if any benchmark exceedance occurred.
 - (h) This facility must submit all soil testing with the application for permit renewal.
 - (i) The facility must submit all control methods used, or considered, for control of algae within the cooling basin.

E. LAND APPLICATION CONDITIONS

1. Land application of wastewater and/or sludge materials listed in the Facility Description of this permit is authorized and shall be conducted according to the conditions enumerated in Section E. These land application conditions do not apply to fertilizer products receiving a current exemption under the Missouri Clean Water Law and regulations in 10 CSR 20-6.015(3)(B)8, and are land applied in accordance with the exemption.
2. Soil pH shall be maintained in an optimal range for crop growth.
3. The permittee shall develop, maintain and implement an Operation and Maintenance (O&M) Manual that includes all necessary items to ensure the operation and integrity of the waste handling and land application systems, including key operating procedures, an aerial or topographic site map with the permitted features, land application fields, and irrigation buffer zones marked, and a brief summary of the operation of the facility. The O & M manual shall be made available to the operator and available to the department upon request. The O&M Manual shall be reviewed and updated at least every five years.
4. Earthen Storage Basins Minimum BMPs.
 - (a) To maintain structural integrity, basins shall be inspected at least monthly, the berms of the storage basin(s) shall be mowed and kept free of any deep-rooted vegetation, animal dens, or other potential sources of damage, any leaks or issues shall be noted and fixed.
 - (b) The facility shall ensure adequate provisions are provided to prevent surface water intrusion and run-in into the storage basin(s), to divert stormwater runoff from around the storage basin(s), and protect embankments from erosion.
 - (c) The minimum and maximum operating water levels for the storage basin(s) shall be clearly marked.
 - (d) Each storage basin shall be operated and maintained to achieve and maintain no discharge status; including maximum water elevations up to the operating level of the 1-in-10 year or 25-year, 24-hour storm events.
 - (e) Storage basins shall be lowered to the minimum operating level prior to November 30 each year.
 - (f) The facility must be maintained so access to lagoons and open wastewater structures is restricted to the public.
 - (g) It is a violation of this permit to place material in the emergency spillway or otherwise cause it to cease to function properly, as this may result in a catastrophic failure of the storage basin.

E. LAND APPLICATION CONDITIONS (CONTINUED)

5. Land Application Equipment Minimum Requirements.
 - (a) Spray application equipment shall minimize the formation of aerosols.
 - (b) Application equipment shall be visually inspected daily during land application to check for equipment malfunctions and leaks. The application system shall be operated so as to provide uniform distribution of wastes over the entire land application site.
 - (c) Equipment shall be calibrated at least once per calendar year to ensure even distribution of wastewater and/or sludge.
6. Land Application Field(s) Minimum Requirements.
 - (a) No land application shall occur when the soil or ground is frosted, frozen, snow covered, or saturated. Daily observation of fields is required. Application activities shall cease if these conditions occur.
 - (b) There shall be no application during a precipitation event or if a precipitation event likely to create runoff is forecasted to occur within 24 hours of a planned application.
 - (c) Public Access Restrictions; this permit does not authorize application of wastewater to public use areas.
 - (d) If land application sites listed in this permit are also included as land application sites in another permit, the wastewater and sludge applications from all sources shall be included in the application rates in the facility description. Records all sources must be kept for all permits.
 - (e) Grazing and Harvesting Deferment.
 - (1) May 1 to October 31, the minimum grazing or forage harvest deferment shall be fourteen (14) days from application;
 - (2) November 1 to April 30, the minimum grazing or forage harvest deferment shall be thirty (30) days from application;
 - (3) If deferment period spans two timeframes, the minimum grazing or forage harvest deferment shall be thirty (30) days from most recent application.
 - (4) Lactating dairy animal grazing is generally not recommended for application areas unless there has been a much longer deferment period.
 - (f) Land application shall occur only during daylight hours unless night time irrigation is necessary and the Water Protection Program has approved a nighttime irrigation plan.
 - (g) Land application fields shall be checked daily during land application for runoff.
 - (h) Sites utilizing spray irrigation shall monitor for the drifting of spray across property lines. Spray drift is not permissible.
 - (i) Setback distances from sensitive features per 10 CSR 20-8.200(6)(B). There shall be no land application within:
 - (1) The 10 year floodplain;
 - (2) 50 feet inside of the property line;
 - (3) 100 feet of any classified or unclassified gaining perennial or intermittent stream, any wetland, or any public or privately owned pond or lake;
 - (4) 150 feet of any dwelling, residence, public building, or public use area (excluding roadways);
 - (5) 300 feet of any potable water supply well not located on the property, adequate protections shall be implemented and maintained for any potable water supply well located within the application area;
 - (6) 300 feet from any sinkhole, losing stream, or any other physiographic structure with a conduit to groundwater;
7. Application Rate(s) and Loading.
 - (a) This permit does not authorize application of materials in concentrations known to cause, or having the potential to cause, phytotoxicity in plants per 10 CSR 20-6.015(4)1. If plant stress is observed, the facility may need to reduce application of wastewaters and/or sludges. If phytotoxicity is observed, the facility shall cease land application activities and evaluate the applied substances to determine the cause of phytotoxicity.
 - (b) Applications shall not exceed any agronomic rates listed in the facility description to ensure plant use of nutrients and prevent contamination of surface and groundwater. The agronomic rate is the amount of wastewater or sludge applied to a field to meet the fertilization needs of the plants.
 - (c) Runoff and ponding is prohibited.
 - (d) This permit does not authorize land disposal or the application of hazardous waste.
 - (e) The fertilizer recommendation shall be based on all of the following:
 - (1) The nutrient recommendation (nitrogen or phosphorus) for each crop. Recommendations can be found in University of Missouri Extension Guide EQ202 Crop/Nutrient Considerations for Biosolids or from publications by other land grant universities in adjoining states,
 - (2) Realistic yield goal for each crop. Yield goals should be based on actual crop yield records from multiple years for each field. Good judgment should be used to counteract unusually high or low yields. If a field's yield history is not available the USDA county wide average or other approved source may be used, and
 - (3) The most recent soil test.

E. LAND APPLICATION CONDITIONS (CONTINUED)

(f) Applications shall be conducted according to one the following nutrient based management practices. The chosen method is required to be the most stringent (not over-applying one pollutant).

(1) Nitrogen:

- i. Plant Available Nitrogen (PAN) based application. This method can be used when soil test phosphorus (P) levels are 120 pounds or less per acre using Bray P-1 test method, or if the field has been assessed by Missouri Phosphorus Index (P-index) with a low or medium rating. The amount of wastewater and/or sludge to be applied shall be adjusted annually based on the PAN calculation using the current wastewater and/or sludge nutrient analysis and the following:
- ii. For non-legume crops, the nitrogen fertilizer recommendation shall be adjusted to account for nitrogen credits from a preceding legume crop and residual nitrogen from the previous year's application. Nitrogen removal rates can be found in WQ430.
- iii. For legume crops, the nitrogen removal capacity of the legume crops should be based on the estimated nitrogen content of the harvested crop as defined in WQ430 and a realistic yield goal. The estimated nitrogen content of the crop must be adjusted using nitrogen credits for residual nitrogen fertilizer from the previous year's application.
- iv. $PAN = [Ammonia\ Nitrogen \times volatilization\ factor*] + [Organic\ Nitrogen \times 0.2] + [Nitrate\ Nitrogen]$
*Volatilization factor is 0.7 for surface application and 1 for subsurface application.
- v. The amount of wastewater and/or sludge applied shall not exceed the nitrogen fertilizer recommendation or the estimated nitrogen removal capacity of the planned crop during the year of the application;

(2) Phosphorus:

- i. This method must be used when soil test phosphorus (P) levels are above 120 pounds per acre using Bray P-1 test method, or if the P-index rating is high. The amount of wastewater and/or sludge to be applied shall be adjusted annually based the phosphorus content of the current wastewater and/or sludge nutrient analysis and may be applied according to one of the following methods;
- ii. The annual amount of phosphorus applied shall not exceed the planned crop's phosphorus removal estimate from WQ430, or from publications by other land grant universities in adjoining states; or,
- iii. Multi-year phosphorus applications. Wastewater and/or sludge applications can exceed the annual planned phosphate removal estimate for the crop when a multi-year phosphorus application is utilized. The multi-year application must comply with the following conditions:
- iv. The amount of phosphorus banked shall not exceed four years of the estimated crop removal rate for the planned crop rotation;
- v. The actual application rate shall not exceed the multi-year application rate; and
- vi. No additional applications shall occur until the applied phosphorus has been removed from the field by crop removal or harvest.
- vii. No land application can occur if the P-index rating for a field is very high.

8. Soil Monitoring.

- (a) Composite soil samples shall be collected every five years from each field listed in this permit where land application has occurred in the last 12 months. No land application shall occur on fields listed in this permit if soil sample results are more than five years old.
- (b) Composite soil samples shall be taken from the top 6 to 8 inches of soil.
- (c) Soil sampling shall be in accordance with University of Missouri (MU) Guides G9215, Soil Sampling Pastures or G9217, Soil Sampling Hayfields and Row Crops or other methods approved by the Department. The recommendation of one composite sample per 20 acres in G9215 and G9217 is not required by this permit, however, this is a useful method to identify soil fertility fluctuations in large fields due to past management practices, soil type, and variability of crop yields. There shall be at least one composite sample per 80 acres.
- (d) Testing shall conform to Recommended Chemical Soil Testing Procedures for North Central Region (North Central Regional Research Publication 221 Revised), or Soil Testing in Missouri (MU Extension Guide EC923), or other methods approved by the Department.
- (e) Sample results will be submitted with the next permit renewal application.

E. LAND APPLICATION CONDITIONS (CONTINUED)

9. Record Keeping. The following record keeping shall occur, be maintained for at least five years, be made available to the Department upon request, and shall be submitted with the application for renewal.
- (a) Daily land application log showing, at a minimum: date(s) of application, field identified, acres used, volume applied, weather condition (sunny, overcast, air temperature, etc), soil moisture condition, days since last precipitation event, and application method;
 - (b) Monthly visual storage structure inspections;
 - (c) Equipment inspections and calibrations;
 - (d) Land application field inspections, including runoff, saturation, and ponding;
 - (e) Record of maintenance and repairs;
 - (f) Description of any unusual operating conditions encountered, narrative summary of any problems or deficiencies identified, corrective action taken, or improvements planned;
 - (g) The number of days the storage structure discharged during the year, the discharge flow, reason the discharge occurred, and effluent analysis performed including analytical result laboratory pages and any clean-up actions taken.
 - (h) To ensure the soil does not exceed the cumulative loading rate, all records shall be maintained from the initial application date and for at least five years after application activities have ceased.
 - (i) Annual summary for each field used for land application showing: number of days application occurred, crop grown and yield, and total amount of wastewater and/or sludge applied (gallons and/or tons per acre).
 - (j) For fields where total nitrogen application exceeded 150 pounds per acre, the facility must submit PAN calculations to document the applied nitrogen was utilized.

F. NOTICE OF RIGHT TO APPEAL

If you were adversely affected by this decision, you may be entitled to pursue an appeal before the administrative hearing commission (AHC) pursuant to 621.250 and 644.051.6 RSMo. To appeal, you must file a petition with the AHC within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Any appeal should be directed to:

Administrative Hearing Commission
U.S. Post Office Building, Third Floor
131 West High Street, P.O. Box 1557
Jefferson City, MO 65102-1557
Phone: 573-751-2422
Fax: 573-751-5018
Website: <https://ahc.mo.gov>

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FACT SHEET
FOR THE PURPOSE OF RENEWAL
OF
MO-0115061
TYSON PROCESSING – SEDALIA

The Federal Water Pollution Control Act (Clean Water Act (CWA) §402 Public Law 92-500 as amended) established the National Pollutant Discharge Elimination System (NPDES) permit program. This program regulates the discharge of pollutants from point sources into the waters of the United States, and the release of stormwater from certain point sources. All such discharges are unlawful without a permit (§301 of the Clean Water Act). After a permit is obtained, a discharge not in compliance with all permit terms and conditions is unlawful. Missouri State Operating Permits (MSOPs) are issued by the Director of the Missouri Department of Natural Resources (Department) under an approved program, operating in accordance with federal and state laws (Federal Clean Water Act and Missouri Clean Water Law 644 RSMo as amended). MSOPs may also cover underground injection, non-discharging facilities, and land application facilities. Permits are issued for a period of five (5) years unless otherwise specified for less.

As per [40 CFR Part 124.8(a)] and [10 CSR 20-6.020(1)(A)2.] a factsheet shall be prepared to give pertinent information regarding the applicable regulations, rationale for the development of effluent limitations and conditions, and the public participation process for the Missouri State Operating Permit (MSOP or operating permit) listed below. A factsheet is not an enforceable part of an operating permit.

PART I. FACILITY INFORMATION

Facility Type:	Industrial: Major, Categorical Wastewater >1 MGD
SIC Code(s):	2015, 2077
NAICS Code(s):	311615, 311613
Application Date:	04/02/2020
Modification Dates:	8/16/2016 permit language mod 12/1/2016 eDMR & reporting frequency mod 01/01/2018 second eDMR mod
Expiration Date:	09/30/2020
Last Inspection:	02/06/2019

FACILITY DESCRIPTION:

Poultry processing complex consisting of slaughter, blood removal, de-feathering, evisceration, washing, chilling broilers, and further processing of meat. The complex includes a feed mill, hatchery, processing plant, rendering plant and wastewater treatment facility.

At outfall #001, the treatment plant is conventional activated sludge plant with dissolved air flotation pretreatment. Both domestic and process wastewater is received into a 322,000 gallon above ground flow equalization basin. From this basin, it passes through flocculation tubes where coagulant cationic/anionic polymer are injected to flocculate waste particles. The particles then become buoyant with air bubbles and the floating solids are skimmed off by the DAF units. The tricanter centrifuge separates wastewater into three phases: poultry oil, clarified liquid, and dewatered solids.

Wastewater then flows by gravity to the four-cell anaerobic lagoon for further treatment. From here, the wastewater is pumped to an anoxic basin then into a 2.3 million gallon complete mix aeration system, which uses induced air jet aeration for activated sludge growth. Wastewater gravity flows to one final clarifier for sedimentation and solids removal, then through a chlorination/dechlorination basin for final disinfection before being discharged from outfall #001.

Waste sludge from the process is transferred to a storage lagoon for land application. This sludge is land applied on cropland adjacent to the processing facility. Remaining sludge is returned to the complete mix aeration system basin to maintain sludge concentration and biological growth. A portion of the clarified effluent is used at the rendering plant for process cleanup water and the rest discharges from outfall #001.

The truck service center domestic package plant has been switched to a subsurface septic system under a Health Department authorization for less than 3000 gpd, in 2017.

Outfall #01A, not yet constructed, will be a holding basin for the attenuation of wastewater to ensure wastewater is ambient temperature prior to entering the stream. A TMDL for temperature was developed and this basin is expected to ensure in-stream compliance with the TMDL.

PERMITTED FEATURES TABLE:

PERMITTED FEATURE	DESCRIPTION	DESIGN FLOW	AVERAGE FLOW	TREATMENT LEVEL	EFFLUENT TYPE
#001	#001	2.5 MGD	2.8 MGD	Secondary	Industrial and domestic wastewater
#01A	earthen basin CP# 0002141	2.5 MGD	2.8 MGD	retention or aeration or mixing or any combination to assure near-ambient temperatures at discharge	Industrial and domestic wastewater – post retention
#002 ♦	#002; 13 ac	1.733 MGD	0.158 MGD	Best Management Practices (BMPs)	Stormwater
#003 ♦	#003; 6 ac	0.8 MGD	0.073 MGD	BMPs	Stormwater
#004 ♦	#004; 17 ac	2.266 MGD	0.206 MGD	BMPs	Stormwater
#008 ♦	#008; 2.5 ac	0.13 MGD	0.012 MGD	BMPs; catch basin	Stormwater
#SM1	formerly outfall #009	upstream of confluence in-stream sampling			
#SM2	formerly outfall #010	downstream of confluence in-stream sampling			
#011	Earthen Basin	storage (max 1,775,000 gallons)		sludge	
#012	Steel Basin	storage (max 210,000 gallons)		sludge	
#013	Steel Basin	storage (max 210,000 gallons)		sludge	
#014	Land Application Field #1	PAN*		land application	sludge
#015	Land Application Field #2	PAN*		land application	sludge
#016	Land Application Field #3	PAN*		land application	sludge
#017	Land Application Field #4	PAN*		land application	sludge
#018	Land Application Field #5	PAN*		land application	sludge
#019	Land Application Field #6	PAN*		land application	sludge
#020	Land Application Field #7	PAN*		land application	sludge
#021	Land Application Field #8	PAN*		land application	sludge
#022	Land Application Field #9	PAN*		land application	sludge
#023	Land Application Field #10	PAN*		land application	sludge
#024	Land Application Field #11	PAN*		land application	sludge
#025	Land Application Field #12	PAN*		land application	sludge
#026	Land Application Field #13	PAN*		land application	sludge
#027	Land Application Field #14	PAN*		land application	sludge
#028	Land Application Field #15	PAN*		land application	sludge
#029	Land Application Field #16	PAN*		land application	sludge
#030	Land Application Field #17	PAN*		land application	sludge

* PAN – Plant Available Nitrogen, sludge is land applied at agronomic rates based on crop type, acreage, and soils.

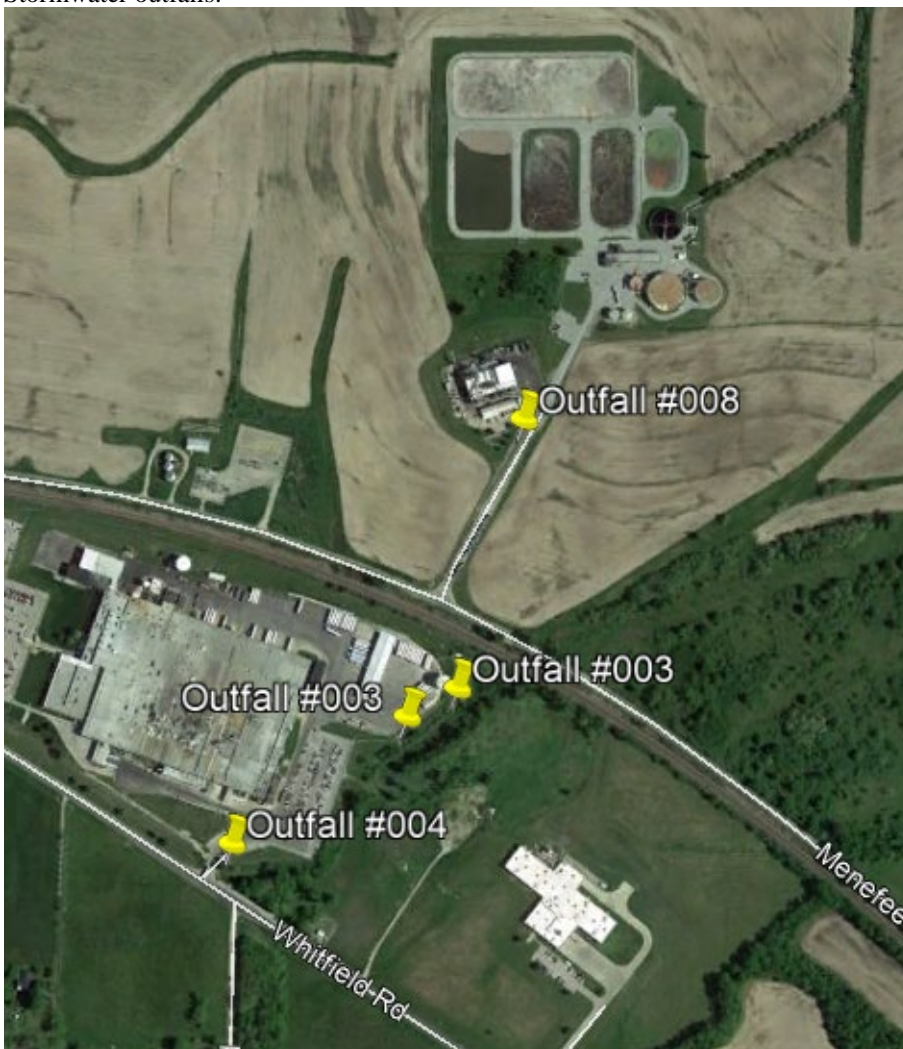
♦ Peak rainfall event calculated by the facility using rational equation $Q=CIA$ and 0.5 inches for a 24 hour rainfall; the Department uses the maximum stormwater for the year at 5.5 inches per day for this region of Missouri, which rendered the values higher. The facility's peak calculations were used for the average flows, the department's peak calculations were used for the maximum; these are not design flows and may be exceeded without need for antidegradation review as it is only stormwater. Additionally, runoff values may not be indicative of actual discharge, outfalls #004 and #008 have a first flush catch system where stormwater is piped to the wastewater treatment facility for treatment. Runoff coefficient used was 0.9 for #002, #003, and #004; 0.35 used for #008.

FACILITY MAPS:

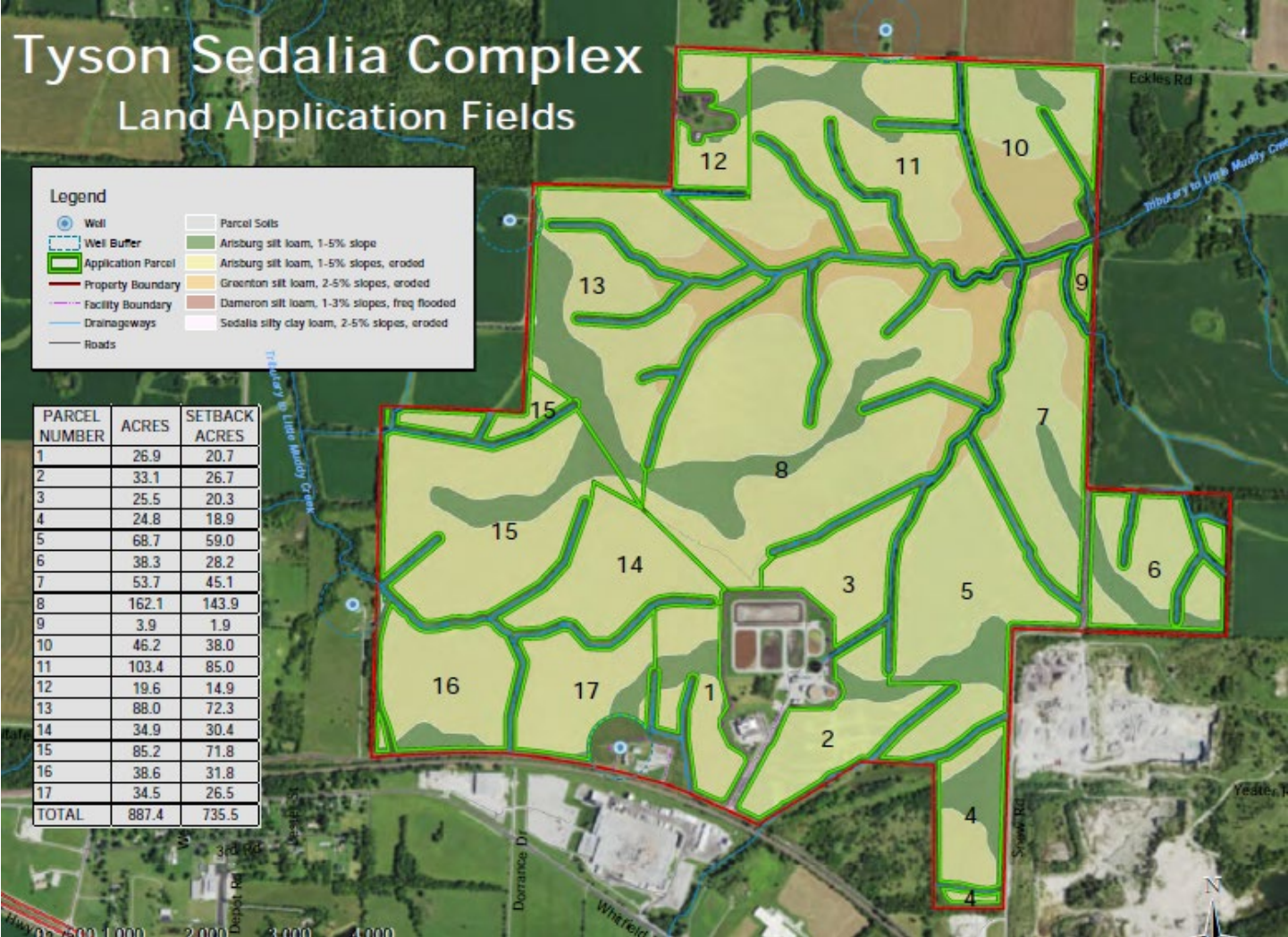
Wastewater outfall:



Stormwater outfalls:

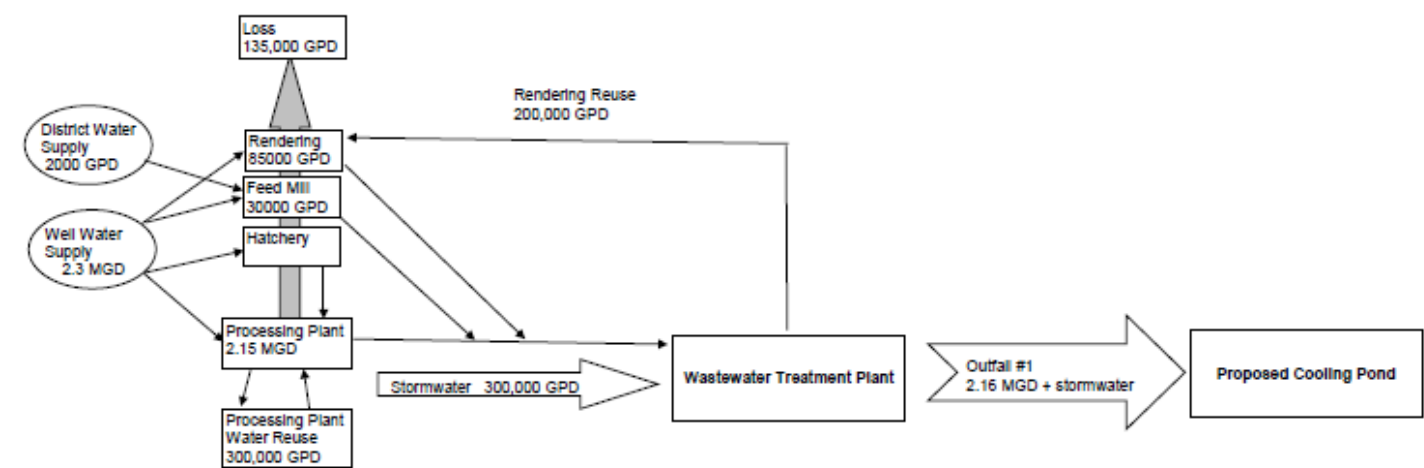


Application Fields:

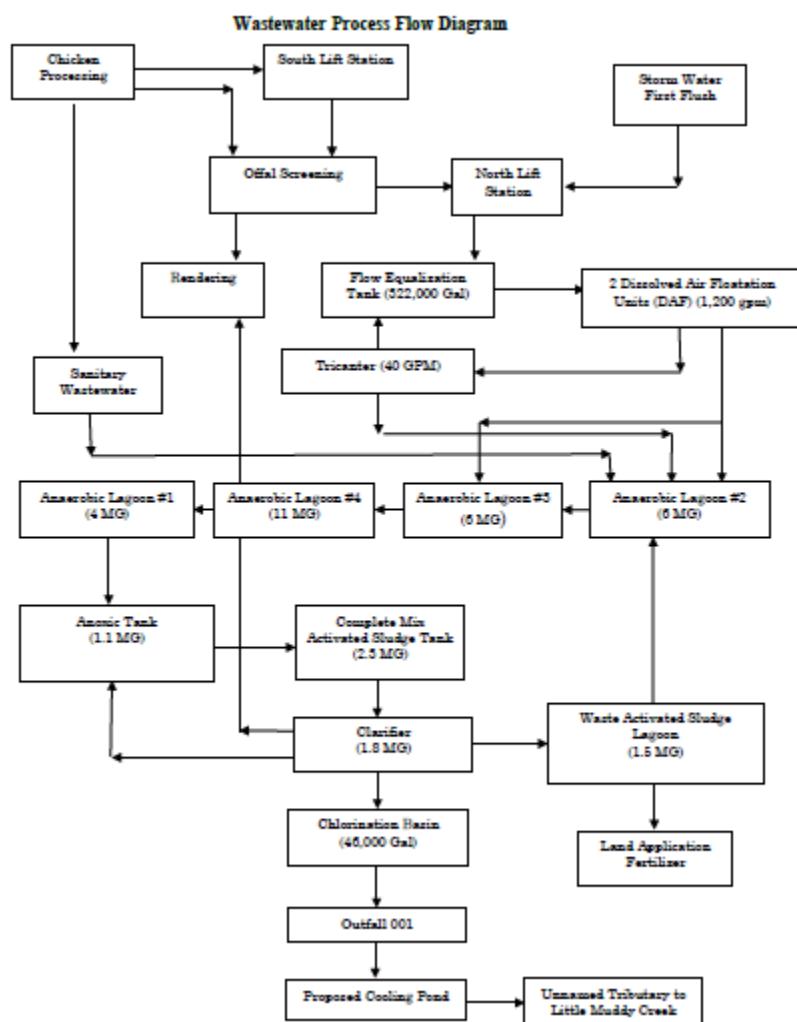


WATER BALANCE DIAGRAMS:

Sedalia Complex Flow:



Outfall #001



FACILITY PERFORMANCE HISTORY & COMMENTS:

The electronic discharge monitoring reports were reviewed for the last permit term. The established design flow from the last permit is 2.16 MGD, this is lower than the average flow of 2.42 MGD; the facility exceed the established design flow every month except for four during the last permit term. Under construction permit CP #0001170, the facility completed an expansion project with the addition of an anaerobic lagoon which increased the size of the wastewater treatment facility to 2.16 MGD. Bypasses of treatment are not authorized under this permit.

The facility received permission to construct an earthen basin, CP# 0002141, for the purposes of retention to assure wastewater is the ambient temperature, to meet the assumptions of the TMDL, see PART II. RECEIVING WATERBODY INFORMATION below. The facility plan indicated that the design flow was now 2.5 MGD and the engineering unit determined an antidegradation review was not necessary in an email dated 9/18/2020. The approved modification will consist of a new 2.5 acre, 15 feet deep, 750 feet long, and 200 feet wide wastewater cooling pond east of the current outfall #001. This cooling pond can be operated year round with only passive cooling. Six floating aerators will be installed to increase the rate of heat loss. A 24 inch diameter pipe will be anchored at the bottom of the cooling pond. The 24 inch diameter pipe will extend up the side wall, over the berm to a rock apron on the outside slope of the pond and into the existing ditch. The design flow of the facility was increased to 2.5 million gallons per day.

Four instances of exceedances occurred in the last permit term, one for *E. coli*, the other three for fecal coliform, all at outfall #001. Benchmark results for the stormwater outfalls were generally favorable except for outfall #003, which showed many benchmark exceedances. See specific information in fact sheet Part IV.

The last permit required the facility to sample the sludge applied to each field individually each quarter to each field, see permit dated 2/1/2016; Table C-2. However, after review of the data, and showing similarity, the sludge in the basin will be sampled quarterly and as applied per 100 tons to determine constituents. If no sludge was applied in the quarter, no sample will be required.

The 2019 inspection determined the facility was in compliance.

This facility is installing a basin for the purposes of cooling. The facility must assure that any algae in the pond is dealt with appropriately in accordance with general water criteria requirements in 10 CSR 20-7.031(4). The facility will be required to describe the processes and products applied in the next permit renewal to control algae. Products applied under FIFRA in accordance with package directions, and products used in accordance with the Department's FAQ for additives are not required to be specifically covered by this permit. <https://dnr.mo.gov/pubs/pub2653.htm>

CONTINUING AUTHORITY:

The Missouri Secretary of State continuing authority charter number for this facility is F00465749; this number was verified by the permit writer to be associated with the facility and matches the continuing authority reported by the facility. This business registration expires 1/31/2021.

OTHER ENVIRONMENTAL PERMITS:

In accordance with 40 CFR 122.21(f)(6), the Department evaluated other permits currently held by this facility. This facility has the following permit: air intermediate operating permit 6/26/2017 through 6/26/2022.

PART II. RECEIVING WATERBODY INFORMATION

RECEIVING WATERBODY TABLE:

OUTFALL	WATERBODY NAME	CLASS	WBID	DESIGNATED USES	DISTANCE TO SEGMENT	12-DIGIT HUC
#001 and #01A	Tributary to 100K Extent Remaining Stream	n/a	n/a	GEN	0.0 mi	Little Muddy Creek 10300103-0404
	100K Extent-Remaining Stream; Locally known as Tributary to Tributary to Little Muddy Creek	C	3960	GEN, HHP, IRR, LWW, SCR, WBC-B, WWH (ALP)	0.88 mi	
	Tributary to Little Muddy Creek	C	3490 303(d) TMDL	GEN, HHP, IRR, LWW, SCR, WBC-B, WWH (ALP)	1.07 mi	
	Little Muddy Creek	C	0856 TMDL	GEN, HHP, IRR, LWW, SCR, WBC-B, WWH (ALP)	3.38 mi	
SM1/SM2	Little Muddy Creek	C	0856 TMDL	GEN, HHP, IRR, LWW, SCR, WBC-B, WWH (ALP)	0 mi	Coon Creek – Muddy Creek 10300103-0405
#002	100K Extent Remaining Stream	C	3960	GEN, HHP, IRR, LWW, SCR, WBC-B, WWH (ALP)	0 mi	
	Muddy Creek	P	0853 303(d)	GEN, HHP, IRR, LWW, SCR, WBC-B, WWH (ALP)	3.73 mi	
#003	100K Extent Remaining Stream	C	3960	GEN, HHP, IRR, LWW, SCR, WBC-B, WWH (ALP)	0 mi	
	Muddy Creek	P	0853 303(d)	GEN, HHP, IRR, LWW, SCR, WBC-B, WWH (ALP)	3.71 mi	
#004	Tributary to 100K Extent Remaining Stream	n/a	n/a	GEN	0 mi	
	100K Extent Remaining Stream	C	3960	GEN, HHP, IRR, LWW, SCR, WBC-B, WWH (ALP)	0.2	
	Muddy Creek	P	0853 303(d)	GEN, HHP, IRR, LWW, SCR, WBC-B, WWH (ALP)	3.91	
#008	Tributary to 100K Extent Remaining Stream	n/a	n/a	GEN	0.8	
	100K Extent Remaining Stream	C	3960	GEN, HHP, IRR, LWW, SCR, WBC-B, WWH (ALP)	0.13	
	Muddy Creek	P	0853 303(d)	GEN, HHP, IRR, LWW, SCR, WBC-B, WWH (ALP)	0.97	

Permitted features for land application basins and fields are not designed to discharge, therefore are not listed here.

Classes are representations of hydrologic flow volume or lake basin size as defined in 10 CSR 20-7.031(1)(F). L1: Lakes with drinking water supply - wastewater discharges are not permitted to occur to L1 watersheds per 10 CSR 20-7.015(3)(C); L2: major reservoirs; L3: all other public and private lakes; P: permanent streams;

C: streams which may cease flow in dry periods but maintain pools supporting aquatic life; E: streams which do not maintain surface flow; and W: wetland. Losing streams are defined in 10 CSR 20-7.031(1)(O) and are designated on the losing stream dataset or determined by the Department to lose 30% or more of flow to the subsurface.

WBID = Waterbody Identification: Missouri Use Designation Dataset per 10 CSR 20-7.031(1)(Q) and (S) as 100K Extant-Remaining Streams or newer; data can be found as an ArcGIS shapefile on MSDIS at http://msdis.missouri.edu/pub/Inland_Water_Resources/MO_2014_WQS_Stream_Classifications_and_Use.shp.zip; New C streams described on the dataset per 10 CSR 20-7.031(2)(A)3. as 100K Extent Remaining Streams.

HUC: Hydrologic Unit Code; TMDLs and lake nutrient criteria are the two most common watershed based limits. <https://dnr.mo.gov/env/wpp/watersheds.htm> will have additional information about the watersheds in Missouri

Designated Uses:

10 CSR 20-7.031(1)(C)1.: **ALP** = Aquatic Life Protection (formerly AQL); current uses are defined to ensure the protection and propagation of fish shellfish and wildlife, further subcategorized as: WWH = Warm Water Habitat; CLH = Cool Water Habitat; CDH = Cold Water Habitat; EAH = Ephemeral Aquatic Habitat; MAH = Modified Aquatic Habitat; LAH = Limited Aquatic Habitat. This permit uses ALP effluent limitations in 10 CSR 20-7.031 Table A1-B3 for all habitat designations unless otherwise specified.

10 CSR 20-7.031(1)(C)2.: Recreation in and on the water

WBC = Whole Body Contact recreation where the entire body is capable of being submerged;

WBC-A = whole body contact recreation supporting swimming uses and has public access;

WBC-B = whole body contact recreation not included in WBC-A;

SCR = Secondary Contact Recreation (like fishing, wading, and boating)

10 CSR 20-7.031(1)(C)3. to 7.:

HHP (formerly HHF) = Human Health Protection as it relates to the consumption of fish and drinking of water;

IRR = irrigation for use on crops utilized for human or livestock consumption, includes aquifers per 10 CSR 20-7.031(6)(A);

LWW = Livestock and Wildlife Watering (current narrative use is defined as LWP = Livestock and Wildlife Protection), includes aquifers per 10 CSR 20-7.031(6)(A);

DWS = Drinking Water Supply, includes aquifers per 10 CSR 20-7.031(6)(A);

IND = industrial water supply

10 CSR 20-7.031(1)(C)8. to 11.: Wetlands (10 CSR 20-7.031 Tables A1-B3 currently does not have corresponding habitat use criteria for these defined uses): WSA = storm- and flood-water storage and attenuation; WHP = habitat for resident and migratory wildlife species; WRC = recreational, cultural, educational, scientific, and natural aesthetic values and uses; WHC = hydrologic cycle maintenance.

10 CSR 20-7.015(7) and 10 CSR 20-7.031(6): **GRW** = Groundwater

10 CSR 20-7.031(4): **GEN** = general criteria; acute toxicity criteria applicable to all waters even those lacking designated uses

n/a = not applicable

WATERS OF THE STATE DESIGNATIONS:

Waters of the state are divided into seven categories per 10 CSR 20-7.015(1)(B)1 through 7. The applicable water of the state category is listed below. Missouri's technology-based effluent regulations are found in [10 CSR 20-7.015] and are implemented in 10 CSR 20-7.015(2) through (8). When implementing technology regulations, considerations are made for the facility type, discharge type, and category of waters of the state. Effluent limitations may not be applicable to certain waters of the state, facility type, or discharge type. In these cases, effluent limitations may be based on a best professional judgment evaluation. The best professional judgment evaluation will take site specific conditions into consideration; including facility type, the receiving water body classification, and type of discharge. Stormwater discharges and land application sites are not directly subject to limitations found in 10 CSR 20-7.015, but may be subject to limitations determined by the best professional judgment evaluation. Effluent limitation derivations are discussed in PART IV: EFFLUENTS LIMITS DETERMINATIONS.

✓ All other waters; identified at 10 CSR 20-7.015(B)7 and 10 CSR 20-7.015(8)

EXISTING WATER QUALITY:

See below.

303(d) LIST:

Section 303(d) of the federal Clean Water Act requires each state identify waters not meeting water quality standards and for which adequate water pollution controls have not been required. Water quality standards protect such beneficial uses of water as whole body contact (such as swimming), maintaining fish and other aquatic life, and providing drinking water for people, livestock, and wildlife. The 303(d) list helps state and federal agencies keep track of impaired waters not addressed by normal water pollution control programs. <http://dnr.mo.gov/env/wpp/waterquality/303d/303d.htm>

✓ Applicable; Muddy Creek (P) WBID# 0853 was added on the 2018 Missouri CWA §303(d) list for *E. coli*. This facility was not considered a source of the above listed pollutant; the 303(d) indicated rural non-point sources were the cause of the WBC-B impairment. L. Muddy Creek WBID 856 had a use attainment assessment 09/13/2019. It found AQL use fully supported. Other uses were not assessed. WBID 3490 Tributary to Little Muddy creek had a use attainment assessment 09/18/2019 which found AQL use not supported. Stated it was impaired for chloride and temperature. WBID 0853 Muddy Creek had a use attainment assessment on 09/18/2019 which found AQL use fully supported but WBC-B not supported. Other uses were not assessed. These streams are impaired for bacteria, but non-point sources were listed as the cause.

TOTAL MAXIMUM DAILY LOAD (TMDL):

A TMDL is a calculation of the maximum amount of a given pollutant a water body can absorb before its water quality is affected; hence, the purpose of a TMDL is to determine the pollutant loading a specific waterbody can assimilate without exceeding water

quality standards. If a water body is determined to be impaired as listed on the §303(d) list, then a watershed management plan or TMDL for that watershed may be developed. The TMDL shall include the WLA calculation. <http://dnr.mo.gov/env/wpp/tmdl/>

- ✓ Applicable; Little Muddy Creek, WBID# 0856, is associated with the 1/11/2001 EPA approved TMDL for temperature. This facility is considered to be the source of above listed pollutant. This permit implements conditions to satisfy the TMDL requirements, including in-stream monitoring. The facility is installing a detention pond to assure wastewater is ambient temperature prior to releasing.

UPSTREAM OR DOWNSTREAM IMPAIRMENTS:

The permit writer has reviewed upstream and downstream stream segments of this facility for impairments.

- ✓ This facility is located at the top of two watersheds therefore no upstream is present at this facility.
- ✓ The permit writer has noted downstream of the facility the stream is on the §303(d) list and has a TMDL; see above for specific permitting information.

RECEIVING WATERBODY MONITORING REQUIREMENTS:

- ✓ No receiving water monitoring requirements are recommended at this time.

WATERBODY MIXING CONSIDERATIONS:

For all outfalls, mixing zone and zone of initial dilution are not allowed per 10 CSR 20-7.031(5)(A)4.B.(I)(a) and (b), as the base stream flow does not provide dilution to the effluent.

PART III. RATIONALE AND DERIVATION OF PERMIT CONDITIONS

ALTERNATIVE EVALUATIONS FOR NEW FACILITIES:

As per [10 CSR 20-7.015(4)(A)], discharges to losing streams shall be permitted only after other alternatives including: land application, discharges to a gaining stream, and connection to a regional wastewater treatment facility have been evaluated and determined to be unacceptable for environmental and/or economic reasons.

- ✓ Not applicable; the facility is an existing facility.

ANTIBACKSLIDING:

Federal Regulations [CWA §303(d)(4); CWA §402(c); 40 CFR Part 122.44(l)] require a reissued permit to be as stringent as the previous permit with some exceptions. Backsliding (a less stringent permit limitation) is only allowed under certain conditions.

- ✓ Limitations in this operating permit reissuance conform to the anti-backsliding provisions of CWA §402(o), and 40 CFR 122.44.
 - ✓ The Department determined technical mistakes or mistaken interpretations of law were made in issuing the permit under CWA §402(a)(1)(b).
 - ✓ Precipitation monitoring was moved from the land application fields to the no-discharge basin. Precipitation measurements are not expected to vary between fields, therefore only reporting precipitation with one outfall is appropriate and reduces duplicative reporting.
 - ✓ pH limits implemented on the stormwater outfalls were removed and replaced with a technology-based benchmark. The stormwater data for pH did not contain any pH values which would indicate in-stream water quality exceedances or general criteria violations.
 - ✓ The Department has determined calculating effluent limitations for ammonia to not be applicable to normal statistical procedures outlined in the TSD; many effluent limitations have been changed; some more restrictive, some less, and some now based on the effluent limitation guideline applicable to this facility for ammonia. Part IV details the current procedures used for ammonia derivation and contains specific effluent limitations for each month instead of seasonally (two seasons per year in the previous permit).
 - ✓ The previous permit special conditions contained a specific set of prohibitions related to general criteria (GC) found in 10 CSR 20-7.031(4); however, there was no determination as to whether the discharges have reasonable potential to cause or contribute to excursion of those general water quality criteria in the previous permit. This permit assesses each general criteria as listed in the previous permit's special conditions. Federal regulations 40 CFR 122.44(d)(1)(iii) requires instances where reasonable potential (RP) to cause or contribute to an exceedance of a water quality standard exists, a numeric limitation must be included in the permit. Rather than conducting the appropriate RP determination, the previous permit simply placed the prohibitions in the permit. These conditions were removed from the permit. Appropriate reasonable potential determinations were conducted for each general criterion listed in 10 CSR 20-7.031(4)(A) through (I) and effluent limitations were placed in the permit for those general criteria where it was determined the discharge had reasonable potential to cause or contribute to excursions of the general criteria. Specific effluent limitations were not included for those general criteria where it was determined the discharges will not cause or contribute to excursions of general criteria. Removal of the prohibitions does not reduce the protections of the permit or allow for impairment of the receiving stream. The permit maintains sufficient effluent limitations, monitoring requirements and best management practices to protect water quality while maintaining permit conditions applicable to

facility disclosures and in accordance with 10 CSR 20-7.031(4) where no water contaminant by itself or in combination with other substances shall prevent the water of the state from meeting the following conditions:

- ✓ Permitted Feature #011, and the land application fields were not considered to be applicable to the following discussion as they are no-discharge features, therefore only discharging outfalls were considered below:
- (A) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses.
 - For outfall #001, there is RP for putrescent bottom deposits if basins are not operated properly; the operational controls stipulated in this permit will protect this general criterion.
 - For all other outfalls, there is no RP for putrescent bottom deposits preventing full maintenance of beneficial uses because nothing disclosed by the facility indicates putrescent wastewater would be discharged from the facility.
 - For outfall #001, there is RP for unsightly or harmful bottom deposits preventing full maintenance of beneficial uses; limits established in the permit for minimum flocculation and settling requirements will assure the facility does not discharge unsightly or harmful bottom deposits and be protective of this general criterion.
 - For all other outfalls, there is no RP for unsightly or harmful bottom deposits preventing full maintenance of beneficial uses because nothing disclosed by the facility indicates unsightly or harmful bottom deposits would be discharged from the facility.
- (B) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses.
 - For outfall #001, there is RP for oil in sufficient amounts to be unsightly preventing full maintenance of beneficial uses; however, the facility is subject to an effluent limitation guideline for this parameter and water quality limits are less restrictive. The technology limitations will be protective of this general criterion.
 - For all other outfalls, there is no RP for oil in sufficient amounts to be unsightly preventing full maintenance of beneficial uses because nothing disclosed by the facility indicates oil will be present in sufficient amounts to impair beneficial uses.
 - For outfall #001, there is RP for scum and floating debris in sufficient amounts to be unsightly preventing full maintenance of beneficial uses; operational controls required in this permit will prevent receiving waters from scum and floating debris and are protective of this general criterion.
 - For all other outfalls, there is no RP for scum and floating debris in sufficient amounts to be unsightly preventing full maintenance of beneficial uses because nothing disclosed by the facility indicates scum and floating debris will be present in sufficient amounts to impair beneficial uses.
- (C) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.
 - For all outfalls, there is no RP for unsightly color or turbidity in sufficient amounts preventing full maintenance of beneficial uses because nothing disclosed by the facility indicates unsightly color or turbidity will be present in sufficient amounts to impair beneficial uses.
 - For all outfalls, there is no RP for offensive odor in sufficient amounts preventing full maintenance of beneficial uses because nothing disclosed by the facility indicates offensive odor will be present in sufficient amounts to impair beneficial uses.
- (D) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life.
 - The permit writer considered specific toxic pollutants when writing this permit. Numeric effluent limitations are included for those pollutants could be discharged in toxic amounts. These effluent limitations are protective of human health, animals, and aquatic life.
- (E) Waters shall maintain a level of water quality at their confluences to downstream waters that provides for the attainment and maintenance of the water quality standards of those downstream waters, including waters of another state.
 - This criteria was not assessed for antibacksliding as this is a new requirement, approved by the EPA on July 30, 2019.
- (F) There shall be no significant human health hazard from incidental contact with the water.
 - This criterion is very similar to (D) above. See Part IV, Effluent Limits Derivation below.
- (G) There shall be no acute toxicity to livestock or wildlife watering.
 - This criterion is very similar to (D) above. See Part IV, Effluent Limits Derivation below.
- (H) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community.
 - For all outfalls, there is no RP for physical changes impairing the natural biological community because nothing disclosed by the facility indicates this is occurring.
 - It has been established any chemical changes are covered by the specific numeric effluent limitations established in the permit.

- For all outfalls, there is no RP for hydrologic changes impairing the natural biological community because nothing disclosed by the facility indicates this is occurring.
- (I) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law 260.200 RSMo, except as the use of such materials is specifically permitted pursuant to 260.200 through 260.247 RSMo.
 - There are no solid waste disposal activities or any operation which has reasonable potential to cause or contribute to the materials listed above being discharged through any outfall.
- ✓ The previous permit's special conditions required sampling of total petroleum hydrocarbons (TPH) under the decision model to discharge stormwater having a sheen in secondary containment. The special condition has been revised in all permits beginning in 2015 to remove TPH as 40 CFR 136 does not contain any approved methods for the TPH parameter nor are there water quality standards for TPH. This permit requires oil and grease and BTEX (benzene, toluene, ethylbenzene, and xylene) sampling of the potentially contaminated stormwater in secondary containment. The facility need only sample for these constituents prior to release when a sheen or petroleum odor is present.
- ✓ The previous permit had a special condition which stated: "Any pesticide discharge from any point source shall comply with the requirements of Federal Insecticide, Fungicide and Rodenticide Act, as amended (7 U.S.C. 136 et. seq.) and the use of such pesticides shall be in a manner consistent with its label." The permit writer has determined this special condition was outside the scope of NPDES permitting and therefore it was removed.
- ✓ The previous permit had a special condition which indicated spills from hazardous waste substances must be reported to the department. However, this condition is covered under standard conditions therefore was removed from special conditions.
- ✓ The previous permit special condition regarding ammonia was "This permit establishes final ammonia limitations based on Missouri's current Water Quality Standard. On August 22, 2013, the U.S. Environmental Protection Agency (EPA) published a notice in the Federal Register announcing of the final national recommended ambient water quality criteria for protection of aquatic life from the effects of ammonia in freshwater. The EPA's guidance, Final Aquatic Life Ambient Water Quality Criteria for Ammonia – Fresh Water 2013, is not a rule, nor automatically part of a state's water quality standards. States must adopt new ammonia criteria consistent with EPA's published ammonia criteria into their water quality standards that protect the designated uses of the water bodies. The Department of Natural Resources has initiated stakeholder discussions on how to best incorporate these new criteria into the State's rules. A date for when this rule change will occur has not been determined. Also, refer to Section VI of this permit's factsheet for further information including estimated future effluent limits for this facility. It is recommended the permittee view the Department's 2013 EPA criteria Factsheet located at <http://dnr.mo.gov/pubs/pub2481.htm>" However, this condition was superseded by February 2020 guidance for calculation of ammonia and therefore was removed.
- ✓ This permit reissuance conforms to 40 CFR 122.41(d)(1)(vii)(A).
 - The Department derived, and the EPA approved in December 2019, new water quality standards for total residual chlorine for warm water habitats; increasing from 10 µg/L to 11 µg/L; see 10 CSR 20-7.031 Table A1. Permit reissuance must utilize currently applicable water quality standards when calculating water quality based effluent limitations therefore the limitations within this permit are slightly higher than the last permit. The Department has determined, through reissuance of elevated water quality standards, the discharges of this parameter within permitted limits will not cause or contribute to exceedances of the WQS. The revision resulted in less stringent effluent limits for this facility. However, given that detections are not perceptible at levels typically below 100 µg/L, the minimum level has remained at 130 µg/L for this parameter which is the past and current compliance point. The ML does not permit discharges of chlorine above permitted limits; and if a better detection method is available, should be utilized. The facility may also determine the need for engineering controls on the chlorine and dechlor feed, and operational measures should be taken to maintain the proper water quality limitation while still rendering bacteria inactive.

ANTIDEGRADATION REVIEW:

Process water discharges with new, altered, or expanding flows, the Department is to document, by means of antidegradation review, if the use of a water body's available assimilative capacity is justified. In accordance with Missouri's water quality regulations for antidegradation [10 CSR 20-7.031(3)], degradation may be justified by documenting the socio-economic importance of a discharge after determining the necessity of the discharge. Facilities must submit the antidegradation review request to the Department prior to establishing, altering, or expanding discharges. See <http://dnr.mo.gov/env/wpp/permits/antideg-implementation.htm>

- ✓ Not applicable; while the facility submitted information proposing additional wastewater discharge, no further degradation was proposed; therefore, in an email dated 9/18/2020, the engineering unit determined there was no further review for antidegradation necessary.

This permit requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) which must include an alternative analysis (AA) of the BMPs. The SWPPP must be developed, implemented, updated, and maintained at the facility. Failure to implement and maintain the chosen alternative, is a permit violation. The AA is a structured evaluation of BMPs to determine which are reasonable and cost effective. Analysis should include practices designed to be 1) non-degrading, 2) less degrading, or 3) degrading water quality. The chosen BMP will be the most reasonable and cost effective while ensuring the highest statutory and regulatory requirements are achieved and the highest quality water attainable for the facility is discharged. The analysis must

demonstrate why “no discharge” or “no exposure” are not feasible alternatives at the facility. Existing facilities with established SWPPPs and BMPs need not conduct an additional alternatives analysis unless new BMPs are established to address BMP failures or benchmark exceedances. This structured analysis of BMPs serves as the antidegradation review, fulfilling the requirements of 10 CSR 20-7.015(9)(A)5 and 7.031(3). For stormwater discharges with new, altered, or expanding discharges, the stormwater BMP chosen for the facility, through the AA performed by the facility, must be implemented and maintained at the facility. Failure to implement and maintain the chosen BMP alternative is a permit violation; see SWPPP.

- ✓ Applicable; the facility must review and maintain stormwater BMPs as appropriate.

BEST MANAGEMENT PRACTICES:

Minimum site-wide best management practices are established in this permit to ensure all facilities are managing their sites equally to protect waters of the state from certain activities which could cause negative effects in receiving water bodies. While not all sites require a SWPPP because the SIC codes are specifically exempted in 40 CFR 122.26(b)(14), these best management practices are not specifically included for stormwater purposes. These practices are minimum requirements for all industrial sites to protect waters of the state. If the minimum best management practices are not followed, the facility may violate general criteria [10 CSR 20-7.031(4)]. Statutes are applicable to all permitted facilities in the state, therefore pollutants cannot be released unless in accordance with 644.011 and 644.016 (17) RSMo.

COST ANALYSIS FOR COMPLIANCE (CAFCom):

Pursuant to 644.145 RSMo, when incorporating a new requirement for discharges from publicly owned facilities, or when enforcing provisions of this chapter or the CWA, pertaining to any portion of a publicly owned facility, the Department shall make a finding of affordability on the costs to be incurred and the impact of any rate changes on ratepayers upon which to base such permits and decisions, to the extent allowable under this chapter and the CWA. This process is completed through a CAFCom. Permits not including new requirements may be deemed affordable.

- ✓ The Department is not required to complete a cost analysis for compliance because the facility is not publicly owned.

CHANGES IN DISCHARGES OF TOXIC POLLUTANT:

This special condition reiterates the federal rules found in 40 CFR 122.44(f) for technology treatments and 122.42(a)(1) for all other toxic substances. In these rules, the facility is required to report changes in amounts of toxic substances discharged. Toxic substances are defined in 40 CFR 122.2 as “...any pollutant listed as toxic under section 307(a)(1)” or, in the case of “sludge use or disposal practices,” any pollutant identified in regulations implementing section 405(d) of the CWA.” Section 307 of the clean water act then refers to those parameters listed in 40 CFR 401.15 and any other toxic parameter the Department determines is applicable for reporting under these rules in the permit. The facility should also consider any other toxic pollutant in the discharge as reportable under this condition and must report all increases to the Department as soon as discovered in the effluent. The Department may open the permit to implement any required effluent limits pursuant to CWA §402(k) where sufficient data was not supplied within the application but was supplied at a later date by either the permittee or other resource determined to be representative of the discharge, such as sampling by Department personnel.

COMPLIANCE AND ENFORCEMENT:

Enforcement is the action taken by the Water Protection Program (WPP) to bring an entity into compliance with the Missouri Clean Water Law, its implementing regulations, and/or any terms and conditions of an operating permit. The primary purpose of the enforcement activity in the WPP is to resolve violations and return the entity to compliance.

- ✓ Not applicable; the facility is not currently under Water Protection Program enforcement action.

DOMESTIC WASTEWATER, SLUDGE, AND BIOSOLIDS:

Domestic wastewater is defined as wastewater (i.e., human sewage) originating primarily from the sanitary conveyances of bathrooms and kitchens. Domestic wastewater excludes stormwater, animal waste, process waste, and other similar waste.

- ✓ Applicable; this facility does not fall under the jurisdiction of the Health Department and discharges domestic wastewater, after treatment, to waters of the state through outfall #001.

Sewage sludge is solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works; including but not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in a treatment works. Biosolids are solid materials resulting from domestic wastewater treatment meeting federal and state criteria for productive use (i.e. fertilizer) and after having pathogens removed.

Additional information: <http://extension.missouri.edu/main/DisplayCategory.aspx?C=74> (WQ422 through WQ449).

- ✓ Applicable; this permit authorizes surficial land application of biosolids in accordance with Standard Conditions III.
- ✓ Applicable, sludge/biosolids/septage may be removed by contract hauler, and stored in the lagoon. The permitted management strategy must be followed, see FACILITY DESCRIPTION in the permit. If the described management strategy cannot be followed, the facility must obtain a permit modification. See Standard Conditions Part III.
- ✓ Standard conditions Part III is incorporated into this permit.

EFFLUENT LIMITATIONS:

Effluent limitations derived and established for this permit are based on current operations of the facility and applied per 10 CSR 20-7.015(9)(A) as applicable. Any flow through the outfall is considered a discharge and must be sampled and reported as provided in the permit. Future permit action due to facility modification may contain new operating permit terms and conditions which supersede the terms and conditions, including effluent limitations, of this operating permit. Daily maximums and monthly averages are required per 40 CFR 122.45(d)(1) for continuous discharges (not from a POTW).

ELECTRONIC DISCHARGE MONITORING REPORT (EDMR) SUBMISSION SYSTEM:

The U.S. Environmental Protection Agency (EPA) promulgated a final rule on October 22, 2015, to modernize Clean Water Act reporting for municipalities, industries, and other facilities by converting to an electronic data reporting system. The final rule requires regulated entities and state and federal regulators to use information technology to electronically report data required by the National Pollutant Discharge Elimination System (NPDES) permit program instead of filing paper reports. To comply with the federal rule, the Department is requiring all facilities to begin submitting discharge monitoring data and reports online.

Per 40 CFR 127.15 and 127.24, permitted facilities may request a temporary waiver for up to 5 years or a permanent waiver from electronic reporting from the Department. To obtain an electronic reporting waiver, a facility must first submit an eDMR Waiver Request Form: <http://dnr.mo.gov/forms/780-2692-f.pdf>. A request must be made for each facility. If more than one facility is owned or operated by a single entity, then the entity must submit a separate request for each facility based on its specific circumstances. An approved waiver is not transferable.

The Department must review and notify the facility within 120 calendar days of receipt if the waiver request has been approved or rejected [40 CFR 124.27(a)]. During the Department review period as well as after a waiver is granted, the facility must continue submitting a hard-copy of any reports required by their permit. The Department will enter data submitted in hard-copy from those facilities allowed to do so and electronically submit the data to the EPA on behalf of the facility.

To assist the facility in entering data into the eDMR system, the permit describes limit sets designators in each table in Part A of the permit. The data entry personnel should use these identifiers to ensure data entry is being completed appropriately. For example, M for monthly, Q for quarterly, and others.

✓ The facility is currently using the eDMR data reporting system.

FEDERAL EFFLUENT LIMITATION GUIDELINE:

Effluent Limitation Guidelines, or ELGs, are found at 40 CFR 400-499. These are limitations established by the EPA based on the SIC code and the type of work a facility is conducting. Most ELGs are for process wastewater and some address stormwater. All are technology based limitations which must be met by the applicable facility at all times.

✓ The facility has an associated Effluent Limit Guideline (ELG) at 40 CFR 432 Subpart K, applicable to the wastewater discharge at this site, and is applied under 40 CFR 125.3(a). Should Reasonable Potential be established for any particular parameter, and water-quality derived effluent limits are more protective of the receiving water's quality, the WQS will be used as the limiting factor in accordance with 40 CFR 122.44(d) and 10 CSR 20-7.015(9)(A). See Part IV: EFFLUENT LIMITS DETERMINATION.

Regulated Parameter	Daily Maximum Limit (mg/L)	Monthly Average Limit (mg/L)
Ammonia as N	8.0	4.0
BOD-5	26	16
Fecal Coliform	400 #/100 mL	n/a
Oil and Grease	14	8.0
Total Suspended Solids (TSS)	30	20

GENERAL CRITERIA CONSIDERATIONS:

In accordance with 40 CFR 122.44(d)(1), effluent limitations shall be placed into permits for pollutants determined to cause, have reasonable potential to cause, or to contribute to, an excursion above any water quality standard, including narrative water quality criteria. In order to comply with this regulation, the permit writer has completed a reasonable potential determination on whether discharges have reasonable potential to cause, or contribute to an excursion of the general criteria listed in 10 CSR 20-7.031(4). In instances where reasonable potential exists, the permit includes limitations within the permit to address the reasonable potential. In discharges where reasonable potential does not exist, the permit may include monitoring to later determine the discharge's potential to impact the narrative criteria. Additionally, 644.076.1 RSMo, as well as Part I §D – Administrative Requirements of Standard Conditions included in this permit state it shall be unlawful for any person to cause or allow any discharge of water contaminants from any water contaminant or point source located in Missouri in violation of §§644.006 to 644.141 of the Missouri Clean Water Law or any standard, rule, or regulation promulgated by the commission. See Part IV for specific determinations.

GROUNDWATER MONITORING:

Groundwater is a water of the state according to 644.016(27) RSMo, is subject to regulations at 10 CSR 20-7.015(7) and 10 CSR 20-7.031(6), and must be protected accordingly.

✓ This facility is not required to monitor groundwater for the water protection program.

LAND APPLICATION:

Land application, or surficial dispersion of wastewater and/or sludge, is performed by facilities to maintain a basin as no-discharge. Requirements for these types of operations are found in 10 CSR 20-6.015; authority to regulate these activities is from 644.026 RSMo.

✓ Applicable, the facility shall comply with all applicable land application requirements listed in this permit. These requirements incorporated into this permit pursuant to 10 CSR 20-6.015(4) ensure appropriate minimum operational controls of the no-discharge land application systems. When operated correctly these permit conditions will prevent unauthorized and illicit discharges to waters of the state; and will protect soils, vegetation, surface water, groundwater, and public health. These requirements also ensure application activities fall within a productive use demonstration (agricultural use), prevent plant phytotoxicity, and prevent and protect soils loading of specified pollutants. The minimum requirements established in the permit are to meet, not only DNRs requirements, but to also ensure the exemptions for agricultural stormwater runoff in 10 CSR 20-6.200(1)(B)5 or 10 CSR 20-6.300(2)(D)2 continue to be met. When the facility follows all permit requirements, discharge monitoring requirements found at 10 CSR 20-6.200(2)(B)3.B. for will be excused. See permit FACILITY DESCRIPTION; LAND APPLICATION and permit Part A EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS for specific requirements.

Equipment Type: Tank Wagon and subsurface injection
Equipment Capacity: 10,250 gal/hr; about 300 hours per year
Vegetation & Goal Yield/Acre: Row Crop – 200 bushels per acre (BU/AC) corn, 60 BU/AC beans, 75 BU/AC wheat
Vegetation & Actual Yield/Acre: Row Crop – 148 BU/AC corn

• Following is a list of helpful publications; while generally geared to biosolids and domestic sludge, these documents can show operators and facilities specific best management practices which may be important to their own operations.

- Land Applications Considerations for Animal Manure (contains nutrient requirements for plant growth) <https://extension2.missouri.edu/eq202>
- State and EPA Regulations for Domestic Wastewater Sludge and Biosolids <https://extension2.missouri.edu/eq421>
- Land Application of Septage <https://extension2.missouri.edu/eq422>
- Monitoring Requirements for Biosolids Land Application <https://extension2.missouri.edu/wq423>
- Biosolids Standards for Pathogens and Vectors <https://extension2.missouri.edu/wq424>
- Biosolids Standards for Metals and Other Trace Substances <https://extension2.missouri.edu/wq425>
- Best Management Practices for Biosolids Land Application <https://extension2.missouri.edu/wq426>
- Benefits and Risks of Biosolids <https://extension2.missouri.edu/wq427>
- Activity and Movement of Plant Nutrients and Other Trace Substances <https://extension2.missouri.edu/wq428>
- Interpretation of Laboratory Analysis of Biosolids Samples <https://extension2.missouri.edu/wq429>
- Crop/Nutrient Considerations of Biosolids <https://extension2.missouri.edu/eq430>
- Collection and Storage of Biosolids <https://extension2.missouri.edu/eq431>
- Equipment for Off-Site Application of Biosolids <https://extension2.missouri.edu/wq432>
- Equipment for On-Site Land Application of Biosolids <https://extension2.missouri.edu/wq433>
- Operating Considerations for Biosolids Equipment <https://extension2.missouri.edu/wq434>
- Biosolids Glossary of Terms <https://extension2.missouri.edu/eq449>

✓ The facility must follow the applicable application loading rates indicated in the permit's facility description and/or special conditions. Following are an explanation of the conditions in this permit.

- **Nitrogen Loading Rates (Plant Available Nitrogen/PAN)** – wastewater application rates should not exceed a nitrogen application rate of 150 pounds total nitrogen per acre per year, and the applied wastewater should not exceed 10 mg/L of nitrate nitrogen as N at any time. These are limited in the permit.
- Fertilizer recommendations can also be obtained by using one of the following tools:
 - The University of Missouri Extension online fertilizer recommendation calculator at <http://soilplantlab.missouri.edu/soil/scripts/manualentry.aspx>
 - University of Missouri Nutrient Management Home Page: <http://nmplanner.missouri.edu/>
 - United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Nutrient Management technical resources <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/ecoscience/mnm/?cid=stelprdb1044741>
- **Trace Element Loading Rate** – specific parameters have maximum soil loading rates; limitations are established in this permit to protect phytotoxicity, future soil use, and plant fertility and fecundity over the long term. These requirements are authorized under 10 CSR 20-6.015(4)(A)1. Information used to develop parameter-specific conditions were based on *Design of Land Treatment Systems for Industrial Wastes – Theory and Practice*; by Pal and Overcash; 1981; and 40 CFR 503 Subpart B. See additional citations below for specific parameters.

Per 40 CFR 503.13 Table 4:

Pollutant	Annual pollutant loading rate (kilograms per hectare per 365 day period)	Annual pollutant loading rate (lbs/acre per 365 days)
Arsenic	2.0	1.78
Cadmium	1.9	1.70
Copper	75	66.91
Lead	15	13.38
Mercury	0.85	0.76
Nickel	21	18.74
Selenium	5.0	4.46
Zinc	140	124.91

- ✓ Soils testing. The permit's special conditions stipulate soil testing for this facility. Soil testing is performed to ensure soil accumulation rates of the specified parameters are below established soil loading rates.
- ✓ Sludge testing. 40 CFR 503.16 indicates sludge testing frequency should be based on the amount of sludge applied annually; this facility's annual application is 690 dry tons, therefore sludge sampling is required quarterly. The Program has determined these frequencies to be a suitable guideline to other sludges or high-strength wastewater as well. Sludge and/or wastewater sampling frequency for this permit was based on the following:

Amount of sewage sludge (metric tons)	US Tons	Liquid Gallons	Frequency
Greater than zero but < 290	+0 to 319.6	+0 to 76,609.9	once per year
≥ 290 but < 1,500	319.7 to 1653.4	76,610.0 to 396,258.1	once per quarter
≥ 1,500 but < 15,000	1653.5 to 16534.6	396,258.2 to 3,962,580.7	six times per year
≥ 15,000	≥ 16534.7	≥ 3,962,580.7	once per month

- ✓ Definitions used in the land application section of the permit can be found at 644.016 RSMo, 10 CSR 20-2, and 40 CFR 503.11.
- ✓ This permit does not authorize land disposal or the application of hazardous waste.

Historic Sludge Sampling Data

Field #	Acres	pH	P (ppm)	K (ppm)	Ca (ppm)	Mg (ppm)	S (ppm)	Zn (ppm)	Organic Matter %	CEC
1	27.4	5.8	116	74	2211	323	7.8	2.9	3.5	17.5
2	32.2	5.9	118	69	2186	341	6.4	3.1	3.7	17
3	26.6	5.6	119	71	2257	374	6.7	2	3.7	19.1
4	27	6.4	123	78	2483	293	6.2	3.7	3.7	16.6
5	64	6.2	157	87	2403	336	7	2.5	3.8	17.2
6	36.6	6.6	70	73	2715	338	6.3	1.8	3.6	17.8
7	48.8	6	152	64	2344	343	6.5	2.3	4.1	17.4
8	152.1	6	151	75	2362	309	6.9	2.9	3.9	17.3
10	44.4	6.6	59	68	2633	323	6.4	1.6	3.7	17.2
11	101	6.7	81	62	2509	295	7	1.7	3.7	15.8
12	13.3	6.5	69	94	2170	258	6.3	2.6	3.8	14.4
13	123.6	6.5	166	63	2168	263	6.8	4.1	3.7	14.5
14	35.2	6.2	130	74	1764	234	7	3.5	3.7	12.6
15	65.9	6.3	126	61	1916	237	5.3	2.8	3.8	13
16	34	6.4	207	52	1648	219	5.3	3.4	3.7	11.2
17	32.9	6.3	176	103	2552	348	7.9	3.6	3.9	18

LAND DISTURBANCE:

Land disturbance, sometimes called construction activities, are actions which cause disturbance of the root layer or soil; these include clearing, grading, and excavating of the land. 40 CFR 122.26(b)(14) and 10 CSR 20-6.200(3) requires permit coverage for these activities. Coverage is not required for facilities when only providing maintenance of original line and grade, hydraulic capacity, or to continue the original purpose of the facility.

- ✓ Not applicable; this permit does not provide coverage for land disturbance activities. The facility may obtain a separate land disturbance permit (MORA) online at <https://dnr.mo.gov/env/wpp/stormwater/sw-land-disturb-permits.htm>; MORA permits do

not cover disturbance of contaminated soils, however, site specific permits such as this one can be modified to include appropriate controls for land disturbance of contaminated soils by adding site-specific BMP requirements and additional outfalls.

MAJOR WATER USER:

Any surface or groundwater user with a water source and the equipment necessary to withdraw or divert 100,000 gallons (or 70 gallons per minute) or more per day combined from all sources from any stream, river, lake, well, spring, or other water source is considered a major water user in Missouri. All major water users are required by law to register water use annually (Missouri Revised Statutes Chapter 256.400 Geology, Water Resources and Geodetic Survey Section). <https://dnr.mo.gov/pubs/pub2236.htm>

✓ Applicable; this facility is a major water user and is registered with the state as user #63444248.

NUTRIENT MONITORING:

Nutrient monitoring is required for facilities characteristically or expected to discharge nutrients (nitrogenous compounds and/or phosphorus) when the design flow is equal to or greater than 0.1 MGD per 10 CSR 20-7.015(9)(D)8. This requirement is applicable to all Missouri waterways.

✓ The design flow for outfall #001 is 2.5 MGD and the facility discharges nutrients, therefore nutrient monitoring is required on a monthly basis per 10 CSR 20-7.015(9)(D)8.B. for discharges equal to or greater than 1 MGD. This facility is required to monitor for ammonia, total Kjeldahl nitrogen, nitrate plus nitrite, and phosphorus.

Water quality standards per 10 CSR 20-7.031(5)(N) describe nutrient criteria requirements assigned to lakes (which include reservoirs) in Missouri, equal to or greater than 10 acres during normal pool conditions. The Department's Nutrient Criteria Implementation Plan (NCIP) may be reviewed at: <https://dnr.mo.gov/env/wpp/rules/documents/nutrient-implementation-plan-final-072618.pdf> Discharges of wastewater in to lakes or lake watersheds designated as L1 (drinking water use) are prohibited per 10 CSR 20-7.015(3)(C).

✓ Not applicable; this facility does not discharge in a lake watershed.

OIL/WATER SEPARATORS:

Oil water separator (OWS) tank systems are frequently found at industrial sites where process water and stormwater may contain oils and greases, oily wastewaters, or other immiscible liquids requiring separation. Food industry discharges typically require pretreatment prior to discharge to municipally owned treatment works. Per 10 CSR 26-2.010(2)(B), all oil water separator tanks must be operated according to manufacturer's specifications and authorized in NPDES permits per 10 CSR 26-2.010(2) or may be regulated as a petroleum tank.

✓ Not applicable; the facility has not disclosed the use of any oil water separators they wish to include under the NPDES permit at this facility and therefore oil water separator tanks are not authorized by this permit.

OPERATOR CERTIFICATION REQUIREMENTS:

Operators or supervisors of operations at regulated domestic wastewater treatment facilities shall be certified in accordance with 10 CSR 20-9 and any other applicable state law or regulation.

✓ Not applicable; this facility is not required to have a certified operator. This permit does not cover domestic wastewater or the domestic wastewater population equivalent (PE) is less than two hundred (200) individuals. Additionally, this facility is not owned or operated by a municipality, public sewer district, county, public water supply district, or private sewer company regulated by the Public Service Commission, or operated by a state or federal agency. Private entities are exempted from the population equivalent requirement unless the Department has reason to believe a certified operator is necessary.

PRETREATMENT:

This permit does not regulate pretreatment requirements for facilities discharging to an accepting permitted wastewater treatment facility. If applicable, the receiving entity (the publicly owned treatment works - POTW) is to ensure compliance with any effluent limitation guidelines for pretreatment listed in 40 CFR Subchapter N per 10 CSR 20-6.100. Pretreatment regulations per 644.016 RSMo are limitations on the introduction of pollutants or water contaminants into publicly owned treatment works or facilities.

✓ Not applicable, this facility does not discharge industrial wastewater to a POTW. Domestic wastewater is not subject to pretreatment requirements.

REASONABLE POTENTIAL (RP):

Federal regulation [40 CFR Part 122.44(d)(1)(i)] requires effluent limitations for all pollutants which are (or may be) discharged at a level causing or have the reasonable potential to cause (or contribute to) an in-stream excursion above narrative or numeric water quality standards. Per 10 CSR 20-7.031(4), general criteria shall be applicable to all waters of the state at all times; however, acute toxicity criteria may be exceeded by permit in zones of initial dilution, and chronic toxicity criteria may be exceeded by permit in mixing zones. If the permit writer determines any given pollutant has the reasonable potential to cause or contribute to an in-stream excursion above the WQS, the permit must contain effluent limits for the pollutant per 40 CFR Part 122.44(d)(1)(iii) and the most stringent limits per 10 CSR 20-7.031(9)(A). Permit writers may use mathematical reasonable potential analysis (RPA) using the Technical Support Document for Water Quality Based Toxics Control (TSD) methods (EPA/505/2-90-001) as found in Section 3.3.2, or may also use reasonable potential determinations (RPD) as provided in Sections 3.1.2, 3.1.3, and 3.2 of the TSD.

- ✓ Applicable; an RPA was conducted on appropriate parameters and was conducted as per (TSD Section 3.3.2). A more detailed version including calculations of this RPA is available upon request. See Wasteload Allocations (WLA) for limits in this section.

Parameter:	Units	CMC Acute	CCC Chronic	Listing	Daily Max	Monthly Average	n#	CV	n Max	MF	RWC Acute	RWC Chronic	RP
Chloride	mg/L	860	230	AQL	266	220	54	0.132	481	1.13	543.83	543.83	Yes

Units are (µg/L) unless otherwise noted.

n/a Not Applicable

n number of samples; if the number of samples is 10 or greater, then the CV value must be used in the WQBEL for the applicable constituent.

CV Coefficient of Variation (CV) is calculated by dividing the Standard Deviation of the sample set by the mean of the same sample set.

CCC continuous chronic concentration

CMC continuous maximum concentration

RWC Receiving Water Concentration: concentration of a toxicant or the parameter in the receiving water after mixing (if applicable)

MF Multiplying Factor; 99% confidence level and 99% probability basis

RP Reasonable Potential: an effluent is projected or calculated to cause an excursion above a water quality standard based on a number of factors including, as a minimum, the four factors listed in 40 CFR 122.44(d)(1)(ii).

- ✓ Applicable for outfall #001; the permit writer conducted an RPD on applicable parameters within the permit. See Part IV: Effluent Limits Determinations below.
- ✓ Not applicable at stormwater outfalls; a mathematical RPA was not conducted on the stormwater for this facility. This permit establishes permit limits and benchmarks for stormwater at these outfalls. The Department has determined stormwater is not a continuous discharge and is therefore not necessarily dependent on mathematical RPAs. However, the permit writer completed an RPD, a reasonable potential determination, using best professional judgment for all of the appropriate parameters in this permit. An RPD consists of reviewing application data and/or discharge monitoring data for the last five years and comparing those data to narrative or numeric water quality criteria.
- ✓ A mathematical RPA was not conducted on wastewater for BOD₅, ammonia, oil and grease, or pH at this facility. Effluent limits and water quality limitations are applicable based on the likelihood pollutants are present at levels which may have or have reasonable potential to exceed in-stream water quality standards. RPD decisions are based on the type of effluent proposed for discharge, or the unavailability of numerical RPA for a parameter, such as pH or oil and grease. Absent effluent data, effluent limits are derived without consideration of effluent variability and is assumed to be present unless found to be absent to meet the requirements of antidegradation review found in 10 CSR 20-7.031(3) and reporting of toxic substances pursuant to 40 CFR 122.44(f).
- ✓ Permit writers use the Department's permit writer's manual (<http://dnr.mo.gov/env/wpp/permits/manual/permit-manual.htm>), the EPA's permit writer's manual (<https://www.epa.gov/npdes/npdes-permit-writers-manual>), program policies, and best professional judgment. For each parameter in each permit, the permit writer carefully considers all applicable information regarding: technology based effluent limitations, effluent limitation guidelines, water quality standards, stream flows and uses, and all applicable site specific information and data gathered by the facility through discharge monitoring reports and renewal (or new) application sampling. Best professional judgment is based on the experience of the permit writer, cohorts in the Department and resources at the EPA, research, and maintaining continuity of permits if necessary. For stormwater permits, the permit writer is required per 10 CSR 6.200(6)(B)2 to consider: A. application and other information supplied by the facility; B. effluent guidelines; C. best professional judgment of the permit writer; D. water quality; and E. BMPs. Part IV provides specific decisions related to this permit.

RENEWAL REQUIREMENTS:

The renewal special condition permit requirement is designed to guide the facility to prepare and include all relevant and applicable information in accordance with 10 CSR 20-6.010(7)(A)-(C), and if applicable, federal regulations. The special condition may not include all requirements and requests for additional information may be made at the time of permit renewal under 644.051.13(5) RSMo and 40 CFR 122.21(h). Prior to submittal, the facility must review the entire submittal to confirm all required information and data is provided; it is the facility's responsibility to discern if additional information is required. Failure to fully disclosure applicable information with the application or application addendums may result in a permit revocation per 10 CSR 20-6.010(8)(A) and may result in the forfeiture of permit shield protection authorized in 644.051.16 RSMo.

- ✓ Although this facility is considered categorical, there are no additional sampling requirements (i.e. Department Form D) associated per 40 CFR 122 Appendix D.

SAMPLING FREQUENCY JUSTIFICATION:

Sampling and reporting frequency was generally retained from previous permit. 40 CFR 122.45(d)(1) indicates all continuous discharges, such as wastewater discharges, shall be permitted with daily maximum and monthly average limits. Minimum sampling frequency for all parameters is annually per 40 CFR 122.44(i)(2).

Sampling frequency for stormwater-only outfalls is typically quarterly even though BMP inspection occurs monthly or more often dependent on site needs. The facility may sample more frequently if additional data is required to determine if best management operations and technology are performing as expected.

SAMPLING TYPE JUSTIFICATION:

Sampling type was continued from the previous permit. The sampling types are representative of the discharges, and are protective of water quality. Discharges with altering effluent should have composite sampling; discharges with uniform effluent can have grab samples. Grab samples are usually appropriate for stormwater. Parameters which must have grab sampling are: pH, ammonia, *E. coli*, total residual chlorine, free available chlorine, hexavalent chromium, dissolved oxygen, total phosphorus, volatile organic compounds, and others. For further information on sampling and testing methods see 10 CSR 20-7.015(9)(D)2.

BOD₅, TSS, and WET test samples collected for mechanical plants per 10 CSR 20-7.015, shall be a 24 hour composite sample. Due to the small size of this facility this composite sample shall be made up from a minimum of four/six grab samples collected within a 24-hour period with a minimum of two hours between each grab sample. Grab samples, however, must be collected for pH, Ammonia as N, *E. coli*, TRC, oil & grease, and total phosphorus. This is due to the holding time restriction for *E. coli*, the volatility of Ammonia and TRC, and pH and DO cannot be preserved and must be sampled in the field. Ammonia, oil & grease, and total phosphorus samples must be immediately preserved with acid, these samples are to be collected as a grab.

SCHEDULE OF COMPLIANCE (SOC):

A schedule of remedial measures included in a permit, including an enforceable sequence of interim requirements (actions, effluent limits, operations, or milestone events) leading to compliance with the Missouri Clean Water Law, its implementing regulations, and/or the terms and conditions of an operating permit. SOC's are allowed under 40 CFR 122.47 and 10 CSR 20-7.031(11) providing certain conditions are met. An SOC is not allowed:

- For effluent limitations based on technology-based standards established in accordance with federal requirements, if the deadline for compliance established in federal regulations has passed in accordance with 40 CFR 125.3.
- For a newly constructed facility in most cases per 644.029 RSMo. Newly constructed facilities must meet all applicable effluent limitations (technology and water quality) when discharge begins. New facilities are required to install the appropriate control technologies as specified in a permit or antidegradation review. A SOC is allowed for a new water quality based effluent limit not included in a previously public noticed permit or antidegradation review, which may occur if a regulation changes during construction.
- To develop a TMDL, UAA, or other study associated with development of a site specific criterion. A facility is not prohibited from conducting these activities, but a SOC may not be specifically granted for conducting these activities.

In order to provide guidance in developing SOC's, and to attain a greater level of consistency, the Department issued a policy on development of SOC's on October 25, 2012. The policy provides guidance to permit writers on standard time frames for schedules for common activities, and guidance on factors to modify the length of the schedule.

- ✓ Applicable; the time given for effluent limitations of this permit listed under Interim Effluent Limitations and Final Effluent Limitations were established in accordance with [10 CSR 20-7.031(11)]. See permit Sections A and B for compliance dates.
 - The facility's SOC for temperature at outfall #001 has been continued from a final date of February 1, 2021 and extended by 6 months to August 1, 2021; primarily due to the COVID19 pandemic and construction delays due to the pandemic and unseasonably wet summer. The facility has obtained construction permit CP# 0002141 and has begun construction on the earthen basin. The temperature compliance point has been moved from outfall #001 to newly established outfall #01A to account for the basin. The facility will continue to sample in-stream at #SM1 and #SM2 to further determine thermal compliance for the TMDL.
 - The facility has been given a schedule of compliance to meet final effluent limits for chloride at outfall #001.

SPILLS, OVERFLOWS, AND OTHER UNAUTHORIZED DISCHARGE REPORTING:

Per 260.505 RSMo, any emergency involving a hazardous substance must be reported to the Department's 24 hour Environmental Emergency Response hotline at (573) 634-2436 at the earliest practicable moment after discovery. The Department may require the submittal of a written report detailing measures taken to clean up a spill. These reporting requirements apply whether or not the spill results in chemicals or materials leaving the permitted property or reaching waters of the state. This requirement is in addition to the noncompliance reporting requirement found in Standard Conditions Part I. <http://dnr.mo.gov/env/esp/spillbill.htm>

Any other spills, overflows, or unauthorized discharges reaching waters of the state must be reported to the regional office during normal business hours, or after normal business hours, to the Department's 24 hour Environmental Emergency Response spill line at 573-634-2436.

SLUDGE – INDUSTRIAL:

Industrial sludge is solid, semi-solid, or liquid residue generated during the treatment of industrial process or non-process wastewater in a treatment works; including but not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment process; scum and solids filtered from water supplies and backwashed; and any material derived from industrial sludge. Industrial sludge could also be derived from lagoon dredging or other similar maintenance activities.

- ✓ Applicable; this permit authorizes land application of industrial sludge in accordance with Part A and Special Conditions of this permit; see additional information below in Part IV.

- ✓ Applicable; sludge may also be removed by contract hauler, or stored in the lagoon. The permitted management strategy must be followed, see permit under FACILITY DESCRIPTION. If the permitted management strategy cannot be followed, the facility must obtain a permit modification.

STANDARD CONDITIONS:

The standard conditions Part I attached to this permit incorporate all sections of 10 CSR 20-6.010(8) and 40 CFR 122.41(a) through (n) by reference as required by law. These conditions, in addition to the conditions enumerated within the standard conditions should be reviewed by the facility to ascertain compliance with this permit, state regulations, state statutes, federal regulations, and the Clean Water Act. Standard Conditions Part III, if attached to this permit, incorporate requirements dealing with domestic wastewater, domestic sludge, and land application of domestic wastes.

STORMWATER PERMITTING: LIMITATIONS AND BENCHMARKS:

Because of the fleeting nature of stormwater discharges, the Department, under the direction of EPA guidance, has determined monthly averages are capricious measures of stormwater-only discharges. The *Technical Support Document for Water Quality Based Toxics Control* (EPA/505/2-90-001; 1991) §3.1 indicates most procedures within the document apply only to water quality based approaches, not end-of-pipe technology-based controls. Hence, stormwater-only outfalls will generally only contain a maximum daily limit (MDL), a benchmark, or a monitoring requirement as dictated by site specific conditions, the BMPs in place, the BMPs proposed, past performance of the facility, and the receiving water's current quality.

Sufficient rainfall to cause a discharge for one hour or more from a facility would not necessarily cause significant flow in a receiving stream. Acute Water Quality Standards (WQSs) are based on one hour of exposure, and must be protected at all times. Therefore, industrial stormwater facilities with toxic contaminants present in the stormwater may have the potential to cause a violation of acute WQSs if toxic contaminants occur in sufficient amounts. In this instance, the permit writer may apply daily maximum limitations.

Conversely, it is unlikely for rainfall to cause a discharge for four continuous days from a facility; if this does occur however, the receiving stream will also likely sustain a significant amount of flow providing dilution. Most chronic WQSs are based on a four-day exposure with some exceptions. Under this scenario, most industrial stormwater facilities have limited potential to cause a violation of chronic water quality standards in the receiving stream.

A standard mass-balance equation cannot be calculated for stormwater because stormwater flow and flow in the receiving stream cannot be determined for conditions on any given day or storm event without real-time ad-hoc monitoring. The amount of stormwater discharged from the facility will vary based on current and previous rainfall, soil saturation, humidity, detention time, BMPs, surface permeability, etc. Flow in the receiving stream will vary based on climatic conditions, size of watershed, area of surfaces with reduced permeability (houses, parking lots, and the like) in the watershed, hydrogeology, topography, etc. Decreased permeability may increase the stream flow dramatically over a short period of time (flash).

Numeric benchmark values are based on site specific requirements taking in to account a number of factors but cannot be applied to any process water discharges. First, the technology in place at the site to control pollutant discharges in stormwater is evaluated. The permit writer also evaluates other similar permits for similar activities. A review of the guidance forming the basis of Environmental Protection Agency's (EPA's) *Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity* (MSGP) may also occur. Because precipitation events are sudden and momentary, benchmarks based on state or federal standards or recommendations use the Criteria Maximum Concentration (CMC) value, or acute standard may also be used. The CMC is the estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed briefly without resulting in an unacceptable effect. The CMC for aquatic life is intended to be protective of the vast majority of the aquatic communities in the United States. If a facility has not disclosed BMPs applicable to the pollutants for the site, the facility may not be eligible for benchmarks.

40 CFR 122.44(b)(1) requires the permit implement the most stringent limitations for each discharge, including industrially exposed stormwater; and 40 CFR 122.44(d)(1)(i) and (iii) requires the permit to include water-quality based effluent limitations where reasonable potential has been found. However, because of the non-continuous nature of stormwater discharges, staff are unable to perform statistical Reasonable Potential Analysis (RPA) under most stormwater discharge scenarios. Reasonable potential determinations (RPDs; see REASONABLE POTENTIAL above) using best professional judgment are performed.

Benchmarks require the facility to monitor, and if necessary, replace and update stormwater control measures. Benchmark concentrations are not effluent limitations. A benchmark exceedance, therefore, is not a permit violation; however, failure to take corrective action is a violation of the permit. Benchmark monitoring data is used to determine the overall effectiveness of control measures and to assist the facility in knowing when additional corrective actions may be necessary to comply with the conditions of the permit.

BMP inspections typically occur more frequently than sampling. Sampling frequencies are based on the facility's ability to comply with the benchmarks and the requirements of the permit. Inspections should occur after large rain events and any other time an issue is noted; sampling after a benchmark exceedance may need to occur to show the corrective action taken was meaningful.

When a permitted feature or outfall consists of only stormwater, a benchmark may be implemented at the discretion of the permit writer, if there is no RP for water quality excursions.

- ✓ Applicable, this facility has stormwater-only outfalls where benchmarks or limitations were deemed appropriate contaminant measures.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

In accordance with 40 CFR 122.44(k), Best Management Practices (BMPs) must be used to control or abate the discharge of pollutants when: 1) Authorized under §304(e) of the Clean Water Act (CWA) for the control of toxic pollutants and hazardous substances from ancillary industrial activities; 2) Authorized under §402(p) of the CWA for the control of stormwater discharges; 3) Numeric effluent limitations are infeasible; or 4) the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA. In accordance with the EPA's *Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators*, (EPA 833-B-09-002) published by the EPA in 2015 https://www.epa.gov/sites/production/files/2015-11/documents/swppp_guide_industrial_2015.pdf, BMPs are measures or practices used to reduce the amount of pollution entering waters of the state from a permitted facility. BMPs may take the form of a process, activity, or physical structure. Additionally in accordance with the Stormwater Management, a SWPPP is a series of steps and activities to 1) identify sources of pollution or contamination, and 2) select and carry out actions which prevent or control the pollution of storm water discharges. Additional information can be found in *Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices* (EPA 832-R-92-006; September 1992).

A SWPPP must be prepared by the facility if the SIC code is found in 40 CFR 122.26(b)(14) and/or 10 CSR 20-6.200(2). A SWPPP may be required of other facilities where stormwater has been identified as necessitating better management. The purpose of a SWPPP is to comply with all applicable stormwater regulations by creating an adaptive management plan to control and mitigate stream pollution from stormwater runoff. Developing a SWPPP provides opportunities to employ appropriate BMPs to minimize the risk of pollutants being discharged during storm events. The following paragraph outlines the general steps the facility should take to determine which BMPs will work to achieve the benchmark values or limits in the permit. This section is not intended to be all encompassing or restrict the use of any physical BMP or operational and maintenance procedure assisting in pollution control. Additional steps or revisions to the SWPPP may be required to meet the requirements of the permit.

Areas which should be included in the SWPPP are identified in 40 CFR 122.26(b)(14). Once the potential sources of stormwater pollution have been identified, a plan should be formulated to best control the amount of pollutant being released and discharged by each activity or source. This should include, but is not limited to, minimizing exposure to stormwater, good housekeeping measures, proper facility and equipment maintenance, spill prevention and response, vehicle traffic control, and proper materials handling. Once a plan has been developed the facility will employ the control measures determined to be adequate to achieve the benchmark values discussed above. The facility will conduct monitoring and inspections of the BMPs to ensure they are working properly and re-evaluate any BMP not achieving compliance with permitting requirements. For example, if sample results from an outfall show values of TSS above the benchmark value, the BMP being employed is deficient in controlling stormwater pollution. Corrective action should be taken to repair, improve, or replace the failing BMP. This internal evaluation is required at least once per month but should be continued more frequently if BMPs continue to fail. If failures do occur, continue this trial and error process until appropriate BMPs have been established.

For new, altered, or expanded stormwater discharges, the SWPPP shall identify reasonable and effective BMPs while accounting for environmental impacts of varying control methods. The antidegradation analysis must document why no discharge or no exposure options are not feasible. The selection and documentation of appropriate control measures shall serve as an alternative analysis of technology and fulfill the requirements of antidegradation [10 CSR 20-7.031(3)]. For further guidance, consult the antidegradation implementation procedure (<http://dnr.mo.gov/env/wpp/docs/AIP050212.pdf>).

Alternative Analysis (AA) evaluation of the BMPs is a structured evaluation of BMPs which are reasonable and cost effective. The AA evaluation should include practices designed to be: 1) non-degrading; 2) less degrading; or 3) degrading water quality. The glossary of AIP defines these three terms. The chosen BMP will be the most reasonable and effective management strategy while ensuring the highest statutory and regulatory requirements are achieved and the highest quality water attainable for the facility is discharged. The AA evaluation must demonstrate why "no discharge" or "no exposure" is not a feasible alternative at the facility. This structured analysis of BMPs serves as the antidegradation review, fulfilling the requirements of 10 CSR 20-7.031(3) Water Quality Standards and *Antidegradation Implementation Procedure* (AIP), §II.B.

If parameter-specific numeric benchmark exceedances continue to occur and the facility feels there are no practicable or cost-effective BMPs which will sufficiently reduce a pollutant concentration in the discharge to the benchmark values established in the permit, the facility can submit a request to re-evaluate the benchmark values. This request needs to include 1) a detailed explanation of why the

facility is unable to comply with the permit conditions and unable to establish BMPs to achieve the benchmark values; 2) financial data of the company and documentation of cost associated with BMPs for review and 3) the SWPPP, which should contain adequate documentation of BMPs employed, failed BMPs, corrective actions, and all other required information. This will allow the Department to conduct a cost analysis on control measures and actions taken by the facility to determine cost-effectiveness of BMPs. The request shall be submitted in the form of an operating permit modification, which includes an appropriate fee; the application is found at: <https://dnr.mo.gov/forms/#WaterPollution>

- ✓ Applicable; a SWPPP shall be developed and implemented for this facility; see specific requirements in the SPECIAL CONDITIONS section of the permit. Certain areas of this facility do not require stormwater monitoring per 40 CFR 122.26(b)(14).
- ✓ Land application sites are required to consider stormwater per 10 CSR 20-6.200(2)(B)3.B but compliance with the application rates and when all other specific obligations of the permit are followed, the stormwater conditions are met. The facility is not required to develop a SWPPP for the application fields specifically, but is required to maintain the fields as no discharge of wastewater, sludge, or biosolids.

SUFFICIENTLY SENSITIVE ANALYTICAL METHODS:

Please review Standard Conditions Part 1, §A, No. 4. The analytical and sampling methods used shall conform to the reference methods listed in 10 CSR 20-7.015 and/or 40 CFR 136 unless alternates are approved by the Department and incorporated within this permit. The facility shall use sufficiently sensitive analytical methods for detecting, identifying, and measuring the concentrations of pollutants. The facility shall ensure the selected methods are able to quantify the presence of pollutants in a given discharge at concentrations low enough to determine compliance with Water Quality Standards in 10 CSR 20-7.031 or effluent limitations unless provisions in the permit allow for other alternatives. A method is “sufficiently sensitive” when; 1) the method quantifies the pollutant below the level of the applicable water quality criterion or; 2) the method minimum level is above the applicable water quality criterion, but the amount of pollutant in a facility’s discharge is high enough the method detects and quantifies the level of pollutant in the discharge, or 3) the method has the lowest minimum level of the analytical methods approved under 10 CSR 20-7.015 and or 40 CFR 136. These methods are also required for parameters listed as monitoring only, as the data collected may be used to determine if numeric limitations need to be established. A facility is responsible for working with their contractors to ensure the analysis performed is sufficiently sensitive.

UNDERGROUND INJECTION CONTROL (UIC):

The UIC program for all classes of wells in the State of Missouri is administered by the Missouri Department of Natural Resources and approved by EPA pursuant to §§1422 and 1425 of the Safe Drinking Water Act (SDWA) and 40 CFR 147 Subpart AA. Injection wells are classified based on the liquids which are being injected. Class I wells are hazardous waste wells which are banned by 577.155 RSMo; Class II wells are established for oil and natural gas production; Class III wells are used to inject fluids to extract minerals; Class IV wells are also banned by Missouri in 577.155 RSMo; Class V wells are shallow injection wells; some examples are heat pump wells and groundwater remediation wells. Domestic wastewater being disposed of sub-surface is also considered a Class V well. In accordance with 40 CFR 144.82, construction, operation, maintenance, conversion, plugging, or closure of injection wells shall not cause movement of fluids containing any contaminant into Underground Sources of Drinking Water (USDW) if the presence of any contaminant may cause a violation of drinking water standards or groundwater standards under 10 CSR 20-7.031, or other health based standards, or may otherwise adversely affect human health. If the director finds the injection activity may endanger USDWs, the Department may require closure of the injection wells, or other actions listed in 40 CFR 144.12(c), (d), or (e). In accordance with 40 CFR 144.26, the facility shall submit a Class V Well Inventory Form for each active or new underground injection well drilled, or when the status of a well changes, to the Missouri Department of Natural Resources, Geological Survey Program, P.O. Box 250, Rolla, Missouri 65402. The Class V Well Inventory Form can be requested from the Geological Survey Program or can be found at the following web address: <http://dnr.mo.gov/forms/780-1774-f.pdf> Single family residential septic systems and non-residential septic systems used solely for sanitary waste and having the capacity to serve fewer than 20 persons a day are excluded from the UIC requirements (40 CFR 144.81(9)).

- ✓ Not applicable; the facility has not submitted materials indicating the facility will be performing UIC at this site.

VARIANCE:

Per the Missouri Clean Water Law §644.061.4, variances shall be granted for such period of time and under such terms and conditions as specified by the commission in its order. The variance may be extended by affirmative action of the commission. In no event shall the variance be granted for a period of time greater than is reasonably necessary for complying with the Missouri Clean Water Law §§644.006 to 644.141 or any standard, rule or regulation promulgated pursuant to Missouri Clean Water Law §§644.006 to 644.141. Thermal variances are regulated separately and are found under 644.

- ✓ Not applicable; this permit is not drafted under premise of a petition for variance.

WASTELOAD ALLOCATIONS (WLA) FOR LIMITS:

As per [10 CSR 20-2.010; definitions], the WLA is the maximum amount of pollutant each discharger is allowed to discharge into the receiving stream without endangering water quality. Two general types of effluent limitations, technology-based effluent limits (TBELs) and water quality based effluent limits (WQBELs) are reviewed. If one limit does not provide adequate protection for the receiving water, then the other must be used per 10 CSR 20-7.015(9)(A).

- ✓ Applicable; wasteload allocations for toxic parameters were calculated using water quality criteria or water quality model results and by applying the dilution equation below; WLAs are calculated using the *Technical Support Document For Water Quality-Based Toxics Control* or “TSD” EPA/505/2-90-001; 3/1991, §4.5.5.

$$C = \frac{(Cs \times Qs) + (Ce \times Qe)}{(Qe + Qs)}$$

Where C = downstream concentration
Cs = upstream concentration
Qs = upstream flow
Ce = effluent concentration
Qe = effluent flow

- Acute wasteload allocations designated as daily maximum limits (MDL) were determined using applicable water quality criteria (CMC: criteria maximum concentration) and stream volume of flow at the edge of the zone of initial dilution (ZID).
 - Chronic wasteload allocations designated as monthly average limits (AML) were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and stream volume of flow at the edge of the mixing zone (MZ).
 - Number of Samples “n”: effluent quality is determined by the underlying distribution of daily values, determined by the Long Term Average (LTA) associated with a particular Wasteload Allocation (WLA) and by the Coefficient of Variation (CV) of the effluent concentrations. Increasing or decreasing the monitoring frequency does not affect this underlying assumption which should be, at a minimum, targeted to comply with the values dictated by the WLA. Therefore, it is recommended the actual planned frequency of monitoring be used to determine the value of “n” for calculating the AML. However, in situations where monitoring frequency is once per month or less, a higher value for “n” must be assumed for AML derivation purposes. Thus, the statistical procedure being employed uses an assumed number of samples “n = 4”.
- ✓ See section on stormwater permitting for stormwater outfalls as applying WLAs to stormwater is not normally applicable per TSD §3.1.

WASTELOAD ALLOCATION (WLA) MODELING:

Facilities may submit site specific studies to better determine the site specific wasteload allocations applied in permits.

- ✓ Not applicable; a WLA study was either not submitted or determined not applicable by Department staff.

WATER QUALITY STANDARD REVISION:

In accordance with 644.058 RSMo, the Department is required to utilize an evaluation of the environmental and economic impacts of modifications to water quality standards of twenty-five percent or more when making individual site-specific permit decisions.

- ✓ This operating permit does not contain requirements for a water quality standard changing twenty-five percent or more since the previous operating permit.

PART IV. EFFLUENT LIMIT DETERMINATIONS

OUTFALL #001 – INDUSTRIAL AND DOMESTIC WASTEWATER

EFFLUENT LIMITATIONS TABLE:

PARAMETERS	UNIT	DAILY MAX	MONTHLY AVG.	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	REPORTING FREQUENCY	SAMPLE TYPE
PHYSICAL							
FLOW	MGD	*	*	SAME	DAILY	MONTHLY	24 Hr. Tot
TEMPERATURE AT #01A	°F	*, 90	*	NEW OUTFALL	DAILY	MONTHLY	MEASURED
UPSTREAM TEMPERATURE (AT #SM1)	°F	*	*	SAME	DAILY	MONTHLY	MEASURED
DOWNSTREAM TEMP. (AT #SM2)	°F	*	*	SAME	DAILY	MONTHLY	MEASURED
TEMP DIFFERENCE SM2-SM1	± °F	*	*	*	DAILY	MONTHLY	MEASURED
CONVENTIONAL							
BOD ₅	mg/L	26	16	SAME	TWICE/WEEK	MONTHLY	COMPOSITE ††
CHLORINE, TOTAL RESIDUAL ‡	µg/L	18.1	9.0	17, 8	TWICE/WEEK	MONTHLY	GRAB
<i>E. COLI</i> † April 1 to Oct 31	#/100 mL	1030	206	SAME	TWICE/WEEK	MONTHLY	GRAB
FECAL COLIFORM	#/100 mL	400	*	SAME	TWICE/WEEK	MONTHLY	GRAB
OIL & GREASE	mg/L	14	8.0	SAME	TWICE/WEEK	MONTHLY	GRAB
OXYGEN, DISSOLVED ∴ at #01A	mg/L	5 MIN	*	*, SOC	TWICE/WEEK	MONTHLY	GRAB
pH †	SU	6.5 to 9.0		SAME	TWICE/WEEK	MONTHLY	GRAB
TOTAL SUSPENDED SOLIDS (TSS)	mg/L	30	20	SAME	TWICE/WEEK	MONTHLY	COMPOSITE ††
NUTRIENTS							
AMMONIA AS N – OCT TO APRIL	mg/L	8.0	4.0	10.1, 2.7	TWICE/WEEK	MONTHLY	GRAB
AMMONIA AS N – MAY	mg/L	8.0	3.5	2.5, 1.4	TWICE/WEEK	MONTHLY	GRAB
AMMONIA AS N – JUNE	mg/L	8.0	2.7	2.5, 1.4	TWICE/WEEK	MONTHLY	GRAB
AMMONIA AS N – JULY	mg/L	8.0	2.3	2.5, 1.4	TWICE/WEEK	MONTHLY	GRAB
AMMONIA AS N – AUGUST	mg/L	8.0	2.4	2.5, 1.4	TWICE/WEEK	MONTHLY	GRAB
AMMONIA AS N – SEPTEMBER	mg/L	8.0	3.1	2.5, 1.4	TWICE/WEEK	MONTHLY	GRAB
KJELDAHL NITROGEN, TOTAL (TKN)	mg/L	*	*	NEW	ONCE/MONTH	MONTHLY	COMPOSITE ††
NITRATE PLUS NITRITE AS N	mg/L	*	*	NEW	ONCE/MONTH	MONTHLY	COMPOSITE ††
NITROGEN, TOTAL (TN)	mg/L	147	103	SAME	TWICE/WEEK	MONTHLY	COMPOSITE ††
PHOSPHORUS, TOTAL P (TP)	mg/L	*	*	NEW	ONCE/MONTH	MONTHLY	GRAB
OTHER							
CHLORIDE	mg/L	266.2	219.9	*, SOC	TWICE/WEEK	MONTHLY	COMPOSITE ††
WET TEST - CHRONIC	TUc	*	-	ACUTE	ONCE/YEAR	ANNUALLY	COMPOSITE ††

- * monitoring and reporting requirement only
- † report the minimum and maximum pH values; pH is not to be averaged
- †† composite samples, see permit
- new parameter not established in previous state operating permit
- SOC see permit for dates
- ∴ DO limit is a minimum requirement. An SOC is afforded to this parameter.

DERIVATION AND DISCUSSION OF LIMITS:

PHYSICAL:

Flow

In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to ensure compliance with permitted effluent limitations. If the facility is unable to obtain effluent flow, then it is the responsibility of the facility to inform the Department, which may require the submittal of an operating permit modification. The facility will report the total flow in millions of gallons per day (MGD), daily monitoring continued from previous permit.

Temperature at Outfall #01A; #SM1 and #SM2

In accordance with 10 CSR 20-7.031(5)(D), water contaminant sources shall not cause or contribute to stream temperature in excess of ninety degrees Fahrenheit (90 °F) or change the stream temperature by more than 5 degrees Fahrenheit (ΔT 5° F); there is a TMDL for temperature in Little Muddy Creek, WBID# 0856.

The previous permit required the facility to meet a final effluent limit of 90 °F by February 1, 2021; however, the facility indicated issues with meeting this SOC date, and requested an additional six months. The Department has granted this request within this permit and the SOC has been moved to August 1, 2021. Current temperatures exhibited at outfall #001 range from 67.46 to 95.2, showing seasonal variation; the cooling basin, at #01A is expected to decrease temperature to 90 °F using a two-day detention time; limits will be implemented at the end of the SOC at outfall #01A at 90 °F.

Because the facility is installing new technology to comply with the in-stream Δ 5 °F limit, and the Department has determined this specific technology is appropriate to detain wastewater for a sufficient amount of time to meet the Δ 5 °F limit instream. Two-day detention coupled with a one mile travel time; the temperature requirement for the TMDL will be met, and no further reasonable potential is found at this time. The permit reissued therefore will remove the Δ 5 °F limit, previously required at the end of the SOC for in-stream temperature compliance at SM1/SM2.

Daily monitoring will be continued during this permit, and reasonable potential for temperature will be further evaluated at #01A in the next permit renewal. Thermal compliance has been moved from outfall #001 to #01A in this permit, however, the Department recognizes the facility has not yet constructed the basin serving outfall #01A. At permit issuance, all thermal data collected at outfall #001 or #01A will be submitted with outfall #001 in the EDMR system. The facility is required to submit a letter to the Department indicating construction of the basin is complete therefore the next permit will only evaluate data occurring after the technology is being utilized to determine reasonable potential.

CONVENTIONAL:

Biochemical Oxygen Demand - 5 Day (BOD₅)

26 mg/L daily maximum; 16 mg/L monthly average per 40 CFR 432.112 effluent limitation guideline. However; the effluent contains domestic wastewater; domestic wastewater and the poultry processing effluent are considered similar therefore technology-based limits for BOD in 10 CSR 20-7.015(8) of 45 mg/L daily maximum and 30 mg/L monthly average are compared. The more stringent limits are found in the ELG, therefore the ELG will be applied; there are no water quality standards applicable to this facility, nor are water quality limits being derived for this discharge. Twice weekly composite sampling continued from the previous permit.

Chlorine, Total Residual (TRC)

18.1 µg/L daily maximum; 9.0 µg/L monthly average. This facility utilizes a chlorination/dechlorination system to kill pathogens and bacteria. Previous permit limits were 17 µg/L daily maximum and 8 µg/L monthly average. Method detection limit minimum level continued from previous permit at 130 µg/L. See Part III, ANTIBACKSLIDING for more information. Twice weekly grab sampling continued from the previous permit. There are no technology-based effluent limits established for this parameter for this category of discharger.

Acute AQL: 19 µg/L

Chronic AQL: 11 µg/L

LTAa: $WLAa * LTAa \text{ multiplier} = 19 * 0.321 = 6.101$ [CV: 0.6, 99th %ile]

LTAc: $WLAc * LTAc \text{ multiplier} = 11 * 0.527 = 5.802$ [CV: 0.6, 99th %ile]

use most protective LTA: 5.802

Daily Maximum: MDL = $LTA * MDL \text{ multiplier} = 5.802 * 3.114 = 18.1 \mu\text{g/L}$ [CV: 0.6, 99th %ile]

Monthly Average: AML = $LTA * AML \text{ multiplier} = 5.802 * 1.552 = 9 \mu\text{g/L}$ [CV: 0.6, 95th %ile, n=4]

Escherichia coli (E. coli)

WBC-B stream requires daily maximum limit of 1030 colony forming units per 100 mL [10 CSR 20-7.015(9)(B)1.E.] and a monthly geometric mean limit of 206 bacteria per 100 mL [10 CSR 20-7.031 Table A1] during the recreational season from April 1 through October 31 only [10 CSR 20-7.031(5)(C)], to protect Whole Body Contact (B) [10 CSR 20-7.031(C)2.A.(II)] designated use of the receiving stream. Data for this parameter range from non-detect to 197 #/100 mL; with one value of 15,400 #/100 mL which shows a failure of chlorine treatment during that time period. Effluent limits and twice per week monitoring continued from the previous permit.

An effluent limit for both daily maximum and monthly geometric mean is required by 40 CFR 122.45(d). The geometric mean is calculated by multiplying all of the data points and then taking the n^{th} root of this product, where $n = \#$ of samples collected. For example: Five *E. coli* samples were collected with results of 1, 4, 5, 6, and 10 (#/100 mL). Geometric mean = 5^{th} root of $(1)(4)(5)(6)(10) = 5^{\text{th}}$ root of 1,200 = 4.1 #/100 mL.

Fecal Coliform

Fecal coliform daily maximum limit of 400 #/100 mL required by the effluent limitation guideline found at 40 CFR 432.112. The facility reported from 10 to 30,000 #/100 mL during the last permit term. Twice weekly grab sampling continued from previous permit. There are no established water quality standards for this parameter, but the Department has established water quality standards for *E. coli*; see above.

Oil & Grease

14 mg/L daily maximum, 8.0 mg/L monthly average per 40 CFR 432.112 effluent limitation guideline; typical water quality limits of 15 mg/L daily maximum; 10 mg/L monthly average (per 10 CSR 20-7.031, the chronic standard for oil and grease is 10 mg/L) are less stringent therefore the ELG limits must be used. Oil and grease is considered a conventional pollutant. Oil and grease is a comprehensive test which measures for gasoline, diesel, crude oil, creosote, kerosene, heating oils, heavy fuel oils, lubricating oils, waxes, animal fats and greases, and some asphalt and pitch. The test can also detect some volatile organics such as benzene, toluene, ethylbenzene, or toluene, but these constituents are often lost during testing due to their boiling points. The facility reported from 1 to 4.4 mg/L. The permit writer completed an RPD on this parameter and found no RP, as data were all below the applicable WQS for this system. Oils and greases of different densities will possibly form sheen or unsightly bottom deposits at levels which vary from 10 mg/L. To protect the general criteria, it is the responsibility of the facility to visually observe the discharge and receiving waters for sheen or bottom deposits. Twice weekly grab sampling continued from the previous permit.

Oxygen, Dissolved

5 mg/L minimum limit; after SOC; monitoring of average only; minimum monitoring frequency is now twice weekly; grab-type sample. Previous permit was monthly monitoring only where the facility reported from 3.18 to 9.25 mg/L. the minimum established water quality standards for dissolved oxygen is minimum 5 mg/L per 10 CSR 20-7.031 Table A1. The permit writer has determined this discharge has reasonable potential to cause or contribute to in-stream water contaminants of minimal DO; therefore limits are implemented. Eight monitoring periods have values less than 5 mg/L. A schedule of compliance is implemented to coincide with the thermal effluent limits as the Department believes operational controls can elevate the DO component without any major plant upgrades. Causes of low DO may result from warm water, high chlorine, or other oxygen demanding constituents in the effluent. The Department has determined measurement of this parameter is better suited at outfall #01A and will be taken at the alternate location as soon as the facility begins to utilize the cooling basin.

pH

6.5 to 9.0 SU – instantaneous grab sample. Water quality limits [10 CSR 20-7.031(5)(E)] are applicable to this outfall. pH is a fundamental water quality indicator. Additionally, metals leachability and ammonia availability in wastewater is dependent on pH. Limitations in this permit will protect against aquatic organism toxicity, downstream water quality issues, human health hazard contact, and negative physical changes in accordance with the general criteria at 10 CSR 20-7.031(4) and the Clean Water Act's (CWA) goal of 100% fishable and swimmable rivers and streams.

Total Suspended Solids (TSS)

30 mg/L daily maximum; 20 mg/L monthly average per 40 CFR 432.112 effluent limitation guideline. However; the effluent contains domestic wastewater; domestic wastewater and the poultry processing effluent are considered similar therefore TSS in 10 CSR 20-7.015(8) of 45 mg/L daily maximum and 30 mg/L monthly average are compared. The more stringent limits are found in the ELG, therefore the ELG will be applied; there are no water quality standards applicable to this facility, nor are water quality limits being derived for this discharge. Twice weekly composite sampling continued from the previous permit. Discharge of solids, including algae, may cause violation of general water quality criteria for unsightly, scummy, or turbid discharge, which is prohibited under 10 CSR 20-7.031(4)(A), (B), and (C). This condition also is protective of downstream criteria per 10 CSR-20-7.031(4)(E), and 10 CSR 20-7.031(4)(H) for hydrologic changes associated with which could impair the biological community.

NUTRIENTS:

Ammonia, Total as Nitrogen

Nitrogen is expected to be present in this discharge therefore a minimum of monthly monitoring is required per 10 CSR 20-7.015(9)(D)8.B. However, because ammonia is identified as a parameter of concern for this industry in the applicable effluent limitation guideline, the previous permit established sampling at twice weekly, which will be maintained.

Early life stages present [10 CSR 20-7.031(5)(B)7.C & Table B3], salmonids absent based on WWH designation of stream; total ammonia nitrogen criteria apply. Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(5)(B)7.C. & Table B3].

The Department previously followed the 2007 Ammonia Guidance method for derivation of ammonia limits. However, the EPA's Technical Support Document for Water Quality-Based Toxic Controls (TSD) establishes other alternatives to limit derivation. The Department has determined the approach established in §5.4.2 of the TSD, which allows for direct application of both the acute and chronic wasteload allocations (WLA) as permit limits for toxic pollutants, is a more appropriate limit derivation approach for ammonia. Using this method for a discharge to a waterbody where mixing is not allowed, the criterion continuous concentration (CCC) and the criterion maximum concentration (CMC) will equal the chronic and acute WLA respectively. The WLAs are then applied as effluent limits, per §5.4.2 of the TSD, where the CMC is the Daily Maximum and the CCC is the Monthly Average. The direct application of both acute and chronic criteria as WLA is also applicable for facilities discharging into receiving waterbodies with mixing considerations. The CCC and CMC will need to be calculated into WLA with mixing considerations using the standard mass-balance equation. The effluent limitations calculated below conform to antibacksliding regulations. See Part III, ANTIBACKSLIDING for more information.

Any daily effluent limitation derivation above 8.0 mg/L will be reduced to 8.0 mg/L per the effluent limitation guideline applicable to this facility found in 40 CFR 432.112 and 432.113; any monthly average calculated above 4.0 will be reduced to 4.0 per the same ELG. ELG requirements cannot be afforded schedules of compliance nor can water quality limitations be applied to discharges where the ELG limits are more conservative. The changes detailed below indicate no water quality limitations are becoming more restrictive therefore no SOC is afforded to this parameter.

This facility is located in the Central Irregular Plains. Site specific pH data was used; the median of the reported data was 7.1 SU, and the pH remained steady throughout all seasons; data ranged from 6.75 to 7.57 SU. Because the facility's current thermal discharge measurements are not reflective of future operations, the default regional temperature values were used and remain protective of the receiving waterbody, as the detention basin is designed to return wastewater to ambient temperatures.

	Central Irregular Plains	
	Median pH	75th %ile °C
Jan	7.7	3.0
Feb	7.8	4.0
Mar	7.9	10.6
Apr	7.9	16.8
May	7.8	22.0
Jun	7.7	25.9
Jul	7.8	28.8
Aug	7.7	28.0
Sep	7.8	24.0
Oct	7.8	17.5
Nov	7.7	11.6
Dec	7.8	5.0

January

Previous permit limit: 10.1 mg/L daily maximum, 2.7 mg/L monthly average

Acute AQL: $(0.411/(1+10^{7.204-7.1}))+(58.4/(1+10^{(7.1-7.204)})) = 32.861$ mg/L

Chronic AQL: $(0.0577/(1+10^{7.688-7.1}))+(2.487/(1+10^{7.1-7.688}))*\text{MIN}(2.85,(1.45*10^{0.028*(25-3)})) = 5.645$ mg/L

Will apply ELG maximum of 8.0 mg/L, and monthly average of 4 mg/L.

February

Previous permit limit: 10.1 mg/L daily maximum, 2.7 mg/L monthly average

Acute AQL: $(0.411/(1+10^{7.204-7.1}))+(58.4/(1+10^{(7.1-7.204)})) = 32.861$ mg/L

Chronic AQL: $(0.0577/(1+10^{7.688-7.1}))+(2.487/(1+10^{7.1-7.688}))*\text{MIN}(2.85,(1.45*10^{0.028*(25-4)})) = 5.645$ mg/L

Will apply ELG maximum of 8.0 mg/L, and monthly average of 4 mg/L.

March

Previous permit limit: 10.1 mg/L daily maximum, 2.7 mg/L monthly average

Acute AQL: $(0.411/(1+10^{7.204-7.1}))+(58.4/(1+10^{(7.1-7.204)})) = 32.861$ mg/L

Chronic AQL: $(0.0577/(1+10^{7.688-7.1}))+(2.487/(1+10^{7.1-7.688}))*\text{MIN}(2.85,(1.45*10^{0.028*(25-10.6)})) = 5.645$ mg/L

Will apply ELG maximum of 8.0 mg/L, and monthly average of 4 mg/L.

April

Previous permit limit: 2.5 mg/L daily maximum, 1.4 mg/L monthly average

Acute AQL: $(0.411/(1+10^{7.204-7.1}))+(58.4/(1+10^{(7.1-7.204)})) = 32.861$ mg/L

Chronic AQL: $(0.0577/(1+10^{7.688-7.1}))+(2.487/(1+10^{7.1-7.688}))*\text{MIN}(2.85,(1.45*10^{0.028*(25-16.8)})) = 4.875$ mg/L

Will apply ELG maximum of 8.0 mg/L, and monthly average of 4 mg/L.

May

Previous permit limit: 2.5 mg/L daily maximum, 1.4 mg/L monthly average

Acute AQL: $(0.411/(1+10^{7.204-7.1}))+(58.4/(1+10^{(7.1-7.204)})) = 32.861$ mg/L

Chronic AQL: $(0.0577/(1+10^{7.688-7.1}))+(2.487/(1+10^{7.1-7.688}))*\text{MIN}(2.85,(1.45*10^{0.028*(25-22)})) = 3.489$ mg/L

Will apply ELG maximum of 8.0 mg/L.

June

Previous permit limit: 2.5 mg/L daily maximum, 1.4 mg/L monthly average

Acute AQL: $(0.411/(1+10^{7.204-7.1}))+(58.4/(1+10^{(7.1-7.204)})) = 32.861$ mg/L

Chronic AQL: $(0.0577/(1+10^{7.688-7.1}))+(2.487/(1+10^{7.1-7.688}))*\text{MIN}(2.85,(1.45*10^{0.028*(25-25.9)})) = 2.716$ mg/L

Will apply ELG maximum of 8.0 mg/L.

July

Previous permit limit: 2.5 mg/L daily maximum, 1.4 mg/L monthly average

Acute AQL: $(0.411/(1+10^{7.204-7.1}))+(58.4/(1+10^{(7.1-7.204)})) = 32.861$ mg/L

Chronic AQL: $(0.0577/(1+10^{7.688-7.1}))+(2.487/(1+10^{7.1-7.688}))*\text{MIN}(2.85,(1.45*10^{0.028*(25-28.8)})) = 2.255$ mg/L

Will apply ELG maximum of 8.0 mg/L.

August

Previous permit limit: 2.5 mg/L daily maximum, 1.4 mg/L monthly average

Acute AQL: $(0.411/(1+10^{7.204-7.1}))+(58.4/(1+10^{(7.1-7.204)})) = 32.861$ mg/L

Chronic AQL: $(0.0577/(1+10^{7.688-7.1}))+(2.487/(1+10^{7.1-7.688}))*\text{MIN}(2.85,(1.45*10^{0.028*(25-28)})) = 2.374$ mg/L

Will apply ELG maximum of 8.0 mg/L.

September

Previous permit limit: 2.5 mg/L daily maximum, 1.4 mg/L monthly average

Acute AQL: $(0.411/(1+10^{7.204-7.1}))+(58.4/(1+10^{(7.1-7.204)})) = 32.861$ mg/L

Chronic AQL: $(0.0577/(1+10^{7.688-7.1}))+(2.487/(1+10^{7.1-7.688}))*\text{MIN}(2.85,(1.45*10^{0.028*(25-24)})) = 3.069$ mg/L

Will apply ELG maximum of 8.0 mg/L.

October

Previous permit limit: 10.1 mg/L daily maximum, 2.7 mg/L monthly average

Acute AQL: $(0.411/(1+10^{7.204-7.1}))+(58.4/(1+10^{(7.1-7.204)})) = 32.861$ mg/L

Chronic AQL: $(0.0577/(1+10^{7.688-7.1}))+(2.487/(1+10^{7.1-7.688}))*\text{MIN}(2.85,(1.45*10^{0.028*(25-17.5)})) = 4.66$ mg/L

Will apply ELG maximum of 8.0 mg/L, and monthly average of 4 mg/L.

November

Previous permit limit: 10.1 mg/L daily maximum, 2.7 mg/L monthly average

Acute AQL: $(0.411/(1+10^{7.204-7.1}))+(58.4/(1+10^{(7.1-7.204)})) = 32.861$ mg/L

Chronic AQL: $(0.0577/(1+10^{7.688-7.1}))+(2.487/(1+10^{7.1-7.688}))*\text{MIN}(2.85,(1.45*10^{0.028*(25-11.6)})) = 5.645$ mg/L

Will apply ELG maximum of 8.0 mg/L, and monthly average of 4 mg/L.

December

Previous permit limit: 10.1 mg/L daily maximum, 2.7 mg/L monthly average

Acute AQL: $(0.411/(1+10^{7.204-7.1}))+(58.4/(1+10^{(7.1-7.204)})) = 32.861$ mg/L

Chronic AQL: $(0.0577/(1+10^{7.688-7.1}))+(2.487/(1+10^{7.1-7.688}))*\text{MIN}(2.85,(1.45*10^{0.028*(25-5)})) = 5.645$ mg/L

Will apply ELG maximum of 8.0 mg/L, and monthly average of 4 mg/L.

Kjeldahl Nitrogen, Total (TKN)

Nitrogen is expected to be present in this discharge therefore monthly monitoring is required per 10 CSR 20-7.015(9)(D)8.B. This is a new requirement for the wastewater at the site and shall be collected at least once per month as a composite sample.

Nitrate plus Nitrite

Nitrogen is expected to be present in this discharge therefore monthly monitoring is required per 10 CSR 20-7.015(9)(D)8.B. This is a new requirement for the wastewater at the site and shall be collected at least once per month as a composite sample.

Nitrogen, Total

Effluent limitation guidelines promulgated at 40 CFR 432.113 provide requirements for maximal nitrogen discharge of 147 mg/L daily maximum, and 103 mg/L monthly average; this is continued from the previous permit as twice per week composite sample.

Phosphorus, Total P (TP)

Phosphorus is expected to be present in this discharge therefore monthly monitoring is required per 10 CSR 20-7.015(9)(D)8.B. This is a new requirement for the wastewater at the site and shall be collected at least once per month as a grab sample.

OTHER:

Chloride

The previous permit required monitoring of this parameter twice weekly; twice weekly composite sample required for this permit. Data for daily maximum range from 248 to 481 mg/L; while the variation was low, daily data was above the monthly average; running the RPA on the monthly average data provided similar results with an even lower CV of 0.086, but monthly average data were still typically above the chronic water quality values and ranged from 234 to 329 mg/L. The facility will be afforded a schedule of compliance for this parameter. See Part III, SCHEDULE OF COMPLIANCE for more information.

Acute AQL: 860 mg/L

Chronic AQL: 230 mg/L

Acute WLA: $C_e = ((3.868 \text{ cfsDF} + 0 \text{ cfsZID}) * 860 - (0 \text{ cfsZID} * 0 \text{ background})) / 3.868 \text{ cfsDF} = 860$

Chronic WLA: $C_e = ((3.868 \text{ cfsDF} + 0 \text{ cfsMZ}) * 230 - (0 \text{ cfsMZ} * 0 \text{ background})) / 3.868 \text{ cfsDF} = 230$

LTAa: $WLAa * LTAa \text{ multiplier} = 860 * 0.743 = 638.669$ [CV: 0.132, 99th %ile]

LTAc: $WLAc * LTAc \text{ multiplier} = 230 * 0.859 = 197.681$ [CV: 0.132, 99th %ile]

use most protective LTA: 197.681

Daily Maximum: $MDL = LTA * MDL \text{ multiplier} = 197.681 * 1.347 = 266.2 \text{ mg/L}$ [CV: 0.132, 99th %ile]

Monthly Average: $AML = LTA * AML \text{ multiplier} = 197.681 * 1.112 = 219.9 \text{ mg/L}$ [CV: 0.132, 95th %ile, n=4]

Whole Effluent Toxicity (WET) Test

A WET test is a quantifiable method to determine conclusively if discharges from the facility cause toxicity to aquatic life by itself, in combination with, or through synergistic responses, when mixed with receiving stream water. Under the CWA §101(a)(3), requiring WET testing is reasonably appropriate for site-specific Missouri State Operating Permits to quantify toxicity. WET testing is also required by 40 CFR 122.44(d)(1). WET testing ensures the provisions in 10 CSR 20-6 and Missouri's Water Quality Standards in 10 CSR 20-7 are being met. Under 10 CSR 20-6.010(8)(A)4, the Department may require other terms and conditions it deems necessary to ensure compliance with the CWA and related regulations of the Missouri Clean Water Commission. Missouri Clean Water Law (MCWL) 644.051.3 RSMo. requires the Department to set permit conditions complying with the MCWL and CWA. 644.051.4 RSMo specifically references toxicity as an item the Department must consider in permits (along with water quality-based effluent limits); and 644.051.5 RSMo. is the basic authority to require testing conditions.

- ✓ The previous permit required acute testing, however, chronic whole effluent testing is deemed to be protective of the receiving streams, and the first classified receiving stream is designated as intermittent flow. In times of year where rainfall is absent, the stream contains mostly, if not all, effluent. Organisms must be able to survive in 100% effluent for greater than four days therefore chronic testing is warranted.
- ✓ As historical testing did not show toxicity, limitations for chronic toxicity are not required at this time. However, given that ammonia effluent limitations have increased, it is possible for whole effluent toxicity to show that the ammonia limitations are not adequate to protect the receiving stream from in-stream toxicity.
- ✓ Should toxicity be found, the facility is not required to perform follow up testing or determine the cause of the toxicity; however, it is in the facility's best interest to determine the cause of the toxicity and ameliorate the cause, as causing toxicity in the receiving stream is a general criteria violation per 10 CSR 20-7.031(4) and is not allowed even in the absence of WET effluent limitations.
- ✓ There is no upstream at this facility therefore the facility will need to request the laboratory use synthetic water for dilution.
- ✓ Annual testing is the minimum testing frequency; monitoring requirements promulgated in 40 CFR 122.44(i)(2) state "requirements to report monitoring results shall be established on a case-by-case basis with a frequency dependent on the nature and effect of the discharge, but in no case less than once per year."

WET, Chronic

Monitoring is required to determine if reasonable potential exists for the discharge to cause toxicity within the receiving stream. The standard Allowable Effluent Concentration (AEC) for facilities discharging to streams without mixing considerations or lakes is 100%. The standard dilution series for facilities discharging to waterbodies without mixing considerations is 100%, 50%, 25%, 12.5%, & 6.25%.

OUTFALL #002, #003, #004, AND #008 – STORMWATER ONLY

EFFLUENT LIMITATIONS TABLE:

PARAMETERS	UNIT	DAILY MAXIMUM LIMIT	BENCH- MARK	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	REPORTING FREQUENCY	SAMPLE TYPE
PHYSICAL							
FLOW	MGD	*		SAME	ONE/QUARTER	QUARTERLY	24 HR. ESTIMATE
CONVENTIONAL							
BOD-5	mg/L	**	30	SAME	ONE/QUARTER	QUARTERLY	GRAB
COD	mg/L	**	120	SAME	ONE/QUARTER	QUARTERLY	GRAB
<i>E. COLI</i>	#/100 mL	**	1030	*	ONE/QUARTER	QUARTERLY	GRAB
OIL & GREASE	mg/L	**	10	SAME	ONE/QUARTER	QUARTERLY	GRAB
pH †	SU	**	6.0 to 9.0	SAME	ONE/QUARTER	QUARTERLY	GRAB
SETTLABLE SOLIDS	mL/L/hr	**	1.5	SAME	ONE/QUARTER	QUARTERLY	GRAB
TSS	mg/L	**	100	SAME	ONE/QUARTER	QUARTERLY	GRAB

* monitoring and reporting requirement only

** monitoring with associated benchmark

† report the minimum and maximum pH values; pH is not to be averaged

DERIVATION AND DISCUSSION OF LIMITS:

PHYSICAL:

Flow

In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to ensure compliance with permitted effluent limitations. If the facility is unable to obtain effluent flow, then it is the responsibility of the facility to inform the Department, which may require the submittal of an operating permit modification. The facility will report the total flow in millions of gallons per day (MGD), quarterly monitoring continued from previous permit.

CONVENTIONAL:

Biochemical Oxygen Demand - 5 Day (BOD₅)

Monitoring with daily maximum benchmark of 30 mg/L continued from previous permit. Stormwater data range from non-detect to 195 mg/L. There is no water quality standard for BOD for stormwater, but this benchmark is continued to assess the oxygen demanding load of stormwater to receiving streams. Outfall #003 had the highest data and improvements should be made to the BMPs for this area to improve benchmark data.

Chemical Oxygen Demand (COD)

Monitoring with 120 mg/L daily maximum benchmark is included using the permit writer's best professional judgment and continued from the previous permit. Data supplied range from non-detect to 554 mg/L; the majority of the high data were at outfall #003. There is no numeric water quality standard for COD; however, increased oxygen demand may impact instream water quality. COD is also a valuable indicator parameter. COD monitoring allows the facility to identify increases in COD may indicate materials/chemicals coming into contact with stormwater causing an increase in oxygen demand. Increases in COD may indicate a need for maintenance or improvement of BMPs. The benchmark value falls within the range of values implemented in other permits having similar industrial activities and is achievable through proper BMP controls.

Escherichia coli (E. coli)

Previous permit implemented monitoring of E. coli at the stormwater outfalls; this permit implements a benchmark of 1030 #/100 mL to meet the CWA goal of fishable and swimmable waters and general criteria of harmful substances to result in harm to human, animal or aquatic life per 10 CSR 20-7.031(4)(C), (D), (E), (F), and (G). The data reported by the facility range from non-detect to 13,700,000 #/ 100 mL; most of the highest data are at outfall #003. Numerical benchmarks which are exceeded require a corrective action report be completed. This is a new requirement for this parameter this permit.

Oil & Grease

Monitoring with a daily maximum benchmark of 10 mg/L. The facility reported from non-detect to 9.2 mg/L with the highest data being recorded at outfalls #003 and #004. Oil and grease is considered a conventional pollutant. Oil and grease is a comprehensive test which measures for gasoline, diesel, crude oil, creosote, kerosene, heating oils, heavy fuel oils, lubricating oils, waxes, and some asphalt and pitch. The test can also detect some volatile organics such as benzene, toluene, ethylbenzene, or toluene, but these constituents are often lost during testing due to their boiling points. It is recommended to perform separate testing for these constituents if they are a known pollutant of concern at the site, i.e. aquatic life toxicity or human health is a concern. Results do not allow for separation of specific pollutants within the test, they are reported, totaled, as "oil and grease". Per 10 CSR 20-7.031 Table A1: *Criteria for Designated Uses*; 10 mg/L is the standard for protection of aquatic life. This standard will also be used to protect the general criteria found at 10 CSR 20-7.031(4). Ten mg/L is the level at which sheen is expected to form on receiving waters. Oils and greases of different densities will possibly form sheen or unsightly bottom deposits at levels which vary from 10 mg/L. To protect the general criteria, it is the responsibility of the facility to visually observe the discharge and receiving waters for sheen or bottom deposits. The benchmark is achievable through proper operational and maintenance of BMPs and falls within the range of values implemented in other permits having similar industrial activities.

pH

6.0 to 9.0 SU – instantaneous grab sample; limits converted to benchmark in this permit. See Part III, Antibalancing for more information. Technology benchmark is applicable to this outfall based on 10 CSR 20-7.015(9)(I) for industrial sites. pH is a fundamental water quality indicator. The pH at the site has been reviewed and determined benchmarks are appropriate for the stormwater discharges at this site. The stormwater does not have the potential to be altered by operational practices which may elevate the pH of the stormwater. It is the responsibility of the facility to ensure the pH remains stable to protect aquatic life in the receiving streams.

Settleable Solids (SS)

Monitoring with a daily maximum benchmark of 1.5 mL/L/hour. There is no numeric water quality standard for SS; however, sediment discharges can negatively impact aquatic life habitat. Settleable solids are also a valuable indicator parameter. Solids monitoring allows the facility to identify increases in sediment and solids may indicate uncontrolled materials leaving the site. The benchmark value falls within the range of values implemented in other permits having similar industrial activities.

Total Suspended Solids (TSS)

Monitoring with a daily maximum benchmark of 100 mg/L; continued from previous permit. Data range from non-detect to 286 mg/L; with the highest data being found at outfall #003. There is no numeric water quality standard for TSS; however, sediment discharges can negatively impact aquatic life habitat. TSS is also a valuable indicator parameter. TSS monitoring allows the facility to identify increases in TSS indicating uncontrolled materials leaving the site. Increased suspended solids in runoff can lead to decreased available oxygen for aquatic life and an increase of surface water temperatures in a receiving stream. Suspended solids can also be carriers of toxins, which can adsorb to the suspended particles; therefore, total suspended solids are a valuable indicator parameter for other pollution. The benchmark is achievable through proper operational and maintenance of BMPs and falls within the range of values implemented in other permits having similar industrial activities.

PERMITTED FEATURE #011 – WAS NO-DISCHARGE WASTEWATER STRUCTURE

EFFLUENT LIMITATIONS TABLE:

PARAMETERS	UNIT	DAILY VALUE	MONTHLY OR QUARTERLY AVERAGE	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQUENCY	SAMPLE TYPE
OPERATIONAL MONITORING							
FREEBOARD (MINIMUM)	FEET	2.0	*	NEW	ONCE MONTH	MONTHLY	MEASUREMENT
PRECIPITATION	IN	*	*	SAME	DAILY	MONTHLY	RECORD OR MEASUREMENT
SLUDGE MONITORING							
SOLIDS, PERCENT	%	*	*	SAME	ONE/QUARTER	QUARTERLY	COMPOSITE ††
PH	SU	*	*	SAME	ONE/QUARTER	QUARTERLY	COMPOSITE ††
AMMONIA AS N	MG/KG DRY	*	*	SAME	ONE/QUARTER	QUARTERLY	COMPOSITE ††
ORGANIC NITROGEN	MG/KG DRY	*	*	SAME	ONE/QUARTER	QUARTERLY	CALCULATION
KJELDAHL NITROGEN, TKN	MG/KG DRY	*	*	SAME	ONE/QUARTER	QUARTERLY	COMPOSITE ††
NITRATE AS N	MG/KG DRY	*	*	SAME	ONE/QUARTER	QUARTERLY	COMPOSITE ††
NITRITE AS N	MG/KG DRY	*	*	SAME	ONE/QUARTER	QUARTERLY	COMPOSITE ††
NITROGEN, TOTAL (TN)	MG/KG DRY	*	*	SAME	ONE/QUARTER	QUARTERLY	CALCULATION
PLANT AVAILABLE N (PAN)	MG/KG DRY	*	*	SAME	ONE/QUARTER	QUARTERLY	COMPOSITE ††
PHOSPHORUS, TOTAL (TP)	MG/KG DRY	*	*	SAME	ONE/QUARTER	QUARTERLY	COMPOSITE ††
SLUDGE MONITORING PER 100 TONS APPLIED							
ALUMINUM	MG/KG DRY	*		SAME	ONE/100 TON	AS APPLIED	COMPOSITE ††
ARSENIC	MG/KG DRY	*		SAME	ONE/100 TON	AS APPLIED	COMPOSITE ††
BERYLLIUM	MG/KG DRY	*		SAME	ONE/100 TON	AS APPLIED	COMPOSITE ††
BORON	MG/KG DRY	*		SAME	ONE/100 TON	AS APPLIED	COMPOSITE ††
CADMIUM	MG/KG DRY	*		SAME	ONE/100 TON	AS APPLIED	COMPOSITE ††
CHROMIUM	MG/KG DRY	*		SAME	ONE/100 TON	AS APPLIED	COMPOSITE ††
COPPER	MG/KG DRY	*		SAME	ONE/100 TON	AS APPLIED	COMPOSITE ††
LEAD	MG/KG DRY	*		SAME	ONE/100 TON	AS APPLIED	COMPOSITE ††
MERCURY	MG/KG DRY	*		SAME	ONE/100 TON	AS APPLIED	COMPOSITE ††
MOLYBDENUM	MG/KG DRY	*		SAME	ONE/100 TON	AS APPLIED	COMPOSITE ††
NICKEL	MG/KG DRY	*		SAME	ONE/100 TON	AS APPLIED	COMPOSITE ††
SELENIUM	MG/KG DRY	*		SAME	ONE/100 TON	AS APPLIED	COMPOSITE ††
TIN	MG/KG DRY	*		SAME	ONE/100 TON	AS APPLIED	COMPOSITE ††
ZINC	MG/KG DRY	*		SAME	ONE/100 TON	AS APPLIED	COMPOSITE ††
CHLORIDE	MG/KG DRY	*		SAME	ONE/100 TON	AS APPLIED	COMPOSITE ††
FLUORIDE	MG/KG DRY	*		SAME	ONE/100 TON	AS APPLIED	COMPOSITE ††
SODIUM	MG/KG DRY	*		SAME	ONE/100 TON	AS APPLIED	COMPOSITE ††
SODIUM ABSORPTION RATIO	MG/KG DRY	*		SAME	ONE/100 TON	AS APPLIED	COMPOSITE ††
OIL AND GREASE	MG/KG DRY	*		SAME	ONE/100 TON	AS APPLIED	COMPOSITE ††
TPH	MG/KG DRY	*		SAME	ONE/100 TON	AS APPLIED	COMPOSITE ††

* monitoring requirement

†† composite sludge sample, see permit

♣ sampling location was moved from individual fields to sludge that is being land applied as stored in the basin

DERIVATION AND DISCUSSION OF LIMITS:

OPERATIONAL MONITORING:

Freeboard

2 foot minimum. Monthly monitoring of the freeboard in the basin is required to ensure proper operational controls. This permitted feature was listed as no-discharge. As such, an antidegradation review was not conducted and discharge authorization has not been granted. To ensure the basin remains no-discharge, comply with all BMPs listed, monitor freeboard/liquid levels, and report highest reading monthly. Permits only authorize discharges after the facility has documented compliance with state and

federal Clean Water laws and regulations, including antidegradation and construction requirements. Freeboard is the distance between the top of the liquid level and the bottom of the discharge pipe or canal. Freeboard should be measured to the nearest inch.

Precipitation

Monitoring only requirement; measuring the amount of precipitation [(10 CSR 20-6.200(2)(C)1.E(VI)] during an event is necessary to ensure adequate stormwater management exists at the site. Knowing the amount of potential stormwater runoff can provide the facility a better understanding of any specific control measures be employed to ensure protection of water quality. The facility will provide the 24 hour accumulation value of precipitation from the day of sampling the other parameters. The facility may measure precipitation occurring on site with a calibrated measurement device or obtain records from a nearby weather reporting station.

SLUDGE MONITORING:

See additional information in fact sheet Part III LAND APPLICATION for the rationale for these specific requirements.

Percent Solids

Determining percentage of solids assists the permittee in understanding the mechanics of sludge application and determining best management practices of the sludge. Quarterly monitoring required only when sludge is being applied.

pH

Determining the pH of the sludge is important to determine sludge interaction with nutrients and soils at the site. Quarterly monitoring of the sludge in the basin only when sludge is being applied in the quarter. Monitoring the pH of applied sludge is to ensure compliance with 10 CSR 20-6.015(4)(A)1. It will also help ensure it is not harmful to vegetation and help to maintain soil pH in an optimal range for plant growth and nutrient utilization.

Ammonia as N, Organic Nitrogen; Kjeldahl Nitrogen, Total as N; Nitrate plus Nitrite as N; Total Nitrogen (TN); and Phosphorus, Total

Determining the above nutrients in the sludge is important in understanding the nutrient interactions between the sludge being applied and the soils at the site, and optimal growing conditions for the crops in the fields. These will be collected quarterly. Monitoring nutrient content of the applied wastewater is to ensure compliance with 10 CSR 20-6.015(4)(A)1. and determining application rates to ensure appropriate nutrient utilization.

TKN = Org N + Ammonia

The facility will sample for the following parameters for every 100 tons applied:

Aluminum, arsenic, beryllium, boron, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, tin, zinc, chloride, fluoride, oil and grease, and total petroleum hydrocarbons. The data for the analysis will be submitted by the 28th day of the month following sampling. This information will be used to determine overall pollutant loading on fields.

APPLICATION FIELDS, FEATURES #014, #015, #016 #017 #018, #019, #020, #021, #023, #024, #025, #026, #027, #028, #029, #030

EFFLUENT LIMITATIONS TABLE:

PARAMETERS	UNIT	DAILY MAXIMUM VALUE	AVERAGE	PREVIOUS PERMIT LIMITS	MINIMUM SAMPLING FREQUENCY	REPORTING FREQUENCY	SAMPLE TYPE
OPERATIONAL MONITORING							
APPLICATION AREA	ac	*	*	SAME	DAILY ▲	MONTHLY	MEASURED
APPLICATION RATE	inches	*	*	SAME	DAILY ▲	MONTHLY	MEASURED
VOLUME APPLIED	gal	*	*	SAME	DAILY ▲	MONTHLY	MEASURED
NITRATE AS N	mg/L	10	*	NEW	DAILY ▲	MONTHLY	MEASURED
SOIL SAMPLES, CALCULATIONS, AND LIMITS							
PAN	lbs/ac/year	**		NEW	RECORD	ANNUAL	CALCULATED
Arsenic	lbs/ac/year	1.78		NEW	RECORD	ANNUAL	CALCULATED
Cadmium	lbs/ac/year	1.70		NEW	RECORD	ANNUAL	CALCULATED
Copper	lbs/ac/year	66.91		NEW	RECORD	ANNUAL	CALCULATED
Lead	lbs/ac/year	13.38		NEW	RECORD	ANNUAL	CALCULATED
Mercury	lbs/ac/year	0.76		NEW	RECORD	ANNUAL	CALCULATED
Nickel	lbs/ac/year	18.74		NEW	RECORD	ANNUAL	CALCULATED
Selenium	lbs/ac/year	4.46		NEW	RECORD	ANNUAL	CALCULATED
Zinc	lbs/ac/year	124.91		NEW	RECORD	ANNUAL	CALCULATED

* monitoring and reporting requirement only

▲ daily is days applied; monitoring is not required when not applying. Specific daily data is reported as an attachment in the eDMR system.

** 150 lbs/ac/year or in accordance with Land App E.6 which allows the facility to apply enough N to meet crop N need. Corn needs about 1.5 lb N/acre to produce 1 bu/acre according to EQ202.

PHYSICAL MEASUREMENTS AND RECORD KEEPING REQUIREMENTS:

Application Area

The facility will report the acreage used in the field for application. Monitoring requirement only. Monitoring is included to ensure compliance with 10 CSR 20-6.015(4)(A)1. This will help the permittee ensure appropriate application rates are followed and to help to prevent unauthorized discharges from land applications.

Application Rate

Inches of sludge applied per area is required to determine appropriate methods are being used for application. Monitoring requirement only. Monitoring is included to ensure compliance with 10 CSR 20-6.015(4)(A)1. This will help the permittee ensure appropriate application rates are followed and to help to prevent unauthorized discharges from land applications.

Volume Applied

Used to determine overall pollutant loading. Monitoring requirement only. Monitoring is included to ensure compliance with 10 CSR 20-6.015(4)(A)1. This will help the permittee ensure appropriate application rates are followed and to help to prevent unauthorized discharges from land applications.

CALCULATIONS:

See fact sheet Part III, LAND APPLICATION for additional information and basis for soil limitations.

PART V. ADMINISTRATIVE REQUIREMENTS

On the basis of preliminary staff review and the application of applicable standards and regulations, the Department, as administrative agent for the Missouri Clean Water Commission, proposes to issue a permit(s) subject to certain effluent limitations, schedules, and special conditions contained herein and within the operating permit. The proposed determinations are tentative pending public comment.

PERMIT SYNCHRONIZATION:

Permits are normally issued on a five-year term, but to achieve watershed synchronization some permits will need to be issued for less than the full five years as allowed by regulation. The intent is all permits within a watershed will move through the Watershed Based Management (WBM) cycle together will all expire in the same fiscal year. <http://dnr.mo.gov/env/wpp/cpp/docs/watershed-based-management.pdf>. This will allow the Department to explore a watershed based permitting effort at some point in the future. Renewal applications must continue to be submitted within 180 days of expiration, however, in instances where effluent data from the previous renewal is less than two years old, such data may be re-submitted to meet the requirements of the renewal application. If the permit provides a schedule of compliance for meeting new water quality based effluent limits beyond the expiration date of the permit, the time remaining in the schedule of compliance will be allotted in the renewed permit.

✓ This permit will maintain synchronization by expiring in 5 years.

PUBLIC NOTICE:

The Department shall give public notice a draft permit has been prepared and its issuance is pending. Additionally, public notice will be issued if a public hearing is to be held because of a significant degree of interest in or with concerns related to a draft permit. No public notice is required when a request for a permit modification or termination is denied; however, the requester and facility must be notified of the denial in writing. <http://dnr.mo.gov/env/wpp/permits/pn/index.html> The Department must issue public notice of a pending operating permit. The public comment period is the length of time not less than 30 days following the date of the public notice which interested persons may submit written comments about the proposed permit.

For persons wishing to submit comments regarding this proposed operating permit, please refer to the Public Notice page located at the front of this draft operating permit. The Public Notice page gives direction on how and where to submit appropriate comments. All comments must be in written form.

- ✓ The Public Notice period for this operating permit started December 11, 2020 and ended January 11, 2021. No comments were received.
- ✓ Permitted feature #011 limit set Q was changed to QS; sample type was changed from “composite” to “calculation” for Plant Available Nitrogen.
- ✓ Table A-6 limit set OM was edited to change units of Application Rate from “inches” to “gallon per acre” and to add to Volume Applied “(Irrigated) Total” and added “(month total)” to clarify row component. Mg/kg is the same as PPM. Limit set AP measurement frequency was changed from annual to annual total.
- ✓ Formatting and pagination was completed after PN.

DATE OF FACT SHEET: JANUARY 12, 2021

COMPLETED BY:

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STANDARD CONDITIONS FOR NPDES PERMITS
ISSUED BY
THE MISSOURI DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION
REVISED
AUGUST 1, 2014

These Standard Conditions incorporate permit conditions as required by 40 CFR 122.41 or other applicable state statutes or regulations. These minimum conditions apply unless superseded by requirements specified in the permit.

Part I – General Conditions

Section A – Sampling, Monitoring, and Recording

1. **Sampling Requirements.**
 - a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
 - b. All samples shall be taken at the outfall(s) or Missouri Department of Natural Resources (Department) approved sampling location(s), and unless specified, before the effluent joins or is diluted by any other body of water or substance.
2. **Monitoring Requirements.**
 - a. Records of monitoring information shall include:
 - i. The date, exact place, and time of sampling or measurements;
 - ii. The individual(s) who performed the sampling or measurements;
 - iii. The date(s) analyses were performed;
 - iv. The individual(s) who performed the analyses;
 - v. The analytical techniques or methods used; and
 - vi. The results of such analyses.
 - b. If the permittee monitors any pollutant more frequently than required by the permit at the location specified in the permit using test procedures approved under 40 CFR Part 136, or another method required for an industry-specific waste stream under 40 CFR subchapters N or O, the results of such monitoring shall be included in the calculation and reported to the Department with the discharge monitoring report data (DMR) submitted to the Department pursuant to Section B, paragraph 7.
3. **Sample and Monitoring Calculations.** Calculations for all sample and monitoring results which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in the permit.
4. **Test Procedures.** The analytical and sampling methods used shall conform to the reference methods listed in 10 CSR 20-7.015 unless alternates are approved by the Department. The facility shall use sufficiently sensitive analytical methods for detecting, identifying, and measuring the concentrations of pollutants. The facility shall ensure that the selected methods are able to quantify the presence of pollutants in a given discharge at concentrations that are low enough to determine compliance with Water Quality Standards in 10 CSR 20-7.031 or effluent limitations unless provisions in the permit allow for other alternatives. A method is “sufficiently sensitive” when; 1) the method minimum level is at or below the level of the applicable water quality criterion for the pollutant or, 2) the method minimum level is above the applicable water quality criterion, but the amount of pollutant in a facility’s discharge is high enough that the method detects and quantifies the level of pollutant in the discharge, or 3) the method has the lowest minimum level of the analytical methods approved under 10 CSR 20-7.015. These methods are also required for parameters that are listed as monitoring only, as the data collected may be used to determine if limitations need to be established. A permittee is responsible for working with their contractors to ensure that the analysis performed is sufficiently sensitive.
5. **Record Retention.** Except for records of monitoring information required by the permit related to the permittee’s sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 40 CFR part 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by the permit, and records of all data used to complete the application for the permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Department at any time.

6. **Illegal Activities.**
 - a. The Federal Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under the permit shall, upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than two (2) years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than four (4) years, or both.
 - b. The Missouri Clean Water Law provides that any person or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained pursuant to sections 644.006 to 644.141 shall, upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than six (6) months, or by both. Second and successive convictions for violation under this paragraph by any person shall be punished by a fine of not more than \$50,000 per day of violation, or by imprisonment for not more than two (2) years, or both.

Section B – Reporting Requirements

1. **Planned Changes.**
 - a. The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility when:
 - i. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or
 - ii. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42;
 - iii. The alteration or addition results in a significant change in the permittee’s sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan;
 - iv. Any facility expansions, production increases, or process modifications which will result in a new or substantially different discharge or sludge characteristics must be reported to the Department 60 days before the facility or process modification begins. Notification may be accomplished by application for a new permit. If the discharge does not violate effluent limitations specified in the permit, the facility is to submit a notice to the Department of the changed discharge at least 30 days before such changes. The Department may require a construction permit and/or permit modification as a result of the proposed changes at the facility.
2. **Non-compliance Reporting.**
 - a. The permittee shall report any noncompliance which may endanger health or the environment. Relevant information shall be provided orally or via the current electronic method approved by the Department, within 24 hours from the time the permittee becomes aware of the circumstances, and shall be reported to the appropriate Regional Office during normal business hours or the Environmental Emergency Response hotline at 573-634-2436 outside of normal business hours. A written submission shall also be provided within five (5) business days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.



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- b. The following shall be included as information which must be reported within 24 hours under this paragraph.
 - i. Any unanticipated bypass which exceeds any effluent limitation in the permit.
 - ii. Any upset which exceeds any effluent limitation in the permit.
 - iii. Violation of a maximum daily discharge limitation for any of the pollutants listed by the Department in the permit required to be reported within 24 hours.
 - c. The Department may waive the written report on a case-by-case basis for reports under paragraph 2. b. of this section if the oral report has been received within 24 hours.
3. **Anticipated Noncompliance.** The permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. The notice shall be submitted to the Department 60 days prior to such changes or activity.
 4. **Compliance Schedules.** Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of the permit shall be submitted no later than 14 days following each schedule date. The report shall provide an explanation for the instance of noncompliance and a proposed schedule or anticipated date, for achieving compliance with the compliance schedule requirement.
 5. **Other Noncompliance.** The permittee shall report all instances of noncompliance not reported under paragraphs 2, 3, and 6 of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraph 2. a. of this section.
 6. **Other Information.** Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.
 7. **Discharge Monitoring Reports.**
 - a. Monitoring results shall be reported at the intervals specified in the permit.
 - b. Monitoring results must be reported to the Department via the current method approved by the Department, unless the permittee has been granted a waiver from using the method. If the permittee has been granted a waiver, the permittee must use forms provided by the Department.
 - c. Monitoring results shall be reported to the Department no later than the 28th day of the month following the end of the reporting period.
- b. Notice.
 - i. Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least 10 days before the date of the bypass.
 - ii. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Section B – Reporting Requirements, paragraph 5 (24-hour notice).
 - c. Prohibition of bypass.
 - i. Bypass is prohibited, and the Department may take enforcement action against a permittee for bypass, unless:
 1. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 2. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
 3. The permittee submitted notices as required under paragraph 2. b. of this section.
 - ii. The Department may approve an anticipated bypass, after considering its adverse effects, if the Department determines that it will meet the three (3) conditions listed above in paragraph 2. c. i. of this section.
3. **Upset Requirements.**
 - a. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph 3. b. of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
 - b. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - i. An upset occurred and that the permittee can identify the cause(s) of the upset;
 - ii. The permitted facility was at the time being properly operated; and
 - iii. The permittee submitted notice of the upset as required in Section B – Reporting Requirements, paragraph 2. b. ii. (24-hour notice).
 - iv. The permittee complied with any remedial measures required under Section D – Administrative Requirements, paragraph 4.
 - c. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

Section C – Bypass/Upset Requirements

1. **Definitions.**
 - a. *Bypass*: the intentional diversion of waste streams from any portion of a treatment facility, except in the case of blending.
 - b. *Severe Property Damage*: substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
 - c. *Upset*: an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
2. **Bypass Requirements.**
 - a. Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs 2. b. and 2. c. of this section.

Section D – Administrative Requirements

1. **Duty to Comply.** The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Missouri Clean Water Law and Federal Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.
 - a. The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Federal Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.
 - b. The Federal Clean Water Act provides that any person who violates section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any such sections in a permit issued under section 402, or any requirement imposed in a pretreatment program approved under sections 402(a)(3) or 402(b)(8) of the Act, is subject to a civil penalty not to exceed \$25,000 per day for each violation. The Federal Clean Water Act provides that any person who negligently violates sections 301, 302, 306, 307, 308, 318, or 405 of the Act, or any condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, or any requirement



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imposed in a pretreatment program approved under section 402(a)(3) or 402(b)(8) of the Act, is subject to criminal penalties of \$2,500 to \$25,000 per day of violation, or imprisonment of not more than one (1) year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than \$50,000 per day of violation, or by imprisonment of not more than two (2) years, or both. Any person who knowingly violates such sections, or such conditions or limitations is subject to criminal penalties of \$5,000 to \$50,000 per day of violation, or imprisonment for not more than three (3) years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than \$100,000 per day of violation, or imprisonment of not more than six (6) years, or both. Any person who knowingly violates section 301, 302, 303, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than \$250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than \$500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than \$1,000,000 and can be fined up to \$2,000,000 for second or subsequent convictions.

- c. Any person may be assessed an administrative penalty by the EPA Director for violating section 301, 302, 306, 307, 308, 318 or 405 of this Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed \$10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed \$25,000. Penalties for Class II violations are not to exceed \$10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed \$125,000.
 - d. It is unlawful for any person to cause or permit any discharge of water contaminants from any water contaminant or point source located in Missouri in violation of sections 644.006 to 644.141 of the Missouri Clean Water Law, or any standard, rule or regulation promulgated by the commission. In the event the commission or the director determines that any provision of sections 644.006 to 644.141 of the Missouri Clean Water Law or standard, rules, limitations or regulations promulgated pursuant thereto, or permits issued by, or any final abatement order, other order, or determination made by the commission or the director, or any filing requirement pursuant to sections 644.006 to 644.141 of the Missouri Clean Water Law or any other provision which this state is required to enforce pursuant to any federal water pollution control act, is being, was, or is in imminent danger of being violated, the commission or director may cause to have instituted a civil action in any court of competent jurisdiction for the injunctive relief to prevent any such violation or further violation or for the assessment of a penalty not to exceed \$10,000 per day for each day, or part thereof, the violation occurred and continues to occur, or both, as the court deems proper. Any person who willfully or negligently commits any violation in this paragraph shall, upon conviction, be punished by a fine of not less than \$2,500 nor more than \$25,000 per day of violation, or by imprisonment for not more than one year, or both. Second and successive convictions for violation of the same provision of this paragraph by any person shall be punished by a fine of not more than \$50,000 per day of violation, or by imprisonment for not more than two (2) years, or both.
2. **Duty to Reapply.**
- a. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit.
 - b. A permittee with a currently effective site-specific permit shall submit an application for renewal at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Department. (The Department shall not grant permission

for applications to be submitted later than the expiration date of the existing permit.)

- c. A permittee with currently effective general permit shall submit an application for renewal at least 30 days before the existing permit expires, unless the permittee has been notified by the Department that an earlier application must be made. The Department may grant permission for a later submission date. (The Department shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)
3. **Need to Halt or Reduce Activity Not a Defense.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
4. **Duty to Mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.
5. **Proper Operation and Maintenance.** The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.
6. **Permit Actions.**
- a. Subject to compliance with statutory requirements of the Law and Regulations and applicable Court Order, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:
 - i. Violations of any terms or conditions of this permit or the law;
 - ii. Having obtained this permit by misrepresentation or failure to disclose fully any relevant facts;
 - iii. A change in any circumstances or conditions that requires either a temporary or permanent reduction or elimination of the authorized discharge; or
 - iv. Any reason set forth in the Law or Regulations.
 - b. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.
7. **Permit Transfer.**
- a. Subject to 10 CSR 20-6.010, an operating permit may be transferred upon submission to the Department of an application to transfer signed by the existing owner and the new owner, unless prohibited by the terms of the permit. Until such time the permit is officially transferred, the original permittee remains responsible for complying with the terms and conditions of the existing permit.
 - b. The Department may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Missouri Clean Water Law or the Federal Clean Water Act.
 - c. The Department, within 30 days of receipt of the application, shall notify the new permittee of its intent to revoke or reissue or transfer the permit.
8. **Toxic Pollutants.** The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Federal Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the Federal Clean Water Act within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.
9. **Property Rights.** This permit does not convey any property rights of any sort, or any exclusive privilege.



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10. **Duty to Provide Information.** The permittee shall furnish to the Department, within a reasonable time, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Department upon request, copies of records required to be kept by this permit.
11. **Inspection and Entry.** The permittee shall allow the Department, or an authorized representative (including an authorized contractor acting as a representative of the Department), upon presentation of credentials and other documents as may be required by law, to:
 - a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;
 - b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
 - c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
 - d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Federal Clean Water Act or Missouri Clean Water Law, any substances or parameters at any location.
12. **Closure of Treatment Facilities.**
 - a. Persons who cease operation or plan to cease operation of waste, wastewater, and sludge handling and treatment facilities shall close the facilities in accordance with a closure plan approved by the Department.
 - b. Operating Permits under 10 CSR 20-6.010 or under 10 CSR 20-6.015 are required until all waste, wastewater, and sludges have been disposed of in accordance with the closure plan approved by the Department and any disturbed areas have been properly stabilized. Disturbed areas will be considered stabilized when perennial vegetation, pavement, or structures using permanent materials cover all areas that have been disturbed. Vegetative cover, if used, shall be at least 70% plant density over 100% of the disturbed area.
13. **Signatory Requirement.**
 - a. All permit applications, reports required by the permit, or information requested by the Department shall be signed and certified. (See 40 CFR 122.22 and 10 CSR 20-6.010)
 - b. The Federal Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six (6) months per violation, or by both.
 - c. The Missouri Clean Water Law provides that any person who knowingly makes any false statement, representation or certification in any application, record, report, plan, or other document filed or required to be maintained pursuant to sections 644.006 to 644.141 shall, upon conviction, be punished by a fine of not more than ten thousand dollars, or by imprisonment for not more than six months, or by both.
14. **Severability.** The provisions of the permit are severable, and if any provision of the permit, or the application of any provision of the permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of the permit, shall not be affected thereby.

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PART III – BIOSOLIDS AND SLUDGE FROM DOMESTIC TREATMENT FACILITIES

SECTION A – GENERAL REQUIREMENTS

1. PART III Standard Conditions pertain to biosolids and sludge requirements under the Missouri Clean Water Law and regulations for domestic and municipal wastewater and also incorporates federal sludge disposal requirements under 40 CFR Part 503 for domestic wastewater. The Environmental Protection Agency (EPA) has principal authority for permitting and enforcement of the federal sludge regulations under 40 CFR Part 503 for domestic biosolids and sludge.
2. PART III Standard Conditions apply only to biosolids and sludge generated at domestic wastewater treatment facilities, including public owned treatment works (POTW) and privately owned facilities.
3. Biosolids and Sludge Use and Disposal Practices:
 - a. The permittee is authorized to operate the biosolids and sludge generating, treatment, storage, use, and disposal facilities listed in the facility description of this permit.
 - b. The permittee shall not exceed the design sludge/biosolids volume listed in the facility description and shall not use biosolids or sludge disposal methods that are not listed in the facility description, without prior approval of the permitting authority.
 - c. For facilities operating under general operating permits that incorporate Standard Conditions PART III, the facility is authorized to operate the biosolids and sludge generating, treatment, storage, use and disposal facilities identified in the original operating permit application, subsequent renewal applications or subsequent written approval by the department.
4. Biosolids or Sludge Received from other Facilities:
 - a. Permittees may accept domestic wastewater biosolids or sludge from other facilities as long as the permittee's design sludge capacity is not exceeded and the treatment facility performance is not impaired.
 - b. The permittee shall obtain a signed statement from the biosolids or sludge generator or hauler that certifies the type and source of the sludge
5. Nothing in this permit precludes the initiation of legal action under local laws, except to the extent local laws are preempted by state law.
6. This permit does not preclude the enforcement of other applicable environmental regulations such as odor emissions under the Missouri Air Pollution Control Law and regulations.
7. This permit may (after due process) be modified, or alternatively revoked and reissued, to comply with any applicable biosolids or sludge disposal standard or limitation issued or approved under Section 405(d) of the Clean Water Act or under Chapter 644 RSMo.
8. In addition to Standard Conditions PART III, the Department may include biosolids and sludge limitations in the special conditions portion or other sections of a site specific permit.
9. Exceptions to Standard Conditions PART III may be authorized on a case-by-case basis by the Department, as follows:
 - a. The Department may modify a site-specific permit following permit notice provisions as applicable under 10 CSR 20-6.020, 40 CFR § 124.10, and 40 CFR § 501.15(a)(2)(ix)(E).
 - b. Exceptions cannot be granted where prohibited by the federal sludge regulations under 40 CFR Part 503.

SECTION B – DEFINITIONS

1. Best Management Practices are practices to prevent or reduce the pollution of waters of the state and include agronomic loading rates (nitrogen based), soil conservation practices, spill prevention and maintenance procedures and other site restrictions.
2. Biosolids means organic fertilizer or soil amendment produced by the treatment of domestic wastewater sludge.
3. Biosolids land application facility is a facility where biosolids are spread onto the land at agronomic rates for production of food, feed or fiber. The facility includes any structures necessary to store the biosolids until soil, weather, and crop conditions are favorable for land application.
4. Class A biosolids means a material that has met the Class A pathogen reduction requirements or equivalent treatment by a Process to Further Reduce Pathogens (PFRP) in accordance with 40 CFR Part 503.
5. Class B biosolids means a material that has met the Class B pathogen reduction requirements or equivalent treatment by a Process to Significantly Reduce Pathogens (PSRP) in accordance with 40 CFR Part 503.
6. Domestic wastewater means wastewater originating from the sanitary conveniences of residences, commercial buildings, factories and institutions; or co-mingled sanitary and industrial wastewater processed by a (POTW) or a privately owned facility.
7. Feed crops are crops produced primarily for consumption by animals.
8. Fiber crops are crops such as flax and cotton.
9. Food crops are crops consumed by humans which include, but is not limited to, fruits, vegetables and tobacco.
10. Industrial wastewater means any wastewater, also known as process wastewater, not defined as domestic wastewater. Per 40 CFR Part 122.2, process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product. Land application of industrial wastewater, residuals or sludge is not authorized by Standard Conditions PART III.
11. Mechanical treatment plants are wastewater treatment facilities that use mechanical devices to treat wastewater, including, sand filters, extended aeration, activated sludge, contact stabilization, trickling filters, rotating biological contact systems, and other similar facilities. It does not include wastewater treatment lagoons or constructed wetlands for wastewater treatment.
12. Plant Available Nitrogen (PAN) is nitrogen that will be available to plants during the growing seasons after biosolids application.
13. Public contact site is land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses.
14. Sludge is the solid, semisolid, or liquid residue removed during the treatment of wastewater. Sludge includes septage removed from septic tanks or equivalent facilities. Sludge does not include carbon coal byproducts (CCBs), sewage sludge incinerator ash, or grit/screenings generated during preliminary treatment of domestic sewage.
15. Sludge lagoon is part of a mechanical wastewater treatment facility. A sludge lagoon is an earthen or concrete lined basin that receives sludge that has been removed from a wastewater treatment facility. It does not include a wastewater treatment lagoon or sludge treatment units that are not a part of a mechanical wastewater treatment facility.
16. Septage is the sludge pumped from residential septic tanks, cesspools, portable toilets, Type III marine sanitation devices, or similar treatment works such as sludge holding structures from residential wastewater treatment facilities with design populations of less than 150 people. Septage does not include grease removed from grease traps at a restaurant or material removed from septic tanks and other similar treatment works that have received industrial wastewater. The standard for biosolids from septage is different from other sludges. See Section H for more information.

SECTION C – MECHANICAL WASTEWATER TREATMENT FACILITIES

1. Biosolids or sludge shall be routinely removed from wastewater treatment facilities and handled according to the permit facility description and the requirements of Standard Conditions PART III or in accordance with Section A.3.c., above.
2. The permittee shall operate storage and treatment facilities, as defined by Section 644.016(23), RSMo, so that there is no biosolids or sludge discharged to waters of the state. Agricultural storm water discharges are exempt under the provisions of Section 644.059, RSMo.
3. Mechanical treatment plants shall have separate biosolids or sludge storage compartments in accordance with 10 CSR 20, Chapter 8. Failure to remove biosolids or sludge from these storage compartments on the required design schedule is a violation of this permit.

SECTION D – BIOSOLIDS OR SLUDGE DISPOSED AT OTHER TREATMENT FACILITY OR BY CONTRACT HAULER

1. Permittees that use contract haulers, under the authority of their operating permit, to dispose of biosolids or sludge, are responsible for compliance with all the terms of this permit. Contract haulers that assume the responsibility of the final disposal of biosolids or sludge, including biosolids land application, must obtain a Missouri State Operating Permit unless the hauler transports the biosolids or sludge to another permitted treatment facility.
2. Testing of biosolids or sludge, other than total solids content, is not required if biosolids or sludge are hauled to a permitted wastewater treatment facility, unless it is required by the accepting facility.

SECTION E – INCINERATION OF SLUDGE

1. Please be aware that sludge incineration facilities may be subject to the requirements of 40 CFR Part 503 Subpart E, Missouri Air Conservation Commission regulations under 10 CSR 10, and solid waste management regulations under 10 CSR 80, as applicable.
2. Permittee may be authorized under the facility description of this permit to store incineration ash in lagoons or ash ponds. This permit does not authorize the disposal of incineration ash. Incineration ash shall be disposed in accordance with 10 CSR 80; or, if the ash is determined to be hazardous, with 10 CSR 25.
3. In addition to normal sludge monitoring, incineration facilities shall report the following as part of the annual report, mass of sludge incinerated and mass of ash generated. Permittee shall also provide the name of the ash disposal facility and permit number if applicable.

SECTION F – SURFACE DISPOSAL SITES AND BIOSOLIDS AND SLUDGE LAGOONS

1. Please be aware that surface disposal sites of biosolids or sludge from wastewater treatment facilities may be subject to other laws including the requirements in 40 CFR Part 503 Subpart C, Missouri Air Conservation Commission regulations under 10 CSR 10, and solid waste management regulations under 10 CSR 80, as applicable.
2. Biosolids or sludge storage lagoons are temporary facilities and are not required to obtain a permit as a solid waste management facility under 10 CSR 80. In order to maintain biosolids or sludge storage lagoons as storage facilities, accumulated biosolids or sludge must be removed routinely, but not less than once every two years unless an alternate schedule is approved in the permit. The amount of biosolids or sludge removed will be dependent on biosolids or sludge generation and accumulation in the facility. Enough biosolids or sludge must be removed to maintain adequate storage capacity in the facility.
 - a. In order to avoid damage to the lagoon seal during cleaning, the permittee may leave a layer of biosolids or sludge on the bottom of the lagoon, upon prior approval of the Department; or
 - b. Permittee shall close the lagoon in accordance with Section I.

SECTION G – LAND APPLICATION OF BIOSOLIDS

1. The permittee shall not land apply biosolids unless land application is authorized in the facility description, the special conditions of the issued NPDES permit, or in accordance with Section A.3.c., above.
2. This permit only authorizes “Class A” or “Class B” biosolids derived from domestic wastewater to be land applied onto grass land, crop land, timber, or other similar agricultural or silviculture lands at rates suitable for beneficial use as organic fertilizer and soil conditioner.
3. Class A Biosolids Requirements: Biosolids shall meet Class A requirements for application to public contact sites, residential lawns, home gardens or sold and/or given away in a bag or other container.
4. Class B biosolids that are land applied to agricultural and public contact sites shall comply with the following restrictions:
 - a. Food crops that touch the biosolids/soil mixture and are totally above the land surface shall not be harvested for 14 months after application of biosolids.
 - b. Food crops below the surface of the land shall not be harvested for 20 months after application of biosolids when the biosolids remain on the land surface for four months or longer prior to incorporation into the soil.
 - c. Food crops below the surface of the land shall not be harvested for 38 months after application of biosolids when the biosolids remain on the land surface for less than four months prior to incorporation into the soil.
 - d. Animal grazing shall not be allowed for 30 days after application of biosolids.
 - e. Food crops, feed crops, and fiber crops shall not be harvested for 30 days after application of biosolids.
 - f. Turf shall not be harvested for one year after application of biosolids if used for lawns or high public contact sites in close proximity to populated areas such as city parks or golf courses.
 - g. After Class B biosolids have been land applied to public contact sites with high potential for public exposure, as defined in 40 CFR § 503.31, such as city parks or golf courses, access must be restricted for 12 months.
 - h. After Class B biosolids have been land applied public contact sites with low potential for public exposure as defined in 40 CFR § 503.31, such as a rural land application or reclamation sites, access must be restricted for 30 days.
5. Pollutant limits
 - a. Biosolids shall be monitored to determine the quality for regulated pollutants listed in Table 1, below. Limits for any pollutants not listed below may be established in the permit.
 - b. The number of samples taken is directly related to the amount of biosolids or sludge produced by the facility (See Section J, below). Samples should be taken only during land application periods. When necessary, it is permissible to mix biosolids with lower concentrations of biosolids as well as other suitable Department approved material to achieve pollutant concentration below those identified in Table 1, below.
 - c. Table 1 gives the ceiling concentration for biosolids. Biosolids which exceed the concentrations in Table 1 may not be land applied.

TABLE 1

Biosolids ceiling concentration	
Pollutant	Milligrams per kilogram dry weight
Arsenic	75
Cadmium	85
Copper	4,300
Lead	840
Mercury	57
Molybdenum	75
Nickel	420
Selenium	100
Zinc	7,500

- d. Table 2 below gives the low metal concentration for biosolids. Because of its higher quality, biosolids with pollutant concentrations below those listed in Table 2 can safely be applied to agricultural land, forest, public contact sites, lawns, home gardens or be given away without further analysis. Biosolids containing metals in concentrations above the low metals concentrations but below the ceiling concentration limits may be land applied but shall not exceed the annual loading rates in Table 3 and the cumulative loading rates in Table 4. The permittee is required to track pollutant loading onto application sites for parameters that have exceeded the low metal concentration limits.

TABLE 2

Biosolids Low Metal Concentration	
Pollutant	Milligrams per kilogram dry weight
Arsenic	41
Cadmium	39
Copper	1,500
Lead	300
Mercury	17
Nickel	420
Selenium	100
Zinc	2,800

- e. Annual pollutant loading rate.

Table 3

Biosolids Annual Loading Rate	
Pollutant	Kg/ha (lbs./ac) per year
Arsenic	2.0 (1.79)
Cadmium	1.9 (1.70)
Copper	75 (66.94)
Lead	15 (13.39)
Mercury	0.85 (0.76)
Nickel	21 (18.74)
Selenium	5.0 (4.46)
Zinc	140 (124.96)

- f. Cumulative pollutant loading rates.

Table 4

Biosolids Cumulative Pollutant Loading Rate	
Pollutant	Kg/ha (lbs./ac)
Arsenic	41 (37)
Cadmium	39 (35)
Copper	1500 (1339)
Lead	300 (268)
Mercury	17 (15)
Nickel	420 (375)
Selenium	100 (89)
Zinc	2800 (2499)

6. Best Management Practices. The permittee shall use the following best management practices during land application activities to prevent the discharge of biosolids to waters of the state.
- Biosolids shall not be applied to the land if it is likely to adversely affect a threatened or endangered species listed under § 4 of the Endangered Species Act or its designated critical habitat.
 - Apply biosolids only at the agronomic rate of nitrogen needed (see 5.c. of this section).
 - The applicator must document the Plant Available Nitrogen (PAN) loadings, available nitrogen in the soil, and crop

nitrogen removal when either of the following occurs: 1) When biosolids are greater than 50,000 mg/kgTN; or 2) When biosolids are land applied at an application rate greater than two dry tons per acre per year.

- i. PAN can be determined as follows:
(Nitrate + nitrite nitrogen) + (organic nitrogen x 0.2) + (ammonia nitrogen x volatilization factor¹).
¹ Volatilization factor is 0.7 for surface application and 1 for subsurface application. Alternative volatilization factors and mineralization rates can be utilized on a case-by-case basis.
 - ii. Crop nutrient production/removal to be based on crop specific nitrogen needs and realistic yield goals. **NOTE:** There are a number of reference documents on the Missouri Department of Natural Resources website that are informative to implement best management practices in the proper management of biosolids, including crop specific nitrogen needs, realistic yields on a county by county basis and other supporting references.
 - iii. Biosolids that are applied at agronomic rates shall not cause the annual pollutant loading rates identified in Table 3 to be exceeded.
- d. Buffer zones are as follows:
- i. 300 feet of a water supply well, sinkhole, water supply reservoir or water supply intake in a stream;
 - ii. 300 feet of a losing stream, no discharge stream, stream stretches designated for whole body contact recreation, wild and scenic rivers, Ozark National Scenic Riverways or outstanding state resource waters as listed in the Water Quality Standards, 10 CSR 20-7.031;
 - iii. 150 feet of dwellings or public use areas;
 - iv. 100 feet (35 feet if biosolids application is down-gradient or the buffer zone is entirely vegetated) of lake, pond, wetlands or gaining streams (perennial or intermittent);
 - v. 50 feet of a property line. Buffer distances from property lines may be waived with written permission from neighboring property owner.
 - vi. For the application of dry, cake or liquid biosolids that are subsurface injected, buffer zones identified in 5.d.i. through 5.d.iii above, may be reduced to 100 feet. The buffer zone may be reduced to 35 feet if the buffer zone is permanently vegetated. Subsurface injection does not include methods or technology reflective of combination surface/shallow soil incorporation.
- e. Slope limitation for application sites are as follows:
- i. For slopes less than or equal to 6 percent, no rate limitation;
 - ii. Applied to a slope 7 to 12 percent, the applicator may apply biosolids when soil conservation practices are used to meet the minimum erosion levels;
 - iii. Slopes > 12 percent, apply biosolids only when grass is vegetated and maintained with at least 80 percent ground cover at a rate of two dry tons per acre per year or less.
 - iv. Dry, cake or liquid biosolids that are subsurface injected, may be applied on slopes not to exceed 20 percent. Subsurface injection does not include the use of methods or technology reflective of combination surface/shallow soil incorporation.
- f. No biosolids may be land applied in an area that it is reasonably certain that pollutants will be transported into waters of the state.
- g. Biosolids may be land applied to sites with soil that are snow covered, frozen, or saturated with liquid when site restrictions or other controls are provided to prevent pollutants from being discharged to waters of the state during snowmelt or stormwater runoff. During inclement weather or unfavorable soil conditions use the following management practices:
- i. A maximum field slope of 6% and a minimum 300 feet grass buffer between the application site and waters of the state. A 35 feet grass buffer may be utilized for the application of dry, cake or liquid biosolids that are subsurface injected. Subsurface injection does not include the use of methods or technology reflective of combination surface/shallow soil incorporation;
 - ii. A maximum field slope of 2% and 100 feet grass buffer between the application site and waters of the state. A 35 feet grass buffer may be used for the application of dry, cake or liquid biosolids that are subsurface injected. Subsurface injection does not include the use of methods or technology reflective of combination surface/shallow soil incorporation;
 - iii. Other best management practices approved by the Department.

SECTION H – SEPTAGE

1. Haulers that land apply septage must obtain a state permit. An operating permit is not required for septage haulers who transport septage to another permitted treatment facility for disposal.
2. Do not apply more than 30,000 gallons of septage per acre per year or the volume otherwise stipulated in the operating permit.
3. Septic tanks are designed to retain sludge for one to three years which will allow for a larger reduction in pathogens and vectors, as compared to mechanical treatment facilities.
4. Septage must comply with Class B biosolids regarding pathogen and vector attraction reduction requirements before it may be applied to crops, pastures or timberland. To meet required pathogen and vector reduction requirements, mix 50 pounds of hydrated lime for every 1,000 gallons of septage and maintain a septage pH of at least 12 pH standard units for 30 minutes or more prior to application.
5. Lime is to be added to the pump truck and not directly to the septic tanks, as lime would harm the beneficial bacteria of the septic tank.
6. As residential septage contains relatively low levels of metals, the testing of metals in septage is not required.

SECTION I– CLOSURE REQUIREMENTS

1. This section applies to all wastewater facilities (mechanical and lagoons) and sludge or biosolids storage and treatment facilities. It does not apply to land application sites.
2. Permittees of a domestic wastewater facility who plan to cease operation must obtain Department approval of a closure plan which addresses proper removal and disposal of all sludges and/or biosolids. Permittee must maintain this permit until the facility is closed in accordance with the approved closure plan per 10 CSR 20 – 6.010 and 10 CSR 20 – 6.015.
3. Biosolids or sludge that are left in place during closure of a lagoon or earthen structure or ash pond shall not exceed the agricultural loading rates as follows:
 - a. Biosolids and sludge shall meet the monitoring and land application limits for agricultural rates as referenced in Section G, above.
 - b. If a wastewater treatment lagoon has been in operation for 15 years or more without sludge removal, the sludge in the lagoon qualifies as a Class B biosolids with respect to pathogens due to anaerobic digestion, and testing for fecal coliform is not required. For other lagoons, testing for fecal coliform is required to show compliance with Class B biosolids limitations. In order to reach Class B biosolids requirements, fecal coliform must be less than 2,000,000 colony forming units or 2,000,000 most probable number. All fecal samples must be presented as geometric mean per gram.
 - c. The allowable nitrogen loading that may be left in the lagoon shall be based on the plant available nitrogen (PAN) loading. For a grass cover crop, the allowable PAN is 300 pounds/acre. Alternative, site-specific application rates may be included in the closure plan for department consideration.
 - i. PAN can be determined as follows:
$$(\text{Nitrate} + \text{nitrite nitrogen}) + (\text{organic nitrogen} \times 0.2) + (\text{ammonia nitrogen} \times \text{volatilization factor}^1).$$
¹ Volatilization factor is 0.7 for surface application and 1 for subsurface application. Alternative volatilization factors and mineralization rates can be utilized on a case-by-case basis.
4. Domestic wastewater treatment lagoons with a design treatment capacity less than or equal to 150 persons, are “similar treatment works” under the definition of septage. Therefore the sludge within the lagoons may be treated as septage during closure activities. See Section B, above. Under the septage category, residuals may be left in place as follows:
 - a. Testing for metals or fecal coliform is not required.
 - b. If the wastewater treatment lagoon has been in use for less than 15 years, mix lime with the sludge at a rate of 50 pounds of hydrated lime per 1000 gallons (134 cubic feet) of sludge.
 - c. The amount of sludge that may be left in the lagoon shall be based on the plant available nitrogen (PAN) loading. 100 dry tons/acre of sludge may be left in the basin without testing for nitrogen. If 100 dry tons/acre or more will be left in the lagoon, test for nitrogen and determine the PAN using the calculation above. Allowable PAN loading is 300 pounds/acre.
5. Biosolids or sludge left within the domestic lagoon shall be mixed with soil on at least a 1 to 1 ratio, and unless otherwise approved, the lagoon berm shall be demolished, and the site shall be graded and contain $\geq 70\%$ vegetative density over 100% of the site so as to avoid ponding of storm water and provide adequate surface water drainage without creating erosion. Alternative biosolids or sludge and soil mixing ratios may be included in the closure plan for department consideration.
6. Lagoon and earthen structure closure activities shall obtain a storm water permit for land disturbance activities that equal or exceed one acre in accordance with 10 CSR 20-6.200.
7. When closing a mechanical wastewater plant, all biosolids or sludge must be cleaned out and disposed of in accordance with the Department approved closure plan before the permit for the facility can be terminated.
 - a. Land must be stabilized which includes any grading, alternate use or fate upon approval by the Department, remediation, or other work that exposes sediment to stormwater per 10 CSR 20-6.200. The site shall be graded and contain $\geq 70\%$ vegetative density over 100% of the site, so as to avoid ponding of storm water and provide adequate

- surface water drainage without creating erosion.
- b. Hazardous Waste shall not be land applied or disposed during mechanical plant closures unless in accordance with Missouri Hazardous Waste Management Law and Regulations pursuant to 10 CSR 25.
 - c. After demolition of the mechanical plant, the site must only contain clean fill defined in Section 260.200.1(6) RSMo as uncontaminated soil, rock, sand, gravel, concrete, asphaltic concrete, cinderblocks, brick, minimal amounts of wood and metal, and inert solids as approved by rule or policy of the Department for fill, reclamation, or other beneficial use. Other solid wastes must be removed.
8. If biosolids or sludge from the domestic lagoon or mechanical treatment plant exceeds agricultural rates under Section G and/or I, a landfill permit or solid waste disposal permit must be obtained if the permittee chooses to seek authorization for on-site sludge disposal under the Missouri Solid Waste Management Law and regulations per 10 CSR 80, and the permittee must comply with the surface disposal requirements under 40 CFR Part 503, Subpart C.

SECTION J – MONITORING FREQUENCY

1. At a minimum, biosolids or sludge shall be tested for volume and percent total solids on a frequency that will accurately represent sludge quantities produced and disposed. Please see the table below.

TABLE 5

Biosolids or Sludge produced and disposed (Dry Tons per Year)	Monitoring Frequency (See Notes 1, and 2)		
	Metals, Pathogens and Vectors, Total Phosphorus, Total Potassium	Nitrogen TKN, Nitrogen PAN ¹	Priority Pollutants ²
319 or less	1/year	1 per month	1/year
320 to 1650	4/year	1 per month	1/year
1651 to 16,500	6/year	1 per month	1/year
16,501+	12/year	1 per month	1/year

¹ Calculate plant available nitrogen (PAN) when either of the following occurs: 1) when biosolids are greater than 50,000 mg/kg TN; or 2) when biosolids are land applied at an application rate greater than two dry tons per acre per year.

² Priority pollutants (40 CFR 122.21, Appendix D, Tables II and III) are required only for permit holders that must have a pre-treatment program. Monitoring requirements may be modified and incorporated into the operating permit by the Department on a case-by-case basis.

Note 1: Total solids: A grab sample of sludge shall be tested one per day during land application periods for percent total solids. This data shall be used to calculate the dry tons of sludge applied per acre.

Note 2: Table 5 is not applicable for incineration and permit holders that landfill their sludge.

2. Permittees that operate wastewater treatment lagoons, peak flow equalization basins, combined sewer overflow basins or biosolids or sludge lagoons that are cleaned out once a year or less, may choose to sample only when the biosolids or sludge is removed or the lagoon is closed. Test one composite sample for each 319 dry tons of biosolids or sludge removed from the lagoon during the reporting year or during lagoon closure. Composite sample must represent various areas at one-foot depth.
3. Additional testing may be required in the special conditions or other sections of the permit.
4. Biosolids and sludge monitoring shall be conducted in accordance with federal regulation 40 CFR § 503.8, Sampling and analysis.

SECTION K – RECORD KEEPING AND REPORTING REQUIREMENTS

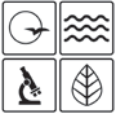
1. The permittee shall maintain records on file at the facility for at least five years for the items listed in Standard Conditions PART III and any additional items in the Special Conditions section of this permit. This shall include dates when the biosolids or sludge facility is checked for proper operation, records of maintenance and repairs and other relevant information.
2. Reporting period
 - a. By February 19th of each year, applicable facilities shall submit an annual report for the previous calendar year period for all mechanical wastewater treatment facilities, sludge lagoons, and biosolids or sludge disposal facilities.
 - b. Permittees with wastewater treatment lagoons shall submit the above annual report only when biosolids or sludge are removed from the lagoon during the report period or when the lagoon is closed.
3. Report Form. The annual report shall be prepared on report forms provided by the Department or equivalent forms approved by the Department.
4. Reports shall be submitted as follows:
Major facilities, which are those serving 10,000 persons or more or with a design flow equal to or greater than 1 million gallons per day or that are required to have an approved pretreatment program, shall report to both the Department and EPA if the facility land applied, disposed of biosolids by surface disposal, or operated a sewage sludge incinerator. All other facilities shall maintain their biosolids or sludge records and keep them available to Department personnel upon request. State reports shall be submitted to the address listed as follows:

DNR regional or other applicable office listed in the
permit (see cover letter of permit)
ATTN: Sludge Coordinator

Reports to EPA must be electronically submitted online via the Central Data Exchange at: <https://cdx.epa.gov/> Additional information is available at: <https://www.epa.gov/biosolids/compliance-and-annual-reporting-guidance-about-clean-water-act-laws>

5. Annual report contents. The annual report shall include the following:
 - a. Biosolids and sludge testing performed. If testing was conducted at a greater frequency than what is required by the permit, all test results must be included in the report.
 - b. Biosolids or sludge quantity shall be reported as dry tons for the quantity produced and/or disposed.
 - c. Gallons and % solids data used to calculate the dry ton amounts.
 - d. Description of any unusual operating conditions.
 - e. Final disposal method, dates, and location, and person responsible for hauling and disposal.
 - i. This must include the name and address for the hauler and sludge facility. If hauled to a municipal wastewater treatment facility, sanitary landfill, or other approved treatment facility, give the name of that facility.
 - ii. Include a description of the type of hauling equipment used and the capacity in tons, gallons, or cubic feet.
 - f. Contract Hauler Activities:

If using a contract hauler, provide a copy of a signed contract from the contractor. Permittee shall require the contractor to supply information required under this permit for which the contractor is responsible. The permittee shall submit a signed statement from the contractor that he has complied with the standards contained in this permit, unless the contract hauler has a separate biosolids or sludge use permit.
 - g. Land Application Sites:
 - i. Report the location of each application site, the annual and cumulative dry tons/acre for each site, and the landowners name and address. The location for each spreading site shall be given as a legal description for nearest ¼, ¼, Section, Township, Range, and county, or UTM coordinates. The facility shall report PAN when either of the following occurs: 1) When biosolids are greater than 50,000 mg/kg TN; or 2) when biosolids are land applied at an application rate greater than two dry tons per acre per year.
 - ii. If the “Low Metals” criteria are exceeded, report the annual and cumulative pollutant loading rates in pounds per acre for each applicable pollutant, and report the percent of cumulative pollutant loading which has been reached at each site.
 - iii. Report the method used for compliance with pathogen and vector attraction requirements.
 - iv. Report soil test results for pH and phosphorus. If no soil was tested during the year, report the last date when tested and the results.



MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
**FORM A – APPLICATION FOR NONDOMESTIC PERMIT UNDER MISSOURI
CLEAN WATER LAW**

FOR AGENCY USE ONLY

CHECK NUMBER

DATE RECEIVED

FEE SUBMITTED

JET PAY CONFIRMATION NUMBER

**PLEASE READ ALL THE ACCOMPANYING INSTRUCTIONS BEFORE COMPLETING THIS FORM.
SUBMITTAL OF AN INCOMPLETE APPLICATION MAY RESULT IN THE APPLICATION BEING RETURNED.**

IF YOUR FACILITY IS ELIGIBLE FOR A NO EXPOSURE EXEMPTION:

Fill out the No Exposure Certification Form (Mo 780-2828): <https://dnr.mo.gov/forms/780-2828-f.pdf>

1. REASON FOR APPLICATION:

- ☐ a. This facility is now in operation under Missouri State Operating Permit (permit) MO – _____, is submitting an application for renewal, and there is no proposed increase in design wastewater flow. Annual fees will be paid when invoiced and there is no additional permit fee required for renewal.
- ☐ b. This facility is now in operation under permit MO – _____, is submitting an application for renewal, and there is a proposed increase in design wastewater flow. Antidegradation Review may be required. Annual fees will be paid when invoiced and there is no additional permit fee required for renewal.
- ☐ c. This is a facility submitting an application for a new permit (for a new facility). Antidegradation Review may be required. New permit fee is required.
- ☐ d. This facility is now in operation under Missouri State Operating Permit (permit) MO – _____ and is requesting a modification to the permit. Antidegradation Review may be required. Modification fee is required.

2. FACILITY

NAME		TELEPHONE NUMBER WITH AREA CODE	
ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE

3. OWNER

NAME		TELEPHONE NUMBER WITH AREA CODE	
EMAIL ADDRESS			
ADDRESS (MAILING)	CITY	STATE	ZIP CODE

4. CONTINUING AUTHORITY

NAME		TELEPHONE NUMBER WITH AREA CODE	
EMAIL ADDRESS			
ADDRESS (MAILING)	CITY	STATE	ZIP CODE

5. OPERATOR CERTIFICATION

NAME	CERTIFICATE NUMBER	TELEPHONE NUMBER WITH AREA CODE	
ADDRESS (MAILING)	CITY	STATE	ZIP CODE

6. FACILITY CONTACT

NAME	TITLE	TELEPHONE NUMBER WITH AREA CODE	
E-MAIL ADDRESS			

7. DOWNSTREAM LANDOWNER(S) Attach additional sheets as necessary.

NAME			
ADDRESS	CITY	STATE	ZIP CODE

8. ADDITIONAL FACILITY INFORMATION**8.1 Legal Description of Outfalls. (Attach additional sheets if necessary.)***For Universal Transverse Mercator (UTM), use Zone 15 North referenced to North American Datum 1983 (NAD83)*

001 W $\frac{1}{4}$ NW $\frac{1}{4}$ Sec 23 T 46N R 22W Pettis _____ County
UTM Coordinates Easting (X): 472533 Northing (Y): 4289606
002 NE $\frac{1}{4}$ SE $\frac{1}{4}$ Sec 22 T 46N R 22W Pettis _____ County
UTM Coordinates Easting (X): 472268 Northing (Y): 4289058
003 NE $\frac{1}{4}$ SE $\frac{1}{4}$ Sec 22 T 46N R 22W Pettis _____ County
UTM Coordinates Easting (X): 472212 Northing (Y): 4289027
004 SW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec 22 T 46N R 22W Pettis _____ County
UTM Coordinates Easting (X): 472019 Northing (Y): 428889

8.2 Primary Standard Industrial Classification (SIC) and Facility North American Industrial Classification System (NAICS) Codes.

Primary SIC 2015 and NAICS 311615 SIC 2077 and NAICS 31163
SIC _____ and NAICS _____ SIC _____ and NAICS _____

9. ADDITIONAL FORMS AND MAPS NECESSARY TO COMPLETE THIS APPLICATION

- A. Is this permit for a manufacturing, commercial, mining, solid/hazardous waste, or silviculture facility? YES ☒ NO ☐
If yes, complete Form C.
- B. Is the facility considered a "Primary Industry" under EPA guidelines (40 CFR Part 122, Appendix A): YES ☐ NO ☒
If yes, complete Forms C and D.
- C. Is wastewater land applied? YES ☐ NO ☒
If yes, complete Form I.
- D. Are sludge, biosolids, ash, or residuals generated, treated, stored, or land applied? YES ☒ NO ☐
If yes, complete Form R.
- E. Have you received or applied for any permit or construction approval under the CWA or any other environmental regulatory authority? YES ☒ NO ☐
If yes, please include a list of all permits or approvals for this facility.
- F. Do you use cooling water in your operations at this facility? YES ☐ NO ☒
If yes, please indicate the source of the water: _____
- G. Attach a map showing all outfalls and the receiving stream at 1" = 2,000' scale.

10. ELECTRONIC DISCHARGE MONITORING REPORT (eDMR) SUBMISSION SYSTEM

Per 40 CFR Part 127 National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, reporting of effluent limits and monitoring shall be submitted by the permittee via an electronic system to ensure timely, complete, accurate, and nationally consistent set of data. **One of the following must be checked in order for this application to be considered complete.** Please visit <http://dnr.mo.gov/env/wpp/edmr.htm> to access the Facility Participation Package.

- ☐ - You have completed and submitted with this permit application the required documentation to participate in the eDMR system.
- ☒ - You have previously submitted the required documentation to participate in the eDMR system and/or you are currently using the eDMR system.
- ☐ - You have submitted a written request for a waiver from electronic reporting. See instructions for further information regarding waivers.

11. FEES

Permit fees may be paid by attaching a check, or online by credit card or eCheck through the JetPay system. Use the URL provided to access JetPay and make an online payment: <https://magic.collectorsolutions.com/magic-ui/payments/mo-natural-resources/>

12. CERTIFICATION

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

NAME AND OFFICIAL TITLE (TYPE OR PRINT)

Alan Johnston

SIGNATURE



TELEPHONE NUMBER WITH AREA CODE

660-827-8503

DATE SIGNED

4/1/20

FORM A
Section 7.0
Downstream Landowners

A- Victor Gottschalk
23226 Gottschalk Rd.
Sedalia, MO 65301

B- Dorothy Bundy
Nomah D Peters
19 Clemens Ave
Jamestown, OH 45335

FORM A

Sec. 8.1

Legal Description of Outfalls

Outfall #001 – W 1/4, NW 1/4, Sec. 23, T46N, R22W, Pettis County
X = 472533, Y = 4289606

Outfall #002 – NE 1/4, SE 1/4, Sec. 22, T46N, R22W, Pettis County
X = 472268, Y = 4289058

Outfall #003 - NE 1/4, SE 1/4, Sec. 22, T46N, R22W, Pettis County
X = 472212, Y = 4289027

Outfall #004 – SW 1/4, SE 1/4, Sec. 22, T46N, R22W, Pettis County
X = 472019, Y = 4288889

Outfall #008 – SE 1/4, NE 1/4, Sec. 22, T46N, R22W, Pettis County
X = 472346, Y = 4289360

Outfall SM1 - Background Ambient Temperature Measurement Point:
SE 1/4, SW 1/4, Sec. 12, T46N, R22W, Pettis County
X = 474696, Y = 4291671

Outfall SM2 - Temperature Compliance Point:
NE 1/4, NW 1/4, Sec. 13, T46, R22W, Pettis County
X = 474721, Y 4291627

FORM A
Sec. 9 E
Construction Permit

The Tyson Poultry Inc. – Sedalia Processing Plant will be submitting a construction permit application for installation of a 2.5 acre cooling pond to allow time for treated wastewater discharged from Outfall 001 to warm or cool passively and through mechanical aeration and/or mixing as needed to meet future Operating Permit temperature requirements. The Facility Plan was been approved by the Department and the application is currently being prepared for submittal.

Map center is UTM 15 472100E 4290027N (WGS84/NAD83)
Hughesville quadrangle
 Projection is UTM Zone 15 NAD83 Datum

$M = 2.162$
 $G = -0.201$



MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH
**FORM C – APPLICATION FOR DISCHARGE PERMIT – MANUFACTURING, COMMERCIAL,
MINING, SILVICULTURE OPERATIONS, AND STORMWATER**

GENERAL INFORMATION (PLEASE SEE INSTRUCTIONS)

1.0 NAME OF FACILITY

1.1 THIS FACILITY IS OPERATING UNDER MISSOURI STATE OPERATING PERMIT (MSOP) NUMBER:

1.2 IS THIS A NEW FACILITY? PROVIDE CONSTRUCTION PERMIT (CP) NUMBER IF APPLICABLE.

1.3 Describe the nature of the business, in detail. Identify the goods and services provided by the business. Include descriptions of all raw, intermediate, final products, byproducts, or waste products used in the production or manufacturing process, stored outdoors, loaded or transferred and any other pertinent information for potential sources of wastewater or stormwater discharges.

FLOWS, TYPE, AND FREQUENCY

2.0 Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in item B. Construct a water balance on the line drawing by showing average and maximum flows between intakes, operations, treatment units, evaporation, public sewers, and outfalls. If a water balance cannot be determined (e.g., for certain mining activities), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

2.1 For each outfall (1) below, provide: (2) a description of all operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, stormwater runoff, and any other process or non-process wastewater, (3) the average flow and maximum flow (put max in parentheses) contributed by each operation and the sum of those operations, (4) the treatment received by the wastewater, and (5) the treatment type code. Continue on additional sheets if necessary.

1. OUTFALL NO.	2. OPERATION(S) CONTRIBUTING FLOW; INCLUDE ALL PROCESSES AND SUB PROCESSES AT EACH OUTFALL	3. AVERAGE FLOW AND (MAXIMUM FLOW), INCLUDE UNITS.	4. TREATMENT DESCRIPTION	5. TREATMENT CODES FROM TABLE A

Attach additional pages if necessary.

2.2 INTERMITTENT DISCHARGES

Except for stormwater runoff, leaks, or spills, are any of the discharges described in items 2.0 or 2.1 intermittent or seasonal?

☐ Yes (complete the following table)

☐ No (go to section 2.3)

1. OUTFALL NUMBER	2. OPERATION(S) CONTRIBUTING FLOW	3. FREQUENCY		4. FLOW				C. DURATION (in days)
				A. FLOW RATE (in mgd)		B. TOTAL VOLUME (specify with units)		
		A. DAYS PER WEEK (specify average)	B. MONTHS PER YEAR (specify average)	1. MAXIMUM DAILY	2. LONG TERM AVERAGE	4. LONG TERM DAILY	3. MAXIMUM AVERAGE	

2.3 PRODUCTION

A. Does an effluent limitation guideline (ELG) promulgated by EPA under section 304 of the Clean Water Act apply to your facility? Indicate the part and subparts applicable.

☐ Yes 40 CFR _____ Subpart(s) _____ ☐ No (go to section 2.5)

B. Are the limitations in the effluent guideline(s) expressed in terms of production (or other measure of operation)? Describe in C below.

☐ Yes (complete C.) ☐ No (go to section 2.5)

C. If you answered "yes" to B, list the quantity representing an actual measurement of your maximum level of production, expressed in the terms and units used in the applicable effluent guideline and indicate the affected outfalls.

A. OUTFALL(S)	B. QUANTITY PER DAY	C. UNITS OF MEASURE	D. OPERATION, PRODUCT, MATERIAL, ETC. (specify)

2.4 IMPROVEMENTS

A. Are you required by any federal, state, or local authority to meet any implementation schedule for the construction, upgrading, or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

☐ Yes (complete the following table) ☐ No (go to 2.6)

1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC.	2. AFFECTED OUTFALLS	3. BRIEF DESCRIPTION OF PROJECT	4. FINAL COMPLIANCE DATE	
			A. REQUIRED	B. PROJECTED

B. Optional: provide below or attach additional sheets describing water pollution control programs or other environmental projects which may affect discharges. Indicate whether each program is underway or planned, and indicate actual or planned schedules for construction. This may include proposed bmp projects for stormwater.

2.5 SLUDGE MANAGEMENT

Describe the removal of any industrial or domestic biosolids or sludges generated at your facility. Include names and contact information for any haulers used. Note the frequency, volume, and methods (incineration, landfilling, composting, etc) used. See Form A for additional forms which may need to be completed.

DATA COLLECTION AND REPORTING REQUIREMENTS FOR APPLICANTS

3.0 EFFLUENT (AND INTAKE) CHARACTERISTICS (SEE INSTRUCTIONS)

A. & B. See instructions before continuing – complete one Table 1 for **each outfall** (and intake) – annotate the outfall (intake) number or designation in the space provided. The facility is not required to complete intake data unless required by the department or rule.

C. Use the space below to list any pollutants listed in the instructions section 3.0 C. Table B which you know or have reason to believe is discharged or may be discharged from any outfall not listed in parts 3.0 A or B on Table 1. For every pollutant listed, briefly describe the reasons you believe it to be present and report any analytical data in your possession.

1. POLLUTANT	2. SOURCE	3. OUTFALL(S)	4. ANALYTICAL RESULTS (INCLUDE UNITS)

3.1 Whole Effluent Toxicity Testing

A. To your knowledge, have any Whole Effluent Toxicity (WET) tests been performed on the facility discharges (or on receiving waters in relation to your discharge) within the last three years?

☐ Yes (go to 3.1 B)

☐ No (go to 3.2)

3.1 B


Disclose wet testing conditions, including test duration (chronic or acute), the organisms tested, and the testing results. Provide any results of toxicity identification evaluations (TIE) or toxicity reduction evaluations (TRE) if applicable. Please indicate the conclusions of the test(s) including any pollutants identified as causing toxicity and steps the facility is taking to remedy the toxicity.

3.2 CONTRACT ANALYSIS INFORMATION

Were any of the analyses reported herein, above, or on Table 1 performed by a contract laboratory or consulting firm?

☐ Yes (list the name, address, telephone number, and pollutants analyzed by each laboratory or firm.) ☐ No (go to 4.0)

A. LAB NAME	B. ADDRESS	C. TELEPHONE (area code and number)	D. POLLUTANTS ANALYZED (list or group)

4.0 STORMWATER			
4.1 Do you have industrial stormwater discharges from the site? If so, attach a site map outlining drainage areas served by each outfall. Indicate the following attributes within each drainage area: pavement or other impervious surfaces; buildings; outdoor storage areas; material loading and unloading areas; outdoor industrial activities; structural stormwater control measures; hazardous waste treatment, storage, and disposal units; and wells or springs in the area.			
OUTFALL NUMBER	TOTAL AREA DRAINED (PROVIDE UNITS)	TYPES OF SURFACES (VEGETATED, STONE, PAVED, ETC)	BEST MANAGEMENT PRACTICES EMPLOYED; INCLUDE STRUCTURAL BMPS AND TREATMENT DESIGN FLOW FOR BMPS DESCRIBE HOW FLOW IS MEASURED
002	13 aces	Vegetated, Paved	Good housekeeping, Inspections, PMs, Erosion Control, Spill Prevention
003	6 aces	Paved	and Response, Management of Runoff
004	17 acres	Paved, Vegetated, Roof	
008	2.5 acres	Paved	
4.2 STORMWATER FLOWS Provide the date of sampling with the flows, and how the flows were estimated. Flows are estimated using the rain fall amount and associated surface area. See attached.			
SIGNATORY REQUIREMENTS			
5.0 CERTIFICATION I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.			
NAME AND OFFICIAL TITLE (TYPE OR PRINT)			TELEPHONE NUMBER WITH AREA CODE
Alan Johnston			660-827-8503
SIGNATURE (SEE INSTRUCTIONS)			DATE SIGNED
			4/1/2020

SEE INSTRUCTIONS; PLEASE PRINT OR TYPE.

 You may report some or all of this information on separate sheet *(use similar format)* instead of completing these pages.

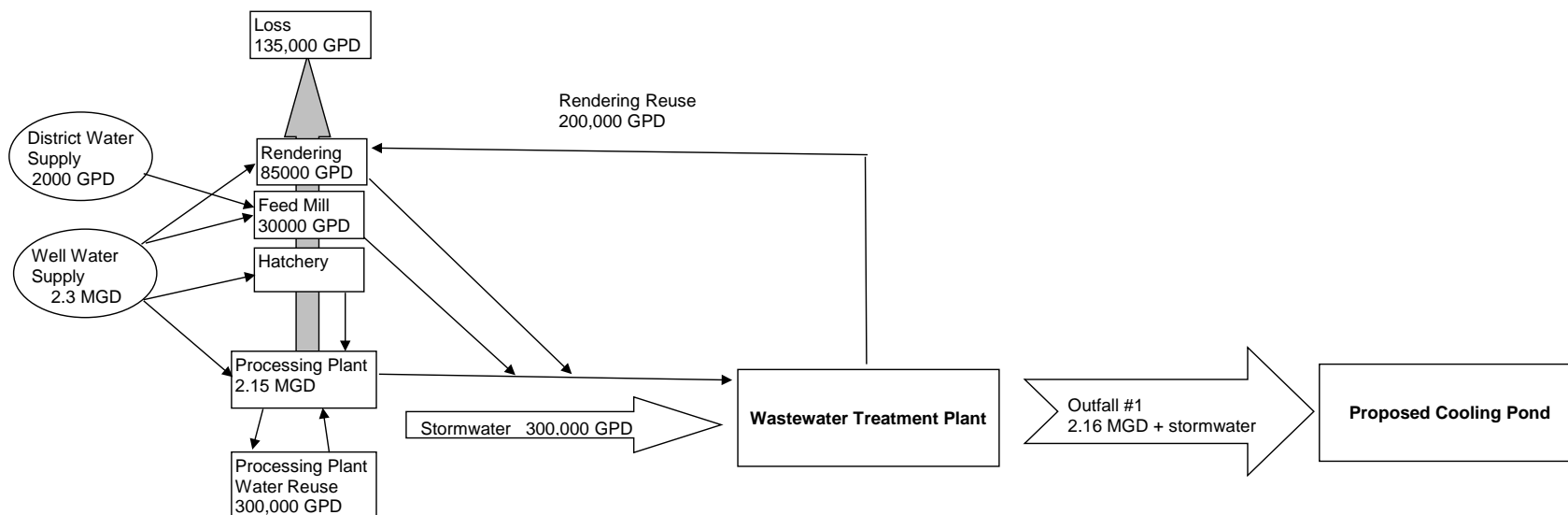
FORM C TABLE 1 FOR 3.0 - ITEMS A AND B

EFFLUENT (AND INTAKE) CHARACTERISTICS								THIS OUTFALL IS:		OUTFALL NO.	
3.0 PART A – You must provide the results of at least one analysis for every pollutant in Part A. Complete one table for each outfall or proposed outfall. See instructions.											
1. POLLUTANT	2. VALUES							3. UNITS <i>(specify if blank)</i>			
	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUES		C. LONG TERM AVERAGE VALUES		D. NO. OF ANALYSES	A. CONCENTRATION	B. MASS		
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS					
A. Biochemical Oxygen Demand, 5-day (BOD ₅)											
B. Chemical Oxygen Demand (COD)											
C. Total Organic Carbon (TOC)											
D. Total Suspended Solids (TSS)											
E. Ammonia as N											
F. Flow	VALUE		VALUE		VALUE			MILLIONS OF GALLONS PER DAY (MGD)			
G. Temperature <i>(winter)</i>	VALUE		VALUE		VALUE			°F			
H. Temperature <i>(summer)</i>	VALUE		VALUE		VALUE			°F			
I. pH	MINIMUM		MAXIMUM		AVERAGE			STANDARD UNITS (SU)			
3.0 PART B – Mark “X” in column 2A for each pollutant you know or have reason to believe is present. Mark “X” in column 2B for each pollutant you believe to be absent. If you mark Column 2A for any pollutant, you must provide the results for at least one analysis for the pollutant. Complete one table for each outfall (intake). Provide results for additional parameters not listed here in Part 3.0 C.											
1. POLLUTANT AND CAS NUMBER <i>(if available)</i>	2. MARK “X”		3. VALUES						4. UNITS		
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUES		C. LONG TERM AVERAGE VALUES		D. NO. OF ANALYSES	A. CONCENTRATION	B. MASS
			CONCENTRATION	MASS	CONCENTRATION	MASS	CONCENTRATION	MASS			
Subpart 1 – Conventional and Non-Conventional Pollutants											
A. Alkalinity (CaCO ₃)			MINIMUM		MINIMUM		MINIMUM				
B. Bromide (24959-67-9)											
C. Chloride (16887-00-6)											
D. Chlorine, Total Residual											
E. Color											
F. Conductivity											
F. Cyanide, Amenable to Chlorination											

1. POLLUTANT AND CAS NUMBER <i>(if available)</i>	2. MARK "X"		3. VALUES							4. UNITS	
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE		C. LONG TERM AVERAGE VALUE		D. NO. OF ANALYSES	A. CONCEN- TRATION	B. MASS
			CONCENTRATION	MASS	CONCENTRATION	MASS	CONCENTRATION	MASS			
Subpart 1 – Conventional and Non-Conventional Pollutants (Continued)											
G. <i>E. coli</i>											
H. Fluoride (16984-48-8)											
I. Nitrate plus Nitrate (as N)											
J. Kjeldahl, Total (as N)											
K. Nitrogen, Total Organic (as N)											
L. Oil and Grease											
M. Phenols, Total											
N. Phosphorus (as P), Total (7723-14-0)											
O. Sulfate (as SO ⁴) (14808-79-8)											
P. Sulfide (as S)											
Q. Sulfite (as SO ³) (14265-45-3)											
R. Surfactants											
S. Trihalomethanes, Total											
Subpart 2 – Metals											
1M. Aluminum, Total Recoverable (7429-90-5)											
2M. Antimony, Total Recoverable (7440-36-9)											
3M. Arsenic, Total Recoverable (7440-38-2)											
4M. Barium, Total Recoverable (7440-39-3)											
5M. Beryllium, Total Recoverable (7440-41-7)											
6M. Boron, Total Recoverable (7440-42-8)											
7M. Cadmium, Total Recoverable (7440-43-9)											
8M. Chromium III Total Recoverable (16065-83-1)											
9M. Chromium VI, Dissolved (18540-29-9)											
10M. Cobalt, Total Recoverable (7440-48-4)											

1. POLLUTANT AND CAS NUMBER <i>(if available)</i>	2. MARK "X"		3. VALUES							4. UNITS	
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE		C. LONG TERM AVERAGE VALUE		D. NO. OF ANALYSES	A. CONCEN- TRATION	B. MASS
			CONCENTRATION	MASS	CONCENTRATION	MASS	CONCENTRATION	MASS			
Subpart 2 – Metals (Continued)											
11M. Copper, Total Recoverable (7440-50-8)											
12M. Iron, Total Recoverable (7439-89-6)											
13M. Lead, Total Recoverable (7439-92-1)											
14M. Magnesium, Total Recoverable (7439-95-4)											
15M. Manganese, Total Recoverable (7439-96-5)											
16M. Mercury, Total Recoverable (7439-97-6)											
17M. Methylmercury (22967926)											
18M. Molybdenum, Total Recoverable (7439-98-7)											
19M. Nickel, Total Recoverable (7440-02-0)											
20M. Selenium, Total Recoverable (7782-49-2)											
21M. Silver, Total Recoverable (7440-22-4)											
22M. Thallium, Total Recoverable (7440-28-0)											
23M. Tin, Total Recoverable (7440-31-5)											
24M. Titanium, Total Recoverable (7440-32-6)											
25M. Zinc, Total Recoverable (7440-66-6)											
Subpart 3 – Radioactivity											
1R. Alpha Total											
2R. Beta Total											
3R. Radium Total											
4R. Radium 226 plus 228 Total											

Form C - Section 2.0
Tyson Foods, Inc.
Sedalia Complex Water Flow



FORM C

Sec. 2.1

Wastewater Treatment Description with Table “A” Codes

The Tyson Foods, Inc., Sedalia, MO WWTP is a conventional activated sludge plant with Dissolved Air Flotation pretreatment. Wastewater is received into a 322,000 gallon above-ground flow equalization basin (1-O). From this basin it passes through flocculation tubes where coagulant, cationic/anionic polymer are injected to flocculate waste particles (2-D). Then the particles become buoyant with air bubbles and the floating solids are skimmed off by the Dissolved Air Flotation units (1-H). Next, the tricanter centrifuge separates wastewater into 3 phases: poultry oil, clarified liquid, and dewatered solids (5-D).

Wastewater flows by gravity to one, two, three or four anaerobic lagoons for further BOD reduction (3-C). After the anaerobic lagoons, wastewater is metered and pumped to a 1.1 MG Anoxic Basin (3-D) then into a 2.3 MG Complete Mix Aeration System, which uses induced air jet aeration for activated sludge growth (3-A & 3-D). Wastewater gravity flows to a 1.8 MG Clarifier for sedimentation and solids removal (1-U). Water then flows through a chlorination/dechlorination (2-F) basin for final disinfection before being discharged out Outfall #001. Treated effluent will then flow through a cooling pond prior to final discharge to the tributary of Little Muddy Creek.

Waste sludge from the process is transferred to a storage lagoon (5-T) for land application (5-P). Remaining sludge is returned to the Complete Mix Aeration System basin to maintain sludge concentration and biological growth. A portion of the clarified effluent is used at the rendering plant for process cleanup water (4-C), and the rest discharges to Outfall #001.

Form C**Sec. 3.0 - Seasonal Temperature Data**

Date	Temp F	Temp C	Monthly Avg (F)
1-Apr-19	68.9	20.5	
2-Apr-19	67.1	19.5	
3-Apr-19	70.16	21.2	
4-Apr-19	73.22	22.9	
5-Apr-19	75.92	24.4	
6-Apr-19	77.36	25.2	
7-Apr-19	78.26	25.7	
8-Apr-19	78.44	25.8	
9-Apr-19	78.98	26.1	
10-Apr-19	79.88	26.6	
11-Apr-19	80.24	26.8	
12-Apr-19	77.9	25.5	
13-Apr-19	76.1	24.5	
14-Apr-19	74.84	23.8	
15-Apr-19	71.24	21.8	
16-Apr-19	70.7	21.5	
17-Apr-19	75.38	24.1	
18-Apr-19	78.08	25.6	
19-Apr-19	77.54	25.3	
20-Apr-19	76.82	24.9	
21-Apr-19	78.44	25.8	
22-Apr-19	76.28	24.6	
23-Apr-19	75.38	24.1	
24-Apr-19	77.36	25.2	
25-Apr-19	79.7	26.5	
26-Apr-19	80.42	26.9	
27-Apr-19	81.86	27.7	
28-Apr-19	77.18	25.1	
29-Apr-19	73.94	23.3	
30-Apr-19	73.94	23.3	76.05
1-May-19	74.84	23.8	
2-May-19	78.98	26.1	
3-May-19	79.88	26.6	
4-May-19	80.24	26.8	
5-May-19	80.96	27.2	
6-May-19	78.62	25.9	
7-May-19	77.72	25.4	
8-May-19	78.44	25.8	
9-May-19	79.7	26.5	
10-May-19	78.26	25.7	
11-May-19	78.44	25.8	
12-May-19	77.54	25.3	
13-May-19	75.56	24.2	
14-May-19	74.66	23.7	

15-May-19	77.18	25.1	
16-May-19	81.14	27.3	
17-May-19	83.48	28.6	
18-May-19	84.92	29.4	
19-May-19	84.74	29.3	
20-May-19	82.22	27.9	
21-May-19	78.44	25.8	
22-May-19	76.64	24.8	
23-May-19	77.36	25.2	
24-May-19	80.6	27.0	
25-May-19	82.04	27.8	
26-May-19	83.84	28.8	
27-May-19	84.2	29.0	
28-May-19	82.94	28.3	
29-May-19	82.4	28.0	
30-May-19	83.48	28.6	
31-May-19	83.84	28.8	80.11
1-Jun-19	83.84	28.8	
2-Jun-19	84.02	28.9	
3-Jun-19	84.02	28.9	
4-Jun-19	82.4	28.0	
5-Jun-19	84.56	29.2	
6-Jun-19	85.64	29.8	
7-Jun-19	87.8	31.0	
8-Jun-19	88.34	31.3	
9-Jun-19	89.06	31.7	
10-Jun-19	87.44	30.8	
11-Jun-19	87.26	30.7	
12-Jun-19	86.36	30.2	
13-Jun-19	85.82	29.9	
14-Jun-19	86.18	30.1	
15-Jun-19	84.74	29.3	
16-Jun-19	85.46	29.7	
17-Jun-19	86	30.0	
18-Jun-19	85.28	29.6	
19-Jun-19	86.72	30.4	
20-Jun-19	86.72	30.4	
21-Jun-19	87.62	30.9	
22-Jun-19	85.82	29.9	
23-Jun-19	86.18	30.1	
24-Jun-19	86.72	30.4	
25-Jun-19	83.66	28.7	
26-Jun-19	85.64	29.8	
27-Jun-19	87.08	30.6	
28-Jun-19	88.7	31.5	
29-Jun-19	89.78	32.1	
30-Jun-19	91.22	32.9	86.34
1-Jul-19	90.68	32.6	
2-Jul-19	91.22	32.9	

3-Jul-19	91.4	33.0	
4-Jul-19	91.76	33.2	
5-Jul-19	91.58	33.1	
6-Jul-19	88.7	31.5	
7-Jul-19	88.88	31.6	
8-Jul-19	89.42	31.9	
9-Jul-19	89.6	32.0	
10-Jul-19	91.4	33.0	
11-Jul-19	86.18	30.1	
12-Jul-19	91.04	32.8	
13-Jul-19	91.94	33.3	
14-Jul-19	92.48	33.6	
15-Jul-19	91.94	33.3	
16-Jul-19	90.14	32.3	
17-Jul-19	90.68	32.6	
18-Jul-19	91.94	33.3	
19-Jul-19	91.94	33.3	
20-Jul-19	92.84	33.8	
21-Jul-19	91.94	33.3	
22-Jul-19	91.58	33.1	
23-Jul-19	88.52	31.4	
24-Jul-19	88.34	31.3	
25-Jul-19	89.06	31.7	
26-Jul-19	88.7	31.5	
27-Jul-19	89.42	31.9	
28-Jul-19	89.24	31.8	
29-Jul-19	89.42	31.9	
30-Jul-19	89.24	31.8	
31-Jul-19	89.78	32.1	90.35
1-Aug-19	89.78	32.1	
2-Aug-19	89.6	32.0	
3-Aug-19	89.42	31.9	
4-Aug-19	89.78	32.1	
5-Aug-19	89.6	32.0	
6-Aug-19	89.06	31.7	
7-Aug-19	90.32	32.4	
8-Aug-19	90.5	32.5	
9-Aug-19	91.04	32.8	
10-Aug-19	91.76	33.2	
11-Aug-19	92.3	33.5	
12-Aug-19	91.4	33.0	
13-Aug-19	91.04	32.8	
14-Aug-19	91.4	33.0	
15-Aug-19	91.22	32.9	
16-Aug-19	90.14	32.3	
17-Aug-19	88.7	31.5	
18-Aug-19	87.44	30.8	
19-Aug-19	86.72	30.4	
20-Aug-19	88.16	31.2	

21-Aug-19	89.96	32.2	
22-Aug-19	90.68	32.6	
23-Aug-19	90.32	32.4	
24-Aug-19	89.78	32.1	
25-Aug-19	87.98	31.1	
26-Aug-19	86.36	30.2	
27-Aug-19	84.56	29.2	
28-Aug-19	85.64	29.8	
29-Aug-19	87.08	30.6	
30-Aug-19	87.44	30.8	
31-Aug-19	86.54	30.3	89.22
1-Sep-19	85.1	29.5	
2-Sep-19	84.02	28.9	
3-Sep-19	84.38	29.1	
4-Sep-19	86	30.0	
5-Sep-19	87.98	31.1	
6-Sep-19	89.6	32.0	
7-Sep-19	90.32	32.4	
8-Sep-19	89.78	32.1	
9-Sep-19	88.88	31.6	
10-Sep-19	89.06	31.7	
11-Sep-19	90.32	32.4	
12-Sep-19	91.58	33.1	
13-Sep-19	92.12	33.4	
14-Sep-19	89.42	31.9	
15-Sep-19	90.32	32.4	
16-Sep-19	89.42	31.9	
17-Sep-19	89.42	31.9	
18-Sep-19	90.14	32.3	
19-Sep-19	90.86	32.7	
20-Sep-19	91.22	32.9	
21-Sep-19	89.96	32.2	
22-Sep-19	87.62	30.9	
23-Sep-19	84.92	29.4	
24-Sep-19	83.48	28.6	
25-Sep-19	83.66	28.7	
26-Sep-19	84.74	29.3	
27-Sep-19	85.64	29.8	
28-Sep-19	85.64	29.8	
29-Sep-19	86.18	30.1	
30-Sep-19	86.18	30.1	87.93
Summer temp max	92.840		90.35
Summer temp avg	85.025		

30 day max

Date	Temp F	Temp C	Monthly Avg (F)
1-Feb-19	59.18	15.1	
2-Feb-19	63.32	17.4	
3-Feb-19	66.92	19.4	
4-Feb-19	67.46	19.7	

5-Feb-19	67.28	19.6	
6-Feb-19	64.58	18.1	
7-Feb-19	65.48	18.6	
8-Feb-19	62.24	16.8	
9-Feb-19	61.7	16.5	
10-Feb-19	61.34	16.3	
11-Feb-19	60.62	15.9	
12-Feb-19	57.92	14.4	
13-Feb-19	59.18	15.1	
14-Feb-19	62.78	17.1	
15-Feb-19	64.04	17.8	
16-Feb-19	64.22	17.9	
17-Feb-19	63.68	17.6	
18-Feb-19	59.9	15.5	
19-Feb-19	58.28	14.6	
20-Feb-19	59.36	15.2	
21-Feb-19	62.42	16.9	
22-Feb-19	65.12	18.4	
23-Feb-19	65.48	18.6	
24-Feb-19	65.3	18.5	
25-Feb-19	64.94	18.3	
26-Feb-19	63.32	17.4	
27-Feb-19	64.58	18.1	
28-Feb-19	64.4	18.0	63.04
1-Mar-19	65.3	18.5	
2-Mar-19	66.02	18.9	
3-Mar-19	64.04	17.8	
4-Mar-19	59.18	15.1	
5-Mar-19	54.5	12.5	
6-Mar-19	54.14	12.3	
7-Mar-19	59.36	15.2	
8-Mar-19	63.68	17.6	
9-Mar-19	66.38	19.1	
10-Mar-19	64.58	18.1	
11-Mar-19	62.24	16.8	
12-Mar-19	60.26	15.7	
13-Mar-19	62.96	17.2	
14-Mar-19	66.2	19.0	
15-Mar-19	65.84	18.8	
16-Mar-19	67.28	19.6	
17-Mar-19	68.72	20.4	
18-Mar-19	67.64	19.8	
19-Mar-19	66.38	19.1	
20-Mar-19	68.9	20.5	
21-Mar-19	68	20.0	
22-Mar-19	72.68	22.6	
23-Mar-19	74.66	23.7	
24-Mar-19	73.94	23.3	
25-Mar-19	72.5	22.5	

26-Mar-19	71.24	21.8	
27-Mar-19	73.76	23.2	
28-Mar-19	73.4	23.0	
29-Mar-19	77.36	25.2	
30-Mar-19	78.08	25.6	
31-Mar-19	72.86	22.7	67.16
1-Oct-19	85.46	29.7	
2-Oct-19	86.9	30.5	
3-Oct-19	86	30.0	
4-Oct-19	86	30.0	
5-Oct-19	83.12	28.4	
6-Oct-19	81.86	27.7	
7-Oct-19	79.34	26.3	
8-Oct-19	77.72	25.4	
9-Oct-19	78.62	25.9	
10-Oct-19	78.62	25.9	
11-Oct-19	78.26	25.7	
12-Oct-19	78.08	25.6	
13-Oct-19	77.9	25.5	
14-Oct-19	73.76	23.2	
15-Oct-19	73.22	22.9	
16-Oct-19	74.84	23.8	
17-Oct-19	75.38	24.1	
18-Oct-19	76.46	24.7	
19-Oct-19	77.18	25.1	
20-Oct-19	77.9	25.5	
21-Oct-19	76.1	24.5	
22-Oct-19	73.22	22.9	
23-Oct-19	74.12	23.4	
24-Oct-19	75.38	24.1	
25-Oct-19	76.1	24.5	
26-Oct-19	76.64	24.8	
27-Oct-19	76.46	24.7	
28-Oct-19	74.48	23.6	
29-Oct-19	71.78	22.1	
30-Oct-19	71.6	22.0	
31-Oct-19	69.8	21.0	77.49
1-Nov-19	69.8	21.0	
2-Nov-19	70.16	21.2	
3-Nov-19	71.06	21.7	
4-Nov-19	68.18	20.1	
5-Nov-19	67.82	19.9	
6-Nov-19	71.6	22.0	
7-Nov-19	74.48	23.6	
8-Nov-19	74.84	23.8	
9-Nov-19	74.48	23.6	
10-Nov-19	73.04	22.8	
11-Nov-19	72.14	22.3	
12-Nov-19	70.52	21.4	

13-Nov-19	68	20.0	
14-Nov-19	67.46	19.7	
15-Nov-19	68.9	20.5	
16-Nov-19	69.98	21.1	
17-Nov-19	70.7	21.5	
18-Nov-19	68.9	20.5	
19-Nov-19	67.64	19.8	
20-Nov-19	70.52	21.4	
21-Nov-19	71.96	22.2	
22-Nov-19	72.32	22.4	
23-Nov-19	72.86	22.7	
24-Nov-19	71.78	22.1	
25-Nov-19	68.9	20.5	
26-Nov-19	67.28	19.6	
27-Nov-19	69.08	20.6	
28-Nov-19	70.16	21.2	
29-Nov-19	69.98	21.1	
30-Nov-19	65.84	18.8	70.35
1-Dec-19	61.7	16.5	
2-Dec-19	56.12	13.4	
3-Dec-19	58.46	14.7	
4-Dec-19	65.84	18.8	
5-Dec-19	69.98	21.1	
6-Dec-19	72.86	22.7	
7-Dec-19	74.3	23.5	
8-Dec-19	71.96	22.2	
9-Dec-19	71.42	21.9	
10-Dec-19	67.28	19.6	
11-Dec-19	68	20.0	
12-Dec-19	68.54	20.3	
13-Dec-19	69.8	21.0	
14-Dec-19	71.42	21.9	
15-Dec-19	69.8	21.0	
16-Dec-19	67.28	19.6	
17-Dec-19	62.78	17.1	
18-Dec-19	63.14	17.3	
19-Dec-19	64.04	17.8	
20-Dec-19	65.48	18.6	
21-Dec-19	66.56	19.2	
22-Dec-19	68.18	20.1	
23-Dec-19	67.82	19.9	
24-Dec-19	66.02	18.9	
25-Dec-19	67.1	19.5	
26-Dec-19	66.02	18.9	
27-Dec-19	64.22	17.9	
28-Dec-19	66.92	19.4	
29-Dec-19	70.52	21.4	
30-Dec-19	66.56	19.2	
31-Dec-19	62.6	17.0	66.86

1-Jan-20	64.4	18.0	
2-Jan-20	64.58	18.1	
3-Jan-20	63.14	17.3	
4-Jan-20	65.3	18.5	
5-Jan-20	66.2	19.0	
6-Jan-20	63.68	17.6	
7-Jan-20	61.16	16.2	
8-Jan-20	64.76	18.2	
9-Jan-20	66.74	19.3	
10-Jan-20	69.62	20.9	
11-Jan-20	70.34	21.3	
12-Jan-20	70.88	21.6	
13-Jan-20	64.58	18.1	
14-Jan-20	61.16	16.2	
15-Jan-20	64.58	18.1	
16-Jan-20	65.66	18.7	
17-Jan-20	63.68	17.6	
18-Jan-20	59.36	15.2	
19-Jan-20	58.28	14.6	
20-Jan-20	56.48	13.6	
21-Jan-20	52.88	11.6	
22-Jan-20	55.58	13.1	
23-Jan-20	59.36	15.2	
24-Jan-20	62.96	17.2	
25-Jan-20	63.68	17.6	
26-Jan-20	63.68	17.6	
27-Jan-20	63.5	17.5	
28-Jan-20	61.34	16.3	
29-Jan-20	62.96	17.2	
30-Jan-20	64.58	18.1	
31-Jan-20	66.92	19.4	63.29

Winter Temp Max 86.9 77.49 30 day max
 Winter Temp Avg 68.10187

FORM C

Sec. 3.0 - Daily WW Data

Date	Eff. Flow (MGD)	COD (mg/L)	pH	BOD (mg/L)	TSS (mg/L)	O&G (mg/L)	TKN (mg/L)	NO3 (mg/L)	NO2 (mg/L)	NO3 + NO2 (mg/L)	Total Nitrogen (mg/L)	Fecal Coliform (#/100/ml)	NH-3 (mg/L)	Temp F	Temp C	Chloride (mg/L)	Chlorine Residual (ug/L)	Ecoli (#/100 ml)
1-Feb-19	1.911	53												59.18	15.1			
2-Feb-19	2.061	55												63.32	17.4			
3-Feb-19	2.147	67												66.92	19.4			
4-Feb-19	2.041	67												67.46	19.7			
5-Feb-19	2.191	69	7.31	6	5	0.500	2.2	23.7	0.003	23.703	25.9	5	0.6	67.28	19.6	285.000	0.00	2.0
6-Feb-19	1.991	67												64.58	18.1			
7-Feb-19	1.963	52	7.44	7	11	0.500	1.1	21.0	0.003	21.003	22.1	5	0.6	65.48	18.6	306.000	0.00	2.0
8-Feb-19	1.966	70												62.24	16.8			
9-Feb-19	1.940	64												61.7	16.5			
10-Feb-19	2.196	43												61.34	16.3			
11-Feb-19	1.989	38												60.62	15.9			
12-Feb-19	1.904	62	7.23	4	7	0.500	2.2	26.8	0.003	26.803	29.0	5	0.3	57.92	14.4	314.000	0.00	1.0
13-Feb-19	2.036	65												59.18	15.1			
14-Feb-19	2.091	46	7.35	5	7	0.500	3.4	26.0	0.003	26.003	29.4	5	0.3	62.78	17.1	301.000	0.00	1.0
15-Feb-19	2.162	52												64.04	17.8			
16-Feb-19	2.044	51												64.22	17.9			
17-Feb-19	1.981	66												63.68	17.6			
18-Feb-19	1.961	65												59.9	15.5			
19-Feb-19	2.066	63	7.09	7	10	1.500	0.5.0	0.4	0.003	0.383	0.4	5	0.3	58.28	14.6	319.000	10.00	1.0
20-Feb-19	2.138	63												59.36	15.2			
21-Feb-19	2.080	67	7.43	7	8	0.5.0	2.2	22.5	0.003	22.503	24.7	5	0.6	62.42	16.9	319.000	0.00	1.0
22-Feb-19	1.656	92												65.12	18.4			
23-Feb-19	1.381	67												65.48	18.6			
24-Feb-19	1.268	89												65.3	18.5			
25-Feb-19	1.367	98												64.94	18.3			
26-Feb-19	1.778	103	7.29	16	20	0.500	4.5	19.9	0.003	19.903	24.4	5	0.3	63.32	17.4	314.000	0.00	1.0
27-Feb-19	2.035	69												64.58	18.1			
28-Feb-19	2.331	84	7.12	8	13	0.500	2.8	26.2	0.003	26.203	29.0	5	0.8	64.4	18.0	340.000	0.00	6.0
1-Mar-19	2.503	67												65.3	18.5			
2-Mar-19	1.733	94												66.02	18.9			
3-Mar-19	1.975	99												64.04	17.8			
4-Mar-19	2.059	87												59.18	15.1			
5-Mar-19	1.447	58	6.99	9	12	0.500	2.2	28.4	0.003	28.403	30.6	5	0.6	54.5	12.5	367.000	0.00	1.0
6-Mar-19	1.341	67												54.14	12.3			
7-Mar-19	1.822	67	7.41	6	5	0.500	2.2	27.4	0.003	27.403	29.6	5	0.3	59.36	15.2	352.000	0.00	1.0
8-Mar-19	2.107	68												63.68	17.6			
9-Mar-19	2.448	48												66.38	19.1			
10-Mar-19	2.604	59												64.58	18.1			
11-Mar-19	2.468	57												62.24	16.8			
12-Mar-19	2.513	55	7.13	4	1	0.500	1.1	37.0	0.003	37.003	38.1	5	0.6	60.26	15.7	332.000	20.00	1.0
13-Mar-19	2.320	68												62.96	17.2			
14-Mar-19	2.349	69	7.28	6	7	0.500	0.5	34.8	0.003	34.803	34.8	5	0.3	66.2	19.0	314.000	0.00	4.00
15-Mar-19	2.233	40												65.84	18.8			
16-Mar-19	2.405	69												67.28	19.6			
17-Mar-19	2.459	49												68.72	20.4			
18-Mar-19	2.387	47												67.64	19.8			
19-Mar-19	2.319	61	7.23	7	18	0.500	0.5	34.8	0.003	34.803	34.8	5	0.3	66.38	19.1	314.000	0.00	2.0
20-Mar-19	2.462	64												68.9	20.5			
21-Mar-19	2.356	50	7.35	5	4	0.500	0.5	33.2	0.003	33.203	33.2	5	0.3	68	20.0	306.000	0.00	8.0

22-Mar-19	2.290	43													72.68	22.6			
23-Mar-19	2.344	66													74.66	23.7			
24-Mar-19	2.206	66													73.94	23.3			
25-Mar-19	2.035	63													72.5	22.5			
26-Mar-19	1.956	62	7.17	5	11	0.500	2.8	32.0	0.003	32.003	39.7	5	0.3		71.24	21.8	322.000	10.00	1.0
27-Mar-19	1.701	82													73.76	23.2			
28-Mar-19	1.769	62	7.28	7	7	0.500	3.4	31.7	0.003	31.703	35.1	5	0.6		73.4	23.0	324.000	0.00	1.0
29-Mar-19	1.789	69													77.36	25.2			
30-Mar-19	2.151	43													78.08	25.6			
31-Mar-19	2.081	68													72.86	22.7			
1-Apr-19	1.964	53													68.9	20.5			
2-Apr-19	1.845	26	7.07	6	4	0.500	1.1	34.1	0.003	34.103	35.2	5	0.8		67.1	19.5	302.000	10.00	1.0
3-Apr-19	1.812	14													70.16	21.2			
4-Apr-19	1.851	72	7.25	6	6	0.500	3.4	30.1	0.003	30.103	33.5	5	0.8		73.22	22.9	336.000	0.00	1.0
5-Apr-19	1.927	66													75.92	24.4			
6-Apr-19	2.014	45													77.36	25.2			
7-Apr-19	1.937	51													78.26	25.7			
8-Apr-19	1.992	60													78.44	25.8			
9-Apr-19	1.916	59	7.15	5	1	0.500	2.2	32.2	0.003	32.203	34.4	5	0.6		78.98	26.1	315.000	10.00	1.0
10-Apr-19	1.978	41													79.88	26.6			
11-Apr-19	1.939	31	7.31	6	1	0.500	3.4	36.2	0.003	36.203	39.6	5	0.6		80.24	26.8	330.000	0.00	1.0
12-Apr-19	1.936	38													77.9	25.5			
13-Apr-19	2.023	60													76.1	24.5			
14-Apr-19	2.065	47													74.84	23.8			
15-Apr-19	1.977	55													71.24	21.8			
16-Apr-19	1.918	62	7.26	6	1	0.500	2.2	37.9	0.003	37.903	40.1	5	0.3		70.7	21.5	284.000	0.00	1.0
17-Apr-19	1.993	56													75.38	24.1			
18-Apr-19	1.899	54	7.38	6	4	0.500	2.2	33.0	0.003	33.003	35.2	5	0.6		78.08	25.6	335.000	0.00	1.0
19-Apr-19	1.841	69													77.54	25.3			
20-Apr-19	1.936	66													76.82	24.9			
21-Apr-19	2.151	68													78.44	25.8			
22-Apr-19	2.020	78													76.28	24.6			
23-Apr-19	1.958	57	7.29	6	4	0.500	0.5	44.4	0.003	44.403	44.4	5	0.3		75.38	24.1	312.000	10.00	1.0
24-Apr-19	1.836	12													77.36	25.2			
25-Apr-19	1.796	10	7.37	5	4	1.100	1.7	38.0	0.003	38.003	39.7	5	0.3		79.7	26.5	320.000	0.00	2.0
26-Apr-19	1.835	69													80.42	26.9			
27-Apr-19	1.914	56													81.86	27.7			
28-Apr-19	1.320	71													77.18	25.1			
29-Apr-19	1.604	62													73.94	23.3			
30-Apr-19	1.588	82	7.17	6	8	0.500	0.5	49.4	0.003	49.403	49.4	5	0.6		73.94	23.3	288.000	0.00	6.0
1-May-19	1.569	75													74.84	23.8			
2-May-19	1.713	62	7.32	6	5	0.500	2.2	33.6	0.003	33.603	35.8	5	0.6		78.98	26.1	291.000	0.00	4.0
3-May-19	1.841	69													79.88	26.6			
4-May-19	2.011	67													80.24	26.8			
5-May-19	2.244	109													80.96	27.2			
6-May-19	2.293	83													78.62	25.9			
7-May-19	2.160	54	7.33	5	11	1.000	1.1	45.4	0.003	45.403	46.5	5	0.3		77.72	25.4	276.000	0.00	1.0
8-May-19	2.258	63													78.44	25.8			
9-May-19	2.100	42	7.31	1	3	1.000	1.1	41.2	0.003	41.203	41.2	5	0.6		79.7	26.5	281.000	0.00	1.0
10-May-19	2.168	59													78.26	25.7			
11-May-19	2.329	52													78.44	25.8			
12-May-19	2.415	66													77.54	25.3			
13-May-19	2.285	28													75.56	24.2			
14-May-19	1.992	64	7.27	5	5	0.500	2.2	34.6	0.003	34.603	36.8	5	0.3		74.66	23.7	286.000	20.00	2.00
15-May-19	2.077	56													77.18	25.1			
16-May-19	2.140	42	7.36	1	2	0.500	2.2	39.1	0.003	39.103	41.3	5	0.3		81.14	27.3	294.000	0.00	2.0

17-May-19	2.120	41													83.48	28.6			
18-May-19	2.255	61													84.92	29.4			
19-May-19	2.345	34													84.74	29.3			
20-May-19	2.349	53													82.22	27.9			
21-May-19	2.339	68	7.26	5	1	0.500	2.8	33.6	0.003	33.603	36.4	5	0.3		78.44	25.8	281.000	10.00	1.0
22-May-19	2.372	69													76.64	24.8			
23-May-19	2.445	68	7.28	4	1	0.500	1.1	31.8	0.003	31.803	32.9	5	0.3		77.36	25.2	263.000	0.00	1.0
24-May-19	2.631	53													80.6	27.0			
25-May-19	2.418	63													82.04	27.8			
26-May-19	2.263	53													83.84	28.8			
27-May-19	2.379	61													84.2	29.0			
28-May-19	2.209	60	7.31	4	1	0.500	1.1	38.6	0.003	38.603	39.7	5	0.6		82.94	28.3	269.000	30.00	1.0
29-May-19	2.108	67													82.4	28.0			
30-May-19	2.090	48	7.25	5	2	0.500	0.5	37.6	0.003	37.603	37.6	5	0.3		83.48	28.6	281.000	0.00	1.0
31-May-19	2.018	67													83.84	28.8			
1-Jun-19	2.118	53													83.84	28.8			
2-Jun-19	2.235	88													84.02	28.9			
3-Jun-19	2.116	66													84.02	28.9			
4-Jun-19	2.008	69	7.22	3	1	0.500	1.1	42.4	0.006	42.406	43.5	20	0.3		82.4	28.0	281.000	20.00	2.0
5-Jun-19	2.063	69													84.56	29.2			
6-Jun-19	2.050	61	7.31	4	3	0.500	2.2	35.4	0.005	35.405	37.6	10	0.3		85.64	29.8	281.000	0.00	1.0
7-Jun-19	2.051	67													87.8	31.0			
8-Jun-19	2.135	53													88.34	31.3			
9-Jun-19	2.231	76													89.06	31.7			
10-Jun-19	2.149	94													87.44	30.8			
11-Jun-19	2.022	83	7.29	6	4	0.500	2.2	29.7	0.005	29.705	31.9	5	0.3		87.26	30.7	276.000	10.00	1.0
12-Jun-19	2.017	66													86.36	30.2			
13-Jun-19	2.073	75	7.22	3	6	0.500	3.4	27.7	0.005	27.705	31.1	5	0.6		85.82	29.9	285.000	10.00	1.0
14-Jun-19	1.947	64													86.18	30.1			
15-Jun-19	1.931	65													84.74	29.3			
16-Jun-19	1.977	48													85.46	29.7			
17-Jun-19	1.895	65													86	30.0			
18-Jun-19	1.879	65	7.18	5	4	0.500	2.2	31.0	0.008	31.008	33.2	5	0.6		85.28	29.6	276.000	0.00	1.0
19-Jun-19	2.045	44													86.72	30.4			
20-Jun-19	2.106	69	7.28	6	10	0.500	2.2	34.8	0.003	34.803	37.0	5	0.6		86.72	30.4	274.000	0.00	1.0
21-Jun-19	2.407	56													87.62	30.9			
22-Jun-19	2.679	56													85.82	29.9			
23-Jun-19	2.833	55													86.18	30.1			
24-Jun-19	2.697	64													86.72	30.4			
25-Jun-19	2.590	53	7.14	6	7	0.500	1.1	32.7	0.003	32.703	33.8	5	0.6		83.66	28.7	276.000	0.00	1.0
26-Jun-19	2.548	69													85.64	29.8			
27-Jun-19	2.577	78	7.34	6	6	0.500	3.4	33.8	0.003	33.803	37.2	5	0.6		87.08	30.6	284.000	0.00	1.0
28-Jun-19	2.604	75													88.7	31.5			
29-Jun-19	2.676	51													89.78	32.1			
30-Jun-19	2.756	44													91.22	32.9			
1-Jul-19	2.634	63													90.68	32.6			
2-Jul-19	2.602	47	7.23	4	4	0.500	3.4	41.3	0.003	41.303	44.7	5	0.6		91.22	32.9	293.000	10.00	2.0
3-Jul-19	2.540	48	7.21	6	11	0.500	2.2	13.9	0.003	13.903	13.1	5	0.3		91.4	33.0	306.000	0.00	1.0
4-Jul-19	2.684	65													91.76	33.2			
5-Jul-19	2.780	65													91.58	33.1			
6-Jul-19	2.699	59													88.7	31.5			
7-Jul-19	2.793	51													88.88	31.6			
8-Jul-19	2.624	88													89.42	31.9			
9-Jul-19	2.448	107	7.22	7	8	0.500	2.2	45.9	0.008	45.908	48.1	5	0.3		89.6	32.0	293.000	0.00	2.0
10-Jul-19	2.452	116													91.4	33.0			
11-Jul-19	2.366	97	7.19	8	13	0.500	3.4	40.3	0.008	40.308	43.7	5	0.6		86.18	30.1	306.000	0.00	1.0

12-Jul-19	2.316	70												91.04	32.8			
13-Jul-19	2.395	75												91.94	33.3			
14-Jul-19	2.396	118												92.48	33.6			
15-Jul-19	2.291	91												91.94	33.3			
16-Jul-19	2.216	111	7.00	10	25	1.300	4.5	40.7	0.003	40.703	45.2	505	0.6	90.14	32.3	332.000	0.00	2.0
17-Jul-19	2.199	103												90.68	32.6			
18-Jul-19	2.069	82	7.05	8	11	1.700	4.5	37.9	0.008	37.908	42.4	20	0.6	91.94	33.3	311.000	0.00	1.0
19-Jul-19	1.980	109												91.94	33.3			
20-Jul-19	2.084	57												92.84	33.8			
21-Jul-19	2.180	101												91.94	33.3			
22-Jul-19	2.223	67												91.58	33.1			
23-Jul-19	2.103	65	7.06	5	5	0.500	2.2	46.4	0.003	46.403	48.6	5	0.3	88.52	31.4	306.000	0.00	1.0
24-Jul-19	2.070	56												88.34	31.3			
25-Jul-19	2.050	47	7.18	4	11	0.500	1.1	32.2	0.006	32.206	33.3	10	0.6	89.06	31.7	301.000	0.00	1.0
26-Jul-19	2.006	45												88.7	31.5			
27-Jul-19	2.080	44												89.42	31.9			
28-Jul-19	2.128	24												89.24	31.8			
29-Jul-19	2.071	67												89.42	31.9			
30-Jul-19	2.016	16	7.32	4	11	0.500	3.4	33.1	0.003	33.103	36.5	50	1.1	89.24	31.8	293.000	0.00	47.0
31-Jul-19	1.984	15												89.78	32.1			
1-Aug-19	1.901	58	7.48	3	4	0.500	1.1	38.3	0.008	38.308	39.4	80	0.3	89.78	32.1	306.000	0.00	2.0
2-Aug-19	1.939	67												89.6	32.0			
3-Aug-19	2.038	66												89.42	31.9			
4-Aug-19	2.150	51												89.78	32.1			
5-Aug-19	2.050	41												89.6	32.0			
6-Aug-19	1.966	42	7.44	7	6	0.500	0.5	49.8	0.018	49.818	49.8	30000	0.6	89.06	31.7	288.000	0.00	15400.0
7-Aug-19	1.963	35												90.32	32.4			
8-Aug-19	1.955	69	7.21	5	3	0.500	1.1	40.7	0.018	40.718	41.8	5	0.3	90.5	32.5	332.000	0.00	1.0
9-Aug-19	1.902	60												91.04	32.8			
10-Aug-19	2.036	68												91.76	33.2			
11-Aug-19	2.165	18												92.3	33.5			
12-Aug-19	2.085	53												91.4	33.0			
13-Aug-19	2.025	13	7.57	4	2	0.500	2.2	30.9	0.009	30.909	33.1	70	0.3	91.04	32.8	268.000	0.00	46.0
14-Aug-19	1.974	19												91.4	33.0			
15-Aug-19	2.031	61	7.31	6	3	0.500	1.1	39.5	0.007	39.507	40.6	5	0.3	91.22	32.9	296.000	0.00	1.0
16-Aug-19	2.153	54												90.14	32.3			
17-Aug-19	2.246	54												88.7	31.5			
18-Aug-19	2.287	36												87.44	30.8			
19-Aug-19	2.171	39												86.72	30.4			
20-Aug-19	2.103	32	7.35	6	6	0.500	2.2	51.7	0.003	51.703	53.9	80	0.2	88.16	31.2	288.000	0.00	1.0
21-Aug-19	2.175	28												89.96	32.2			
22-Aug-19	2.085	74	7.34	6	6	0.500	1.1	40.5	0.003	40.503	41.6	30	1.0	90.68	32.6	293.000	0.00	1.0
23-Aug-19	2.168	49												90.32	32.4			
24-Aug-19	2.427	59												89.78	32.1			
25-Aug-19	2.522	69												87.98	31.1			
26-Aug-19	2.313	10												86.36	30.2			
27-Aug-19	2.159	19	7.14	6	12	0.500	2.2	42.0	0.003	42.003	44.2	5	0.3	84.56	29.2	276.000	0.00	1.0
28-Aug-19	2.327	15												85.64	29.8			
29-Aug-19	2.306	61	7.22	5	13	0.500	2.2	38.4	0.003	38.403	40.6	10	0.6	87.08	30.6	279.000	0.00	1.0
30-Aug-19	2.408	70												87.44	30.8			
31-Aug-19	2.498	69												86.54	30.3			
1-Sep-19	2.576	20												85.1	29.5			
2-Sep-19	2.511	63												84.02	28.9			
3-Sep-19	2.195	30	7.27	4	7	0.500	0.5	71.5	0.005	71.505	71.5	5	0.3	84.38	29.1	264.000	0.00	1.0
4-Sep-19	2.190	35												86	30.0			
5-Sep-19	2.183	62	7.18	5	9	0.500	2.2	39.1	0.003	39.103	41.3	5	0.3	87.98	31.1	269.000	0.00	1.0

6-Sep-19	2.084	54													89.6	32.0			
7-Sep-19	2.012	64													90.32	32.4			
8-Sep-19	1.960	46													89.78	32.1			
9-Sep-19	1.760	49													88.88	31.6			
10-Sep-19	1.639	60	7.50	7	6	0.500	2.2	32.0	0.013	32.013	34.2	5	0.6		89.06	31.7	298.000	0.00	1.0
11-Sep-19	1.629	38													90.32	32.4			
12-Sep-19	1.723	78	7.43	6	3	1.500	2.2	30.4	0.010	30.410	32.6	10	0.3		91.58	33.1	308.000	0.00	2.0
13-Sep-19	1.815	70													92.12	33.4			
14-Sep-19	1.945	78													89.42	31.9			
15-Sep-19	2.023	43													90.32	32.4			
16-Sep-19	1.974	86													89.42	31.9			
17-Sep-19	1.941	60	7.41	11	16	0.500	1.1	50.6	0.011	50.611	51.7	190	0.3		89.42	31.9	328.000	0.00	1.0
18-Sep-19	1.956	35													90.14	32.3			
19-Sep-19	2.117	42	7.35	8	8	0.500	3.4	47.1	0.010	47.110	50.5	100	1.1		90.86	32.7	336.000	0.00	1.0
20-Sep-19	2.177	58													91.22	32.9			
21-Sep-19	2.239	53													89.96	32.2			
22-Sep-19	2.225	57													87.62	30.9			
23-Sep-19	2.062	65													84.92	29.4			
24-Sep-19	1.871	68	7.39	6	12	0.500	1.1	33.8	0.006	33.806	34.9	5	0.6		83.48	28.6	288.000	0.00	1.0
25-Sep-19	1.900	80													83.66	28.7			
26-Sep-19	2.099	40	7.30	6	7	0.500	1.1	35.5	0.006	35.506	36.6	10	0.3		84.74	29.3	293.000	0.00	1.0
27-Sep-19	2.119	67													85.64	29.8			
28-Sep-19	2.305	62													85.64	29.8			
29-Sep-19	2.359	9													86.18	30.1			
30-Sep-19	2.125	18													86.18	30.1			
1-Oct-19	2.115	27	7.16	5	8	0.500	1.2	34.8	0.011	34.811	36.0	5	0.4		85.46	29.7	258.000	10.00	1.0
2-Oct-19	2.142	24													86.9	30.5			
3-Oct-19	2.217	26	7.32	6	3	0.500	2.2	35.7	0.015	35.715	37.9	5	0.6		86	30.0	296.000	0.00	1.0
4-Oct-19	2.257	27													86	30.0			
5-Oct-19	2.344	55													83.12	28.4			
6-Oct-19	2.442	42													81.86	27.7			
7-Oct-19	2.316	51													79.34	26.3			
8-Oct-19	2.208	50	7.35	5	3	0.500	1.1	42.2	0.003	42.203	43.3	5	0.8		77.72	25.4	272.000	0.00	1.0
9-Oct-19	2.257	45													78.62	25.9			
10-Oct-19	2.322	51	7.45	4	1	0.500	0.5	40.5	0.003	40.503	40.5	5	0.6		78.62	25.9	272.000	0.00	1.0
11-Oct-19	2.422	56													78.26	25.7			
12-Oct-19	2.456	51													78.08	25.6			
13-Oct-19	2.577	50													77.9	25.5			
14-Oct-19	2.447	66													73.76	23.2			
15-Oct-19	2.324	62	7.16	4	6	0.500	0.5	39.9	0.003	39.903	39.9	5	0.3		73.22	22.9	284.000	0.00	1.0
16-Oct-19	2.374	47													74.84	23.8			
17-Oct-19	2.342	58	7.30	6	4	0.500	0.5	38.8	0.003	38.803	38.8	5	0.3		75.38	24.1	296.000	0.00	1.0
18-Oct-19	2.366	57													76.46	24.7			
19-Oct-19	2.442	49													77.18	25.1			
20-Oct-19	2.581	51													77.9	25.5			
21-Oct-19	2.304	46													76.1	24.5			
22-Oct-19	2.302	41	7.30	4	8	0.500	1.1	39.7	0.010	39.710	39.7	5	0.6		73.22	22.9	280.000	0.00	2.0
23-Oct-19	2.179	50													74.12	23.4			
24-Oct-19	2.158	59	7.39	7	12	0.500	2.2	35.1	0.006	35.106	37.3	5	0.6		75.38	24.1	272.000	0.00	1.0
25-Oct-19	2.240	54													76.1	24.5			
26-Oct-19	2.030	47													76.64	24.8			
27-Oct-19	2.156	54													76.46	24.7			
28-Oct-19	2.070	54													74.48	23.6			
29-Oct-19	2.016	51	7.20	4	1	0.500	2.2	39.8	0.003	39.803	39.8	10	0.6		71.78	22.1	284.000	0.00	1.0
30-Oct-19	2.032	59													71.6	22.0			
31-Oct-19	2.017	62	7.29	5	6	0.500	2.2	32.1	0.003	32.103	34.3	5	0.3		69.8	21.0	284.000	0.00	1.0

1-Nov-19	2.053	45													69.8	21.0			
2-Nov-19	2.033	63													70.16	21.2			
3-Nov-19	2.208	21													71.06	21.7			
4-Nov-19	2.012	42													68.18	20.1			
5-Nov-19	1.968	49	7.14	4	6	0.500	1.1	38.7	0.003	38.703	39.8	5	0.3		67.82	19.9	265.000	0.00	2.0
6-Nov-19	1.992	52													71.6	22.0			
7-Nov-19	2.012	61	7.31	8	2	0.500	5.6	25.3	0.005	25.305	30.9	5	0.6		74.48	23.6	290.000	0.00	1.0
8-Nov-19	1.982	67													74.84	23.8			
9-Nov-19	2.043	54													74.48	23.6			
10-Nov-19	1.027														73.04	22.8			
11-Nov-19	1.507	61													72.14	22.3			
12-Nov-19	1.904	43	7.42	4	1	0.500	1.1	25.7	0.003	25.703	26.8	5	0.6		70.52	21.4	290.000	0.00	1.0
13-Nov-19	2.014	44													68	20.0			
14-Nov-19	2.133	48	7.29	5	1	0.500	3.4	29.9	0.003	29.903	33.3	5	0.3		67.46	19.7	300.000	0.00	1.00
15-Nov-19	2.154	51													68.9	20.5			
16-Nov-19	2.348	60													69.98	21.1			
17-Nov-19	2.466	44													70.7	21.5			
18-Nov-19	2.327	47													68.9	20.5			
19-Nov-19	2.149	44	7.19	5	2	0.500	2.2	35.9	0.003	35.903	38.1	5	0.3		67.64	19.8	280.000	0.00	2.0
20-Nov-19	2.276	48													70.52	21.4			
21-Nov-19	2.257	49	7.45	8	8	0.500	2.2	35.2	0.003	35.203	37.4	5	0.3		71.96	22.2	300.000	0.00	1.0
22-Nov-19	2.343	64													72.32	22.4			
23-Nov-19	2.347	46													72.86	22.7			
24-Nov-19	2.451	53													71.78	22.1			
25-Nov-19	2.360	53													68.9	20.5			
26-Nov-19	2.213	51	7.40	6	5	0.500	1.100	35.7	0.003	35.703	36.8	5	0.6		67.28	19.6	282.000	0.00	1.0
27-Nov-19	2.284	38	7.55	3	3	0.500	2.2	33.0	0.003	33.003	35.2	5	0.3		69.08	20.6	283.000	0.00	2.0
28-Nov-19	1.939	52													70.16	21.2			
29-Nov-19	2.251	56													69.98	21.1			
30-Nov-19	2.080	66													65.84	18.8			
1-Dec-19	2.048	68													61.7	16.5			
2-Dec-19	1.140	65													56.12	13.4			
3-Dec-19	1.442	59	7.08	7	2	0.500	3.4	30.5	0.006	30.506	33.9	5	0.3		58.46	14.7		10.00	2.0
4-Dec-19	1.582	73													65.84	18.8			
5-Dec-19	1.618	61	7.41	10	9	0.500	3.4	28.2	0.003	28.203	31.6	5	0.6		69.98	21.1	313.000	0.00	1.0
6-Dec-19	1.160	53													72.86	22.7	300.000		
7-Dec-19	1.723	59													74.3	23.5			
8-Dec-19	1.851	54													71.96	22.2			
9-Dec-19	1.753	57													71.42	21.9			
10-Dec-19	1.651	45	7.29	5	3	0.500	2.2	34.0	0.003	34.003	36.2	5	0.6		67.28	19.6	308.000	0.00	2.0
11-Dec-19	1.616	92													68	20.0			
12-Dec-19	1.651	51	7.20	10	28	0.500	2.2	36.9	0.003	36.903	39.1	5	0.3		68.54	20.3	313.000	0.00	1.0
13-Dec-19	1.690	62													69.8	21.0			
14-Dec-19	1.759	41													71.42	21.9			
15-Dec-19	1.789	50													69.8	21.0			
16-Dec-19	1.771	59													67.28	19.6			
17-Dec-19	1.757	66	7.71	5	11	0.500	2.2	36.4	0.003	36.403	38.6	5	0.3		62.78	17.1	310.000	0.00	1.0
18-Dec-19	1.747	62													63.14	17.3			
19-Dec-19	1.801	48	7.34	6	2	0.500	1.1	36.0	0.003	36.003	37.1	30	0.3		64.04	17.8	318.000	0.00	1.0
20-Dec-19	1.831	57													65.48	18.6			
21-Dec-19	1.925	58													66.56	19.2			
22-Dec-19	2.055	65													68.18	20.1			
23-Dec-19	1.928	48	7.21	4	9	0.500	2.2	32.2	0.003	32.203	34.4	5	0.3		67.82	19.9	330.000	0.00	1.0
24-Dec-19	1.962	30													66.02	18.9			
25-Dec-19	2.028	54													67.1	19.5			
26-Dec-19	1.908	42	7.30	4	6	0.500	0.5	34.4	0.003	34.403	34.4	10	0.3		66.02	18.9	312.000	0.00	1.0

27-Dec-19	1.902	58												64.22	17.9			
28-Dec-19	2.041	55												66.92	19.4			
29-Dec-19	2.088	41												70.52	21.4			
30-Dec-19	1.957	86												66.56	19.2			
31-Dec-19	1.833	55	7.34	3	2	0.500	1.1	32.6	0.003	32.603	33.7	5	0.3	62.6	17.0	285.000	0.00	1.0
1-Jan-20	1.972	68												64.4	18.0			
2-Jan-20	1.946	67	7.19	4	2	1.200	2.2	32.4	0.003	32.403	34.6	5	0.3	64.58	18.1	295.000	0.00	1.0
3-Jan-20	1.807	64												63.14	17.3			
4-Jan-20	1.741	62												65.3	18.5			
5-Jan-20	1.664	60												66.2	19.0			
6-Jan-20	1.505	54												63.68	17.6			
7-Jan-20	1.616	96	7.36	5	9	4.400	1.1	35.9	0.003	35.903	37.0	5	0.8	61.16	16.2	300.000	0.00	1.0
8-Jan-20	1.752	64												64.76	18.2			
9-Jan-20	1.794	56	7.23	7	8	0.500	1.1	31.9	0.003	31.903	33.0	10	0.3	66.74	19.3	300.000	0.00	1.0
10-Jan-20	1.848	59												69.62	20.9			
11-Jan-20	2.061	61												70.34	21.3			
12-Jan-20	2.224	63												70.88	21.6			
13-Jan-20	2.169	52												64.58	18.1			
14-Jan-20	2.002	50	7.14	4	1	0.500	2.2	30.0	0.003	30.003	32.2	5	0.8	61.16	16.2	308.000	0.00	1.00
15-Jan-20	1.973	65												64.58	18.1			
16-Jan-20	1.983	57	7.22	6	1	0.500	2.2	33.8	0.003	33.803	36.0	5	0.6	65.66	18.7	313.000	0.00	1.0
17-Jan-20	2.048	50												63.68	17.6			
18-Jan-20	2.042	44												59.36	15.2			
19-Jan-20	2.191	38												58.28	14.6			
20-Jan-20	2.098	36												56.48	13.6			
21-Jan-20	1.853	62	7.14	7	7	0.500	1.7	30.2	0.003	30.203	31.9	5	1.3	52.88	11.6	400.000	0.00	1.0
22-Jan-20	1.710	44												55.58	13.1			
23-Jan-20	1.923	51	7.21	5	5	0.500	2.2	33.3	0.003	33.303	35.5	5	0.6	59.36	15.2	363.000	0.00	1.0
24-Jan-20	2.138	57												62.96	17.2			
25-Jan-20	2.249	65												63.68	17.6			
26-Jan-20	2.305	67												63.68	17.6			
27-Jan-20	2.334	67												63.5	17.5			
28-Jan-20	2.277	64	7.18	5	14	0.500	2.2	30.9	0.003	30.903	33.1	5	1.1	61.34	16.3	318.000	0.00	1.0
29-Jan-20	2.232	64												62.96	17.2			
30-Jan-20	2.296	4	7.29	7	8	0.500	2.2	33.0	0.003	33.003	35.2	5	0.8	64.58	18.1	313.000	0.00	1.0
31-Jan-20	2.354	85												66.92	19.4			
AVG	2.093	57.648	7.278	5.673	6.505	0.599	1.974	34.983	0.004	34.987	36.856	304.567	0.485	76.587	24.770	300.423	1.923	150.337
Min	1.027	4.000	6.990	1.000	0.500	0.500	0.500	0.380	0.003	0.383	0.400	5.000	0.150	52.880	11.600	258.000	0.000	1.000
Max	2.833	118.000	7.710	16.000	28.000	4.400	5.600	71.500	0.018	71.505	71.500	30000.000	1.300	92.840	33.800	400.000	30.000	15400.000
Count	364.000	364.000	104.000	104.000	104.000	103.000	103.000	104.000	104.000	104.000	104.000	104.000	104.000	365.000	365.000	104.000	104.000	104.000
LBS		2358		237	386	59.301	94.0	1308.9		1308.992	1308.9		20.1			6181.608	0.5526918	
AVG Longterm LBS		1006		99	114	10.457	34.5	610.6		610.719	643.3		8.5			5244.1241	0.0335675	

Form C

Sec. 3.0 - Phosphorus Data

Date	Phosphorus (mg/L)	LBS	Flow (MGD)
2/6/2020	1.66	30.90	2.232
2/13/2020	0.64	11.36	2.129
AVG	1.15	21.13	
Min	0.64	11.36	
Max	1.66	30.90	
Count	2	2	

Form C**Sec. 3.0 - Sulfide Data**

Date	Sulfide (mg/L)	30 day avg (mg/L)
2/28/2019	3.6	
2/26/2019	1.2	
2/21/2019	1.6	
2/19/2019	0.4	
2/14/2019	0.4	
2/12/2019	2.8	
2/7/2019	9.6	
2/5/2019	0.4	2.5
3/28/2019	0.4	
3/26/2019	0.8	
3/21/2019	0.2	
3/19/2019	2	
3/14/2019	0.4	
3/12/2019	0.2	
3/7/2019	0.2	
3/5/2019	0.8	0.625
4/30/2019	8	
4/25/2019	2.4	
4/23/2019	1.6	
4/18/2019	0.2	
4/16/2019	2	
4/11/2019	0.8	
4/9/2019	0.8	
4/4/2019	2	
4/2/2019	4	2.42222222
5/30/2019	3.6	
5/28/2019	1.6	
5/23/2019	2.8	
5/21/2019	0.4	
5/16/2019	3.2	
5/14/2019	1.6	
5/9/2019	1.2	
5/7/2019	1.6	
5/2/2019	0.8	1.86666667
6/4/2019	3.6	
6/6/2019	0.8	
6/11/2019	0.4	
6/13/2019	0.8	
6/18/2019	3.6	
6/20/2019	0.4	
6/25/2019	1.2	

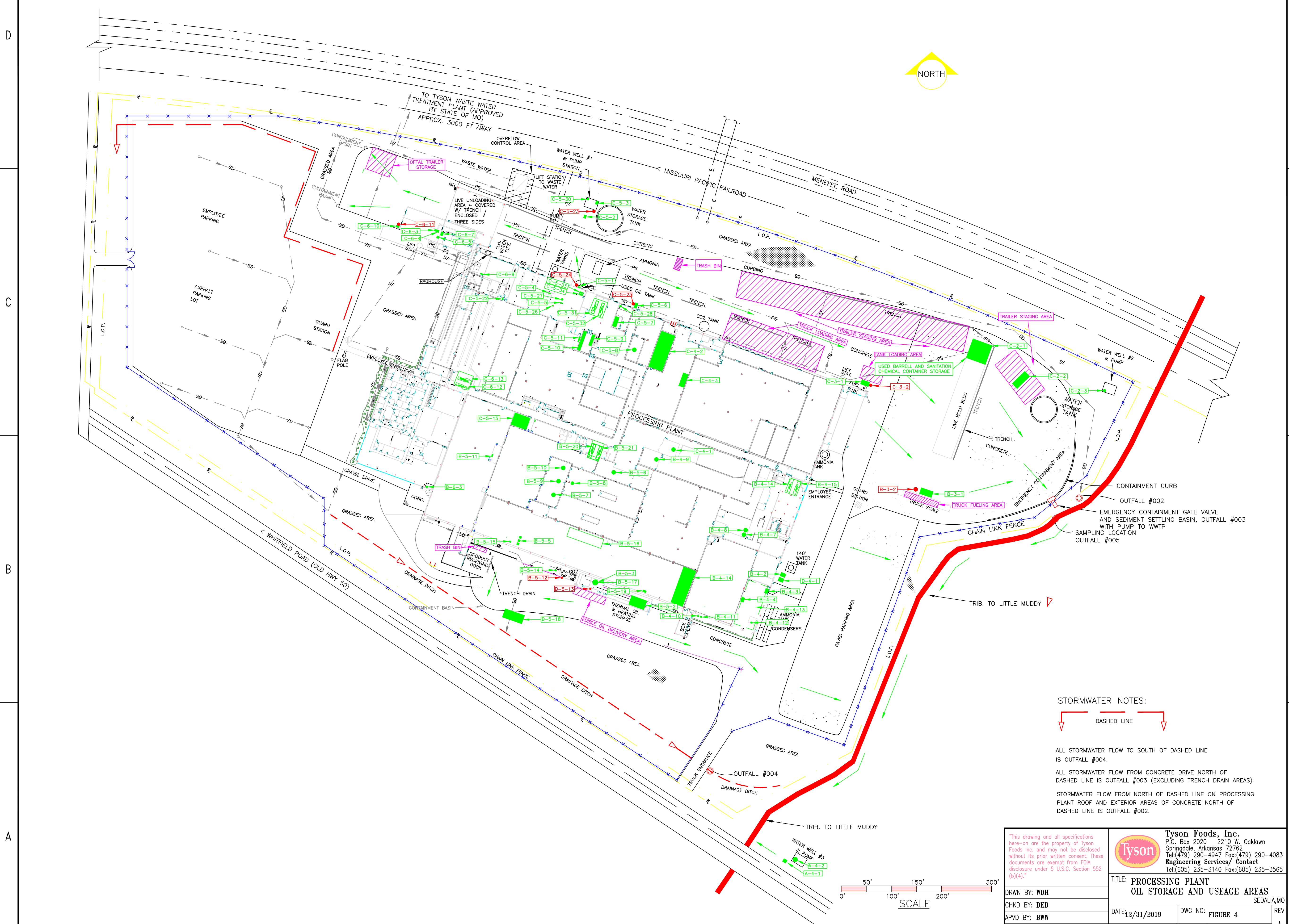
6/27/2019	0.2	1.375
7/2/2019	2	
7/3/2019	1.2	
7/9/2019	0.2	
7/11/2019	0.2	
7/16/2019	2.4	
7/18/2019	2	
7/23/2019	2.4	
7/25/2019	1.2	
7/30/2019	1.6	1.46666667
8/1/2019	2.4	
8/6/2019	2	
8/8/2019	1.2	
8/13/2019	3.2	
8/15/2019	2.8	
8/20/2019	2.4	
8/22/2019	4.2	
8/27/2019	1.6	
8/29/2019	0.4	2.24444444
9/3/2019	2.4	
9/5/2019	0.2	
9/10/2019	1.6	
9/12/2019	0.2	
9/17/2019	0.2	
9/19/2019	0.2	
9/24/2019	0.8	
9/26/2019	2.8	1.05
10/1/2019	2	
10/3/2019	0.4	
10/8/2019	1.2	
10/10/2019	2.1	
10/15/2019	4	
10/17/2019	4	
10/22/2019	3.2	
10/24/2019	7.6	
10/29/2019	0.8	
10/31/2019	1.2	2.65
11/27/2019	0.2	
11/5/2019	2	
11/7/2019	0.4	
11/12/2019	2.4	
11/14/2019	0.4	
11/19/2019	1.4	
11/21/2019	1.6	
11/26/2019	5.6	1.97142857
12/5/2019	6	
12/17/2019	0.8	

12/10/2019	4	
12/12/2019	8	
12/17/2019	2.8	
12/19/2019	1.6	
12/23/2019	0.2	
12/26/2019	2.8	
12/31/2019	20	5.13333333
1/2/2019	3.6	
1/7/2019	2.4	
1/9/2019	2	
1/14/2019	5.2	
1/16/2019	2.8	
1/21/2019	0.4	
1/23/2019	0.4	
1/28/2019	0.8	
1/30/2019	0.4	2
AVG	2.125962	2.11
MIN	0.2	0.63
MAX	20	5.13
Count	104	12.00
LBS	305.7444	75.966441


Form C**Sec. 3.0 - 30 Day Averages**

Month	BOD (mg/L)	COD (mg/L)	pH	TSS (mg/L)	NH3 (mg/L)	Flow (MGD)	Chlorine Residual (ug/l)	Chlorides (mg/L)	Ecoi (#/100 ml)	NO3+NO2 (mg/L)	TKN (mg/L)	O&G (mg/L)	Total N (mg/L)	TOC (mg/L)
February	7.50	65.96	7.44	10.13	0.475	1.953	1.25	312	2	21	2.63	0.64	23.11	
March	6.13	63.45	7.41	8.13	0.413	2.149	3.75	329	2	32	1.65	0.50	34.49	
April	5.78	53.00	7.38	3.61	0.544	1.893	3.33	314	2	37	1.91	0.57	39.06	
May	4.00	59.90	7.36	3.39	0.400	2.191	6.67	280	2	37	1.59	0.61	38.69	
June	4.88	64.70	7.34	5.13	0.488	2.247	5.00	279	1	33	2.23	0.50	35.66	
July	6.22	69.97	7.32	11.00	0.556	2.316	1.11	305	6	37	2.99	0.72	39.51	
August	5.33	47.06	7.57	6.11	0.428	2.146	0.00	292	1717	41	1.52	0.50	42.78	
September	6.63	53.00	7.50	8.50	0.475	2.057	0.00	298	1	43	1.73	0.63	44.16	
October	5.00	49.10	7.45	5.10	0.510	2.273	1.00	280	1	38	1.37	4.78	38.75	
November	5.38	50.76	7.55	3.38	0.413	2.104	0.00	286	1	32	2.36	0.50	34.79	
December	6.00	57.23	7.71	8.00	0.367	1.774	1.11	310	1	33	2.03	0.50	35.44	
January	5.56	57.94	7.36	6.06	0.733	2.003	0.00	323	1	32	1.90	1.01	34.28	11
Max	7.50	69.97	7.71	11.00	0.733	2.32	6.67	328.88	1717	42.51	2.99	4.78	44.16	11
Lbs	122.1400446	1351.32		212.45	12.253		121.85	5895.47		729.29	57.73	90.65	757.67	172.0125

OUTFALL #	DATE	RAIN	FLOW	TEMP	COD	BOD	TSS	SS	O&G	pH
		INCHES	MGD	°F	mg/L	mg/L	mg/L	mL/L/hr	mg/L	SU
2	28	0.20	0.0600	51.98	14.80	9.00	11.00	0.05	0.50	6.97
2	18	0.10	0.03	60.08	31.30	6.00	5.00	0.40	0.50	7.33
2	29	0.40	0.13	71.60	2.50	4.00	8.00	0.10	0.50	6.89
2	10	1.75	0.55	17.30	22.30	6.00	24.00	0.05	0.50	6.79
		AVG	0.19	50.24	17.73	6.25	12.00	0.15	0.50	7.00
		MAX	0.55	71.60	31.30	9.00	24.00	0.40	0.50	7.33
		MIN	0.03	17.30	2.50	4.00	5.00	0.05	0.50	6.79
3	28	0.20	0.0300	51.08	344.00	71.00	235.00	0.10	1.80	7.40
3	17	0.20	0.03	73.76	93.30	29.00	44.00	0.05	0.50	7.08
3	25	1.70	0.25	75.56	554.00	195.00	106.00	0.05	4.00	6.52
3	10	1.75	0.25	17.50	160.00	32.00	31.00	0.05	0.50	7.47
		AVG	0.14	54.48	287.83	81.75	104.00	0.06	1.70	7.12
		MAX	0.25	75.56	554.00	195.00	235.00	0.10	4.00	7.47
4	28	0.20	0.0800	51.62	42.90	11.00	84.00	0.20	0.50	6.98
4	18	0.10	0.04	61.88	49.80	10.00	136.00	0.50	0.50	7.09
4	29	0.40	0.16	75.20	14.60	6.00	27.00	0.50	0.50	6.78
4	10	1.75	0.72	17.80	86.80	6.00	128.00	1.00	0.50	7.29
		AVG	0.25	51.63	48.53	8.25	93.75	0.55	0.50	7.04
		MAX	0.72	75.20	86.80	11.00	136.00	1.00	0.50	7.29




STORMWATER NOTES:

 DASHED LINE

ALL STORMWATER FLOW TO SOUTH OF DASHED LINE
IS OUTFALL #004.

ALL STORMWATER FLOW FROM CONCRETE DRIVE NORTH OF
DASHED LINE IS OUTFALL #003 (EXCLUDING TRENCH DRAIN AREAS)

STORMWATER FLOW FROM NORTH OF DASHED LINE ON PROCESSING
PLANT ROOF AND EXTERIOR AREAS OF CONCRETE NORTH OF
DASHED LINE IS OUTFALL #002.

<p>* This drawing and all specifications here-on are the property of Tyson Foods Inc. and may not be disclosed without its prior written consent. These documents are exempt from FOIA disclosure under 5 U.S.C. Section 552 (b)(4).</p>				<p>Tyson Foods, Inc. P.O. Box 2020 2210 W. Oaklawn Springdale, Arkansas 72762 Tel: (479) 290-4947 Fax: (479) 290-4083 Engineering Services / Contact Tel: (605) 235-3140 Fax: (605) 235-3565</p>					
				<p>TITLE: PROCESSING PLANT</p>					
				<p>OIL STORAGE AND USAGE AREAS</p>					
				<p>SEDALIA, MO</p>					
<p>DRWN BY: WDH</p>	<p>DATE: 12/31/2019</p>		<p>DWG NO: FIGURE 4</p>		<p>REV</p>				
<p>CHKD BY: DED</p>	<p>SCALE: AS SHOWN</p>		<p>SHEET: 1</p>		<p>A</p>				
<p>APVD BY: BWW</p>					<p>PROJECT:</p>				

4

3

2

1

NO.	BY	CHKD	APRV	REVISION	DATE
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D

D

C

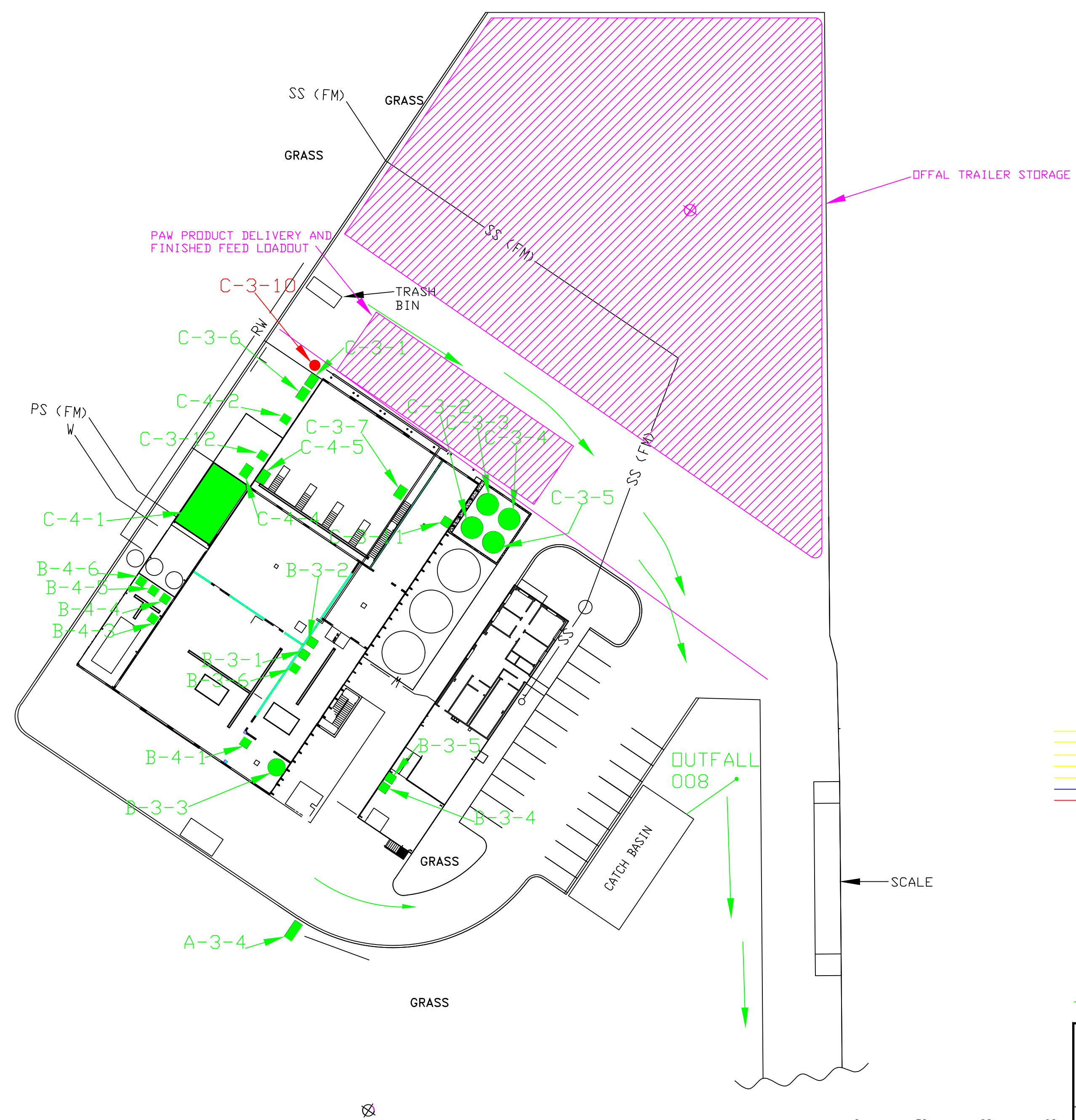
C

B

B

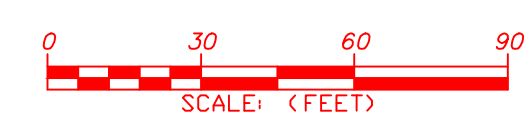
A

A



LEGEND

E	ELECTRIC LINE
T	TELEPHONE LINE
SAN	SANITARY SEWER LINE
SS	STORM SEWER LINE
G	GAS LINE
X	FENCE
	DRAINAGE SWALE
	ANCHOR
GP	GUY POLE
CI	CAST IRON
UP	UTILITY POLE
LS	LIGHT STANDARD
FO	FIBER OPTIC CABLE
PSV	PROCESS SEWER VALVE
GV	GAS VALVE
WV	WATER VALVE
CMP	CORRUGATED METAL PIPE
PVC	POLYVINYL CHLORIDE PIPE
FL	FLOW LINE
	IRON
	R/W MARKER
	EXISTING CONTOUR
	OIL STORAGE & USAGE AREA
	SPILL FLOW DIRECTION



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Tyson

Tyson Foods, Inc.
P.O. Box 2020 2210 W. Oaklawn
Springdale, Arkansas 72762
Tel:(479) 290-4947 Fax:(479) 290-4083
Engineering Services/Contact
Tel:(605) 235-3140 Fax:(605) 235-3565

TITLE: RENDERING PLANT OIL STORAGE AND USAGE AREAS		SEDALIA, MO.	
DRWN BY: DED	DATE: 01/15/2019	DWG NO: FIGURE 4	REV A
CHKD BY: WDH	SCALE: AS SHOWN	SHEET: 1	
APVD BY: BWV			
PROJECT:			

4

3

2

1

FORM C

Sec. 4.2 Stormwater Runoff Calculation Spreadsheet

Peak Stormwater Runoff using Rational Method ($Q=CIA$)

revised 3/2020

24-hour Rainfall = 0.5 inches

Outfall

2

Coefficient = 0.9 (Appendix 20.A - surface type)

Intensity = 0.020833333 in/hr

Area = 13 acres

Flow = 0.2 cfs

Q = 0.15753 MGD

Plant

Outfall

3

Coefficient = 0.9 (Appendix 20.A - surface type)

Intensity = 0.020833333 in/hr

Area = 6 acres

Flow = 0.1 cfs

Q = 0.07271 MGD

Plant

Outfall

4

Coefficient = 0.9 (Appendix 20.A - surface type)

Intensity = 0.020833333 in/hr

Area = 17 acres

Flow = 0.3 cfs

Q = 0.20600 MGD

Plant

Outfall

8

Coefficient = 0.35 (Appendix 20.A - surface type)

Intensity = 0.020833333 in/hr

Area = 2.50 acres

Flow = 0.018 cfs

Q = 0.012 MGD

RVAF

Outfall	SF	Acres
2	5.6E+05	13
3	2.5E+05	6
4	7.5E+05	17
Plant Total	1.6E+06	36
6	6.0E+03	0.14
7	2.0E+04	0.46
WWTP Total	2.6E+04	0.6

Environmental Analysis South, Inc.

4000 East Jackson Blvd. • Jackson, MO 63755 • 573-204-8817 • Fax 573-204-8818



REPORT OF ACUTE TOXICITY TESTING
Tyson Foods-Sedalia Processing Plant
Outfall 001 (24 hr composite) AEC = 100%
MO-0115061
EAS LOG# 2107227
May 17, 2017 through May 19, 2017

Tests performed by:

John P. Clippard / Chemical Analyst at Environmental Analysis South (EAS)
Kelly J. Ray / Biologist at Environmental Analysis South (EAS)
Sara C. Shields / Lab Supervisor - Chemist at Environmental Analysis South (EAS)
David F. Warren / Lab Director - Chemist at Environmental Analysis South (EAS)

- 1. Report Summation**
 - 1.1. Data Summation**
 - 1.2. Conclusion**
- 2. Method Summation**
 - 2.1. Test Conditions and Methods**
 - 2.2. Potassium chloride Reference Salt Test**
 - 2.2.1. *Pimephales promelas* data**
 - 2.2.2. *Ceriodaphnia dubia* data**
 - 2.3. Literature Cited**
- 3. Raw Data Bench Sheets**
 - 3.1. Initial observations (page 1)**
 - 3.2. Zero hour Observations (page 1)**
 - 3.3. Twenty-four (24) hour Observations (page 1)**
 - 3.4. Forty-eight (48) hour Observations (page 1)**
 - 3.5. Survival Data Table (page 2)**
 - 3.6. Test Comments (page 3)**
- 4. Chain of Custody**
- 5. MO DNR "Whole Effluent Toxicity (WET) Test Report (Form 780-1899)**

Environmental Analysis South, Inc.

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REPORT OF ACUTE TOXICITY TESTING
Tyson Foods-Sedalia Processing Plant
Outfall 001 (24 hr composite) AEC = 100%
MO-0115061
EAS LOG# 2107227
May 17, 2017 through May 19, 2017

1. REPORT SUMMATION:

1.1. Multiple Dilution Data Summation

Test Solution	<i>Pimephales promelas</i> Acute Toxicity Test 48 Hour Survival	<i>Ceriodaphnia dubia</i> Acute Toxicity Test 48 Hour Survival
Reconstituted Control (RC)	100%	100%
Upstream Control (UC)	100%	100%
6.25% Effluent	100%	100%
12.5% Effluent	100%	100%
25% Effluent	100%	100%
50% Effluent	100%	100%
100% Effluent	100%	100%
Estimated 48 Hour LC ₅₀ Value	>100% Effluent	>100% Effluent
TUa	<1.0	<1.0
Result of Toxicity Test	Monitor Only	Monitor Only

* Indicates a significant difference at alpha = 0.5 between effluent and control survival data.

Conclusion:

Pimephales promelas 48 hour WET results:

LC 50 >100% using the Graphical Method
NOAEC = 100% by Steel's Many-One Rank Test
TUa < 1.0

Ceriodaphnia dubia 48 hour WET results:

LC 50 >100% using the Graphical Method
NOAEC = 100% by Steel's Many-One Rank Test
TUa < 1.0

Approved by _____


Sara C. Shields, Chemist

Environmental Analysis South, Inc.

4000 East Jackson Blvd. • Jackson, MO 63755 • 573-204-8817 • Fax 573-204-8818



REPORT OF ACUTE TOXICITY TESTING
Tyson Foods-Sedalia Processing Plant
Outfall 001 (24 hr composite) AEC = 100%
MO-0115061
EAS LOG# 2107227
May 17, 2017 through May 19, 2017

2. TEST METHOD SUMMARY

2.1. TEST CONDITIONS AND METHODS:

	<i>Ceriodaphnia dubia</i> :	<i>Pimephales promelas</i> :
Test duration:	48 hours	48 hours
Temperature:	24 - 26 degree Celsius	24 - 26 degree Celsius
Light quality:	Ambient laboratory illumination	Ambient laboratory illumination
Photoperiod:	16 hour light, 8 hours dark	16 hour light, 8 hours dark
Control Water:	Moderately Hard Reconstituted Water	Moderately Hard Reconstituted Water
Dilution Water:	Upstream Water - If unavailable or toxic, then control water will be used.	Upstream Water - If unavailable or toxic, then control water will be used.
Size of test vessel:	30 milliliters	250 milliliters
Volume of test solution:	15 milliliters	200 milliliters
Age of test organisms:	<24 hours	1 -14 days (all same age)
Number of organisms/test vessel:	5	10
Number of replicates/concentration:	4	2
Number of organisms/concentration:	20	40 for a single dilution test and 20 for a multiple dilution test
Feeding regime:	None (fed prior to test)	None (fed prior to test)
Aeration:	None	None
Test acceptability criterion:	90% or greater survival in controls	90% or greater survival in controls

The methodology used for the chemistry data was taken from the *Standard Methods for the Examination of Water and Wastewater*, 18th edition (1992). The exception was hardness, which was determined using a Hach EDTA titration test kit. The toxicity tests follow guidelines laid out in the permittee's NPDES permit and were conducted according to EPA approved methods (USEPA 2002).

All test organisms were cultured according to EPA approved methods (USEPA 2002). The *Ceriodaphnia dubia* and the *Pimephales promelas* were obtained from C-K Associates Inc. located in Baton Rouge, Louisiana and shipped overnight for use in the whole effluent toxicity test.



REPORT OF ACUTE TOXICITY TESTING
Tyson Foods-Sedalia Processing Plant
Outfall 001 (24 hr composite) AEC = 100%
MO-0115061
EAS LOG# 2107227
May 17, 2017 through May 19, 2017

2.2. REFERENCE TOXICITY TEST:

Environmental Analysis South performs monthly reference toxicity tests. The most recent reference test was initiated on May 3, 2017 using KCL Lot #41713. Following are the results:

2.2.1. ***P. promelas*** - 48 hr. Acute Test – LC_{50} = 1.140 g/l 95%CI (0.826-1.453g/l)

EAS %CV = 13.8%

National Warning Limits (75th percentile) = 19%CV

National Control Limits (90th percentile) = 33%CV

2.2.2. ***C. dubia*** - 48 hr. Acute Test – LC_{50} = 0.499 g/l 95%CI (0.334-0.664g/l)

EAS %CV = 16.5%

National Warning Limits (75th percentile) = 29%CV

National Control Limits (90th percentile) = 34%CV

2.3. LITERATURE CITED:

1. APHA. 1992. *Standard methods for the examination of water and wastewater*, 18th Ed. American Public Health Association, Washington, D.C
2. USEPA. 2002. *Methods for measuring the acute toxicity of effluents and receiving waters to freshwater and marine organisms*, 5th Ed. EPA-821-R-02-012
3. USEPA 2000. *Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications under the National Pollutant Discharge Elimination System, (Table B-2)*. June 2000. EPA 833-R-00-003.

NPDES NUMBER: MO-0115061

TYPE OF METHOD:

multiple condition; 40 ms, 1 & 3D, AES, 100%, 100% report

E OF COLLECTION: 03/15/17 0830 HRS - 03/16/17 0830 HRS by MARK W George

DATE OF SUBMISSION:	05/17/17	0850 hrs by Fed Ex
---------------------	----------	--------------------

Upstream: Little Muddy Creek

Collected: 05/16/17 0910 hrs by MWG

[illegible][illegible][illegible]

Date: 5/30/17

WHOLE EFFLUENT TEST conducted in accordance with US EPA 600/4-90/027
Fifth Edition October 2002

Tyson Poultry Inc. --Sedalia Processing Plant, Outfall 001, 24 hr composite EAS LOG# 2107227

Date Test Began:	May 17, 2018	Time Test Began:	1100 hrs	Analyst 1:	DFW
Date Test Finished:	May 19, 2017	Time Test Finished:	1100 hrs	Analyst 2:	KJR
				Analyst 3:	SCS

P. promelas (PP) AGE: 76 days HATCH NUMBER: 900 c-k

	RC	UC	100%	50%	25%	12.5%	6.25%	X% AEC
PERIOD	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE
0 HR-PP	10,10	10,10	10,10	10,10	10,10	10,10	10,10	
24 HR-PP	10,10	10,10	10,10	10,10	10,10	10,10	10,10	
48 HR-PP	10,10	10,10	10,10	10,10	10,10	10,10	10,10	

Ceriodaphnia dubia (CD) AGE: <24 hours HATCH NUMBER: 3478 c-k

	RC	UC	100%	50%	25%	12.5%	6.25%	X% AEC
PERIOD	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE
0 HR-CD	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	
24 HR-CD	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	
48 HR-CD	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	

Approved by: 

Date: 5/30/17

multiple
1058
The report

ENVIRONMENTAL ANALYSIS SOUTH, INC.
4000 East Jackson Blvd
Jackson, MO 63755
Phone: (573) 204-8817 Fax: (573) 204-8818



141209

WHOLE EFFLUENT TOXICITY TESTING CHAIN OF CUSTODY

CLIENT: Tyson Sedalia Tyson Poultry Inc. - Sedalia
NPDES PERMIT NUMBER: MO 0115061 Processing Plant

EFFLUENT NAME: Outfall 001 GRAB ☐ 24 HR COMPOSITE ☒
(LEGAL NAME)

COLLECTION DATA: START DATE: 051517 START TIME: 0830

FINISH DATE: 051617 FINISH TIME: 0830

UPSTREAM NAME: Little muddy Creek (GRAB SAMPLE)
(LEGAL NAME) outfall 51

COLLECTION DATA: DATE: 051617 TIME: 0910

SAMPLER NAME: Mark W George CARRIER: Fed EX
(PRINT NAME)

Disclaimer: Environmental Analysis South, Inc. shall not be held financially liable for invalid whole effluent toxicity test (WET) or shipping charges resulting from the following reasons:

- Sampling & holding time errors (Will results in a setup charge of \$100 to the client)
- Commercial carrier delivery problems or errors (Will results in a setup charge of \$100 to the client)
- Problems with health or delivery of test organisms by vendor (No setup charge to client)

SAMPLER CHECK LIST

NO HEADSPACE IN BOTTLES ☐
SHIP SAMPLES BY NEXT DAY CARRIER OR DELIVER TO LAB ON 5.17.17 ☐
SAMPLES TO BE HAND DELIVERED TO LABORATORY SAME DAY AS TEST SETUP ☐
SUFFICIENT ICE TO COOL SAMPLES TO A RANGE OF 0 - 6°C WHEN SHIPPING OVERNIGHT ☐

RELINQUISHED BY: Wade A. O'Connell DATE: 5-16-17 TIME: 0925

LABORATORY USE ONLY

EFFLUENT LOG NUMBER: 210722 7

RECEIVED TEMPERATURE: 3 °C THERMOMETER ASSIGNED NUMBER: _____

HEADSPACE: YES or NO SAMPLES ICED or DELIVERED SAME DAY AS TEST

UPSTREAM LOG NUMBER: 210722 7-A

RECEIVED TEMPERATURE: 3 °C THERMOMETER ASSIGNED NUMBER: _____

HEADSPACE: YES or NO SAMPLES ICED or DELIVERED SAME DAY AS TEST

RECEIVED BY: Amulogan DATE: 5/17/17 TIME: 850

FelEx



MISSOURI DEPARTMENT OF NATURAL RESOURCES
NPDES MONITORING REPORT FOR WHOLE EFFLUENT TOXICITY TESTS

RETURN FORM TO: Southeast Regional Office
2155 N. Westwood Blvd. Poplar Bluff, MO 63901

Facility Name	Tyson Poultry Inc--Sedalia Processing Plant	Receiving Water	Little Muddy Creek
Permit Number	MO-0115061	Laboratory Name	Environmental Analysis South, Inc.
Outfall	001	Laboratory Report #	MO_2107227

SAMPLE INFORMATION

Sample Number	Sample Collection				Sample Temperature (°C)		pH (SU)	Hand delivered? (If yes, ≤ 4 hrs?)	Hold Time ≤ 36 hours?	Sample Acceptable
	Effluent or Upstream	Sample Type	Beginning Date	End Date	At Collection	At Lab	At Lab			
1	2107227	Effluent	05/15/17	05/17/17		3	7.81	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
2	2107227A	Upstream	05/16/17	05/16/17		3	7.91	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
3								<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
4								<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N

Describe any unusual conditions during sampling that might influence test results

TEST INFORMATION - ACUTE					QA/QC CONDITIONS - ACUTE			
Test Method:	C. dubia 2002.0	P. promelas 2000.0				YES	NO	
Date Test Initiated:	05/17/2017				Did test conditions meet all test acceptability criterion required by the specified method?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AEC/IWC Info:	AEC = 100%				Temperatures maintained during test (20 ± 1°C)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Dilution Series	100%	50%	25%	12.5%	Temperatures maintained during test (25 ± 1°C)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	6.25%				Dissolved oxygen ≥ 4.0 mg/L throughout test?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dilution Water:	C. dubia	RW <input checked="" type="checkbox"/>	LW <input type="checkbox"/>		Effluent pH maintained within 6.0 - 9.0 SU throughout test?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	P. promelas	RW <input checked="" type="checkbox"/>	LW <input type="checkbox"/>		Concurrent or monthly reference tests within acceptable limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RW = Receiving Stream Control LW = Lab Water Control					Were effluent samples modified prior to testing? (ex. filtration, aeration, chemical addition including de-chlorination or pH adjustment)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Comments:					Comments:			

WATER CHEMISTRY (All values reported in mg/L, except for pH and conductivity)

Sample Type	Sample Number	Conductivity (µmhos)	Unionized Ammonia	Hardness	Alkalinity	pH (SU) After Warming	Total Residual Chlorine	Other	Other	Other
Upstream	2107227A	1320	<0.010	248	276	8.10	<0.04	DO=9.5		
Effluent	2107227	2010	<0.010	222	375	7.93	<0.04	DO=8.9		
Lab Water	RC4181	283	<0.010	59.2	60.0	8.45	<0.04	DO=8.8		

Comments:

TU _a limit = Monitoring only.		Pimephales promelas Acute Results	LC50=	>100%	Confidence Interval % =	N/A	TU _a =	<1.0
		Ceriodaphnia dubia Acute Results	LC50=	>100%	Confidence Interval % =	N/A	TU _a =	<1.0

Receiving Water Controls				Lab Water Controls			
Fathead Minnow		Ceriodaphnia dubia		Fathead Minnow		Ceriodaphnia dubia	
Survival ≥ 90%	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Survival ≥ 90%	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Survival ≥ 90%	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Survival ≥ 90%	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N

Comments:

SIGNATURE AND TITLE OF AUTHORIZED INDIVIDUAL, IN ACCORDANCE WITH 10 CSR 20-6.010	DATE	PHONE NUMBER

Environmental Analysis South, Inc.

4000 East Jackson Blvd. • Jackson, MO 63755 • 573-204-8817 • Fax 573-204-8818



REPORT OF ACUTE TOXICITY TESTING
Tyson Poultry Inc—Sedalia Processing Plant
Outfall 001 (composite) AEC = 100%
MO-0115061
EAS LOG# 2211224
May 16, 2018 through May 18, 2018

Tests performed by:

John P. Clippard / Chemical Analyst at Environmental Analysis South (EAS)
Kelly J. Ray / Biologist at Environmental Analysis South (EAS)
Sara C. Shields / Lab Supervisor - Chemist at Environmental Analysis South (EAS)
David F. Warren / Lab Director - Chemist at Environmental Analysis South (EAS)

1. Report Summation
 - 1.1. Data Summation
 - 1.2. Conclusion
2. Method Summation
 - 2.1. Test Conditions and Methods
 - 2.2. Potassium chloride Reference Salt Test
 - 2.2.1. *Pimephales promelas* data
 - 2.2.2. *Ceriodaphnia dubia* data
 - 2.3. Literature Cited
3. Raw Data Bench Sheets
 - 3.1. Initial observations (page 1)
 - 3.2. Zero hour Observations (page 1)
 - 3.3. Twenty-four (24) hour Observations (page 1)
 - 3.4. Forty-eight (48) hour Observations (page 1)
 - 3.5. Survival Data Table (page 2)
 - 3.6. Test Comments (page 3)
4. Chain of Custody
5. MO DNR "Whole Effluent Toxicity (WET) Test Report (Form 780-1899)

Environmental Analysis South, Inc.

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REPORT OF ACUTE TOXICITY TESTING
Tyson Poultry Inc—Sedalia Processing Plant
Outfall 001 (composite) AEC = 100%
MO-0115061
EAS LOG# 2211224
May 16, 2018 through May 18, 2018

1. REPORT SUMMATION:

1.1. Multiple Dilution Data Summation

Test Solution	<i>Pimephales promelas</i> Acute Toxicity Test 48 Hour Survival	<i>Ceriodaphnia dubia</i> Acute Toxicity Test 48 Hour Survival
Reconstituted Control (RC)	100%	100%
Upstream Control (UC)	100%	100%
6.25% Effluent	100%	100%
12.5% Effluent	100%	100%
25% Effluent	100%	100%
50% Effluent	100%	100%
100% Effluent	100%	100%
Estimated 48 Hour LC ₅₀ Value	>100% Effluent	>100% Effluent
TUa Value	<1.0	<1.0
Result of Toxicity Test	Monitor	Monitor

* Indicates a significant difference at alpha = 0.5 between effluent and control survival data.

Conclusion:

Pimephales promelas 48 hour WET results:

LC 50 >100% using the Graphical Method
NOAEC = 100% by Steel's Many-One Rank Test
TUa <1.0

Ceriodaphnia dubia 48 hour WET results:

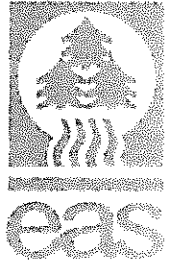
LC 50 >100% using the Graphical Method
NOAEC = 100% by Steel's Many-One Rank Test
TUa <1.0

Approved by _____


Sara C. Shields, Chemist

Environmental Analysis South, Inc.

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REPORT OF ACUTE TOXICITY TESTING
Tyson Poultry Inc—Sedalia Processing Plant
Outfall 001 (composite) AEC = 100%
MO-0115061
EAS LOG# 2211224
May 16, 2018 through May 18, 2018

2. TEST METHOD SUMMARY

2.1. TEST CONDITIONS AND METHODS:

	<i>Ceriodaphnia dubia:</i>	<i>Pimephales promelas:</i>
Test duration:	48 hours	48 hours
Temperature:	24 - 26 degree Celsius	24 - 26 degree Celsius
Light quality:	Ambient laboratory illumination	Ambient laboratory illumination
Photoperiod:	16 hour light, 8 hours dark	16 hour light, 8 hours dark
Control Water:	Moderately Hard Reconstituted Water	Moderately Hard Reconstituted Water
Dilution Water:	Upstream Water - If unavailable or toxic, then control water will be used.	Upstream Water - If unavailable or toxic, then control water will be used.
Size of test vessel:	30 milliliters	250 milliliters
Volume of test solution:	15 milliliters	200 milliliters
Age of test organisms:	<24 hours	1 -14 days (all same age)
Number of organisms/test vessel:	5	10
Number of replicates/concentration:	4	2
Number of organisms/concentration:	20	40 for a single dilution test and 20 for a multiple dilution test
Feeding regime:	None (fed prior to test)	None (fed prior to test)
Aeration:	None	None
Test acceptability criterion:	90% or greater survival in controls	90% or greater survival in controls

The methodology used for the chemistry data was taken from the *Standard Methods for the Examination of Water and Wastewater*, 18th edition (1992). The exception was hardness, which was determined using a Hach EDTA titration test kit. The toxicity tests follow guidelines laid out in the permittee's NPDES permit and were conducted according to EPA approved methods (USEPA 2002).

All test organisms were cultured according to EPA approved methods (USEPA 2002). The *Ceriodaphnia dubia* and the *Pimephales promelas* were obtained from C-K Associates Inc. located in Baton Rouge, Louisiana and shipped overnight for use in the whole effluent toxicity test.

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REPORT OF ACUTE TOXICITY TESTING
Tyson Poultry Inc—Sedalia Processing Plant
Outfall 001 (composite) AEC = 100%
MO-0115061
EAS LOG# 2211224
May 16, 2018 through May 18, 2018

2.2. REFERENCE TOXICITY TEST:

Environmental Analysis South performs monthly reference toxicity tests. The most recent reference test was initiated on May 9, 2018 using KCL Lot #41713. Following are the results:

- 2.2.1. *P. promelas* - 48 hr. Acute Test – $LC_{50} = 1.251 \text{ g/l}$ 95%CI (0.999 g/l - 1.502 g/l)
EAS %CV = 10.1%
National Warning Limits (75th percentile) = 19%CV
National Control Limits (90th percentile) = 33%CV
- 2.2.2. *C. dubia* - 48 hr. Acute Test – $LC_{50} = 0.459 \text{ g/l}$ 95%CI (0.251 g/l - 0.666g/l)
EAS %CV = 22.6%
National Warning Limits (75th percentile) = 29%CV
National Control Limits (90th percentile) = 34%CV

2.3. LITERATURE CITED:

1. APHA. 1992. *Standard methods for the examination of water and wastewater*, 18th Ed. American Public Health Association, Washington, D.C
2. USEPA. 2002. *Methods for measuring the acute toxicity of effluents and receiving waters to freshwater and marine organisms*, 5th Ed. EPA-821-R-02-012
3. USEPA 2000. *Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications under the National Pollutant Discharge Elimination System, (Table B-2)*. June 2000. EPA 833-R-00-003.

WHOLE EFFLUENT TEST conducted in accordance with US EPA 600/4-90/027
Fifth Edition October 2002

CLIENT NAME: Tyson Poultry Inc. -Sedalia Processing Plant, Outfall 001, 24 hr composite

NPDES NUMBER: MO-0115061

TYPE OF METHOD: multiple dilution, 48 hrs, PP & CD, AEC=100%, Taa report

DATE & TIME OF COLLECTION: 05/14/18 0830 hrs - 05/15/18 0830 hrs by Rod Foushee

DATE & TIME OF SUBMISSION: 05/16/18 0835 hrs by Fed Ex

Upstream: Little Muddy Creek

Collected: 05/15/18 0900 hrs by Fed Ex

INITIAL OBSERVATIONS	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	INT EFFL	INT UC	INT RC
LOG NUMBER / ID NUMBER						2211224	2211224A	RC4206
pH - SU	05/16/18	0900 hrs	SCS	SB114 (8.8-9.2)	8.91	7.73	7.87	8.49
TEMPERATURE °C RECEIVED	05/16/18	0900 hrs	SCS	EAS 106		3	3	23
SPECIFIC CONDUCTANCE umhos	05/16/18	0900 hrs	SCS	ERA P255-506 (437-490)	479	2260	586	259
HARDNESS - ppm	05/17/18	1315 hrs	SCS	P257-507 (194-228)	223	222	238	86
CHLORINE - ppm	05/16/18	0900 hrs	SCS	A6298 (0.82 - 1.02)	0.91	<0.04	<0.04	<0.04
DISSOLVED OXYGEN - ppm	05/16/18	0900 hrs	SCS	cal@840		7.9	5.1	8.4
TOTAL ALKALINITY - ppm	05/17/18	1400 hrs	SCS	WP259 (100-128)	111.0	350	208	73.8
INITIAL AMMONIA - ppm	05/17/18	1200 hrs	JPC	EAS 2963 (8-12)	9.5	<0.05	<0.05	<0.05
TOTAL DISSOLVED SOLIDS -ppm								
0 HOUR OBSERVATIONS	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%
pH - SU	05/16/18	1100 hrs	SCS	SB114 (8.8-9.2)	8.91	8.55	8.37	7.95
TEMPERATURE °C	05/16/18	1100 hrs	SCS	EAS 106		24.6	24.9	24.6
SPECIFIC CONDUCTANCE umhos	05/16/18	1100 hrs	SCS	ERA P255-506 (437-490)	479	267	575	270
DISSOLVED OXYGEN - ppm	05/16/18	1100 hrs	SCS	cal@840		8.5	8.5	8.5
								6.25%
								8.30
								25.1
								789
								674
								7.2
								6.25%
								8.39
								25.0
								682
								8.0

24 HOUR OBSERVATIONS - PP	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.5%	6.25%	X %AEC
pH - SU	05/17/18	1100 hrs	SCS	SB114 (8.8-9.2)	8.91	8.14	8.24	8.32	8.32	8.34	8.34	8.30	
TEMPERATURE °C	05/17/18	1100 hrs	SCS	EAS 106		25.1	25.1	25.1	25.1	25.1	25.1	25.1	
SPECIFIC CONDUCTANCE umhos	05/17/18	1100 hrs	SCS	ERA P255-506 (437-490)	479	265	571	2300	1493	1026	789	674	
DISSOLVED OXYGEN - ppm	05/17/18	1100 hrs	SCS	cal@840		8	7.4	7.2	7.4	7.3	7.2	7.2	
48 HOUR OBSERVATIONS - PP	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.5%	6.25%	X %AEC
pH - SU	05/18/18	1100 hrs	SCS	SB114 (8.8-9.2)	8.9	8.09	8.17	8.53	8.44	8.42	8.40	8.39	
TEMPERATURE °C	05/18/18	1100 hrs	SCS	EAS 106		25.0	25.0	25.0	25.0	25.0	25.0	25.0	
SPECIFIC CONDUCTANCE umhos	05/18/18	1100 hrs	SCS	ERA P255-506 (437-490)	477	301	602	2280	1530	1087	809	682	
DISSOLVED OXYGEN - ppm	05/18/18	1100 hrs	SCS	cal@840		8.0	8.0	7.4	7.5	8.0	8.0	8.0	
FINAL AMMONIA - ppm				DMRQA33 (10.0-16.8)									

24 HOUR OBSERVATIONS - CD	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.5%	6.25%	X %AEC
pH - SU	05/17/18	1100 hrs	SCS	SB114 (8.8-9.2)	8.91	8.24	8.34	8.25	8.25	8.31	8.36	8.35	
TEMPERATURE °C	05/17/18	1100 hrs	SCS	EAS 106		25.0	25.0	25.0	25.0	25.0	25.0	25.0	
SPECIFIC CONDUCTANCE umhos	05/17/18	1100 hrs	SCS	ERA P255-506 (437-490)	479	257	567	2210	1434	1014	673	672	
DISSOLVED OXYGEN - ppm	05/17/18	1100 hrs	SCS	cal@840		8.3	8.5	8.2	8.0	7.9	8.0	8.2	
48 HOUR OBSERVATIONS - CD	DATE	TIME	ANALYST	QC LOT	QC EXP VALUE	RC	UC	100%	50%	25%	12.5%	6.25%	X %AEC
pH - SU	05/18/18	1100 hrs	SCS	SB114 (8.8-9.2)	8.9	8.10	8.17	8.36	8.45	8.47	8.52	8.51	
TEMPERATURE °C	05/18/18	1100 hrs	SCS	EAS 106		25.0	25.0	25.0	25.0	25.0	25.0	25.0	
SPECIFIC CONDUCTANCE umhos	05/18/18	1100 hrs	SCS	ERA P255-506 (437-490)	477	276	557	2210	1421	1004	781	671	
DISSOLVED OXYGEN - ppm	05/18/18	1100 hrs	SCS	cal@840		7.8	8.3	7.9	7.9	7.8	8.0	8.0	
FINAL AMMONIA - ppm				DMRQA33 (10.0-16.8)									

Approved by: *[Signature]*

Date: 05/21/18

WHOLE EFFLUENT TEST conducted in accordance with US EPA 600/4-90/027
Fifth Edition October 2002

Tyson Poultry Inc. --Sedalia Processing Plant, Outfall 001, 24 hr composite EAS LOG# 2211224

Date Test Began: May 16, 2018 Time Test Began: 1100 hrs Analyst 1: DFW
Date Test Finished: May 18, 2018 Time Test Finished: 1100 hrs Analyst 2: KJR
Analyst 3: SCS

P. promelas (PP) AGE: 6 days HATCH NUMBER: 549 C-K

	RC	UC	100%	50%	25%	12.5%	6.25%	X% AEC
PERIOD	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE
0 HR-PP	10,10	10,10	10,10	10,10	10,10	10,10	10,10	
24 HR-PP	10,10	10,10	10,10	10,10	10,10	10,10	10,10	
48 HR-PP	10,10	10,10	10,10	10,10	10,10	10,10	10,10	

Ceriodaphnia dubia (CD) AGE: <24 hours HATCH NUMBER: 3642 C-K

	RC	UC	100%	50%	25%	12.5%	6.25%	X% AEC
PERIOD	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE
0 HR-CD	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	
24 HR-CD	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	
48 HR-CD	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	

Approved by: *[Signature]*

Date: 05/21/18

Tyson Poultry Inc. --Sedalia Processing Plant, Outfall 001, 24 hr composite EAS#: 2211224

Notes & Comments

[illegible]

Prepared by: *Shahid*

Date: 05/21/18

multiple
100%
TWA

ENVIRONMENTAL ANALYSIS SOUTH, INC.

4000 East Jackson Blvd

Jackson, MO 63755

Phone: (573) 204-8817 Fax: (573) 204-8818



146046

WHOLE EFFLUENT TOXICITY TESTING CHAIN OF CUSTODY

CLIENT: Tyson-Sidalia

NPDES PERMIT NUMBER: MO-0115061

EFFLUENT NAME: outfall 001 GRAB ☐ 24 HR COMPOSITE ☒
(LEGAL NAME)

COLLECTION DATA: START DATE: 5-14-18 START TIME: 0830

FINISH DATE: 5-15-18 FINISH TIME: 0830

UPSTREAM NAME: L'He Muddy Creek (GRAB SAMPLE)
(LEGAL NAME) outfall 51

COLLECTION DATA: DATE: 5-15-18 TIME: 0900

SAMPLER NAME: Rod Gensher CARRIER: Fed EX
(PRINT NAME)

Disclaimer: Environmental Analysis South, Inc. shall not be held financially liable for invalid whole effluent toxicity test (WET) or shipping charges resulting from the following reasons:

- Sampling & holding time errors (Will results in a setup charge of \$100 to the client)
- Commercial carrier delivery problems or errors (Will results in a setup charge of \$100 to the client)
- Problems with health or delivery of test organisms by vendor (No setup charge to client)

SAMPLER CHECK LIST

NO HEADSPACE IN BOTTLES ☐
SHIP SAMPLES BY NEXT DAY CARRIER OR DELIVER TO LAB ON 5, 16, 18 ☐
SAMPLES TO BE HAND DELIVERED TO LABORATORY SAME DAY AS TEST SETUP ☐
SUFFICIENT ICE TO COOL SAMPLES TO A RANGE OF 0 - 6°C WHEN SHIPPING OVERNIGHT ☐

RELINQUISHED BY: Wade Dams DATE: 5-15-18 TIME: _____

LABORATORY USE ONLY

EFFLUENT

LOG NUMBER: 2211224

RECEIVED TEMPERATURE: 3 °C THERMOMETER ASSIGNED NUMBER: _____

HEADSPACE: YES or NO

SAMPLES ICED or DELIVERED SAME DAY AS TEST

UPSTREAM

LOG NUMBER: 2211224-A

RECEIVED TEMPERATURE: 3 °C THERMOMETER ASSIGNED NUMBER: _____

HEADSPACE: YES or NO

SAMPLES ICED or DELIVERED SAME DAY AS TEST

RECEIVED BY: Sam Wilson DATE: 5/16/18 TIME: 835
Fed Ex

MISSOURI DEPARTMENT OF NATURAL RESOURCES
NPDES MONITORING REPORT FOR WHOLE EFFLUENT TOXICITY TESTSRETURN FORM TO: Southeast Regional Office
2155 N. Westwood Blvd. Poplar Bluff, MO 63901

Facility Name	Tyson Poultry Inc--Sedalia Processing Plant	Receiving Water	Little Muddy Creek
Permit Number	MO-0115061	Laboratory Name	Environmental Analysis South, Inc.
Outfall	001	Laboratory Report #	MO_2211224

SAMPLE INFORMATION

Sample Number	Sample Collection				Sample Temperature (°C)		pH (SU)	Hand delivered? (If yes, ≤ 4 hrs?)	Hold Time ≤ 36 hours?	Sample Acceptable
	Effluent or Upstream	Sample Type	Beginning Date	End Date	At Collection	At Lab	At Lab			
1	2211224	Effluent	05/14/18	05/15/18		3	7.73	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
2	2211224A	Upstream	05/15/18	05/15/18		3	7.87	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
3								<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
4								<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N

Describe any unusual conditions during sampling that might influence test results

TEST INFORMATION - ACUTE					QA/QC CONDITIONS - ACUTE				
Test Method:	<i>C. dubia</i> 2002.0	<i>P. promelas</i> 2000.0				YES	NO		
Date Test Initiated:	05/16/2018				Did test conditions meet all test acceptability criterion required by the specified method?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
AEC/IWC Info:	AEC = 100%				Temperatures maintained during test (20 ± 1°C)	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Dilution Series	100%	50%	25%	12.5%	Temperatures maintained during test (25 ± 1°C)	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
	6.25%				Dissolved oxygen ≥ 4.0 mg/L throughout test?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Dilution Water:	<i>C. dubia</i>	RW <input checked="" type="checkbox"/>	LW <input type="checkbox"/>		Effluent pH maintained within 6.0 - 9.0 SU throughout test?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
	<i>P. promelas</i>	RW <input checked="" type="checkbox"/>	LW <input type="checkbox"/>		Concurrent or monthly reference tests within acceptable limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
RW = Receiving Stream Control LW = Lab Water Control					Were effluent samples modified prior to testing? (ex. filtration, aeration, chemical addition including de-chlorination or pH adjustment)	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Comments:					Comments: UPSTREAM CONTROL AERATED PRIOR TO TEST INITIATION DUE TO LOW DO UPON ARRIVAL TO THE LAB				

WATER CHEMISTRY (All values reported in mg/L, except for pH and conductivity)

Sample Type	Sample Number	Conductivity (µmhos)	Un-ionized Ammonia	Hardness	Alkalinity	pH (SU) After Warming	Total Residual Chlorine	Other	Other	Other
Upstream	2211224A	586	<0.010	238	208	8.37	<0.04	DO=5.1		
Effluent	2211224	2260	<0.010	222	350	7.95	<0.04	DO=7.9		
Lab Water	RC4206	259	<0.010	86.0	73.8	8.55	<0.04	DO=8.4		

Comments:

TU _a limit = Monitoring only.	<i>Pimephales promelas</i> Acute Results	LC50=	>100%	Confidence Interval % =	N/A	TU ₅₀ =	<1.0
	<i>Ceriodaphnia dubia</i> Acute Results	LC50=	>100%	Confidence Interval % =	N/A	TU ₅₀ =	<1.0

Receiving Water Controls				Lab Water Controls			
Fathead Minnow		<i>Ceriodaphnia dubia</i>		Fathead Minnow		<i>Ceriodaphnia dubia</i>	
Survival ≥ 90%	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Survival ≥ 90%	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Survival ≥ 90%	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Survival ≥ 90%	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N

Comments:

SIGNATURE AND TITLE OF AUTHORIZED INDIVIDUAL, IN ACCORDANCE WITH 10 CSR 20-6.010	DATE	PHONE NUMBER

Environmental Analysis South, Inc.

4000 East Jackson Blvd. • Jackson, MO 63755 • 573-204-8817 • Fax 573-204-8818



REPORT OF ACUTE TOXICITY TESTING
Tyson Poultry Inc—Sedalia Processing Plant
Outfall 001 (composite) AEC = 100%
MO-0115061
EAS LOG# 2401506
June 12, 2019 through June 14, 2019

Tests performed by:

John P. Clippard / Chemical Analyst at Environmental Analysis South (EAS)
Kelly J. Ray / Biologist at Environmental Analysis South (EAS)
Sara C. Shields / Lab Supervisor - Chemist at Environmental Analysis South (EAS)
David F. Warren / Lab Director - Chemist at Environmental Analysis South (EAS)

1. Report Summation
 - 1.1. Data Summation
 - 1.2. Conclusion
2. Method Summation
 - 2.1. Test Conditions and Methods
 - 2.2. Potassium chloride Reference Salt Test
 - 2.2.1. *Pimephales promelas* data
 - 2.2.2. *Ceriodaphnia dubia* data
 - 2.3. Literature Cited
3. Raw Data Bench Sheets
 - 3.1. Initial observations (page 1)
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 - 3.5. Survival Data Table (page 2)
 - 3.6. Test Comments (page 3)
4. Chain of Custody
5. MO DNR "Whole Effluent Toxicity (WET) Test Report (Form 780-1899)

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1. REPORT SUMMATION:

1.1. Multiple Dilution Data Summation

Test Solution	<i>Pimephales promelas</i> Acute Toxicity Test 48 Hour Survival	<i>Ceriodaphnia dubia</i> Acute Toxicity Test 48 Hour Survival
Reconstituted Control (RC)	100%	100%
Upstream Control (UC)	100%	100%
6.25% Effluent	100%	100%
12.5% Effluent	100%	100%
25% Effluent	100%	100%
50% Effluent	100%	100%
100% Effluent	95%	100%
Estimated 48 Hour LC ₅₀ Value	>100% Effluent	>100% Effluent
TUa Result	<1.00	<1.00
Result of Toxicity Test	Monitor	Monitor

* Indicates a significant difference at alpha = 0.5 between effluent and control survival data.

Conclusion:

Pimephales promelas 48 hour WET results:

LC 50 > 100% by the Graphical Method
NOAEC = 100% using Steel's Many-One Rank Test
TUa < 1.00

Ceriodaphnia dubia 48 hour WET results:

LC 50 > 100% by the Graphical Method
NOAEC = 100% using Steel's Many-One Rank Test
TUa < 1.00

Approved by _____


Sara C. Shields, Chemist



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2. TEST METHOD SUMMARY

2.1. TEST CONDITIONS AND METHODS:

	<i>Ceriodaphnia dubia:</i>	<i>Pimephales promelas:</i>
Test duration:	48 hours	48 hours
Temperature:	24 - 26 degree Celsius	24 - 26 degree Celsius
Light quality:	Ambient laboratory illumination	Ambient laboratory illumination
Photoperiod:	16 hour light, 8 hours dark	16 hour light, 8 hours dark
Control Water:	Moderately Hard Reconstituted Water	Moderately Hard Reconstituted Water
Dilution Water:	Upstream Water - If unavailable or toxic, then control water will be used.	Upstream Water - If unavailable or toxic, then control water will be used.
Size of test vessel:	30 milliliters	250 milliliters
Volume of test solution:	15 milliliters	200 milliliters
Age of test organisms:	<24 hours	1 -14 days (all same age)
Number of organisms/test vessel:	5	10
Number of replicates/concentration:	4	2
Number of organisms/concentration:	20	40 for a single dilution test and 20 for a multiple dilution test
Feeding regime:	None (fed prior to test)	None (fed prior to test)
Aeration:	None	None
Test acceptability criterion:	90% or greater survival in controls	90% or greater survival in controls

The methodology used for the chemistry data was taken from the *Standard Methods for the Examination of Water and Wastewater*, 18th edition (1992). The exception was hardness, which was determined using a Hach EDTA titration test kit. The toxicity tests follow guidelines laid out in the permittee's NPDES permit and were conducted according to EPA approved methods (USEPA 2002).

All test organisms were cultured according to EPA approved methods (USEPA 2002). The *Ceriodaphnia dubia* and the *Pimephales promelas* were obtained from ARO (Aquatic Research Organisms) located in Hampton, New Hampshire and shipped overnight for use in the whole effluent toxicity test.



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June 12, 2019 through June 14, 2019

2.2. REFERENCE TOXICITY TEST:

Environmental Analysis South performs monthly reference toxicity tests. The most recent reference test was initiated on June 5, 2019 using KCL Lot #41713. Following are the results:

- 2.2.1. ***P. promelas*** - 48 hr. Acute Test – $LC_{50} = 1.147$ g/l 95%CI (0.814 g/l - 1.480 g/l)
EAS %CV = 14.5%
National Warning Limits (75th percentile) = 19%CV
National Control Limits (90th percentile) = 33%CV
- 2.2.2. ***C. dubia*** - 48 hr. Acute Test – $LC_{50} = 0.394$ g/l 95%CI (0.211 g/l - 0.576 g/l)
EAS %CV = 23.2%
National Warning Limits (75th percentile) = 29%CV
National Control Limits (90th percentile) = 34%CV

LITERATURE CITED:

1. APHA. 1992. *Standard methods for the examination of water and wastewater*, 18th Ed. American Public Health Association, Washington, D.C
2. USEPA. 2002. *Methods for measuring the acute toxicity of effluents and receiving waters to freshwater and marine organisms*, 5th Ed. EPA-821-R-02-012
3. USEPA 2000. *Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications under the National Pollutant Discharge Elimination System, (Table B-2)*. June 2000. EPA 833-R-00-003.

Tyson Poultry Inc.-Sedalia Processing Plant, Outfall 001, composite

MO-0115061

multiple diluti

multiple dilution, 48 hr non-renewal WET. PP and CD species AEC=100%, TUA report

Upstream: Little Muddy Creek

Collected: 06/11/19 0930 hrs MB

[illegible][illegible][illegible]

[Signature]

Date: 6/18/19

WHOLE EFFLUENT TEST conducted in accordance with US EPA 600/4-90/027
Fifth Edition October 2002

Tyson Poultry Inc--Sedalia Processing Plant, Outfall 001, composite EAS LOG# 2401506

Date Test Began:	June 12, 2019	Time Test Began:	1200 hrs	Analyst 1:	DFW
Date Test Finished:	June 14, 2019	Time Test Finished:	1200 hrs	Analyst 2:	KJR
				Analyst 3:	SCS

P. promelas (PP) AGE: 11 days HATCH NUMBER: 052719FH

	RC	UC	100%	50%	25%	12.5%	6.25%	X% AEC
PERIOD	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE
0 HR-PP	10,10	10,10	10,10	10,10	10,10	10,10	10,10	
24 HR-PP	10,10	10,10	10,9	10,10	10,10	10,10	10,10	
48 HR-PP	10,10	10,10	10,9	10,10	10,10	10,10	10,10	

Ceriodaphnia dubia (CD) AGE: <24 hours HATCH NUMBER: 061119CD

	RC	UC	100%	50%	25%	12.5%	6.25%	X% AEC
PERIOD	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE	ALIVE
0 HR-CD	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	
24 HR-CD	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	
48 HR-CD	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	5,5,5,5	

Approved by: 

Date: 06/18/19

Tyson Poultry Inc--Sedalia Processing Plant, Outfall 001, composite EAS#: 2401506

Notes & Comments

Outfall 001 aerated prior to test initiation due to lower DO upon arrival to the lab

Prepared by:  Date: 06/18/19

ENVIRONMENTAL ANALYSIS SOUTH, INC.

4000 East Jackson Blvd

Jackson, MO 63755

Phone: (573) 204-8817 Fax: (573) 204-8818



151533

WHOLE EFFLUENT TOXICITY TESTING
CHAIN OF CUSTODY

CLIENT: Tyson - Sedalia

NPDES PERMIT NUMBER: MO-C115061

EFFLUENT NAME: 001 GRAB ☐ 24 HR COMPOSITE ☒
(LEGAL NAME)

COLLECTION DATA: START DATE: 6-10-19 START TIME: 0830

FINISH DATE: 6-11-19 FINISH TIME: 0830

UPSTREAM NAME: Little Muddy Creek (GRAB SAMPLE)
(LEGAL NAME)

COLLECTION DATA: DATE: 6-11-19 TIME: 0930

SAMPLER NAME: Michael Brackeen CARRIER: Fed Ex
(PRINT NAME)

Disclaimer: Environmental Analysis South, Inc. shall not be held financially liable for invalid whole effluent toxicity test (WET) or shipping charges resulting from the following reasons:

- Sampling & holding time errors (Will results in a setup charge of \$100 to the client)
- Commercial carrier delivery problems or errors (Will results in a setup charge of \$100 to the client)
- Problems with health or delivery of test organisms by vendor (No setup charge to client)

SAMPLER CHECK LIST

NO HEADSPACE IN BOTTLES ☐

SHIP SAMPLES BY NEXT DAY CARRIER OR DELIVER TO LAB ON 6-12-19 5/15/19 ☐

SAMPLES TO BE HAND DELIVERED TO LABORATORY SAME DAY AS TEST SETUP ☐

SUFFICIENT ICE TO COOL SAMPLES TO A RANGE OF 0 - 6°C WHEN SHIPPING OVERNIGHT ☐

RELINQUISHED BY: Michael Brackeen DATE: 6-11-19 TIME: 1200

LABORATORY USE ONLY

EFFLUENT LOG NUMBER: 2401506

RECEIVED TEMPERATURE: 10 °C THERMOMETER ASSIGNED NUMBER: _____

HEADSPACE: YES or NO SAMPLES ICED or DELIVERED SAME DAY AS TEST

UPSTREAM LOG NUMBER: 2401506A

RECEIVED TEMPERATURE: 12 °C THERMOMETER ASSIGNED NUMBER: _____

HEADSPACE: YES or NO SAMPLES ICED or DELIVERED SAME DAY AS TEST

RECEIVED BY: [Signature] DATE: 6/12/19 TIME: 1200
Fed Ex

MISSOURI DEPARTMENT OF NATURAL RESOURCES
NPDES MONITORING REPORT FOR WHOLE EFFLUENT TOXICITY TESTSRETURN FORM TO: Southeast Regional Office
2155 N. Westwood Blvd. Poplar Bluff, MO 63901

Facility Name	Tyson Poultry Inc--Sedalia Processing Plant	Receiving Water	Little Muddy Creek
Permit Number	MO-0115061	Laboratory Name	Environmental Analysis South, Inc.
Outfall	001	Laboratory Report #	MO_2401506

SAMPLE INFORMATION

Sample Number	Sample Collection				Sample Temperature (°C)		pH (SU)	Hand delivered? (If yes, ≤ 4 hrs?)	Hold Time ≤ 36 hours?	Sample Acceptable
	Effluent or Upstream	Sample Type	Beginning Date	End Date	At Collection	At Lab	At Lab			
1	2401506Eff	composite	06/10/19	06/11/19		10	7.76	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
2	2401506A Upstr	grab	06/11/19	06/11/19		12	7.72	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
3								<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
4								<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N

Describe any unusual conditions during sampling that might influence test results

TEST INFORMATION - ACUTE					QA/QC CONDITIONS - ACUTE			
Test Method:	<i>C. dubia</i> 2002.0	<i>P. promelas</i> 2000.0				YES	NO	
Date Test Initiated:	06/12/2019				Did test conditions meet all test acceptability criterion required by the specified method?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AEC/IWC Info:	ABC = 100%				Temperatures maintained during test (20 ± 1°C)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Dilution Series	100%	50%	25%	12.5%	Temperatures maintained during test (25 ± 1°C)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	6.25%				Dissolved oxygen ≥ 4.0 mg/L throughout test?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dilution Water:	<i>C. dubia</i>	RW <input checked="" type="checkbox"/>	LW <input type="checkbox"/>		Effluent pH maintained within 6.0 - 9.0 SU throughout test?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<i>P. promelas</i>	RW <input checked="" type="checkbox"/>	LW <input type="checkbox"/>		Concurrent or monthly reference tests within acceptable limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RW = Receiving Stream Control LW = Lab Water Control					Were effluent samples modified prior to testing? (ex. filtration, aeration, chemical addition including de-chlorination or pH adjustment)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:					Comments: Outfall 001 aerated prior to test initiation due to low DO upon arrival to the lab. Further aeration was not required during the test duration.			

WATER CHEMISTRY (All values reported in mg/L, except for pH and conductivity)

Sample Type	Sample Number	Conductivity (µmhos)	Unionized Ammonia	Hardness	Alkalinity	pH (SU) After Warming	Total Residual Chlorine	Other	Other	Other
Upstream	2401506A	402	<0.010	175	162	8.25	<0.04	DO=8.9		
Effluent	2401506	2080	<0.010	178	359	8.28	<0.04	DO=6.6		
Lab Water	RC4232	248	<0.010	68.0	58.0	8.22	<0.04	DO=8.6		

Comments:

TU _a limit = Monitoring only.		<i>Pimephales promelas</i> Acute Results	LC50=	>100%	Confidence Interval % =	N/A	TU _a =	<1.00
		<i>Ceriodaphnia dubia</i> Acute Results	LC50=	>100%	Confidence Interval % =	N/A	TU _a =	<1.00

Receiving Water Controls				Lab Water Controls			
Fathead Minnow		<i>Ceriodaphnia dubia</i>		Fathead Minnow		<i>Ceriodaphnia dubia</i>	
Survival ≥ 90%	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Survival ≥ 90%	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Survival ≥ 90%	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Survival ≥ 90%	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N

Comments:

SIGNATURE AND TITLE OF AUTHORIZED INDIVIDUAL, IN ACCORDANCE WITH 10 CSR 20-6.010	DATE	PHONE NUMBER
		573-204-8817



MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH
(SEE MAP FOR APPROPRIATE REGIONAL OFFICE)

**FORM R – PERMIT APPLICATION FOR LAND APPLICATION
OF INDUSTRIAL WASTEWATER BIOSOLIDS AND RESIDUALS**

FOR AGENCY USE ONLY

PERMIT NUMBER

MO -

DATE RECEIVED

INSTRUCTIONS: FORMS A and C or F (CAFOs) (and D where applicable) must also be submitted for land application of industrial wastewater sludge biosolids or residuals. **Submit FORMS E and G** for land disturbance permit if construction areas total five acres or more.

Attach **FORM I**, if wastewater will be land applied or irrigated.

1.00 FACILITY INFORMATION

1.1 FACILITY NAME

- 1.2 Application for: ☐ Construction Permit (attach Engineering report, Plans and Specifications per 10 CSR 20-8.020)
☐ Operating Permit (if no construction permit, attach engineering documents)
Date Land Application System Began Operation: _____
☐ Operating Permit Renewal

1.3 Months when the business or enterprise will operate or generate sludge or residuals:
☐ 12 months per year ☐ Part of year (list Months): _____

1.4 List the Facility outfalls which will be applicable to the land application system from outfalls listed on Form A, C, D and F.
Outfall Nos. _____

2.00 STORAGE BASINS

2.1 Number of storage basins: _____ Type of basin: ☐ Steel ☐ Concrete ☐ Fiberglass ☐ Earthen
☐ Earthen with membrane liner

2.2 Storage basin dimensions at inside top of berm (feet): Report freeboard as feet from top of berm to emergency spillway or overflow pipe.

(Complete Attachment A: Profile Sketch)

Basin #1: Length _____ Width _____ Depth _____ Freeboard _____ Berm Width _____ % Slope _____
Basin #2: Length _____ Width _____ Depth _____ Freeboard _____ Berm Width _____ % Slope _____

2.2.1 Storage basin volumes (gallons): Permanent volume means two foot water depth for seal protection, and any required treatment volume capacity.

Basin #1: Gallons: _____ Permanent Volume + _____ Storage = _____ Total volume (gallons)
Basin #2: Gallons: _____ Permanent Volume + _____ Storage = _____ Total volume (gallons)

2.3 Storage Basin operating levels (report as feet below emergency overflow level)

Basin #1: Maximum water level _____ ft. Minimum operating water level _____ ft.
Basin #2: Maximum water level _____ ft. Minimum operating water level _____ ft.

2.4 Storage Basin design storage capacity: (storage between minimum and maximum operating levels for 1-in-10 year stormwater flows.)

Basin #1: _____ days Basin #2: _____ days Basin #3: _____ days

2.5 Attach Water Balance Test results to verify earthen basin seal in accordance with 10 CSR 20-8.020(13) and (16), when required by the department.

2.6 Attach a sludge management plan for materials that are not land applied.

2.7 Attach a closure plan for lagoons, storage basins and treatment units.

3.00 LAND APPLICATION SYSTEM

3.1 Number of application sites _____ Total Available Acres _____ Minimum & Maximum % field slopes _____
Location: _____ ¼ _____ ¼ _____ ¼ _____ Sec. _____ T _____ R _____ County _____ Acres
Location: _____ ¼ _____ ¼ _____ ¼ _____ Sec. _____ T _____ R _____ County _____ Acres

Attach extra sheets as necessary.

3.1.1 Type of vegetation: ☐ Grass hay ☐ Pasture ☐ Timber ☐ Row crops ☐ Other (describe) _____
Specific Crops and Yields/acre: _____ Goal: _____ Actual for last five years: _____

3.2	Annual sludge production (gallons per year):	_____ Actual	_____ Design	
	(dry tons per year):	_____ Actual	_____ Design	
	Human Population Equivalent:	_____ Actual	_____ Design	
3.2.1	Land Application rate per acre:			
	Design:	_____ dry ton/year	_____ dry ton/application	_____ No. applications/year
	Actual:	_____ dry ton/year	_____ dry ton/application	_____ No. applications/year
	Total amount land applied each year (total all sites)		Design _____ dry ton/year	Actual _____ dry ton/year
	Actual months used for land application: <input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep			
	<input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec			
3.2.2	Land Application Rate is based on:			
	<input type="checkbox"/> Nutrient Management Plan (N&P)	<input type="checkbox"/> PAN	<input type="checkbox"/> Conservative	
	<input type="checkbox"/> Hydraulic Loading	<input type="checkbox"/> Limiting Pollutant (Specify) _____		
	<input type="checkbox"/> Other (describe) _____			
3.3	Equipment type: <input type="checkbox"/> Tank wagon <input type="checkbox"/> Tank truck <input type="checkbox"/> Subsurface injection <input type="checkbox"/> Slinger spreader <input type="checkbox"/> Dry spreader			
	<input type="checkbox"/> Other (describe) _____			
	Equipment Capacity: _____ Gallons (cubic feet) per hour		_____ Total hours of operation per year	
3.4	Public Use/Access Sites: If public use or access to land application site, describe pathogen treatment and site access restrictions. If human, animal, or organic wastes, refer to 40 CFR 503.32 for pathogen treatment methods. Attach extra sheets as necessary.			
3.5	Separation distance (in feet) from the outside edge of the biosolids application area to down gradient features:			
	_____ Permanent flowing stream	_____ Losing Stream	_____ Intermittent (wet weather) stream	_____ Lake or pond
	_____ Property boundary	_____ Dwellings	_____ Water supply well	_____ Other (describe) _____
3.6	Soils Information: Use information from the County Soil Survey, NRCS, or professional soil scientist.			
	Note: On-site soils classification by a professional soil scientist may be required by the department where appropriate.			
	Soil Series Name _____	Depth of bedrock _____ Feet	Depth to water table _____ Feet	
	Soil Infiltration rate in inches/hour (in/hr) for most restrictive layer within the following soil depth ranges:			
	_____ In/hr for 0-12 inch soil depth	_____ In/hr for 12-24 inch soil depth	_____ In/hr for 24-60 inch soil depth	
3.7	Attach Nutrient Management Plan (NMP) including calculations for plant available nitrogen (PAN) and other nutrients, crop requirements, crop yields and other management factors. Include USDA/NRCS phosphorus recommendations.			
3.8	Geologic Investigation: _____ Date of most recent geologic report by the department's Missouri Geological Survey.			
3.8.1	Groundwater Monitoring Wells: (Attach Groundwater Monitoring Plan when required by department)			
	<input type="checkbox"/> None	<input type="checkbox"/> Existing	<input type="checkbox"/> Planned	Number: _____ Monitoring Wells _____ Lysimeters
3.9	Attach a current copy of the Operation and Maintenance (O&M) Plan for the land application system. Date of O&M Plan:			
3.9.1	Attach a site map showing topography, storage basins, land application sites, property boundary, streams, wells, roads, dwellings and other pertinent features.			
3.9.2	Attach a facility sketch showing treatment units, storage basins, pipelines, application sites and other features.			
4.00 INDUSTRIAL PROCESS INFORMATION				
4.1	Brief description of treatment processes prior to land application and note any changes made in last five years. (Attach extra sheets as necessary.)			
4.2	Detailed description of industrial production processes. Also indicate any changes made in last five years. (Attach extra sheets as necessary.)			

4.3 List of raw materials, chemicals, additives, products and by-products (Attach extra sheets as necessary.)

4.3.1 Attach the following forms for wastewater to be land applied.

FORM C or F is required for all applicants. Use Form F for CAFOs.

FORM D is required for those industries listed in the Form D instructions or when required by the department.

Use actual testing results within last 12 months. For new operations use testing results from other similar operations or from published literature.

4.3.2 Are there any listed hazardous wastes in the material to be land applied: ☐ YES ☐ NO (If YES, attach testing results)

4.4 A. Are any Pollutants listed in 40 CFR 268.40 believed to be present in detectable concentrations: ☐ YES ☐ NO

B. Are any Pollutants listed in 10 CSR 20-7.031 believed to be present in detectable concentrations: ☐ YES ☐ NO

C. Are any Pollutants listed in EPA Process Design Manual for Land Treatment of Municipal Wastewater publication

EPA-625/1-81-013, Table 4-5 and Table 4-16 believed present in detectable concentrations: ☐ YES ☐ NO

(Attach a copy of testing results for any pollutants that may be present in detectable concentrations.)

4.5 Environmental Assessment. Do any of the pollutants detected exceed the criteria for pollutant concentrations of limitations contained in the publications referenced in Section 4.40 of this form?: ☐ YES ☐ NO

If YES, attach a copy of the Environmental Assessment as required in 10 CSR 20-8.020(3)(D).

5.00 SOIL TESTING RESULTS: Complete information for each pollutant listed and each land application site. Attach results of any other soil testing performed in the last 12 months. Soil sampling and testing should conform to University publication G9110, Sampling Your Soil for Testing; Soil Test Procedures for North Central Region (North Dakota Agricultural Experiment Bulletin 499-Revised); Methods of Soil Analysis, American Society of Agronomy, Inc.; Soil Testing and Plant Analysis, Soil Science Society of America; EPA Methods; or other methods approved by the department. Attach extra sheets as necessary.

Total area sampled is ____ acres. Each composite sample covers ____ acres. Each composite consists of ____ subsamples.
Sample depth: ☐ 0-6 inches ☐ 0-12 inches ☐ Other (describe) ____

Pollutant	Concentration (mg/kg or ppm)			Pounds/ Acre	No. Composite Samples	Sample Period
	Minimum	Maximum	Average			
Organic Nitrogen as N						
Ammonia Nitrogen as N						
Nitrate Nitrogen as N						
Phosphorus as P (Bray 1P)						
Exchangeable Sodium %						
Organic Matter (percent)						
Cation Exchange Capacity						
pH (standard units)						

Other pollutants present in the material to be land applied: (Attach extra sheets as necessary)

6.00 LAND LIMITING CONSTITUENTS FOR LAND APPLICATION

6.1 Metals of Concern for Land Application. Complete information for each pollutant listed.

Analysis results must be for "Total Metals". (Do **not** use TCLP, dissolved, total recoverable or other extraction methods.

Include all test results for the last five years and a minimum of four separate samples.

Pollutant (total metals)	Concentration (mg/kg dry weight)			Design LBS/ Acre/Year	Type of Samples	Number Samples	Sample Location	Sample Period
	Minimum	Maximum	Average					
Aluminum								
Arsenic								
Beryllium								
Cadium								
Chromium								
Copper								
Fluoride								
Lead								
Manganese								
Mercury								
Molybdenum								
Nickel								
Selenium								
Silver								
Tin								
Zinc								

6.2 Major Pollutants of Concern for Land Application. Complete information for each pollutant listed. Include any other pollutants that are most limiting for determining land application rates. Attach extra sheets as necessary.

Organic Nitrogen as N								
Ammonia Nitrogen as N								
Nitrate Nitrogen as N								
Total Nitrogen as N								
Plant Available Nitrogen (PAN)								
Total Phosphorus as P								
Boron								
Chlorides								
Sodium								
COD								
TPH								
Total Suspended Solids								
Oil and Grease								
Sodium Absorption Ration (SAR)								
pH (standard units)								

6.3 Other Limiting Pollutants for Land Application Rates. Specify any other pollutants that are most limiting for determining land application rates. Include any additional significant pollutants from Section 4 that is not already listed in Section 6.00. Attach extra sheets as necessary.

Pollutant	Concentration (mg/kg dry weight)			Design LBS/ Acre/Year	Type of Samples	Number Samples	Sample Location	Sample Period
	Minimum	Maximum	Average					
Potassium	4510	10700	7337		COMP	11	WAS	15-19

6.4 Requirements for Public Use Sites. Complete this if land application onto public use or public access sites or if material will be distributed for general public use. Fecal Coliform, Salmonella and Enteric Virus must be tested if the biosolids include waste material from humans, animals, vegetables or organic matter.

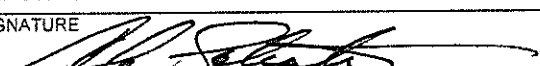
Pollutant	Concentration (mg/kg dry weight)			Type of Samples	Number Samples	Sample Location	Sample Period
	Minimum	Maximum	Average				
Total Dioxin TEQ*							

* Required Only for public access sites. TEQ = Toxicity Equivalents for CDD and CDF isomers per EPA Publication EPA/625/3-89/016 and EPA method 1613. Detection limits must be less than 1.0 ppt.

Fecal Coliform							
Salmonella							
Enteric Virus							
Other (specify)							

7.00 CERTIFICATION

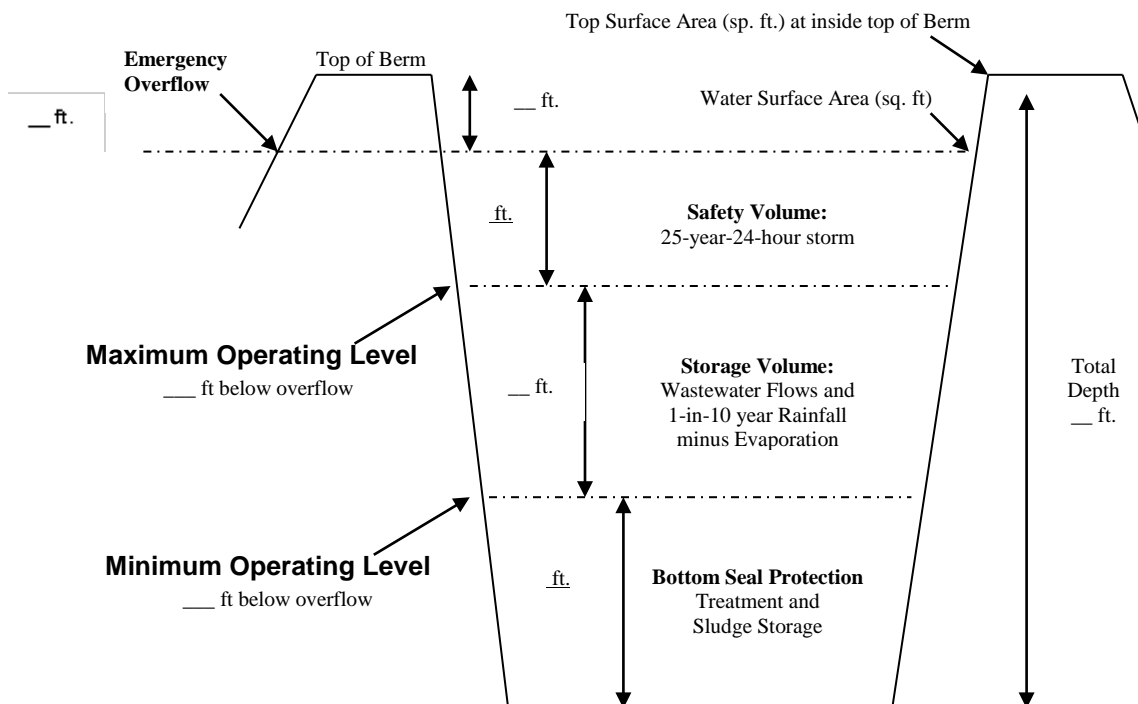
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage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

CONSULTING ENGINEER – Name, Official Title and Engineering Firm (TYPE OR PRINT)		TELEPHONE NUMBER WITH AREA CODE
SIGNATURE		DATE SIGNED
OWNER OR AUTHORIZED REPRESENTATIVE – Name and Official Title (TYPE OR PRINT)		TELEPHONE NUMBER WITH AREA CODE
Alan Johnston		660-827-8503
SIGNATURE 		DATE SIGNED
		4-1-20

ATTACHMENT A

(To be included with Form I and Form R)

Lagoon or Storage Basin PROFILE SKETCH



Definition of Terms (Refer to the profile sketch above.)

- Freeboard is depth from top of berm to emergency spillway (minimum 1 foot).
- Safety Volume is depth for 25-year, 24-hour storm (minimum of 1 foot).
- Maximum Operating Level is at bottom of the safety volume (minimum of 2 feet below top of berm).
- Minimum Operating Level is 2 feet above bottom of lagoon for seal protection per 10 CSR 20-8.
The minimum operating level may be greater than 2 feet when additional treatment volume is included.
- Storage Volume and days storage are based on the volume between Minimum and Maximum Operating Levels.
- Total Depth is from top of berm to bottom of basin including freeboard.

Form R

Section 2.6 - Sludge Management of Materials Not Land Applied

In the event sludge is not able to be land applied, it will be disposed of in an approved landfill under a special waste profile.

Form R

Section 2.7 - Lagoon Closure Plan

1. Remaining wastewater and sludge will be land-applied at the appropriate agronomic rates to either off-site or onsite locations.
2. The influent water line shall be plugged or capped. All wastewater will be drained from the piping and disposed of in an approved manner.
3. After the wastewater and sludge has been drained from the lagoon, the remaining solids on the bottom of the lagoon will be allowed to dry.
4. A disinfectant suitable for control of odors and vectors shall be applied to all remaining solids when necessary. After drying, the solids will be mixed with soil and left on the bottom of the lagoon to be removed for disposal in an approved landfill, or for land application at agronomic rates.
5. All mechanical equipment, piping, and valves will be removed from the lagoon and disposed of in an approved manner.
6. The lagoon will then be filled with clean soil to the desired final grade.
7. A backfill and grading plan shall be instituted to provide positive drainage without ponding.
8. Disturbed areas will be properly stabilized and vegetated. Disturbed areas will be considered stabilized when perennial vegetation, pavement, or structures using permanent materials cover all areas that have been disturbed.

Form R

Section 3.1 - Land Application Sites

Permit Feature 14

Tyson Field No. 1
Legal Description: SE 1/4, NE 1/4 Sec. 22, T46N, R22W Pettis County
UTM Coordinates: X=472159, Y=4289553
Total Field Acreage 26.9
Set Backs (acres) 6.2
Acreage (net set backs) 20.7

Permit Feature 15

Field No. 2
Legal Description: NW 1/4, SW 1/4 Sec. 23, T46N, R22W Pettis County
UTM Coordinates: X=472158, Y=4289373
Total Field Acreage 33.1
Set Backs (acres) 6.4
Acreage (net set backs) 26.7

Permit Feature 16

Field No. 3
Legal Description: SW 1/4, NW 1/4 Sec. 23, T46N, R22W Pettis County
UTM Coordinates: X=472544, Y=4289835
Total Field Acreage 25.5
Set Backs (acres) 5.2
Acreage (net set backs) 20.3

Permit Feature 17

Field No. 4
Legal Description: NE 1/4, SW 1/4 Sec. 23, T46N, R22W Pettis County
UTM Coordinates: X=472954, Y=4289149
Total Field Acreage 24.8
Set Backs (acres) 5.9
Acreage (net set backs) 18.9

Permit Feature 18

Field No. 5
Legal Description: SE 1/4, NW 1/4 Sec. 23, T46N, R22W Pettis County
UTM Coordinates: X=472935, Y=4289790
Total Field Acreage 68.7
Set Backs (acres) 9.7
Acreage (net set backs) 59.0

Permit Feature **19**
Field No. 6
Legal Description: SW 1/4, NW 1/4, NE 1/4 Sec. 23, T46N, R22W Pettis County
UTM Coordinates: X=472474, Y=4289854
Total Field Acreage 38.3
Set Backs (acres) 10.1
Acreage (net set backs) 28.2

Permit Feature **20**
Field No. 7
Legal Description: SE 1/4, SW 1/4 Sec. 14, T46N, R22W Pettis County
UTM Coordinates: X=472176, Y=4290269
Total Field Acreage 53.7
Set Backs (acres) 8.6
Acreage (net set backs) 45.1

Permit Feature **21**
Field No. 8
Legal Description: SW 1/4, SW 1/4 Sec. 14, T46N, R22W Pettis County
UTM Coordinates: X=472491, Y=4290326
Total Field Acreage 162.1
Set Backs (acres) 18.2
Acreage (net set backs) 143.9

Permit Feature **23**
Field No. 10
Legal Description: SE 1/4, NW 1/4 Sec. 14, T46N, R22W Pettis County
UTM Coordinates: X=472164, Y=4291062
Total Field Acreage 46.2
Set Backs (acres) 8.2
Acreage (net set backs) 38.0

Permit Feature **24**
Field No. 11
Legal Description: SE 1/4, NW 1/4 Sec. 14, T46N, R22W Pettis County
UTM Coordinates: X=472164, Y=4291062
Total Field Acreage 103.4
Set Backs (acres) 18.4
Acreage (net set backs) 85.0

Permit Feature **25**
Field No. 12

Legal Description: W 1/2, SE 1/4, NE 1/4 Sec. 15, T46N, R22W Pettis County
UTM Coordinates: X=472243, Y=4291157
Total Field Acreage 19.6
Set Backs (acres) 4.7
Acreage (net set backs) 14.9

Permit Feature 26

Field No. 13
Legal Description: NW 1/4, SE 1/4 Sec. 15, T46N, R22W Pettis County
UTM Coordinates: X=472957, Y=4290624
Total Field Acreage 88
Set Backs (acres) 15.7
Acreage (net set backs) 72.3

Permit Feature 27

Field No. 14
Legal Description: NW 1/4, NE 1/4 Sec. 22, T46N, R22W Pettis County
UTM Coordinates: X=472964, Y=4289849
Total Field Acreage 34.9
Set Backs (acres) 4.5
Acreage (net set backs) 30.4

Permit Feature 28

Field No. 15
Legal Description: NE 1/4, NW 1/4 Sec. 22, T46N, R22W Pettis County
UTM Coordinates: X=472583, Y=4290091
Total Field Acreage 85.2
Set Backs (acres) 13.4
Acreage (net set backs) 71.8

Permit Feature 29

Field No. 16
Legal Description: SE 1/4, NW 1/4 Sec. 22, T46N, R22W Pettis County
UTM Coordinates: X=472424, Y=4289507
Total Field Acreage 38.6
Set Backs (acres) 6.8
Acreage (net set backs) 31.8

Permit Feature 30

Field No. 17
Legal Description: SW 1/4, NE 1/4 Sec. 22, T46N, R22W Pettis County
UTM Coordinates: X=472856, Y=4289488
Total Field Acreage 34.5

Set Backs (acres)	8.0
Acreage (net set backs)	26.5

Total Acres	883.5
Setbacks	150.0
Acres Minus Setbacks	733.5

Form R. Sec. 3.2

Sec. 3.2 - Annual Sludge Production

Date Applied	Field	WAS Sludge Applied	WAS Sludge Applied
		(gals)	(dry tons)
4/26/2019	2	316,066	38.75
4/25/2019	5	531,141	62.02
4/26/2019	4	183,181	22.46
4/23/2019	6	152,728	19.04
4/24/2019	6	113,294	32.74
4/24/2019	7	437,145	54.69
11/26/2019	10	379,755	45.92
11/27/2019	11	520,190	62.91
12/3/2019	11	251,766	93.35
12/4/2019	11	100,000	105.45
12/4/2019	12	93,006	11.25
12/5/2019	4	174,085	22.46
12/5/2019	5	412,465	46.44
12/6/2019	2	296,870	72.17
Total		3,961,692	689.65

Design Annual Production:	6562750 gallons per year (821 Dry Tons)
Design Human Population Equivalent:	306618 gallons per year

Form R

Sec. 3.3 - Equipment Type

Equipment Type:	Tank Wagon, Subsurface Injection
Equipment Capacity:	10250 gal/hr
Total Hours:	300 hrs

Engineering Surveys & Services

Consulting Engineers, Land Surveyors, and Geoprofessionals
Analytical and Materials Laboratories

1775 West Main Street
Sedalia, Missouri 65301
Telephone: 660-826-8618

ess@ess-inc.com
www.ess-inc.com

August 13, 2019

Mr. Jason McCauley
Tyson Foods, Inc.
22851 Highway T
Sedalia, Missouri 65301

RE: Geotechnical Report-Addendum 1
Tyson Poultry-Sedalia Complex
Sedalia, Missouri

Dear Mr. McCauley:

This letter and attachments comprise Addendum 1 to the referenced Geotechnical Report submitted on June 28, 2019. Attached for your use are the test results per ASTM D 5084 *Flex Wall Permeability, Method C-Falling Head/Rising Tailwater* and associated *Atterberg Limit* determinations (ASTM D 4318). The Geotechnical Report's *Summary of Laboratory Test Results* and applicable *Log of Borings* have been revised to reflect the additions.

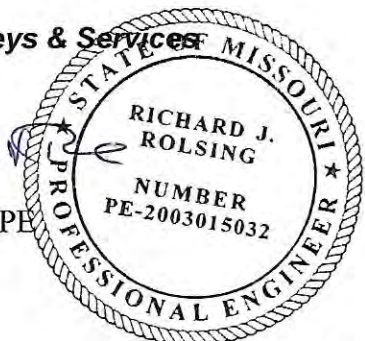
The laboratory test results indicate the samples tested meet the minimum criteria for a lagoon clay liner per the *Missouri Department of Natural Resources 10 CSR 20-8 Clean Water Commissions Minimum Design Standards*. The minimum thickness of the clay liner is twelve (12) inches.

We appreciate the opportunity to assist you on this phase of the project and anticipate inquiries during the design phase. We are prepared to assist during the design phase and through construction with a full range of construction-oriented engineering, surveying, and materials laboratory services. If we can be of further assistance, please contact this office.

Engineering Surveys & Services

Submitted By:

Richard J. Rolsing, PE



attachments: Summary of Laboratory Test Results (2)
Log of Boring (2)

8/13/2019

<

LAB NO. 5828

PROJECT: Tyson Poultry – Sedalia Complex
Sedalia, MissouriSUMMARY OF
LABORATORY TEST RESULTS

BORING NO.	SAMPLE NO.	DEPTH (FEET)	USCS CLASS	NATURAL MOISTURE CONTENT (%)	NATURAL DRY DENSITY (PCF)	ATTERBERG LIMITS			UNCONFINED COMPRESSION (TSF)	COHESION STRAIN %	REMARKS
						LL	PL	PI			
B1	AS1	1.0-3.0		25							
	SS2	3.0-4.5		27							
	SS3	8.5-10.0	CL	24		46	16	30			
	SS4	13.5-15.0		25							
	SS5	18.5-20.0		25							
B2	AS1	1.0-3.0		28							
	ST2	4.0-5.0	CL	23		47	17	30			$k_{20} = 5.33E-08$ cm/sec TV=0.9 tsf, PP=1.3 tsf
	ST2	5.0-6.0									
	SS3	6.0-7.5		30							
	SS4	13.5-15.0		27							
B3	AS1	1.0-3.0		32							
	SS2	3.0-4.5	CL	26		49	17	32			
	ST3	6.0-8.0		23							
	SS4	8.0-9.5		26							
	SS5	13.5-15.0		26							
B4	AS1	1.0-3.0	CH	21		50	16	34			
	ST2	4.0-6.0		23							
	SS3	6.0-7.5	CL	27		49	16	33			
	SS4	8.5-10.0		26							
	SS5	13.5-15.0		17							
B5	AS1	1.0-3.0		25							
	SS2	3.0-4.5	CL	22		47	16	31			
B6	AS1	1.0-3.0	CH	32		68	21	47			
	SS2	3.0-4.5	CL	23		45	15	30			
	ST3	8.0-10.0	CH	29		55	16	39			TV=1.1 tsf, PP=2.3 tsf
	SS4	10.0-11.5		23							
	SS5	13.5-15.0		20							



Engineering Surveys & Services

Sedalia, Missouri

LAB NO. 5828

PROJECT: Tyson Poultry – Sedalia Complex
Sedalia, MissouriSUMMARY OF
LABORATORY TEST RESULTS

BORING NO.	SAMPLE NO.	DEPTH (FEET)	USCS CLASS	NATURAL MOISTURE CONTENT (%)	NATURAL DRY DENSITY (PCF)	ATTERBERG LIMITS			UNCONFINED COMPRESSION (TSF)	REMARKS
						LL	PL	PI		
B7	SS2	3.0-4.5		28						
	ST3	8.0-10.0	CH	29		56	16	40		TV=1.1 tsf, PP=2.0 tsf
	SS4	10.0-11.5		28						
	SS5	13.5-15.0	CH	27		62	17	45		
B8	AS1	1.0-3.0		30						
	SS2	3.0-4.5		22						
	ST3	6.0-7.0	CL	22		43	14	29		$k_{20} = 6.08E-08$ cm/sec TV=0.6 tsf, PP=0.4 tsf
	ST3	7.0-8.0								
	SS4	8.0-9.5		26						
	SS5	13.5-15.0		28						
	SS6	18.5-20.0		19						



LAB NO. 5828

LOG OF BORING NO. B2

PROJECT: Tyson Poultry – Sedalia Complex
Sedalia, Missouri

TYPE: 4" Solid Stem Auger

DEPTH, FT.	SAMPLE TYPE	SOIL DESCRIPTION TYPE, COLOR, MOISTURE & OTHER LOCATION: <i>See Plan of Boring Locations</i> SURF. ELEV.: <i>808.3'</i>	BLOWS PER FT.	UNIFIED CLASSIFICATION	UNIT DRY WT. LB./CU.FT.	COHESION, TON/SQ.FT. ⊗								
						0.2	0.4	0.6	0.8	1.0	1.2	1.4		
						PLASTIC LIMIT	WATER CONTENT, %				LIQUID LIMIT			
						+-----+-----+								
						10	20	30	40	50	60	70		
		CLAYEY SILT: Dark gray, moist, firm												
2		SILTY CLAY: Gray mottled orange, moist, firm												
4				CL										
6		-; free water	4											
8														
10		-; with intermittent chert gravel seams												
12														
14			20											
16														
18														
		SPT REFUSAL ON GRAVEL ZONE	50/2"											
20														
22														

Completion Depth: 18.7'
Date: 28 May 2019

Depth to Water ATD: 6.0'



LAB NO. 5828

LOG OF BORING NO. B8

PROJECT: Tyson Poultry – Sedalia Complex
Sedalia, Missouri

TYPE: 4" Solid Stem Auger

DEPTH, FT.	SAMPLE TYPE	SOIL DESCRIPTION TYPE, COLOR, MOISTURE & OTHER LOCATION: <i>See Plan of Boring Locations</i> SURF. ELEV.: 813.2'	BLOWS PER FT.	UNIFIED CLASSIFICATION	UNIT DRY WT. LB./CU.FT.	COHESION, TON/SQ.FT. 0.2 0.4 0.6 0.8 1.0 1.2 1.4						
						PLASTIC LIMIT	WATER CONTENT, %	LIQUID LIMIT				
						10	20	30	40	50	60	70
		CLAYEY SILT: Dark gray, moist, firm										
2		SILTLY CLAY: Dark gray, moist, firm										
4		-; light gray, trace of orange	7									
6												
8			5	CL								
10												
12												
14		-; w/ intermittent gravel seams	39									
16												
18												
20		-; interbedded w/ fractured limestone	22									
22												

Completion Depth: 20.0'
Date: 28 May 2019

Depth to Water ATD: Not Encountered



Sec. 3.7 - Nutrient Management

Date	Sludge Unit	Sludge Solids (%)	ANALYSIS (average of last 3 tests)					Gallons Per Acre Applied	Daily Gallons Sludge Applied	Daily Applied Area (acres)	Cumulative Acres Applied	Daily Dry Tons Sludge Applied per Acre	Cumulative Sludge Applied (dry tons)	Daily PAN Applied (lbs/ac)	Cumulative PAN Applied (lbs)	Daily Phosphorus Applied (lbs/ac)	Cumulative Phosphorus Applied (lbs)	Daily Chloride Applied (lbs/ac)	Cumulative Chloride Applied (lbs)	Daily O&G Applied (lbs/ac)	Cumulative O&G Applied (lbs)	
			Last Analysis Date	PAN (lbs/dry ton)	Chloride (lbs/dry ton)	Phosphorus (lbs/dry ton)	O&G (lbs/dry ton)															
12/04/19	WAS	2.90	4/24/2019	50.6	4/24/2019	19.2	161.6	45.3	11500	93006	8.1	8.1	1.39	11.25	70	569	225	1818	27	216	63	509

Form R
Sec. 3.7 - Nutrient Management

			Limit	Actual																
					Beans (bushels)	Nitrogen Removal (lbs/bu)	Phosphorus Removal (lbs/bu)	Corn (bushels)	Nitrogen Removal (lbs/bu)	Phosphorus Removal (lbs/bu)										
Field No. 11 (24)	2019	beans	PAN/acre	242	67															
Total Field Acreage	101		PAN/field	19,868	7,697	50	4.84	0.46	0	0.90	0.20									
Set Backs (acres)	18.9		Cl/acre	500	26															
Acreage (net set backs)	82.1		Cl/field	41,050	2,461															
Home			O&G/acre	10,000	60															
			O&G/field	821,000	60.3															
			Phosphorus/acre	23.1	215															
			Phosphorus/field	1,892	15,086															
														Total Phosphorous	Soil Test Results					
														Sampled	ppm	lbs/acre				
														2015	20.97	42				
														2016	25.80	52				
														2017	49.80	100				
														2018	40.24	80				

Date	Sludge Unit	Sludge Solids (%)	ANALYSIS (average of last 3 tests)						Gallons Per Acre Applied	Daily Gallons Sludge Applied	Daily Applied Area (acres)	Cumulative Acres Applied	Daily Dry Tons Sludge Applied per Acre	Cumulative Sludge Applied (dry tons)	Daily PAN Applied (lbs/ac)	Cumulative PAN Applied (lbs)	Daily Phosphorus Applied (lbs/ac)	Cumulative Phosphorus Applied (lbs)	Daily Chloride Applied (lbs/ac)	Cumulative Chloride Applied (lbs)	Daily O&G Applied (lbs/ac)	Cumulative O&G Applied (lbs)
			Last Analysis Date	PAN (lbs/dry ton)	Last Analysis Date	Chloride (lbs/ dry ton)	Phosphorus (lbs/ dry ton)	O&G (lbs/dry ton)														
11/27/19	WAS	2.90	4/24/2019	50.6	4/24/2019	19.2	161.6	45.3	11000	520190	47.3	47.3	1.33	62.91	67	3183	215	10166	26	1208	60	2850
12/03/19	WAS	2.90	4/24/2019	50.6	4/24/2019	19.2	161.6	45.3	11000	251766	22.9	70.2	1.33	93.35	67	4724	215	15086	26	1792	60	4229
12/04/19	WAS	2.90	4/24/2019	50.6	4/24/2019	19.2	161.6	45.3	11000	100000	9.1	79.3	1.33	105.45	67	5336	215	17040	26	2025	60	4777

Form R
Sec. 3.7 - Nutrient Management

			Limit	Actual																
Field No. 10 (23)			2019			Beans (bushels)	Nitrogen Removal (lbs/bu)	Phosphorus Removal (lbs/bu)	Corn (bushels)	Nitrogen Removal (lbs/bu)	Phosphorus Removal (lbs/bu)	Total Phosphorous Soil Test Results								
Total Field Acreage	44.4	corn	PAN/acre	180	70							Sampled	ppm	lbs/acre						
Set Backs (acres)	6.5		PAN/field	6,822	7,697	0	4.84	0.46	200	0.90	0.20	2015	30.00	60						
Acreage (net set backs)	37.9		Cl/acre	500	27							2016	25.60	51						
Home			Cl/field	18,950	2,461							2017	16.30	33						
			O&G/acre	10,000	63							2018	15.58	31						
			O&G/field	379,000	63.0															
			Phosphorus/acre	39.2	225															
			Phosphorus/field	1,486	7,421															

Date	Sludge Unit	Sludge Solids (%)	ANALYSIS (average of last 3 tests)						Gallons Per Acre Applied	Daily Gallons Sludge Applied	Daily Applied Area (acres)	Cumulative Acres Applied	Daily Dry Tons Sludge Applied per Acre	Cumulative Sludge Applied (dry tons)	Daily PAN Applied (lbs/ac)	Cumulative PAN Applied (lbs)	Daily Phosphorus Applied (lbs/ac)	Cumulative Phosphorus Applied (lbs)	Daily Chloride Applied (lbs/ac)	Cumulative Chloride Applied (lbs)	Daily O&G Applied (lbs/ac)	Cumulative O&G Applied (lbs)
			Last Analysis Date	PAN (lbs/dry ton)	Last Analysis Date	Chloride (lbs/ dry ton)	Phosphorus (lbs/ dry ton)	O&G (lbs/dry ton)														
11/26/19	WAS	2.90	4/24/2019	50.6	4/24/2019	19.2	161.6	45.3	11500	379755	33.02	33.02	1.39	45.92	70	2324	225	7421	27	882	63	2080

Form R
Sec. 3.7 - Nutrient Management

			Limit	Actual									
					Beans	Nitrogen	Phosphorus		Nitrogen	Phosphorus			
					(bushels)	Removal	Removal	Corn (bushels)	Removal	Removal			
						(lbs/bu)	(lbs/bu)		(lbs/bu)	(lbs/bu)			
Field No. 8 (21)	2019	PAN/acre	242	97									
Total Field Acreage	152.1	PAN/field	31,920	1,617	50	4.84	0.46	0	0.90	0.20	Total Phosphorous Soil Test Results		
Set Backs (acres)	20.2	Cl/acre	500	9							Sampled	ppm	lbs/acre
Acreage (net set backs)	131.9	Cl/field	65,950	154							2015	327.16	654
Home		O&G/acre	10,000	8,540							2016	296	592
		O&G/field	1,319,000	128,242							2017	305	610
		Phosphorus/acre	23.1	38							2018	248.4	497
		Phosphorus/field	3,040	127									

Date	Sludge Unit	Sludge Solids (%)	ANALYSIS (average of last 3 tests)						Gallons Per Acre Applied	Daily Gallons Sludge Applied	Daily Applied Area (acres)	Cumulative Acres Applied	Daily Dry Tons Sludge Applied per Acre	Cumulative Sludge Applied (dry tons)	Daily PAN Applied (lbs/ac)	Cumulative PAN Applied (lbs)	Daily Phosphorus Applied (lbs/ac)	Cumulative Phosphorus Applied (lbs)	Daily Chloride Applied (lbs/ac)	Cumulative Chloride Applied (lbs)	Daily O&G Applied (lbs/ac)	Cumulative O&G Applied (lbs)
			Last Analysis Date	PAN (lbs/dry ton)	Last Analysis Date	Chloride (lbs/ dry ton)	Phosphorus (lbs/ dry ton)	O&G (lbs/dry ton)														
06/15/19	DAF	21.10	8/17/2015	27.2	8/17/2015	2.6	9.6	2,157.0	4500	15000	3.3	3.3	3.96	13.20	108	359	38	127	10	34	8540	28468
06/19/19	DAF	15.80	8/17/2015	27.2	8/17/2015	2.6	9.6	2,157.0	4500	22500	5.0	8.3	2.96	28.02	81	762	28	269	8	73	6395	60444
06/20/19	DAF	20.10	8/17/2015	27.2	8/17/2015	2.6	9.6	2,157.0	4500	37500	8.3	16.7	3.77	59.45	103	1617	36	571	10	154	8136	128242

Form R
Sec. 3.7 - Nutrient Management

			Limit	Actual										
Field No. 4 (17)					Beans (bushels)	Nitrogen Removal (lbs/bu)	Phosphorus Removal (lbs/bu)	Corn (bushels)	Nitrogen Removal (lbs/bu)	Phosphorus Removal (lbs/bu)				
Total Field Acreage	27	2019	PAN/acre	242	68						Total Phosphorous Soil Test Results			
Set Backs (acres)	7.2	Corn	PAN/field	4,792	2,099	50	4.84	0.46	0	0.90	0.20	Sampled	ppm	lbs/acre
Acreage (net set backs)	19.8		Cl/acre	500	24							2015		
Home			Cl/field	9,900	742							2016	26	52
			O&G/acre	10,000	45							2017	50	100
			O&G/field	198,000	1404.4							2018	40.24	80
			Phosphorus/acre	23.1	211									
			Phosphorus/field	456	6,558									

Date	Sludge Unit	Sludge Solids (%)	ANALYSIS (average of last 3 tests)						Gallons Per Acre Applied	Daily Gallons Sludge Applied	Daily Applied Area (acres)	Cumulative Acres Applied	Daily Dry Tons Sludge Applied per Acre	Cumulative Sludge Applied (dry tons)	Daily PAN Applied (lbs/ac)	Cumulative PAN Applied (lbs)	Daily Phosphorus Applied (lbs/ac)	Cumulative Phosphorus Applied (lbs)	Daily Chloride Applied (lbs/ac)	Cumulative Chloride Applied (lbs)	Daily O&G Applied (lbs/ac)	Cumulative O&G Applied (lbs)
			Last Analysis Date	PAN (lbs/dry ton)	Last Analysis Date	Chloride (lbs/ dry ton)	Phosphorus (lbs/ dry ton)	O&G (lbs/dry ton)														
04/26/19	WAS	2.94	12/11/2018	49.3	12/11/2018	16.3	161.1	23.0	11500	183181	15.9	15.9	1.41	22.46	70	1107	227	3618	23	366	32	517
12/05/19	WAS	2.70	4/24/2019	50.6	4/24/2019	19.2	150	45.3	11500	174085	15.1	31.1	1.29	42.06	66	2099	194	6558	25	742	59	1404

Form R
Sec. 3.7 - Nutrient Management

			Limit	Actual									
Field No. 5 (18)					Beans	Nitrogen	Phosphorus		Nitrogen	Phosphorus	Total Phosphorous Soil Test Results		
Total Field Acreage	64	2018	PAN/acre	242	66	Removal	Removal	Corn (bushels)	Removal	Removal	Sampled	ppm	lbs/acre
Set Backs (acres)	9.5	Beans	PAN/field	13,189	5,407	(bushels)	(lbs/bu)		(lbs/bu)	(lbs/bu)	2015		
Acreage (net set backs)	54.5		Cl/acre	500	23						2016	79	157
Home			Cl/field	27,250	1,902						2017	64	128
			O&G/acre	10,000	43						2018	60.05	120
			O&G/field	545,000	3530.1								
			Phosphorus/acre	23.1	207								
			Phosphorus/field	1,256	16,957								

Date	Sludge Unit	Sludge Solids (%)	ANALYSIS (average of last 3 tests)						Gallons Per Acre Applied	Daily Gallons Sludge Applied	Daily Applied Area (acres)	Cumulative Acres Applied	Daily Dry Tons Sludge Applied per Acre	Cumulative Sludge Applied (dry tons)	Daily PAN Applied (lbs/ac)	Cumulative PAN Applied (lbs)	Daily Phosphorus Applied (lbs/ac)	Cumulative Phosphorus Applied (lbs)	Daily Chloride Applied (lbs/ac)	Cumulative Chloride Applied (lbs)	Daily O&G Applied (lbs/ac)	Cumulative O&G Applied (lbs)
			Last Analysis Date	PAN (lbs/dry ton)	Last Analysis Date	Chloride (lbs/ dry ton)	Phosphorus (lbs/ dry ton)	O&G (lbs/dry ton)														
04/25/19	WAS	2.80	12/11/2018	49.3	12/11/2018	16.3	161.1	23.0	11500	531141	46.2	46.2	1.34	62.02	66	3057	216	9991	22	1011	31	1426
12/5/2019	WAS	2.7	4/24/2019	50.6	4/24/2019	19.2	150	45.3	11500	412465	35.9	82.1	1.29	108.46	66	5407	194	16957	25	1902	59	3530

Form R
Sec. 3.7 - Nutrient Management

		Limit	Actual			Nitrogen Removal (lbs/bu)	Phosphorus Removal (lbs/bu)			Nitrogen Removal (lbs/bu)	Phosphorus Removal (lbs/bu)		
Field No. 6 (19)		2018	PAN/acre	242	70	Beans (bushels)	4.84	0.46	0	0.90	0.20	Total Phosphorous Soil Test Results	
Total Field Acreage	36.6	Beans	PAN/field	6,195	1,614	50						Sampled	ppm
Set Backs (acres)	11.0		Cl/acre	500	23							2015	lbs/acre
Acreage (net set backs)	25.6		Cl/field	12,800	534							2016	69
Home			O&G/acre	10,000	33								139
			O&G/field	256,000	753								
			Phosphorus/acre	23.1	228								
			Phosphorus/field	590	5,275								

Date	Sludge Unit	Sludge Solids (%)	ANALYSIS (average of last 3 tests)						Gallons Per Acre Applied	Daily Gallons Sludge Applied	Daily Applied Area (acres)	Cumulative Acres Applied	Daily Dry Tons Sludge Applied per Acre	Cumulative Sludge Applied (dry tons)	Daily PAN Applied (lbs/ac)	Cumulative PAN Applied (lbs)	Daily Phosphorus Applied (lbs/ac)	Cumulative Phosphorus Applied (lbs)	Daily Chloride Applied (lbs/ac)	Cumulative Chloride Applied (lbs)	Daily O&G Applied (lbs/ac)	Cumulative O&G Applied (lbs)
			Last Analysis Date	PAN (lbs/dry ton)	Last Analysis Date	Chloride (lbs/ dry ton)	Phosphorus (lbs/ dry ton)	O&G (lbs/dry ton)														
04/23/19	WAS	2.99	12/11/2018	49.3	12/11/2018	16.3	161.1	23.0	11500	152728	13.3	13.3	1.43	19.04	71	939	231	3068	23	310	33	438
04/24/19	WAS	2.9	12/11/2018	49.3	12/11/2018	16.3	161.1	23.0	11500	113294	9.9	23.1	1.39	32.74	69	1614	224	5275	23	534	32	753

Form R
Sec. 3.7 - Nutrient Management

			Limit	Actual									
Field No. 7 (20)					Beans	Nitrogen	Phosphorus		Nitrogen	Phosphorus			
					(bushels)	Removal	Removal	Corn (bushels)	Removal	Removal	Total Phosphorous Soil Test Results		
						(lbs/bu)	(lbs/bu)		(lbs/bu)	(lbs/bu)	Sampled	ppm	lbs/acre
Total Field Acreage	48.8	2018 beans	PAN/acre	242	71						2015		
Set Backs (acres)	10.8		PAN/field	9,196	7,697	50	4.84	0.46	0	0.90	2016	26	52
Acreage (net set backs)	38.0		Cl/acre	500	23						2017	50	100
Home			Cl/field	19,000	2,461						2018	40.24	80
			O&G/acre	10,000	33								
			O&G/field	380,000	33.1								
			Phosphorus/acre	23.1	232								
			Phosphorus/field	876	8,810								

Date	Sludge Unit	Sludge Solids (%)	ANALYSIS (average of last 3 tests)						Gallons Per Acre Applied	Daily Gallons Sludge Applied	Daily Applied Area (acres)	Cumulative Acres Applied	Daily Dry Tons Sludge Applied per Acre	Cumulative Sludge Applied (dry tons)	Daily PAN Applied (lbs/ac)	Cumulative PAN Applied (lbs)	Daily Phosphorus Applied (lbs/ac)	Cumulative Phosphorus Applied (lbs)	Daily Chloride Applied (lbs/ac)	Cumulative Chloride Applied (lbs)	Daily O&G Applied (lbs/ac)	Cumulative O&G Applied (lbs)
			Last Analysis Date	PAN (lbs/dry ton)	Last Analysis Date	Chloride (lbs/ dry ton)	Phosphorus (lbs/ dry ton)	O&G (lbs/dry ton)														
04/24/19	WAS	3.00	12/11/2018	49.3	12/11/2018	16.3	161.1	23.0	11500	437145	38.0	38.0	1.44	54.69	71	2696	232	8810	23	891	33	1258

Form R
Sec. 3.7 - Nutrient Management

			Limit	Actual									
Field No. 2 (15)			2018			Beans	Nitrogen	Phosphorus		Nitrogen	Phosphorus		
						(bushels)	Removal	Removal	Corn (bushels)	Removal	Removal	Total Phosphorous Soil Test Results	
Total Field Acreage			32.2	Corn	PAN/acre	0	(lbs/bu)	(lbs/bu)	200	(lbs/bu)	(lbs/bu)	Sampled	ppm
Set Backs (acres)			4.7		PAN/field							lbs/acre	
Acreage (net set backs)			27.5		500							2015	
					13,750							2016	79
					10,000							2017	64
					275,000							2018	60.05
					39.2							120	
					1,078								
					11,256								

Date	Sludge Unit	Sludge Solids (%)	ANALYSIS (average of last 3 tests)						Gallons Per Acre Applied	Daily Gallons Sludge Applied	Daily Applied Area (acres)	Cumulative Acres Applied	Daily Dry Tons Sludge Applied per Acre	Cumulative Sludge Applied (dry tons)	Daily PAN Applied (lbs/ac)	Cumulative PAN Applied (lbs)	Daily Phosphorus Applied (lbs/ac)	Cumulative Phosphorus Applied (lbs)	Daily Chloride Applied (lbs/ac)	Cumulative Chloride Applied (lbs)	Daily O&G Applied (lbs/ac)	Cumulative O&G Applied (lbs)
			Last Analysis Date	PAN (lbs/dry ton)	Last Analysis Date	Chloride (lbs/ dry ton)	Phosphorus (lbs/ dry ton)	O&G (lbs/dry ton)														
04/26/19	WAS	2.94	12/11/2018	49.3	12/11/2018	16.3	161.1	23.0	11500	316066	27.5	27.5	1.41	38.75	70	1910	227	6242	23	632	32	891
12/6/2019	WAS	2.7	4/24/2019	50.6	4/24/2019	19.2	150	45.3	11500	296870	25.8	53.3	1.29	72.17	66	3602	194	11256	25	1273	59	2405



**Land Application Operation and Maintenance Plan
Sedalia, Missouri Complex**

Missouri State Operating Permit
No.: MO-0115061

January 2020

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1.0 INTRODUCTION

This document provides a summary of biosolids sludge management activities performed at the Tyson Poultry, Inc. (Tyson) Sedalia, Missouri Complex (Sedalia Complex). The Sedalia Complex consists of several facilities associated with poultry processing including a Feed Mill, Processing Plant, Hatchery and a Rendering Plant which each discharge sanitary and process wastewater to the Tyson Foods, Inc. full-treatment wastewater plant (WWTP) located at the Sedalia Complex.

Listed in order of treatment, the full-treatment system at the WWTP consists of an equalization tank, two high-capacity dissolved air floatation (DAF) units which operate in parallel followed by four anaerobic treatment lagoons which operate in series, an anoxic reactor, a complete mix activated sludge basin (CMAS basin), a clarifier and a disinfection basin. Final effluent will discharge into a cooling pond then to an unnamed tributary of the Little Muddy Creek. Sludge management and operation of the WWTP is conducted in a manner consistent with the requirements of Missouri State Operating Permit No. MO-0115061 (Permit).

Two types of sludge are generated at the WWTP including DAF sludge and waste activated sludge (WAS sludge). DAF sludge is generated through the operation of the DAF units. WAS sludge is discharged from the clarifier to the WAS Lagoon.

DAF sludge is processed through a Tricanter which separates the sludge into three phases: oil, water and solids. The oil is sold and reused. The water reenters the wastewater treatment system. The solids are land applied off-site by a permitted contractor as an exempted fertilizer product and reported to the Missouri Fertilizer board. The solids tonnage reports and land applied are completed off-site by a permitted contractor. Throughout the year, excess DAF sludge which is not processed through the Tricanter is land applied off-site by a permitted contractor and on occasion on site. WAS sludge is land applied on-site twice per year when the WAS lagoon is pumped down.

DAF and WAS sludge are valuable agronomic soil amendments (fertilizers). DAF sludge is applied by Tyson personnel only in the event Terra Renewal Services, Inc. (TRS) is unable to keep up with sludge production. DAF sludge has been exempted by MDNR as a fertilizer product and is reported to the Missouri Fertilizer Board on the semi-annual report whenever it is applied to Tyson owned land. DAF sludge is normally applied off-site by Terra Renewal Services, Inc. (TRS) for private landowners in Missouri and Arkansas under applicable state fertilizer permits. Currently, and for the past few years, all DAF sludge is land-applied off-site by TRS, with the exception of the Spring of 2019.

WAS sludge is applied on-site by a contractor (Kreisel Nutrient Management).

2.0 LAND APPLICATION AND SLUDGE MANAGEMENT PROGRAM

1.1 On-Site Sludge Application Sites

The Sedalia Complex owns approximately 887 acres of farmland available for on-site sludge application under the provisions of the Permit. The farmland is divided into 17 fields physically separated from one another by drainage ways, topographic highs, terraces, fence lines and/or roads. Field #9 has been removed as an application field and will not be used. Figure 1 presents the location of Fields 1 through 17.

1.2 Soil Sampling Methodology

Consistent with the requirements of the Permit, soil sampling is performed in accordance with University of Missouri-Columbia Publication No. G-9217, Soil Sampling Hayfields and Row Crops. The Permit requires at least one composite soil sample per 80 acres. The contractor utilized by Tyson collects one soil sample from every 2 to 2.5 acres. The analytical results from those samples are averaged by an area weighted averaging method to provide composite results for each field. Soil samples are collected from each location from 0 to 6 inches below grade. The location of each discrete sample is recorded using a Global Positioning System (GPS) device.

1.3 Soil Testing Methodology

Soil testing is performed Waypoint Analytical Services which is accredited by the Missouri Soil Testing Association. As required in the Permit, soil samples are collected prior to land application of sludge. Soil samples are analyzed for the following parameters:

- pH
- Copper
- Magnesium
- Potassium
- Calcium
- Sulfur
- Zinc
- Organic Matter
- Nitrate Nitrogen
- Phosphorus
- Cation Exchange Capacity

The soil sample test results are evaluated to determine whether lime must be incorporated in the soil to raise pH. Soil sample test results are also evaluated along with sludge data and crop plan to determine the sludge application rates.

1.4 Sludge Sampling Methodology

As a standard practice, sludge samples are collected as composite samples representative of the sludge volume applied during each day of sludge application day. With the exception of moisture and total solids tests, sludge samples are analyzed by Engineering Surveys and Services Testing Laboratories located in Columbia, Missouri. Moisture and total solids tests are performed at the WWTP laboratory using standard laboratory methods.

Samples of sludge applied on-site are analyzed for the following parameters at a rate of one composite sample for every 100 tons of sludge applied:

- Ammonia
- Organic N
- Nitrite plus Nitrate
- Kjeldahl Nitrogen
- Oil and Grease
- Total Solids

Metals

- | | |
|------------------------|--------------|
| • Kjeldahl Nitrogen | • Aluminum |
| • Ammonia | • Beryllium |
| • Nitrite plus Nitrate | • Arsenic |
| • Organic Nitrogen | • Boron |
| • Total Nitrogen | • Cadmium |
| • Total Solids | • Chromium |
| • pH | • Copper |
| • Chloride | • Lead |
| • Fluoride | • Mercury |
| • Phosphorous, Total | • Molybdenum |
| • Oil and Grease | • Nickel |
| | • Selenium |
| | • Tin |
| | • Zinc |

1.5 On-Site Sludge Application Methodology

WAS sludge is applied on-site by subsurface injection to a depth of ranging from 0.5 –

1.0 feet below grade. All WAS sludge application is performed by Kreisel Nutrient Management. A pre-operation inspection of the equipment and a post-application inspection of the property perimeter is performed each day that sludge is applied and is documented on the Sludge Percent Solids Data form. Weather conditions of each application day are also recorded on that form. Calibration of the injection equipment is performed on an annual basis.

Land application may only occur during daylight hours and may not occur during frozen, snow covered or saturated soil conditions. Land application does not occur during precipitation events or if precipitation is likely.

Sludge is not applied inside the following setback distances to sensitive features:

- 300 feet of any well
- 150 feet of a residence
- 50 feet of a perennial or intermittent stream (including the waterways within the Tyson farmland)
- 50 feet of the property line or public road.

1.6 On-Site Sludge Application Rates

The Permit specifies sludge application loading limits for nitrogen and phosphorus specific to the agronomic requirements of the crops planted. The Permit also specifies land application loading limits associated with oil & grease and metals.

Nitrogen and phosphorus application limits are determined based on specific requirements of the Permit and based on crop nutrient removal rate estimates presented in Missouri University (MU) Guide EQ202, Land Application Considerations for Animal Manure. Realistic crop production goals (based on past experience) are used to estimate annual crop production and nutrient removal rates.

Soil sample data, sludge sample data and crop plans are monitored and reviewed to determine the allowable sludge application rates per field. Daily total solids determinations are performed to determine the dry tons of sludge, nutrients and oil and grease applied per acre. Metals concentration in sludge are evaluated to determine whether the metals are considered “low level” or “high level”. If they are “high level”, the cumulative total application of individual metals must be determined.

1.7 Cultivation Practices

Under contract, the Tyson farmland is cultivated by Kreisel Farms, Inc. (also known as Kreisel Nutrient Management). The farmland is sown using a typical crop rotation program of corn and soybeans.

1.8 Off-Site Land Application

Under applicable State-specific operating permits issued in Missouri and Arkansas, TRS provides for off-site land application of sludge generated at the Sedalia WWTP. TRS's permits specify many of the same restrictions and requirements stipulated in the Permit applicable to on-site sludge management including: soil sampling and analysis, sludge sampling and analysis and application of sludge to meet the agronomic needs of specific crops. TRS applies sludge through subsurface injection.








APPENDIX A

Site Location Map

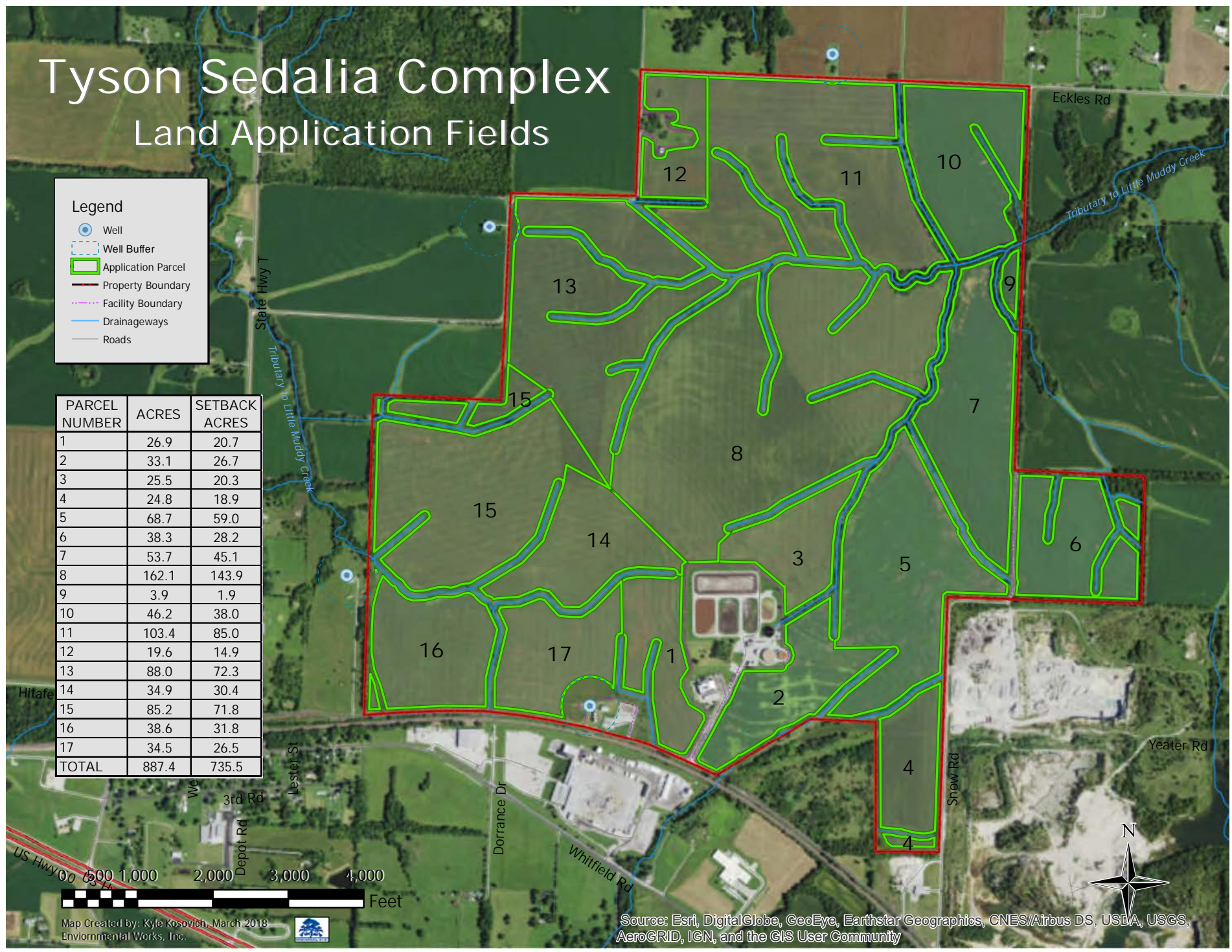
Tyson Sedalia Complex

Land Application Fields

Legend

-  Well
-  Well Buffer
-  Application Parcel
-  Property Boundary
-  Facility Boundary
-  Drainageways
-  Roads

PARCEL NUMBER	ACRES	SETBACK ACRES
1	26.9	20.7
2	33.1	26.7
3	25.5	20.3
4	24.8	18.9
5	68.7	59.0
6	38.3	28.2
7	53.7	45.1
8	162.1	143.9
9	3.9	1.9
10	46.2	38.0
11	103.4	85.0
12	19.6	14.9
13	88.0	72.3
14	34.9	30.4
15	85.2	71.8
16	38.6	31.8
17	34.5	26.5
TOTAL	887.4	735.5



Map Created by: Kyle Kosovich, March 2018
Environmental Works, Inc.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

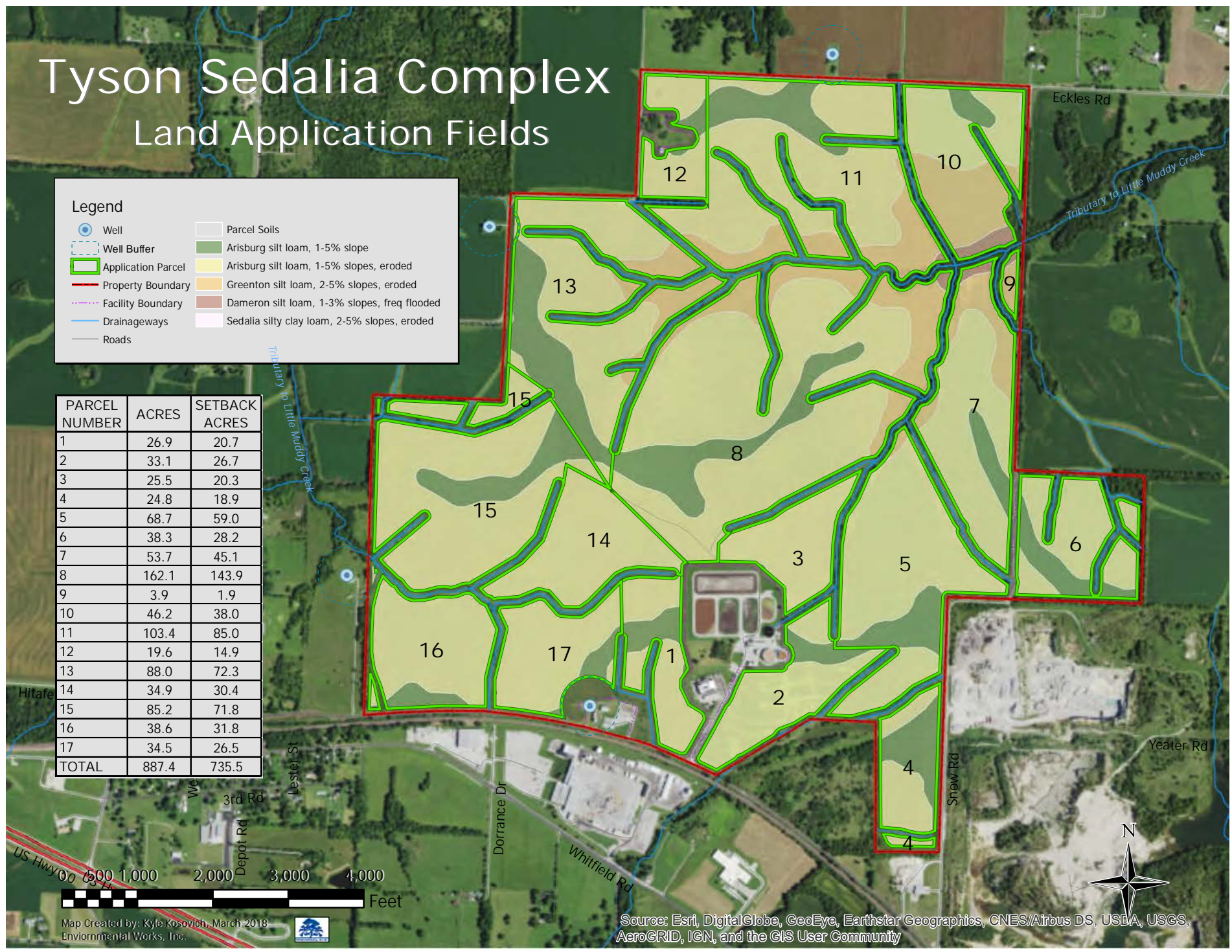
Tyson Sedalia Complex

Land Application Fields

Legend

- Well
- Well Buffer
- Application Parcel
- Property Boundary
- Facility Boundary
- Drainageways
- Roads
- Parcel Soils
 - Arisburg silt loam, 1-5% slope
 - Arisburg silt loam, 1-5% slopes, eroded
 - Greenton silt loam, 2-5% slopes, eroded
 - Dameron silt loam, 1-3% slopes, freq flooded
 - Sedalia silty clay loam, 2-5% slopes, eroded

PARCEL NUMBER	ACRES	SETBACK ACRES
1	26.9	20.7
2	33.1	26.7
3	25.5	20.3
4	24.8	18.9
5	68.7	59.0
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17	34.5	26.5
TOTAL	887.4	735.5



Map Created by: Kyle Kosovich, March 2018
Environmental Works, Inc.










Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

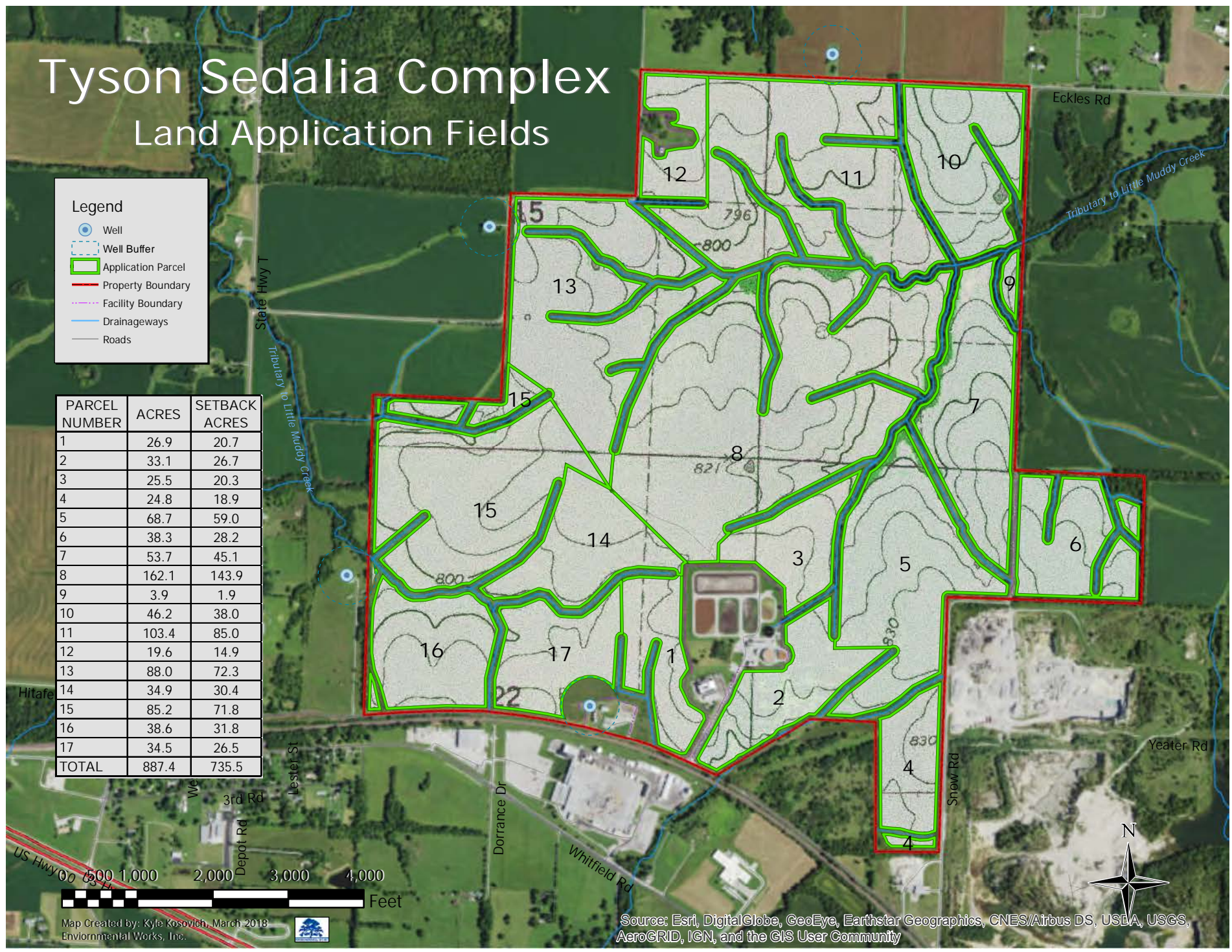
Tyson Sedalia Complex

Land Application Fields

Legend

-  Well
-  Well Buffer
-  Application Parcel
-  Property Boundary
-  Facility Boundary
-  Drainageways
-  Roads

PARCEL NUMBER	ACRES	SETBACK ACRES
1	26.9	20.7
2	33.1	26.7
3	25.5	20.3
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5	68.7	59.0
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8	162.1	143.9
9	3.9	1.9
10	46.2	38.0
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14	34.9	30.4
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16	38.6	31.8
17	34.5	26.5
TOTAL	887.4	735.5



Map Created by: Kyle Kosovich, March 2018
Environmental Works, Inc.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

U.S. GEOLOGICAL SURVEY U.S.C. Section 502 (b)(9)		101 (b)(1) 220-2170 F04 (b)(1) 220-2200	
DRAWN BY: DDD CHECK BY: T001 APPRO BY: BWT PROJECT:	TITLE: WASTEWATER TREATMENT PLANT OIL STORAGE AND USAGE AREAS		
DATE: 9/19/2014 SCALE: AS SHOWN	DWG NO.: 770006 6 SHEET: 1	SERIAL NO. REV	A

FORM R
INDUSTRIAL PROCESS INFORMATION
4.10

Screened wastewater is collected in a Flow Equalization Basin (322,000 Gal) before it is pre-treated through two Dissolved Air Floatation (DAF) units (1200 gpm). A portion of the solids are skimmed and ran through a tricanter centrifuge to extract the oils. The remaining solids are stored in two above ground tanks (280,000 Gal) for reprocessing through the tricanter or for land application. Effluent from the DAF units will flow into a series of four anaerobic lagoons (11 MG, 6 MG, 6MG and 4 MG) and then pumped to the Anoxic Basin (1.8 MG). The Anoxic Basin constantly recirculates with the CMAS Nitrification Reactor (2.3 MG). The effluent from the CMAS Nitrification Reactor is mixed with alum and a coagulant added before it is sent to the final Clarifier (1.8 MG). Water then flows from the Clarifier into a Chlorination/Dechlorination basin (480,000 Gal) and then discharged to Outfall #1. Water from Outfall 001 then discharges into a cooling pond to bring temperature to ambient before final discharge to the Tributary to Little Muddy Creek. Waste Activated Sludge pumped from the clarifier is stored in a WAS lagoon and is land applied as necessary.

4.11

Poultry slaughter and further production facility with approximately 1.3 million chickens being processed a week. Complex includes Processing Plant, Feed Mill, Hatchery, and Rendering Facility.

4.20

Chicken, vegetable oil, marinates, corn, soybeans, feathers, offal, blood, hydraulic oils and lubes, misc. feed minerals and vitamins, NaOCl, NaOH, CO₂, NH₃, PAA, hydrogen peroxide, sodium hypochlorite, sulfuric acid.

Form R
Sec. 5.0 - Soil Data

[illegible]

Form R
Sec. 5.0 - Soil Data

Permit Feature	Tyson Field Id	Sample Id	Report Number	Current Date	Lab Number	Organic Matter	Estimated Nitrogen Release	Cation Exchange Capacity	pH	Buffer pH	Phosphorus (ppm)	Phosphorus lbs/acre	Potassium (ppm)	Potassium lbs/acre	Calcium (ppm)	Calcium lbs/acre	Magnesium (ppm)	Magnesium lbs/acre	Sulfur (ppm)	Sulfur lbs/acre	Zinc (ppm)	Zinc lbs/acre
15	2	27	19-345-0662	20191218	18439	3.8	120	18.6	5.8	6.58	137	274	71	142	2351	4702	376	752	7	14	3.4	6.8
15	2	29	19-345-0662	20191218	18441	4.7	138	24.9	5.4	6.22	139	278	115	230	2622	5244	527	1054	7	14	3.7	7.4
15	2	30	19-345-0662	20191218	18442	4.1	126	19.3	5.8	6.56	108	216	76	152	2365	4730	426	852	6	12	3.8	7.6
15	2	31	19-345-0662	20191218	18444	3.8	120	15.2	5.4	6.5	120	240	49	98	1747	3494	246	492	6	12	2.6	5.2
15	2	32	19-345-0662	20191218	18445	3.1	106	10.8	6.4	6.83	100	200	42	84	1613	3226	196	392	6	12	2.5	5
15	2	33	19-345-0662	20191218	18446	4	124	18.8	6.4	6.76	86	172	85	170	2743	5486	384	768	7	14	3.3	6.6
15	2	34	19-345-0662	20191218	18447	3.6	116	18.8	6.1	6.67	124	248	92	184	2518	5036	408	816	7	14	3.1	6.2
15	2	35	19-345-0662	20191218	18448	4.3	130	21.6	5.8	6.52	161	322	100	200	2625	5250	496	992	9	18	4.4	8.8
15	2	24	19-345-0662	20191218	18436	3.2	108	15.8	5.8	6.63	66	132	47	94	2069	4138	286	572	5	10	2.1	4.2
15	2	25	19-345-0662	20191218	18437	3.2	108	13.5	6	6.73	125	250	45	90	1819	3638	273	546	6	12	2.4	4.8
15	2	26	19-345-0662	20191218	18438	3.2	108	13.8	5.9	6.7	143	286	57	114	1850	3700	250	500	6	12	4	8
15	2	23	19-345-0662	20191218	18435	3.3	110	12.7	6.4	6.82	107	214	51	102	1915	3830	222	444	5	10	2.2	4.4

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Form R
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Permit Feature	Tyson Field Id	Sample Id	Report Number	Current Date	Lab Number	Organic Matter	Estimated Nitrogen Release	Cation Exchange Capacity	pH	Buffer pH	Phosphorus (ppm)	Phosphorus lbs/acre	Potassium (ppm)	Potassium lbs/acre	Calcium (ppm)	Calcium lbs/acre	Magnesium (ppm)	Magnesium lbs/acre	Sulfur (ppm)	Sulfur lbs/acre	Zinc (ppm)	Zinc lbs/acre
17	4	1	19-345-0664	20191218	18466	3.2	108	15.9	6.8	6.88	156	312	61	122	2588	5176	281	562	7	14	1.7	3.4
17	4	2	19-345-0664	20191218	18467	3.7	118	13.3	7.2	6.93	131	262	93	186	2280	4560	197	394	5	10	3.5	7
17	4	3	19-345-0664	20191218	18468	4.5	134	16.4	6.9	6.91	188	376	106	212	2869	5738	194	388	7	14	17.2	34.4
17	4	4	19-345-0664	20191218	18469	3.5	114	16.1	6.9	6.91	151	302	61	122	2781	5562	223	446	7	14	3.1	6.2
17	4	5	19-345-0664	20191218	18470	3.6	116	16.3	6.8	6.88	161	322	74	148	2610	5220	306	612	6	12	2.2	4.4
17	4	6	19-345-0664	20191218	18471	3.3	110	17.7	6.6	6.82	61	122	87	174	2795	5590	292	584	6	12	2.5	5
17	4	7	19-345-0664	20191218	18472	4.1	126	21	6.3	6.71	168	336	101	202	3011	6022	417	834	7	14	2.7	5.4
17	4	8	19-345-0664	20191218	18473	4	124	17.9	5.9	6.63	151	302	97	194	2276	4552	388	776	6	12	2.1	4.2
17	4	9	19-345-0664	20191218	18474	3.8	120	14.1	6	6.72	81	162	51	102	1944	3888	263	526	6	12	2	4
17	4	10	19-345-0664	20191218	18475	3.7	118	17.5	6	6.67	89	178	64	128	2349	4698	354	708	5	10	2.4	4.8
17	4	11	19-345-0664	20191218	18477	3.4	112	15.9	5.5	6.52	16	32	67	134	1808	3616	311	622	6	12	1.2	2.4

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Form R
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Permit Feature	Tyson Field Id	Sample Id	Report Number	Current Date	Lab Number	Organic Matter	Estimated Nitrogen Release	Cation Exchange Capacity	pH	Buffer pH	Phosphorus (ppm)	Phosphorus lbs/acre	Potassium (ppm)	Potassium lbs/acre	Calcium (ppm)	Calcium lbs/acre	Magnesium (ppm)	Magnesium lbs/acre	Sulfur (ppm)	Sulfur lbs/acre	Zinc (ppm)	Zinc lbs/acre	
18	5	1	19-345-0662	20191218	18411	4.2	128	15.9	6.9	6.91	173	346	119	238	2656	5312	255	510	8	16	5.2	10.4	
18	5	2	19-345-0662	20191218	18412	4.1	126	17.7	6.6	6.82	153	306	147	294	2646	5292	355	710	7	14	3.9	7.8	
18	5	3	19-345-0662	20191218	18413	3.2	108	11.4	6.3	6.81	131	262	99	198	1682	3364	179	358	7	14	2.9	5.8	
18	5	4	19-345-0662	20191218	18414	4	124	15.2	6.2	6.75	201	402	105	210	2124	4248	300	600	6	12	2.8	5.6	
18	5	5	19-345-0662	20191218	18415	3.7	118	17.3	6	6.67	151	302	91	182	2384	4768	308	616	7	14	3.1	6.2	
18	5	6	19-345-0662	20191218	18416	3.9	122	23.1	5.9	6.54	178	356	124	248	2882	5764	540	1080	8	16	1.8	3.6	
18	5	7	19-345-0662	20191218	18417	3.5	114	18.5	5.9	6.62	141	282	101	202	2313	4626	427	854	7	14	1.6	3.2	
18	5	8	19-345-0662	20191218	18418	3.7	118	15.8	6	6.69	141	282	83	166	2150	4300	290	580	7	14	2.3	4.6	
18	5	9	19-345-0662	20191218	18419	3.9	122	14.3	6.5	6.82	190	380	61	122	2154	4308	273	546	6	12	3.5	7	
18	5	10	19-345-0662	20191218	18420	3.2	108	14	6.9	6.91	118	236	54	108	2308	4616	255	510	7	14	1.8	3.6	
18	5	11	19-345-0662	20191218	18422	3.8	120	17.9	6.9	6.9	114	228	69	138	2835	5670	392	784	6	12	1.9	3.8	
18	5	12	19-345-0662	20191218	18423	3.8	120	15.9	6.5	6.81	168	336	69	138	2399	4798	306	612	7	14	2.8	5.6	
18	5	13	19-345-0662	20191218	18424	4.2	128	20.8	6	6.62	211	422	108	216	2684	5368	482	964	8	16	2.3	4.6	
18	5	14	19-345-0662	20191218	18425	3.9	122	17.8	5.9	6.63	233	466	111	222	2335	4670	341	682	8	16	2.7	5.4	
18	5	15	19-345-0662	20191218	18426	3.7	118	18.7	6.1	6.67	129	258	70	140	2648	5296	323	646	6	12	1.7	3.4	
18	5	16	19-345-0662	20191218	18427	3.7	118	18.8	6	6.65	204	408	83	166	2498	4996	396	792	8	16	2	4	
18	5	17	19-345-0662	20191218	18428	3.8	120	18.1	6	6.66	142	284	86	172	2469	4938	342	684	7	14	2.1	4.2	
18	5	18	19-345-0662	20191218	18429	4.2	128	20.2	5.8	6.55	141	282	91	182	2566	5132	397	794	7	14	2.5	5	
18	5	19	19-345-0662	20191218	18430	4.3	130	17.6	5.7	6.56	202	404	71	142	2230	4460	307	614	7	14	3.1	6.2	
18	5	20	19-345-0662	20191218	18431	3.7	118	13.7	6.4	6.81	113	226	52	104	2059	4118	248	496	8	16	2.4	4.8	
18	5	21	19-345-0662	20191218	18433	3.2	108	12.3	6.7	6.87	93	186	45	90	1890	3780	254	508	5	10	1.7	3.4	
18	5	22	19-345-0662	20191218	18434	3.6	116	13.8	6.5	6.83	118	236	47	94	2101	4202	260	520	6	12	1.7	3.4	
18	5	28	19-345-0662	20191218	18440	4.8	140	26.1	5.7	6.38	166	332	112	224	3245	6490	492	984	8	16	2.5	5	
						Avg	3.83	120.61	17.17	6.23	6.72	157.00	314.00	86.87	173.74	2402.52	4805.04	335.74	671.48	7.00	14.00	2.53	5.07
						Min	3.2	108	11.4	5.7	6.38	93	186	45	90	1682	3364	179	358	5	10	1.6	3.2
						Max	4.8	140	26.1	6.9	6.91	233	466	147	294	3245	6490	540	1080	8	16	5.2	10.4
						Count	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23

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Permit Feature	Tyson Field Id	Sample Id	Report Number	Current Date	Lab Number	Organic Matter	Estimated Nitrogen Release	Cation Exchange Capacity	pH	Buffer pH	Phosphorus (ppm)	Phosphorus lbs/acre	Potassium (ppm)	Potassium lbs/acre	Calcium (ppm)	Calcium lbs/acre	Magnesium (ppm)	Magnesium lbs/acre	Sulfur (ppm)	Sulfur lbs/acre	Zinc (ppm)	Zinc lbs/acre
19	6	1	19-345-06	20191218	18449	5	144	25.8	7.1	6.92	82	164	123	246	4341	8682	441	882	7	14	2.7	5.4
19	6	2	19-345-06	20191218	18450	3.6	116	19.3	6.8	6.87	132	264	74	148	3157	6314	331	662	6	12	2.3	4.6
19	6	3	19-345-06	20191218	18451	3.1	106	14.2	6.9	6.91	35	70	49	98	2387	4774	237	474	5	10	1.3	2.6
19	6	4	19-345-06	20191218	18452	3.2	108	13.5	7	6.92	114	228	56	112	2306	4612	205	410	8	16	2.2	4.4
19	6	5	19-345-06	20191218	18453	3.6	116	17.1	6.5	6.8	82	164	96	192	2465	4930	383	766	7	14	1.7	3.4
19	6	6	19-345-06	20191218	18455	3.9	122	23.1	6	6.58	11	22	109	218	3019	6038	503	1006	5	10	1.2	2.4
19	6	7	19-345-06	20191218	18456	3.4	112	17	6.4	6.78	62	124	75	150	2513	5026	332	664	6	12	1.4	2.8
19	6	8	19-345-06	20191218	18457	3.5	114	15.9	6.8	6.88	98	196	60	120	2557	5114	290	580	6	12	2.1	4.2
19	6	9	19-345-06	20191218	18458	4.1	126	20.2	6.4	6.75	68	136	76	152	2992	5984	389	778	6	12	2.2	4.4
19	6	10	19-345-06	20191218	18459	3.4	112	15.2	6.7	6.86	50	100	49	98	2389	4778	287	574	5	10	1.7	3.4
19	6	11	19-345-06	20191218	18460	3.5	114	15.1	6.2	6.75	80	160	51	102	2191	4382	269	538	6	12	2.1	4.2
19	6	12	19-345-06	20191218	18461	2.9	102	14.6	6.5	6.82	53	106	55	110	2286	4572	229	458	7	14	1.5	3
19	6	13	19-345-06	20191218	18462	3.1	106	14.4	6.4	6.8	64	128	56	112	2189	4378	246	492	8	16	1.7	3.4
19	6	14	19-345-06	20191218	18463	3.4	112	18.5	6.5	6.79	75	150	77	154	2756	5512	376	752	7	14	2	4
19	6	15	19-345-06	20191218	18464	4	124	22.7	6.4	6.73	47	94	90	180	3180	6360	550	1100	5	10	1.6	3.2

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Form R
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Permit Feature	Tyson Field Id	Sample Id	Report Number	Current Date	Lab Number	Organic Matter	Estimated Nitrogen Release	Cation Exchange Capacity	pH	Buffer pH	Phosphorus (ppm)	Phosphorus lbs/acre	Potassium (ppm)	Potassium lbs/acre	Calcium (ppm)	Calcium lbs/acre	Magnesium (ppm)	Magnesium lbs/acre	Sulfur (ppm)	Sulfur lbs/acre	Zinc (ppm)	Zinc lbs/acre	
20	7	1	19-345-0655	20191218	18310	3.7	118	15.4	6.4	6.79	96	192	45	90	2329	4658	273	546	9	18	2.2	4.4	
20	7	2	19-345-0655	20191218	18311	4.6	136	22.8	6.3	6.69	154	308	102	204	3296	6592	439	878	7	14	2.9	5.8	
20	7	3	19-345-0655	20191218	18313	4.5	134	17.8	6.4	6.77	233	466	66	132	2641	5282	343	686	7	14	3.7	7.4	
20	7	4	19-345-0655	20191218	18314	3.9	122	18.5	6.3	6.74	198	396	74	148	2620	5240	392	784	6	12	2.2	4.4	
20	7	5	19-345-0655	20191218	18315	4.4	132	19.5	6	6.64	183	366	65	130	2554	5108	441	882	6	12	1.9	3.8	
20	7	6	19-345-0655	20191218	18316	4	124	17.6	5.5	6.47	234	468	63	126	2014	4028	328	656	8	16	2.4	4.8	
20	7	7	19-345-0655	20191218	18317	4.2	128	18.4	5.8	6.58	135	270	60	120	2205	4410	449	898	6	12	1.6	3.2	
20	7	8	19-345-0655	20191218	18318	4	124	10.4	6	6.77	114	228	32	64	1431	2862	188	376	6	12	1.8	3.6	
20	7	9	19-345-0655	20191218	18319	3.6	116	12.2	6.3	6.8	133	266	27	54	1832	3664	195	390	6	12	2.3	4.6	
20	7	10	19-345-0655	20191218	18320	4.5	134	19.9	5.8	6.55	100	200	73	146	2358	4716	491	982	6	12	1.4	2.8	
20	7	11	19-345-0655	20191218	18321	4.1	126	18.3	5.9	6.62	158	316	62	124	2383	4766	379	758	6	12	2.2	4.4	
20	7	12	19-345-0655	20191218	18322	3.9	122	16.2	6.5	6.81	131	262	60	120	2438	4876	315	630	6	12	2.1	4.2	
20	7	13	19-345-0655	20191218	18324	3.9	122	17.2	6.3	6.75	141	282	69	138	2431	4862	374	748	5	10	1.9	3.8	
20	7	14	19-345-0655	20191218	18325	4.5	134	14	6.1	6.73	146	292	48	96	1950	3900	254	508	5	10	2.2	4.4	
20	7	15	19-345-0655	20191218	18326	4.2	128	20.5	5.8	6.54	133	266	96	192	2668	5336	365	730	7	14	2.1	4.2	
20	7	16	19-345-0655	20191218	18327	4.1	126	17.2	6.3	6.75	115	230	62	124	2463	4926	350	700	7	14	2.5	5	
20	7	17	19-345-0655	20191218	18328	4.3	130	16.7	5.7	6.58	188	376	58	116	2162	4324	270	540	7	14	2.8	5.6	
20	7	18	19-345-0655	20191218	18329	4	124	21	5.4	6.33	139	278	86	172	2415	4830	321	642	7	14	2.6	5.2	
Avg						4.13	126.67	17.42	6.04	6.66	151.72	303.44	63.78	127.56	2343.89	4687.78	342.61	685.22	6.50	13.00	2.27	4.53	
Min						3.6	116	10.4	5.4	6.33	96	192	27	54	1431	2862	188	376	5	10	1.4	2.8	
Max						4.6	136	22.8	6.5	6.81	234	468	102	204	3296	6592	491	982	9	18	3.7	7.4	
Count						18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18

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Permit Feature	Tyson Field Id	Sample Id	Report Number	Current Date	Lab Number	Organic Matter	Estimated Nitrogen Release	Cation Exchange Capacity	pH	Buffer pH	Phosphorus (ppm)	Phosphorus lbs/acre	Potassium (ppm)	Potassium lbs/acre	Calcium (ppm)	Calcium lbs/acre	Magnesium (ppm)	Magnesium lbs/acre	Sulfur (ppm)	Sulfur lbs/acre	Zinc (ppm)	Zinc lbs/acre
21	8	1	19-352-0591	20191219	25671	3.4	112	14.8	6.4	6.8	133	266	60	120	2281	4562	237	474	5	10	2.7	5.4
21	8	2	19-352-0591	20191219	25672	3.6	116	16.8	5.9	6.65	147	294	79	158	2287	4574	280	560	8	16	3.7	7.4
21	8	3	19-352-0591	20191219	25673	4.5	134	22	6.1	6.62	143	286	101	202	3055	6110	403	806	6	12	5.5	11
21	8	4	19-352-0591	20191219	25674	4.1	126	24.3	6.2	6.64	114	228	133	266	3393	6786	497	994	8	16	4	8
21	8	5	19-352-0591	20191219	25675	4.4	132	28.6	6.3	6.63	172	344	153	306	4050	8100	595	1190	6	12	3.3	6.6
21	8	6	19-352-0591	20191219	25676	4.1	126	18.8	6	6.65	81	162	82	164	2690	5380	286	572	6	12	3.5	7
21	8	7	19-352-0591	20191219	25677	3.8	120	20.9	6.4	6.74	161	322	108	216	3175	6350	346	692	10	20	3.7	7.4
21	8	8	19-352-0591	20191219	25678	4.2	128	21.4	6.2	6.67	130	260	97	194	3075	6150	387	774	7	14	3.7	7.4
21	8	9	19-352-0591	20191219	25679	4.5	134	23	5.8	6.49	149	298	101	202	2978	5956	410	820	8	16	4.6	9.2
21	8	10	19-352-0591	20191219	25680	4.4	132	21.2	6.1	6.63	126	252	137	274	2859	5718	428	856	10	20	3.2	6.4
21	8	11	19-352-0591	20191219	25682	3.3	110	16.5	5.9	6.65	59	118	56	112	2224	4448	297	594	7	14	1.7	3.4
21	8	12	19-352-0591	20191219	25683	3.4	112	12.7	6.3	6.8	97	194	47	94	1871	3742	227	454	5	10	3.1	6.2
21	8	13	19-352-0591	20191219	25684	3.2	108	9	6.1	6.8	97	194	34	68	1269	2538	152	304	3	6	2.6	5.2
21	8	14	19-352-0591	20191219	25685	4.4	132	15.3	6	6.7	201	402	62	124	2128	4256	266	532	5	10	3.1	6.2
21	8	15	19-352-0591	20191219	25686	2.5	94	9.9	6	6.78	110	220	35	70	1333	2666	192	384	8	16	2.4	4.8
21	8	16	19-352-0591	20191219	25687	3.4	112	9.4	6	6.79	125	250	27	54	1360	2720	141	282	9	18	2.7	5.4
21	8	17	19-352-0591	20191219	25688	3.1	106	9.5	6.2	6.82	112	224	24	48	1418	2836	153	306	4	8	3.1	6.2
21	8	18	19-352-0591	20191219	25689	3.1	106	12.1	5.8	6.7	119	238	34	68	1615	3230	192	384	6	12	3.1	6.2
21	8	19	19-352-0591	20191219	25690	3.5	114	13.4	6.4	6.81	131	262	43	86	2007	4014	243	486	10	20	3.6	7.2
21	8	20	19-352-0591	20191219	25691	4.3	130	14.3	6.3	6.78	120	240	40	80	2207	4414	197	394	7	14	4	8
21	8	21	19-352-0591	20191219	25693	4.5	134	16.5	6.3	6.76	187	374	52	104	2482	4964	268	536	11	22	5	10
21	8	22	19-352-0591	20191219	25694	3.7	118	15.9	6.4	6.79	142	284	61	122	2433	4866	259	518	5	10	3.5	7
21	8	23	19-352-0591	20191219	25695	3.6	116	16.9	6.2	6.73	77	154	74	148	2422	4844	312	624	8	16	1.8	3.6
21	8	24	19-352-0591	20191219	25696	4	124	13.2	5.9	6.71	48	96	37	74	1862	3724	188	376	6	12	3.2	6.4
21	8	25	19-352-0591	20191219	25697	3.1	106	12.9	6.1	6.75	151	302	41	82	1846	3692	212	424	5	10	2.2	4.4
21	8	26	19-352-0591	20191219	25698	3.9	122	16.9	6.1	6.69	132	264	62	124	2315	4630	334	668	3	6	2.1	4.2
21	8	27	19-352-0591	20191219	25699	4	124	18.8	5.9	6.61	150	300	85	170	2393	4786	416	832	7	14	2.3	4.6
21	8	28	19-352-0591	20191219	25700	3.6	116	14.9	6.2	6.75	104	208	61	122	2092	4184	295	590	5	10	2.2	4.4
21	8	29	19-352-0591	20191219	25701	4.1	126	16.3	6.3	6.76	188	376	66	132	2358	4716	314	628	10	20	3.5	7
21	8	30	19-352-0591	20191219	25702	4.3	130	19.8	6	6.63	182	364	70	140	2718	5436	363	726	8	16	2.7	5.4
21	8	31	19-352-0591	20191219	25704	3.6	116	16.9	6.3	6.75	189	378	81	162	2432	4864	328	656	9	18	2.3	4.6
21	8	32	19-352-0591	20191219	25705	4.2	128	18	6	6.66	86	172	78	156	2410	4820	362	724	5	10	1.1	2.2
21	8	33	19-352-0591	20191219	25706	3.7	118	16	5.9	6.66	186	372	62	124	2167	4334	272	544	6	12	3.4	6.8
21	8	34	19-352-0591	20191219	25707	4.2	128	16.3	5.8	6.62	137	274	77	154	2153	4306	266	532	5	10	3.2	6.4
21	8	35	19-352-0591	20191219	25708	3.8	120	14.3	6	6.72	189	378	48	96	2014	4028	239	478	4	8	2	4
21	8	36	19-352-0591	20191219	25709	4.2	128	21.3	5.7	6.48	271	542	91	182	2602	5204	423	846	10	20	2.5	5
21	8	37	19-352-0591	20191219	25710	3.9	122	22.8	5.1	6.1	91	182	87	174	2312	4624	282	564	9	18	1.1	2.2
21	8	38	19-352-0591	20191219	25711	4.3	130	17	6.1	6.69	180	360	68	136	2501	5002	235	470	3	6	2.8	5.6
21	8	39	19-352-0591	20191219	25712	4.2	128	14.2	6.2	6.76	235	470	66	132	2093	4186	229	458	12	24	4.5	9
21	8	40	19-352-0591	20191219	25713	4.5	134	26.1	6.3	6.66	213	426	139	278	3838	7676	466	932	5	10	3.3	6.6
21	8	41	19-352-0591	20191219	25715	4.1	126	18.4	6.1	6.67	309	618	72	144	2611	5222	307	614	8	16	4.5	9
21	8	42	19-352-0591	20191219	25716	3.9	122	19	6.2	6.7	244	488	82	164	2772	5544	321	642	8	16	4	8
21	8	43	19-352-0591	20191219	25717	3.7	118	15.2	6.3	6.77	127	254	77	154	2181	4362	299	598	9	18	2.1	4.2
21	8	44	19-352-0591	20191219	25718	4.2	128	22.9	6.6	6.79	215	430	104	208	3526	7052	434	868	6	12	3.4	6.8
21	8	45	19-352-0591	20191219	25719	3.5	114	14.5	5.4	6.52	143	286	35	70	1728	3456	198	396	7	14	2.3	4.6
21	8	46	19-352-0591	20191219	25720	4.2	128	16.4	5.8	6.62	246	492	46	92	2270	4540	219	438	7	14	5.3	10.6
21	8	47	19-352-0591	20191219	25721	3.1	106	15.4	6.3	6.77	184	368	50	100	2312	4624	256	512	13	26	2.9	5.8
21	8	48	19-352-0591	20191219	25722	4.7	138	25.5	5.5	6.27	205	410	135	270	2911	5822	477	954	5	10	1.9	3.8
21	8	49	19-352-0591	20191219	25723	4.4	132	23.5	6.2	6.65	70	140	150	300	3249	6498	492	984	7	14	1.9	3.8
21	8	50	19-352-0591	20191219	25724	3.5	114	21	6.8	6.87	44	88	118	236	3285	6570	439	878	8	16	1.8	3.6
21	8	51	19-352-0591	20191219	25726	3.7	118	13.7	6.2	6.77	147	294	42	84	2051	4102	207	414	4	8	3.4	6.8
21	8	52	19-352-0591	20191219	25727	4.6	136	19.3	6	6.64	132	264	102	204	2580	5160	390	780	6	12	2.9	5.8
21	8	53	19-352-0591	20191219	25728	4.4	132	20.3	5.3	6.3	205	410	102	204	2135	4270	362	724	6	12	1.6	3.2
21	8	54	19-352-0591	20191219	25729	4.9	142	25	5.6	6.34	166	332	131	262	2954	5908	474	948	5	10	2.6	5.2
21	8	55	19-352-0591	20191219	25730	4.3	130	20.2	5.8	6.55	172	344	132	264	2534	5068	405	810	8	16	1.6	3.2
21	8	56	19-352-0591	20191219	25731	3.8	120	14.8	5.7	6.62	245	490	45	90	1889	3778	255	510	12	24	2.6	5.2
21	8	57	19-352-0591	20191219	25732	4.6	136	17.1	5.4	6.44	203	406	77	154	1844	3688	334	668	8	16	2.5	5
21	8	58	19-352-0591	20191219	25733	4.3	130	16.5	6	6.68	177	354	100	200	2121	4242	379	758	4	8	2.1	4.2

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Permit Feature	Tyson Field Id	Sample Id	Report Number	Current Date	Lab Number	Organic Matter	Estimated Nitrogen Release	Cation Exchange Capacity	pH	Buffer pH	Phosphorus (ppm)	Phosphorus lbs/acre	Potassium (ppm)	Potassium lbs/acre	Calcium (ppm)	Calcium lbs/acre	Magnesium (ppm)	Magnesium lbs/acre	Sulfur (ppm)	Sulfur lbs/acre	Zinc (ppm)	Zinc lbs/acre		
23	10	1	19-345-0654	20191218	18291	3.7	118	19	6.5	6.79	42	84	105	210	2952	5904	308	616	9	18	2.4	4.8		
23	10	2	19-345-0654	20191218	18292	3.8	120	19	6.8	6.87	82	164	101	202	3006	6012	373	746	9	18	1.8	3.6		
23	10	3	19-345-0654	20191218	18293	3.2	108	19.4	6.8	6.87	39	78	69	138	3161	6322	334	668	7	14	1.7	3.4		
23	10	4	19-345-0654	20191218	18294	3.1	106	13.9	6.7	6.87	106	212	42	84	2286	4572	215	430	6	12	1.5	3		
23	10	5	19-345-0654	20191218	18295	3.6	116	18.6	6.4	6.76	42	84	101	202	2764	5528	336	672	7	14	1.4	2.8		
23	10	6	19-345-0654	20191218	18296	3.8	120	23.8	5.9	6.53	61	122	91	182	3077	6154	505	1010	7	14	1.4	2.8		
23	10	7	19-345-0654	20191218	18297	3.9	122	19.1	6.7	6.84	74	148	70	140	2921	5842	409	818	6	12	1.7	3.4		
23	10	8	19-345-0654	20191218	18298	3.2	108	20.5	6.9	6.9	31	62	68	136	3285	6570	428	856	7	14	1.5	3		
23	10	9	19-345-0654	20191218	18299	3.9	122	13.1	6.5	6.83	65	130	43	86	2036	4072	216	432	5	10	1.9	3.8		
23	10	10	19-345-0654	20191218	18300	3.8	120	13.6	6.5	6.83	68	136	60	120	2064	4128	256	512	7	14	1.4	2.8		
23	10	11	19-345-0654	20191218	18302	3.7	118	11.3	6.6	6.86	55	110	43	86	1787	3574	181	362	5	10	1.2	2.4		
23	10	12	19-345-0654	20191218	18303	3.3	110	14.4	6.5	6.82	40	80	46	92	2235	4470	245	490	5	10	1	2		
23	10	13	19-345-0654	20191218	18304	3.3	110	12.8	6.8	6.89	56	112	53	106	2117	4234	201	402	8	16	1.8	3.6		
23	10	14	19-345-0654	20191218	18305	4.5	134	21.4	6.6	6.8	76	152	84	168	3181	6362	477	954	7	14	1.7	3.4		
23	10	15	19-345-0654	20191218	18306	4	124	22.1	6.3	6.7	56	112	94	188	3128	6256	465	930	5	10	1.4	2.8		
23	10	16	19-345-0654	20191218	18307	4.2	128	21.7	6.8	6.86	20	40	61	122	3427	6854	450	900	4	8	1.3	2.6		
23	10	17	19-345-0654	20191218	18308	4.3	130	12.9	6.7	6.87	59	118	42	84	2071	4142	223	446	5	10	1.6	3.2		
23	10	18	19-345-0654	20191218	18309	3.7	118	12.3	6.4	6.82	81	162	45	90	1889	3778	200	400	6	12	1.5	3		
						Avg	3.72	118.44	17.16	6.58	6.82	58.50	117.00	67.67	135.33	2632.61	5265.22	323.44	646.89	6.39	12.78	1.57	3.13	
						Min	3.1	106	11.3	5.9	6.53	20	40	42	84	1787	3574	181	362	4	8	1	2	
						Max	4.5	134	23.8	6.9	6.9	106	212	105	210	3427	6854	505	1010	9	18	2.4	4.8	
						Count	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18

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Permit Feature	Tyson Field Id	Sample Id	Report Number	Current Date	Lab Number	Organic Matter	Estimated Nitrogen Release	Cation Exchange Capacity	pH	Buffer pH	Phosphorus (ppm)	Phosphorus lbs/acre	Potassium (ppm)	Potassium lbs/acre	Calcium (ppm)	Calcium lbs/acre	Magnesium (ppm)	Magnesium lbs/acre	Sulfur (ppm)	Sulfur lbs/acre	Zinc (ppm)	Zinc lbs/acre	
24	11	3	19-346-0576	20191218	19293	4.3	130	17.2	6.9	6.9	112	224	84	168	2773	5546	338	676	7	14	2.2	4.4	
24	11	4	19-346-0576	20191218	19294	4.2	128	19.8	6.9	6.9	62	124	110	220	3155	6310	412	824	7	14	1.7	3.4	
24	11	5	19-346-0576	20191218	19296	3.4	112	14.9	6.7	6.86	51	102	59	118	2348	4696	282	564	5	10	1.1	2.2	
24	11	6	19-346-0576	20191218	19297	4.3	130	17.7	7	6.92	58	116	74	148	2836	5672	385	770	7	14	1.4	2.8	
24	11	7	19-346-0576	20191218	19298	4	124	16.1	7	6.92	107	214	62	124	2676	5352	297	594	7	14	1.4	2.8	
24	11	8	19-346-0576	20191218	19299	3.4	112	15.9	7	6.92	37	74	53	106	2629	5258	300	600	7	14	1	2	
24	11	9	19-346-0576	20191218	19300	3	104	13.6	6.9	6.91	36	72	35	70	2265	4530	238	476	6	12	1.1	2.2	
24	11	10	19-346-0576	20191218	19301	4	124	21.2	6.8	6.87	76	152	70	140	3470	6940	374	748	7	14	1.9	3.8	
24	11	11	19-346-0576	20191218	19302	3.6	116	17.5	6.7	6.85	120	240	76	152	2703	5406	361	722	7	14	1.6	3.2	
24	11	12	19-346-0576	20191218	19303	3.1	106	12.6	6.9	6.91	65	130	48	96	2082	4164	227	454	6	12	1.3	2.6	
24	11	13	19-346-0576	20191218	19304	3.4	112	12.3	6.9	6.91	56	112	40	80	2027	4054	228	456	6	12	1.3	2.6	
24	11	14	19-346-0576	20191218	19305	3.3	110	12.3	6.9	6.91	92	184	43	86	2089	4178	188	376	6	12	1.9	3.8	
24	11	18	19-346-0576	20191218	19310	3.8	120	16.4	6.3	6.76	68	136	56	112	2453	4906	271	542	6	12	1.9	3.8	
24	11	19	19-346-0576	20191218	19311	4	124	15.5	6.5	6.81	109	218	61	122	2388	4776	269	538	7	14	2.2	4.4	
24	11	20	19-346-0576	20191218	19312	4	124	14.1	7.1	6.92	80	160	39	78	2419	4838	216	432	6	12	1.9	3.8	
24	11	23	19-346-0576	20191218	19315	3.5	114	14.2	6.3	6.78	54	108	43	86	2109	4218	249	498	5	10	1.8	3.6	
24	11	24	19-346-0576	20191218	19316	3	104	15.5	6.8	6.88	47	94	66	132	2503	5006	283	566	6	12	2.8	5.6	
24	11	25	19-346-0576	20191218	19318	3.4	112	16.4	7	6.92	70	140	69	138	2776	5552	269	538	7	14	2.3	4.6	
24	11	26	19-346-0576	20191218	19319	3.7	118	22.3	6.4	6.73	47	94	104	208	3287	6574	428	856	8	16	2.6	5.2	
24	11	27	19-346-0576	20191218	19320	2.9	102	17.6	6.8	6.88	72	144	63	126	2848	5696	325	650	6	12	2	4	
24	11	28	19-346-0576	20191218	19321	4	124	17.5	6.8	6.88	69	138	57	114	2800	5600	346	692	6	12	2.3	4.6	
24	11	29	19-346-0576	20191218	19322	3.3	110	14.2	6.7	6.87	79	158	57	114	2272	4544	252	504	7	14	1.5	3	
24	11	30	19-346-0576	20191218	19323	3.8	120	18.7	6.6	6.82	172	344	84	168	2898	5796	352	704	10	20	2	4	
24	11	31	19-346-0576	20191218	19324	3.8	120	17.8	6.6	6.82	126	252	74	148	2783	5566	307	614	9	18	2.6	5.2	
24	11	32	19-346-0576	20191218	19325	3.8	120	14.5	6.9	6.91	47	94	52	104	2367	4734	281	562	6	12	1.5	3	
24	11	33	19-346-0576	20191218	19326	4.3	130	16.2	6.7	6.86	85	170	69	138	2525	5050	327	654	6	12	1.6	3.2	
24	11	34	19-346-0576	20191218	19327	3.1	106	13.9	6.8	6.89	67	134	51	102	2245	4490	258	516	6	12	1.3	2.6	
24	11	35	19-346-0576	20191218	19329	3.9	122	21.9	6.3	6.7	101	202	108	216	3146	6292	434	868	9	18	1.9	3.8	
24	11	36	19-346-0576	20191218	19330	4.4	132	13.7	6.2	6.77	51	102	44	88	1865	3730	316	632	8	16	1.1	2.2	
24	11	37	19-346-0576	20191218	19331	3.8	120	16.9	6.7	6.85	74	148	53	106	2628	5256	340	680	6	12	1.2	2.4	
24	11	38	19-346-0576	20191218	19332	4	124	13	6.6	6.85	131	262	42	84	2092	4184	192	384	7	14	1.9	3.8	
24	11	39	19-346-0576	20191218	19333	3.2	108	11.3	7	6.92	83	166	44	88	1886	3772	197	394	6	12	1.7	3.4	
24	11	40	19-346-0576	20191218	19334	3.4	112	13.1	7.1	6.92	114	228	56	112	2227	4454	211	422	6	12	2.2	4.4	
24	11	41	19-346-0576	20191218	19335	3.6	116	12.3	6.8	6.89	118	236	50	100	2018	4036	196	392	6	12	2.3	4.6	
24	11	42	19-346-0576	20191218	19336	3.9	122	18.6	6.4	6.76	104	208	77	154	2688	5376	386	772	7	14	1.7	3.4	
24	11	43	19-346-0576	20191218	19337	3.6	116	15.1	6.7	6.86	91	182	62	124	2303	4606	330	660	7	14	1.2	2.4	
24	11	44	19-346-0576	20191218	19338	3.3	110	14.2	6.7	6.87	71	142	53	106	2258	4516	264	528	6	12	1.2	2.4	
						Avg	3.66	117.24	15.84	6.74	6.86	81.14	162.27	61.84	123.68	2509.11	5018.22	295.38	590.76	6.68	13.35	1.75	3.49
						Min	2.9	102	11.3	6.2	6.7	36	72	35	70	1865	3730	188	376	5	10	1	2
						Max	4.4	132	22.3	7.1	6.92	172	344	110	220	3470	6940	434	868	10	20	2.8	5.6
						Count	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37

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Permit Feature	Tyson Field Id	Sample Id	Report Number	Current Date	Lab Number	Organic Matter	Estimated Nitrogen Release	Cation Exchange Capacity	pH	Buffer pH	Phosphorus (ppm)	Phosphorus lbs/acre	Potassium (ppm)	Potassium lbs/acre	Calcium (ppm)	Calcium lbs/acre	Magnesium (ppm)	Magnesium lbs/acre	Sulfur (ppm)	Sulfur lbs/acre	Zinc (ppm)	Zinc lbs/acre	
26	13	1	19-346-0620	20191218	19721	3.4	112	14.9	6.5	6.82	119	238	102	204	2229	4458	291	582	7	14	3.6	7.2	
26	13	2	19-346-0620	20191218	19722	4	124	13.5	6.6	6.85	131	262	76	152	2007	4014	297	594	7	14	3.1	6.2	
26	13	3	19-346-0620	20191218	19723	3.7	118	14.7	6.7	6.86	130	260	71	142	2318	4636	272	544	6	12	4	8	
26	13	4	19-346-0620	20191218	19724	3.4	112	13.5	6.9	6.91	158	316	49	98	2200	4400	265	530	6	12	4	8	
26	13	5	19-346-0620	20191218	19725	3.8	120	15.4	6.8	6.88	218	436	57	114	2499	4998	274	548	7	14	4.9	9.8	
26	13	6	19-346-0620	20191218	19726	3.7	118	14.5	6.2	6.76	207	414	67	134	2108	4216	248	496	8	16	3.6	7.2	
26	13	7	19-346-0620	20191218	19727	4.2	128	18.8	6.4	6.76	141	282	115	230	2662	5324	417	834	6	12	2.8	5.6	
26	13	8	19-346-0620	20191218	19728	3.5	114	18.3	6.6	6.82	121	242	78	156	2807	5614	352	704	5	10	2.5	5	
26	13	9	19-346-0620	20191218	19729	3.5	114	17.4	6.6	6.83	153	306	67	134	2704	5408	323	646	7	14	3.6	7.2	
26	13	10	19-346-0620	20191218	19730	3.3	110	11.8	7.2	6.93	85	170	44	88	2026	4052	190	380	16	32	2.5	5	
26	13	11	19-346-0620	20191218	19732	4.3	130	20.2	6.4	6.75	143	286	89	178	2901	5802	442	884	7	14	2.3	4.6	
26	13	12	19-346-0620	20191218	19733	4.1	126	12.6	6.4	6.82	229	458	39	78	1965	3930	190	380	6	12	4	8	
26	13	13	19-346-0620	20191218	19734	4	124	13.5	6.6	6.85	191	382	70	140	2114	4228	238	476	9	18	5.3	10.6	
26	13	14	19-346-0620	20191218	19735	3.9	122	16.5	6.7	6.86	215	430	67	134	2606	5212	309	618	5	10	4.6	9.2	
26	13	15	19-346-0620	20191218	19736	4.6	136	20.4	6.7	6.84	383	766	168	336	3294	6588	307	614	10	20	30.6	61.2	
26	13	16	19-346-0620	20191218	19737	3.8	120	13	6.7	6.87	241	482	110	220	2019	4038	238	476	7	14	8	16	
26	13	17	19-346-0620	20191218	19738	3.4	112	12.8	6.3	6.8	181	362	53	106	1901	3802	221	442	7	14	3.6	7.2	
26	13	18	19-346-0620	20191218	19739	3.8	120	14.2	6.3	6.78	224	448	66	132	2089	4178	249	498	6	12	4.2	8.4	
26	13	19	19-346-0620	20191218	19740	4	124	12.9	6.6	6.85	156	312	48	96	1994	3988	246	492	6	12	2.8	5.6	
26	13	20	19-346-0620	20191218	19741	3.9	122	12.5	6.7	6.87	98	196	42	84	1977	3954	234	468	9	18	2	4	
26	13	21	19-346-0620	20191218	19743	3.8	120	13.7	6.8	6.89	108	216	47	94	2275	4550	218	436	4	8	2.2	4.4	
26	13	22	19-346-0620	20191218	19744	3.9	122	12.9	6.7	6.87	166	332	42	84	2093	4186	205	410	8	16	2.5	5	
26	13	23	19-346-0620	20191218	19745	4	124	13.9	6.6	6.85	218	436	43	86	2191	4382	246	492	6	12	3.2	6.4	
26	13	24	19-346-0620	20191218	19746	3.8	120	13.7	6.4	6.81	213	426	47	94	2027	4054	272	544	4	8	2.9	5.8	
26	13	25	19-346-0620	20191218	19747	3.5	114	11.7	6.5	6.84	235	470	36	72	1786	3572	209	418	6	12	3.9	7.8	
26	13	26	19-346-0620	20191218	19748	3.6	116	11.3	6.8	6.9	198	396	55	110	1764	3528	244	488	9	18	4.9	9.8	
26	13	27	19-346-0620	20191218	19749	3.6	116	14.8	6.4	6.8	186	372	65	130	2216	4432	274	548	6	12	4.3	8.6	
26	13	28	19-346-0620	20191218	19750	3.6	116	15.1	6.3	6.77	198	396	62	124	2200	4400	282	564	7	14	3.8	7.6	
26	13	29	19-346-0620	20191218	19751	3.7	118	11.4	6.4	6.83	185	370	47	94	1700	3400	218	436	6	12	3.3	6.6	
26	13	30	19-346-0620	20191218	19752	4.2	128	13.5	6.5	6.83	135	270	68	136	1954	3908	312	624	5	10	2.8	5.6	
26	13	31	19-346-0620	20191218	19754	3.7	118	12.2	6.4	6.82	118	236	45	90	1801	3602	234	468	7	14	2.2	4.4	
26	13	32	19-346-0620	20191218	19755	3.5	114	11.2	6.5	6.85	143	286	50	100	1718	3436	199	398	5	10	3	6	
26	13	33	19-346-0620	20191218	19756	3.1	106	13.1	6.1	6.75	126	252	37	74	1869	3738	224	448	7	14	2.7	5.4	
26	13	34	19-346-0620	20191218	19757	3.4	112	11.5	6.3	6.81	148	296	37	74	1716	3432	196	392	3	6	2.7	5.4	
26	13	35	19-346-0620	20191218	19758	3.2	108	13.2	6.3	6.79	185	370	41	82	1998	3996	205	410	6	12	3.1	6.2	
26	13	36	19-346-0620	20191218	19759	3.6	116	17	6.2	6.73	157	314	64	128	2456	4912	301	602	7	14	3.3	6.6	
26	13	37	19-346-0620	20191218	19760	3.7	118	19.3	5.8	6.56	123	246	83	166	2479	4958	359	718	8	16	3.1	6.2	
26	13	38	19-346-0620	20191218	19761	3.7	118	16.2	5.4	6.47	72	144	61	122	1886	3772	245	490	8	16	2.2	4.4	
26	13	39	19-346-0620	20191218	19762	4.1	126	16.7	5.4	6.45	45	90	47	94	2003	4006	215	430	6	12	1.7	3.4	
						Avg	3.74	118.87	14.46	6.45	6.80	166.23	332.46	62.95	125.90	2168.00	4336.00	263.10	526.21	6.79	13.59	4.10	8.19
						Min	3.1	106	11.2	5.4	6.45	45	90	36	72	1700	3400	190	380	3	6	1.7	3.4
						Max	4.6	136	20.4	7.2	6.93	383	766	168	336	3294	6588	442	884	16	32	30.6	61.2
						Count	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39

Form R
Sec. 5.0 - Soil Data

[illegible]

Form R
Sec. 5.0 - Soil Data

Permit Feature	Tyson Field Id	Sample Id	Report Number	Current Date	Lab Number	Organic Matter	Estimated Nitrogen Release	Cation Exchange Capacity	pH	Buffer pH	Phosphorus (ppm)	Phosphorus lbs/acre	Potassium (ppm)	Potassium lbs/acre	Calcium (ppm)	Calcium lbs/acre	Magnesium (ppm)	Magnesium lbs/acre	Sulfur (ppm)	Sulfur lbs/acre	Zinc (ppm)	Zinc lbs/acre	
28	15	15	19-352-0584	20191219	25635	3.4	112	14.4	6.6	6.84	68	136	101	202	2128	4256	311	622	5	10	2	4	
28	15	16	19-352-0584	20191219	25636	4	124	17.8	6.1	6.68	184	368	70	140	2411	4822	365	730	7	14	3.3	6.6	
28	15	17	19-352-0584	20191219	25637	4	124	11.1	6.3	6.81	180	360	42	84	1674	3348	174	348	6	12	3.7	7.4	
28	15	18	19-352-0584	20191219	25639	3.3	110	12.1	6.4	6.82	141	282	41	82	1869	3738	182	364	5	10	3.3	6.6	
28	15	19	19-352-0584	20191219	25640	3.7	118	13.6	6.3	6.79	58	116	65	130	2056	4112	205	410	5	10	1.5	3	
28	15	20	19-352-0584	20191219	25641	4.2	128	15.8	6.4	6.79	122	244	65	130	2401	4802	262	524	10	20	3.2	6.4	
28	15	21	19-352-0584	20191219	25642	4.5	134	16.2	6.7	6.86	216	432	97	194	2557	5114	298	596	8	16	4.3	8.6	
28	15	22	19-352-0584	20191219	25643	3.7	118	12.7	6	6.74	174	348	50	100	1769	3538	223	446	6	12	3.1	6.2	
28	15	23	19-352-0584	20191219	25644	3.6	116	11.1	6.2	6.8	58	116	43	86	1603	3206	196	392	4	8	2.4	4.8	
28	15	24	19-352-0584	20191219	25645	4.2	128	13.9	6.2	6.76	127	254	77	154	1934	3868	281	562	4	8	3.2	6.4	
28	15	25	19-352-0584	20191219	25646	4.1	126	11.9	6.4	6.82	86	172	66	132	1738	3476	233	466	3	6	2.2	4.4	
28	15	26	19-352-0584	20191219	25647	3.6	116	11.9	6.7	6.88	44	88	45	90	1932	3864	192	384	4	8	1.9	3.8	
28	15	27	19-352-0584	20191219	25648	3.3	110	12.4	6.3	6.8	138	276	55	110	1805	3610	234	468	5	10	2.7	5.4	
28	15	28	19-352-0584	20191219	25650	3.9	122	13.8	6.5	6.83	128	256	63	126	2041	4082	289	578	5	10	3	6	
28	15	29	19-352-0584	20191219	25651	4	124	14.5	6.3	6.78	129	258	77	154	2111	4222	266	532	5	10	3.1	6.2	
28	15	30	19-352-0584	20191219	25652	4.2	128	13.8	6.5	6.83	129	258	66	132	2046	4092	284	568	5	10	3.4	6.8	
28	15	31	19-352-0584	20191219	25653	3.7	118	12.5	6.2	6.78	120	240	72	144	1757	3514	241	482	4	8	2.2	4.4	
28	15	32	19-352-0584	20191219	25654	4	124	11.3	6.7	6.88	106	212	54	108	1735	3470	236	472	4	8	2.8	5.6	
28	15	33	19-352-0584	20191219	25655	3.4	112	11.3	6.4	6.83	95	190	62	124	1708	3416	198	396	4	8	3.9	7.8	
28	15	34	19-352-0584	20191219	25656	3.7	118	12.8	6	6.74	98	196	73	146	1743	3486	243	486	6	12	2	4	
28	15	35	19-352-0584	20191219	25657	3.6	116	18.6	6.2	6.71	181	362	112	224	2599	5198	379	758	6	12	3	6	
28	15	36	19-352-0584	20191219	25658	4	124	10.6	6.3	6.82	166	332	42	84	1557	3114	191	382	5	10	3.3	6.6	
28	15	37	19-352-0584	20191219	25659	3.1	106	7	6.2	6.85	85	170	18	36	1067	2134	98	196	4	8	2.1	4.2	
28	15	38	19-352-0584	20191219	25661	3	104	10.4	6.5	6.85	133	266	37	74	1626	3252	160	320	5	10	2.4	4.8	
28	15	39	19-352-0584	20191219	25662	3.9	122	11.8	6.4	6.82	151	302	37	74	1829	3658	176	352	5	10	2.7	5.4	
28	15	40	19-352-0584	20191219	25663	4.1	126	14.4	6.2	6.76	150	300	47	94	2129	4258	236	472	7	14	2.8	5.6	
						Avg	3.78	119.54	12.99	6.35	6.80	125.65	251.31	60.65	121.31	1916.35	3832.69	236.65	473.31	5.27	10.54	2.83	5.65
						Min	3	104	7	6	6.68	44	88	18	36	1067	2134	98	196	3	6	1.5	3
						Max	4.5	134	18.6	6.7	6.88	216	432	112	224	2599	5198	379	758	10	20	4.3	8.6
						Count	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26

Form R
Sec. 5.0 - Soil Data

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Form R
Sec. 5.0 - Soil Data

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Farm Id	Field Id	Sample Id	Report Nui	Current Da	Lab Numb	Organic Mi	Estimated	Cation Excl	pH
Tysons	T18	1	19-345-06	20191218	18478	3.4	112	19.3	6.3
Tysons	T18	2	19-345-06	20191218	18479	3.2	108	16.1	6.5
Tysons	T18	3	19-345-06	20191218	18480	3.3	110	11.5	6.5
Tysons	T18	4	19-345-06	20191218	18481	3.2	108	11.7	6.1
Tysons	T18	5	19-345-06	20191218	18482	2.6	96	10.8	6.2
Tysons	T18	6	19-345-06	20191218	18483	3.1	106	12.3	6.5
Tysons	T18	7	19-345-06	20191218	18484	3	104	14.9	6.7

Avg	3.114286	106.2857	13.8	6.4
Min	2.6	96	10.8	6.1
Max	3.4	112	19.3	6.7
Count	7	7	7	7

Buffer pH	Results Un	Phosphoru	Potassium	Calcium	Magnesiun	Sulfur	Sodium	Zinc	Manganesi
6.73 ppm		11	101	2601	481		4		0.6
6.81 ppm		8	71	2352	359		4		0.4
6.84 ppm		10	33	1790	182		4		0.6
6.77 ppm		9	32	1695	180		3		0.6
6.8 ppm		7	32	1570	190		3		0.4
6.84 ppm		13	41	1846	248		3		0.5
6.86 ppm		14	42	2397	254		4		0.9

6.807143		10.28571	50.28571	2035.857	270.5714	3.571429		0.571429
6.73		7	32	1570	180	3		0.4
6.86		14	101	2601	481	4		0.9
7		7	7	7	7	7		7

Iron	Copper	Boron	Nitrate Nit	Organic M:	Cation Excl	Ph Rating	Soluble Sal	Phosphoru	Strong Bra
			M					L	
			M					L	
			M					L	
			M					L	
			L					L	
			M					L	
			L					L	

Bicarbonat	Potassium	Calcium Ra	Magnesium	Sulfur	Ratio	Sodium	Ra	Zinc	Rating	Manganese	Iron	Rating	Copper	Ra
L	M	VH	VL					L						
VL	O	VH	VL					VL						
VL	O	M	VL					L						
VL	O	M	VL					L						
VL	O	M	VL					VL						
VL	O	O	VL					VL						
VL	O	O	VL					L						

Boron	Rati	Nitrate	Nit	%K Saturat	%Mg Satur	%Ca Satur	%Na Satur	%H Satur	Extra Elem	Extra Elem	Extra Elem	Resu
				1.3	20.8	67.4		10.4	SOIL_NEUT_ACID			2
				1.1	18.6	73		7.5	SOIL_NEUT_ACID			1.2
				0.7	13.2	77.8		7.8	SOIL_NEUT_ACID			0.9
				0.7	12.8	72.4		13.7	SOIL_NEUT_ACID			1.6
				0.8	14.7	72.7		12	SOIL_NEUT_ACID			1.3
				0.9	16.8	75		7.3	SOIL_NEUT_ACID			0.9
				0.7	14.2	80.4		4.7	SOIL_NEUT_ACID			0.7

Extra Resu Previous C Crop Name Crop Yield: Yield Unit (Lime Reco Nitrogen R Phosphoru Potassium Calcium Re

Magnesium	Sulfur	Recc	Zinc	Recon	Manganese	Iron	Recon	Copper	Re	Boron	Recc	Previous C	Crop Name	Crop Yield
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Yield Unit c Lime Reco Nitrogen F Phosphoru Potassium Calcium R Magnesiun Sulfur Rec Zinc Recor Manganesi

Iron	Reco	Copper	Re	Boron	Reco	Previous C	Crop Name	Crop Yield	Yield Unit	Lime	Reco	Nitrogen	P	Phosphoru
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Potassium Calcium R Magnesium Sulfur Rec Zinc Recor Manganese Iron Recor Copper Re Boron Recommendation

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Form R

Sec. 5.0 - Composite Soil Data

Composite Soil Data Summary											
Field	Date	Acres	pH	P (ppm)	K (ppm)	Ca (ppm)	Mg (ppm)	S (ppm)	Zn (ppm)	Organic Matter %	CEC
1	12/18/2019	27.4	5.8	116	74	2211	323	7.8	2.9	3.5	17.5
2	12/18/2019	32.2	5.9	118	69	2186	341	6.4	3.1	3.7	17
3	12/18/2019	26.6	5.6	119	71	2257	374	6.7	2	3.7	19.1
4	12/18/2019	27	6.4	123	78	2483	293	6.2	3.7	3.7	16.6
5	12/18/2019	64	6.2	157	87	2403	336	7	2.5	3.8	17.2
6	12/18/2019	36.6	6.6	70	73	2715	338	6.3	1.8	3.6	17.8
7	12/18/2019	48.8	6	152	64	2344	343	6.5	2.3	4.1	17.4
8	12/19/2019	152.1	6	151	75	2362	309	6.9	2.9	3.9	17.3
10	12/18/2019	44.4	6.6	59	68	2633	323	6.4	1.6	3.7	17.2
11	12/18/2019	101	6.7	81	62	2509	295	7	1.7	3.7	15.8
12	12/18/2019	13.3	6.5	69	94	2170	258	6.3	2.6	3.8	14.4
13	12/18/2019	123.6	6.5	166	63	2168	263	6.8	4.1	3.7	14.5
14	12/19/2019	35.2	6.2	130	74	1764	234	7	3.5	3.7	12.6
15	12/19/2019	65.9	6.3	126	61	1916	237	5.3	2.8	3.8	13
16	12/19/2019	34	6.4	207	52	1648	219	5.3	3.4	3.7	11.2
17	12/19/2019	32.9	6.3	176	103	2552	348	7.9	3.6	3.9	18

Form R

Sec. 6.0 - Land Limiting Constituant Calculations

Sample Date	Sample Time (24hr clock)	WWTP Sample ID Number	Sample Type	Contract Lab Sample ID Number	% Solids	pH	Total N (mg/kg)	NH3 (mg/kg)	Organic N (mg/kg)	NO2 & NO3 (mg/kg)
04/30/15	9:00	043015-WAS-01C	500 ton	10985	3.0	6.9	66200	10,500	55,700	17.3
05/04/15	9:00	050415-WAS-01C	100 ton	10984	2.5		68300	12,600	55,700	22.4
11/09/15	17:20	110915-WAS-01C	500 ton	15524	2.7	7.2	65900	11,700	54,200	19.2
11/10/15	19:00	111015-WAS-01C	500 ton	15525	2.5					
11/11/15	17:30	111115-WAS-01C	100 ton	15523	2.8		65700	13,000	52,700	11.4
11/12/15	17:10	111215-WAS-01C	100 ton	15594	2.9		67200	9,900	57,300	15.2
11/13/15	16:55	111315-WAS-01C	100 ton	15595	2.9		66212	9,070	57,100	12.1
03/30/16	17:15	033016-WAS-01C	100 ton	19219	2.4		67229	12,700	54,500	28.8
04/04/16	16:00	040416-WAS-01C	500 ton	19220	2.2	7.0	68025	12,300	55,700	25.0
11/21/16	17:30	112116-WAS-01C	100 ton	L7545	2.6		60010	9,850	50,200	10.0
11/26/16	18:30	112617-WAS-01C	500 ton	L7545	2.2	7.0	58610	14,700	43,900	10.0
12/05/16	17:00	120516-WAS-01C	500 ton	L7545	2.1	7.0	57811	10,400	47,400	11.4
04/19/17	17:30	041917-WAS-01C	100 Ton	L7545	2.9		68615	10,900	57,700	14.5
04/21/17	9:44	042117-WAS-01C	500 Ton	L7545	2.5	7.0	62418	10,200	52,200	18.4
11/18/17	17:25	111817-WAS-01C	100 Ton	L7545	2.95		64010	12,000	52,000	10.0
11/21/17	20:45	112117-WAS-01C	500 Ton	L7545	2.97	6.7	67611	11,200	56,400	10.7
05/24/18	9:17	052418-WAS-01C	100 Ton	L7545	2.8		68319	15,300	53,000	19.2
05/28/18	7:30	052818-WAS-01C	500 Ton	L7545	2.4	6.9	69618	16,400	53,200	17.8
12/11/18	18:30	121118-WAS-01C	500 Ton	L7545	3.2	6.8	62516	10,600	51,800	15.6
04/24/19	11:17	042419-WAS-01C	500 Ton	L7545	2.9	6.5	85139	15,700	69,400	38.8
04/24/19	11:17	042417-WAS-01C	100 Ton	L7545	2.9		70927	13,800	57,100	27.2
12/05/19	17:00	120519-WAS-01C	500 ton	L7545	2.7	7.5	65,010	11,700	53,200	10.4
11/27/19	20:25	112719-WAS-01C	100 Ton	L7545	3.1		63,212	10,400	52,800	12.2

AVG	2.7	7.0	66446.7	12120.0	54304.8	17.4
MIN	2.1	6.5	57811.4	9070.0	43900.0	10.0
MAX	3.2	7.5	85138.8	16400.0	69400.0	38.8
COUNT	22	11	21	21	21	21

Form R
Sec. 6.0 - I

Sample Date	Kjeldahl Nitrogen (mg/kg)	Cl (mg/kg)	P (mg/kg)	K (mg/kg)	Na (mg/kg)	O&G (mg/kg)	PAN (mg/kg)	Arsenic dry weight (mg/kg)	Arsenic (lbs/dry ton)	Boron dry weight (mg/kg)	Boron (lbs/dry ton)
04/30/15	66200	11,900	61,000	4,660	8,270	12,000	21,657	1.3	0.0026	23.0	0.0460
05/04/15	68300					33,000	23,762				
11/09/15	65900	14,000	57,300	4,510	9,610	33,000	22,559	0.8	0.0016	42.0	0.0840
11/10/15						18,000					
11/11/15	65700					20,000	23,551				
11/12/15	67200						21,375				
11/13/15	66200						20,502				
03/30/16	67200					17,000	23,629				
04/04/16	68000	15,200	59,100	7,910	11,300	18,000	23,465	1.2	0.0024	50.0	0.1000
11/21/16	60000					16,000	19,900				
11/26/16	58600	3,060	66,500	5,460	12,800	3,000	23,490	1.5	0.0030	30.0	0.0600
12/05/16	57800	3,130	61,900	5,530	12,700	3,000	19,891	1.2	0.0020	35.0	0.0700
04/19/17	68600					15,000	22,455				
04/21/17	62400	13,200	51,400	5,440	12,400	8,000	20,658	2.3	0.0050	40.5	0.0810
11/18/17	64000					8,900	22,410				
11/21/17	67600	9,760	74,800	8,180	9,460	10,000	22,491	1.6	0.0030	49.5	0.0990
05/24/18	68300						25,919				
05/28/18	69600	12,500	93,000	9,670	12,400	12,000	27,058	1.9	0.0040	49.0	0.0980
12/11/18	62500	2,230	73,800	10,700	12,900	11,000	20,976	1.4	0.0030	50.0	<0.200
04/24/19	85100	14,000	75,600	9,640	12,700	29,000	29,619	1.4	0.0030	34.0	0.0680
04/24/19	70900					28,000	25,247				
12/05/19	65,000	12,700	75,600	9,010	10,900		22,350	1.7	0.0034	66.0	0.1320
11/27/19	63,200						20,972				

0

66433.3	10152.7	68181.8	7337.3	11403.6	16383.3	22998.4	1.5		42.6	
57800.0	2230.0	51400.0	4510.0	8270.0	3000.0	19891.4	0.8		23.0	
85100.0	15200.0	93000.0	10700.0	12900.0	33000.0	29618.8	2.3		66.0	
21	11	11	11	11	18	21	11		11	

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Sample Date	Cadmium dry weight (mg/kg)	Cadmium (lbs/dry ton)	Chromium dry weight (mg/kg)	Cadmium (lbs/dry ton)	Copper dry weight (mg/kg)	Copper (lbs/dry ton)	Lead dry weight (mg/kg)	Lead (lbs/dry ton)	Mercury dry weight (mg/kg)	Mercury (lbs/dry ton)	Molybdenum
04/30/15	0.3	0.0008	19.3	0.0386	130.0	0.2600	4.1	0.0082	0.1	0.0004	5.0
05/04/15											
11/09/15	0.3	0.0008	20.0	0.0400	125.0	0.2500	3.2	0.0064	0.1	0.0004	5.0
11/10/15											
11/11/15											
11/12/15											
11/13/15											
03/30/16											
04/04/16	0.3	0.0008	27.0	0.0540	92.8	0.1856	2.0	0.0040	0.1	0.0004	5.0
11/21/16											
11/26/16	0.3	0.0010	32.2	0.0640	89.8	0.1800	2.4	0.0050	0.1	0.0020	5.0
12/05/16	0.3	0.0010	30.8	0.0620	77.5	0.1550	2.5	0.0050	0.1	0.0200	5.0
04/19/17											
04/21/17	0.3	<.001	31.3	0.0630	88.4	0.1770	2.8	0.0060	0.1	<.001	5.0
11/18/17											
11/21/17	0.3	<.001	19.6	0.0392	75.3	0.1510	2.1	<.001	0.1	<.001	5.0
05/24/18											
05/28/18	0.3	<.001	16.2	0.0324	78.2	0.1560	1.6	0.0032	0.1	<.001	5.0
12/11/18	0.3	<0.001	17.4	0.0348	36.3	0.0730	1.8	0.0036	0.1	<0.001	5.0
04/24/19	0.3	<0.001	7.6	0.0152	55.4	0.1110	1.2	0.0024	0.4	0.0010	5.0
04/24/19											
12/05/19	0.1	0.0002	7.6	0.0152	35.7	0.0714	1.3	0.0026	0.1	<0.001	5.0
11/27/19											

0.24		20.8		80.4		2.3		0.09		5.0
0.10		7.6		35.7		1.2		0.05		5.0
0.25		32.2		130.0		4.1		0.40		5.0
11.00		11		11		11		11.00		11

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Sample Date	Molybdenum (lbs/dry ton)	Nickel dry weight (mg/kg)	Nickel (lbs/dry ton)	Selenium dry weight (mg/kg)	Selenium (lbs/dry ton)	Zinc dry weight (mg/kg)	Zinc (lbs/dry ton)	F	COD	TPH	TSS
04/30/15	0.0198	11.6	0.0232	3.4	0.0068	360	0.7200	93.3	833000	10000	28700
05/04/15										20000	
11/09/15	0.0198	16.9	0.0338	4.0	0.0080	286	0.5720	113	941000		25100
11/10/15										7500	
11/11/15										7500	
11/12/15											
11/13/15											
03/30/16											
04/04/16	0.0198	15.8	0.0316	3.4	0.0068	362	0.7240	10.9	904000	9500	21600
11/21/16											
11/26/16	0.0200	15.7	0.0310	4.1	0.0080	450	0.9000	19.1	695000	3000	22900
12/05/16	0.0100	13.7	0.0274	3.8	0.0076	347	0.6940	9.5	710000	3000	20600
04/19/17											
04/21/17	0.0100	14.4	0.0288	4.3	0.0086	351	0.7020	12	760000	8000	23100
11/18/17											
11/21/17	0.0100	14.8	0.0296	3.2	0.0064	226	0.4520	8.28		3350	24900
05/24/18											
05/28/18	0.0100	10.5	0.0210	2.4	0.0048	166	0.3320	11.3		4150	20100
12/11/18	0.0100	9.2	0.0184	2.8	0.0056	188	0.3760	5.31	981000	3700	28,900
04/24/19	0.0100	8.5	0.0170	2.3	0.0046	157	0.3140	7.6	1260000	3550	26800
04/24/19											
12/05/19	0.0100	9.8	0.0196	3.0	0.0060	196	0.3920	7.4	804000		26800
11/27/19											

	12.8		3.3		280.8		27.1	876444.4	6937.5	24500.0
	8.5		2.3		157.0		5.3	695000.0	3000.0	20100.0
	16.9		4.3		450.0		113.0	1260000.0	20000.0	28900.0
	11		11		11		11	9	12	11

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Sample Date	Al	Be	Mn	Ag	Sn	Ca	Mg	SAR	Digestion
04/30/15	22900	2.5	772	0.15	50	25100	5810	12.2	Yes
05/04/15									
11/09/15	28100	2.5	764	0.25	50	30900	6700	12.9	Yes
11/10/15									
11/11/15									
11/12/15									
11/13/15									
03/30/16									
04/04/16	27900	2.5	650	0.15	50	29400	7970	15.1	Yes
11/21/16									
11/26/16	40300	0.2	581	0.15	50	42300	7110	15.1	Yes
12/05/16	36400	0.4	553	0.3	50	33500	7130	16.4	Yes
04/19/17									
04/21/17	31700	0.2	473	0.15	50	35100	6820	15.8	Yes
11/18/17									
11/21/17	28700	0.2	375	0.15	50	37000	10900	13.4	Yes
05/24/18									
05/28/18	28400	0.2	256	0.15	50	34800	10900	14.8	Yes
12/11/18	35400	0.2	271	2	50	36400	12800	14.8	Yes
04/24/19	31800	0.2	176	0.15	50	24000	8120	18.1	Yes
04/24/19									
12/05/19	40300	0.2	275	0.15	50	38400	11400	12.5	Yes
11/27/19									

31990.9	0.8	467.8	0.34	50.0			14.6	
22900.0	0.2	176.0	0.15	50.0			12.2	
40300.0	2.5	772.0	2.00	50.0			18.1	
11	11	11	11.00	11			11	