

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 R.S. Mo. as amended, 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 page 2
UTM Coordinates: See page 2

Receiving Stream: See page 2
First Classified Stream and ID: See page 2
USGS Basin & Sub-watershed No.: See page 2

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

FACILITY DESCRIPTION

See pages 2 through 8

This permit authorizes only wastewater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Sections 640.013, 621.250, and 644.051.6 of the Law.

February 1, 2016
Effective Date

December 1, 2016
Modification Date


Harry D. Bozian, Director, Department of Natural Resources

September 30, 2020
Expiration Date


John Madras, Director, Water Protection Program

FACILITY DESCRIPTION (continued):

Permitted Feature #001 - Outfall #001 – Poultry Processing Wastewater (and Domestic Wastewater) Treatment Plant - SIC #2015, #4952. Poultry processing wastewater includes wastewater from the following activities: hatchery, rendering plant, feedmill, service center package plant and contaminated stormwater from diesel tank secondary containment areas.

Dissolved air flotation / anaerobic lagoons / anoxic reactor / complete mix activate sludge / chlorination / dechlorination / sludge storage basin / sludge is land applied.

Design population equivalent is 53,040.

Design flow is 2.16 Million gallons per day (MGD).

Actual flow is 1.95 MGD.

Design sludge production is 1,800 dry tons/year.

Actual sludge production is 1,800 dry tons/year.

Legal Description: W¼, NW¼, Sec. 23, T46N, R22W, Pettis County
UTM Coordinates: X= 472533, Y= 4289606
Receiving Stream: Unnamed tributary to Tributary to Little Muddy Creek
First Classified Stream and ID: Tributary to Little Muddy Creek (C) (3960)
Second Classified Stream and ID: Tributary to Little Muddy Creek (C) (3490) 303(d) List
USGS Basin & Sub-watershed No.: 10300103-0404

Permitted Feature #002 - Outfall #002 – Stormwater from Poultry Processing Plant - SIC #2015

Design flow is 1.8 MGD.

Actual flow is dependent upon precipitation.

Legal Description: NE¼, SE¼, Sec. 22, T46N, R22W, Pettis County
UTM Coordinates: X= 472268, Y= 4289058
Receiving Stream: Unnamed tributary to Muddy Creek (C) (3960)
First Classified Stream and ID: Unnamed tributary to Muddy Creek (C) (3960)
Second Classified Stream and ID: Muddy Creek (P) (0853) 303(d) List
USGS Basin & Sub-watershed No.: 10300103-0405

Permitted Feature #003 - Outfall #003 – Stormwater from Poultry Processing Plant - SIC #2015

Design flow is 2.5 MGD.

Actual flow is dependent upon precipitation.

Legal Description: NE ¼, SE ¼, Sec. 22, T46N, R22W, Pettis County
UTM Coordinates: X = 472212, Y = 4289027
Receiving Stream: Unnamed tributary to Muddy Creek (C) (3960)
First Classified Stream and ID: Unnamed tributary to Muddy Creek (C) (3960)
Second Classified Stream and ID: Muddy Creek (P) (0853) 303(d) List
USGS Basin & Sub-watershed No.: 10300103-0405

Permitted Feature #004 - Outfall #004 – Stormwater from Poultry Processing Plant parking lot and roof - SIC #2015

Design flow is 1.25 MGD.

Actual flow is dependent upon precipitation.

Legal Description: SW ¼, SE ¼, Sec. 22, T46N, R22W, Pettis County
UTM Coordinates: X = 472019, Y = 4288889
Receiving Stream: Unnamed tributary to Muddy Creek
First Classified Stream and ID: Unnamed tributary to Muddy Creek (C) (3960)
Second Classified Stream and ID: Muddy Creek (P) (0853) 303(d) List
USGS Basin & Sub-watershed No.: 10300103-0405

Permitted Feature #005 - Outfall #005 – Outfall eliminated prior to 2006. Stormwater runoff no longer discharges at this outfall location.

FACILITY DESCRIPTION (continued):

Permitted Feature #006 - Outfall #006 – Stormwater from Wastewater Treatment Plant Roof - SIC #2015

West side of driveway, adjacent to the WWTP gate.

Design flow is 0.1267 MGD.

Actual flow is dependent upon precipitation.

Legal Description: SE ¼, NE ¼, Sec. 22, T46N, R22W, Pettis County
UTM Coordinates: X = 472419, Y = 4289480
Receiving Stream: Unnamed tributary to Muddy Creek
First Classified Stream and ID: Unnamed tributary to Muddy Creek (C) (3960)
Second Classified Stream and ID: Muddy Creek (P) (0853) 303(d) List
USGS Basin & Sub-watershed No.: 10300103-0405

Permitted Feature #007 - Outfall #007 – Stormwater from Wastewater Treatment Plant Parking Lot - SIC #2015

East side of driveway, adjacent to the WWTP gate.

Design flow is 0.156 MGD.

Actual flow is dependent upon precipitation.

Legal Description: SE ¼, NE ¼, Sec. 22, T46N, R22W, Pettis County
UTM Coordinates: X = 472424, Y = 4289477
Receiving Stream: Unnamed tributary to Muddy Creek
First Classified Stream and ID: Unnamed tributary to Muddy Creek (C) (3960)
Second Classified Stream and ID: Muddy Creek (P) (0853) 303(d) List
USGS Basin & Sub-watershed No.: 10300103-0405

Permitted Feature #008 - Outfall #008 – Stormwater from River Valley Animal Foods Plant Rendering - SIC #2077

Rendering plan at the outfall of the stormwater collection basin.

Design flow is 0.039906 MGD.

Actual flow is dependent upon precipitation.

Legal Description: SE ¼, NE ¼, Sec. 22, T46N, R22W, Pettis County
UTM Coordinates: X = 472346, Y = 4289360
Receiving Stream: Unnamed tributary to Muddy Creek
First Classified Stream and ID: Unnamed tributary to Muddy Creek (C) (3960)
Second Classified Stream and ID: Muddy Creek (P) (0853) 303(d) List
USGS Basin & Sub-watershed No.: 10300103-0405

Permitted Feature #009 - Stream Monitoring Location #1 (SM1) – Background Ambient Temperature Measurement Point:

In-stream monitoring of temperature shall be taken on Little Muddy Creek just upstream of the confluence of the unnamed tributary, which receives flow from Outfall #001. This is also a Department monitoring site.

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

Permitted Feature #010 - Stream Monitoring Location #2 (SM2) – Temperature Compliance Point:

In-stream monitoring of temperature shall be taken on Little Muddy Creek just downstream of the confluence of the unnamed tributary, which receives flow from Outfall #001. This is also a Department monitoring site.

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

FACILITY DESCRIPTION (continued)

Sludge Land Application – Industrial Sludge Land Application – SIC #2015

Three storage basins (one earthen basin and two steel tanks). Land application of sludge to the Dresden Farm.

Design annual sludge production is 6,562,750 gallons per year (821 dry tons per year).

Actual annual sludge production is 5,259,596 gallons per year (658 dry tons per year).

Legal Description: N ½, Sec. 22, T46N, R22W, Pettis County
W ½, Sec. 23, T46N, R22W, Pettis County
W ½, Sec. 14, T46N, R22W, Pettis County
SE ¼, Sec. 15, T46N, R22W, Pettis County
UTM Coordinates: X= 472262, Y= 4289202 (intersection of Tyson Plant and Menefee Rd)
Receiving Stream: Unnamed tributary to Tributary to Little Muddy Creek
Unnamed tributary to Muddy Creek
First Classified Stream and ID: Tributary to Little Muddy Creek (C) (3490) 303(d) List
Muddy Creek (P) (0853) 303(d) List
USGS Basin & Sub-watershed No.: 10300103-0404
10300103-0405

Receiving Stream Watershed: a gaining stream setting that flows into an unnamed tributary to Tributary to Little Muddy Creek and an unnamed tributary to Muddy Creek.

Facility Type:

Sludge land application of poultry process and domestic sludge during the months of March - November.

Land Application:

Irrigation volume/year: 821 dry ton/year at design loading (including 1-in-10 year flows; actual is 658 dry ton/year)
Irrigation areas: 17 acres at design loading (849 acres total available)
Application rates: Varies depending on row crop, number of acres of each crop and Plant Available Nitrogen (PAN) loading rates; approximate rates of 2.44 dry ton/year, 0.55 dry ton/application, 1196 number of applications/year
Field slopes: Less than 5 percent
Equipment type: Tank Wagon and subsurface injection
Vegetation: Row Crop – 200 bushels per acre (BU/AC) of Corn, 60 BU/AC Beans, 75 BU/AC Wheat
Application rate is based on: Plant Available Nitrogen loading rate

Permitted Feature #011 – Industrial Sludge Land Application – SIC #2015

Earthen storage basin (same as WAS pond listed in the treatment description for Outfall #001).

Legal Description: SW¼, NW¼, Sec. 23, T46N, R22W, Pettis County
UTM Coordinates: X= 472503, Y= 4289672
Receiving Stream: Unnamed tributary to Tributary to Little Muddy Creek
First Classified Stream and ID: Tributary to Little Muddy Creek (C) (3960)
USGS Basin & Sub-watershed No.: 10300103-0404

Storage Basin/Tank:

Upper operating level (feet below spillway or overflow): 2 feet
Storage volume (minimum to maximum water levels): 1,675,000 gallons

Storage Capacity (in Days):

Design for dry weather flows: 210 days

FACILITY DESCRIPTION (continued)

Permitted Feature #012 – Industrial Sludge Land Application – SIC #2015

Steel storage basin.

Legal Description: SW¼, NW¼, Sec. 23, T46N, R22W, Pettis County
UTM Coordinates: X= 472464, Y= 4289491
Receiving Stream: Unnamed tributary to Tributary to Little Muddy Creek
First Classified Stream and ID: Tributary to Little Muddy Creek (C) (3960)
USGS Basin & Sub-watershed No.: 10300103-0404

Storage Basin/Tank:

Upper operating level (feet below spillway or overflow): N/A
Storage volume (minimum to maximum water levels): 210,000 gallons

Storage Capacity (in Days):

Design for dry weather flows: 20 days

Permitted Feature #013 – Industrial Sludge Land Application – SIC #2015

Steel storage basin.

Legal Description: SE¼, NE¼, Sec. 22, T46N, R22W, Pettis County
UTM Coordinates: X= 472464, Y= 4289491
Receiving Stream: Unnamed tributary to Tributary to Little Muddy Creek
First Classified Stream and ID: Tributary to Little Muddy Creek (C) (3960)
USGS Basin & Sub-watershed No.: 10300103-0404

Storage Basin/Tank:

Upper operating level (feet below spillway or overflow): N/A
Storage volume (minimum to maximum water levels): 210,000 gallons

Storage Capacity (in Days):

Design for dry weather flows: 20 days

Permitted Feature #014 – Tank wagon and subsurface injection sludge land application field

Area Number 1 – 27.4 Acres.

Legal Description: SE¼, NE¼, Sec. 22, T46N, R22W, Pettis County
UTM Coordinates: X= 472159, Y= 4289553
Receiving Stream: Unnamed tributary to Tributary to Little Muddy Creek
Unnamed tributary to Muddy Creek
First Classified Stream and ID: Tributary to Little Muddy Creek (C) (3960)
Muddy Creek (P) (0853) 303(d) List
USGS Basin & Sub-watershed No.: 10300103-0404
10300103-0405

Permitted Feature #015 – Tank wagon and subsurface injection sludge land application field

Area Number 2 – 32.2 Acres.

Legal Description: NW¼, SW¼, Sec. 23, T46N, R22W, Pettis County
UTM Coordinates: X= 472518, Y= 4289373
Receiving Stream: Unnamed tributary to Tributary to Little Muddy Creek
Unnamed tributary to Muddy Creek
First Classified Stream and ID: Tributary to Little Muddy Creek (C) (3960)
Muddy Creek (P) (0853) 303(d) List
USGS Basin & Sub-watershed No.: 10300103-0404
10300103-0405

FACILITY DESCRIPTION (continued)

Permitted Feature #016– Tank wagon and subsurface injection sludge land application field
Area Number 3 – 26.6 Acres.

Legal Description: SW¼, NW¼, Sec. 23, T46N, R22W, Pettis County
UTM Coordinates: X= 472544, Y= 4289835
Receiving Stream: Unnamed tributary to Tributary to Little Muddy Creek
First Classified Stream and ID: Tributary to Little Muddy Creek (C) (3960)
USGS Basin & Sub-watershed No.: 10300103-0404

Permitted Feature #017– Tank wagon and subsurface injection sludge land application field
Area Number 4 – 27.0 Acres.

Legal Description: NE¼, SW¼, Sec. 23, T46N, R22W, Pettis County
UTM Coordinates: X= 472954, Y= 4289149
Receiving Stream: Unnamed tributary to Muddy Creek
First Classified Stream and ID: Muddy Creek (P) (0853) 303(d) List
USGS Basin & Sub-watershed No.: 10300103-0405

Permitted Feature #018– Tank wagon and subsurface injection sludge land application field
Area Number 5 – 64.0 Acres.

Legal Description: SE¼, NW¼, Sec. 23, T46N, R22W, Pettis County
UTM Coordinates: X= 472935, Y= 4289790
Receiving Stream: Unnamed tributary to Tributary to Little Muddy Creek
Unnamed tributary to Muddy Creek
First Classified Stream and ID: Tributary to Little Muddy Creek (C) (3960)
Muddy Creek (P) (0853) 303(d) List
USGS Basin & Sub-watershed No.: 10300103-0404
10300103-0405

Permitted Feature #019– Tank wagon and subsurface injection sludge land application field
Area Number 6 – 36.6 Acres.

Legal Description: SW¼, NW¼, NE¼, Sec. 23, T46N, R22W, Pettis County
UTM Coordinates: X= 473474, Y= 4289854
Receiving Stream: Unnamed tributary to Tributary to Little Muddy Creek
Unnamed tributary to Muddy Creek
First Classified Stream and ID: Tributary to Little Muddy Creek (C) (3960)
Muddy Creek (P) (0853) 303(d) List
USGS Basin & Sub-watershed No.: 10300103-0404
10300103-0405

Permitted Feature #020– Tank wagon and subsurface injection sludge land application field
Area Number 7 – 48.8 Acres.

Legal Description: SE¼, SW¼, Sec. 14, T46N, R22W, Pettis County
UTM Coordinates: X= 473176, Y= 4290269
Receiving Stream: Unnamed tributary to Tributary to Little Muddy Creek
First Classified Stream and ID: Tributary to Little Muddy Creek (C) (3960)
USGS Basin & Sub-watershed No.: 10300103-0404

FACILITY DESCRIPTION (continued)

Permitted Feature #021– Tank wagon and subsurface injection sludge land application field
Area Number 8 – 152.1 Acres.

Legal Description: SW¼, SW¼, Sec. 14, T46N, R22W, Pettis County
UTM Coordinates: X= 472491, Y= 4290326
Receiving Stream: Unnamed tributary to Tributary to Little Muddy Creek
First Classified Stream and ID: Tributary to Little Muddy Creek (C) (3960)
USGS Basin & Sub-watershed No.: 10300103-0404

Permitted Feature #022– Tank wagon and subsurface injection sludge land application field
Area Number 9 – 2.6 Acres.

Legal Description: NE¼, NE¼, SW¼, Sec. 14, T46N, R22W, Pettis County
UTM Coordinates: X= 473284, Y= 4290681
Receiving Stream: Unnamed tributary to Tributary to Little Muddy Creek
First Classified Stream and ID: Tributary to Little Muddy Creek (C) (3960)
USGS Basin & Sub-watershed No.: 10300103-0404

Permitted Feature #023– Tank wagon and subsurface injection sludge land application field
Area Number 10 – 44.4 Acres.

Legal Description: SE¼, NW¼, Sec. 14, T46N, R22W, Pettis County
UTM Coordinates: X= 473164, Y= 4291062
Receiving Stream: Unnamed tributary to Tributary to Little Muddy Creek
First Classified Stream and ID: Tributary to Little Muddy Creek (C) (3960)
USGS Basin & Sub-watershed No.: 10300103-0404

Permitted Feature #024– Tank wagon and subsurface injection sludge land application field
Area Number 11 – 101.0 Acres.

Legal Description: SW¼, NW¼, Sec. 14, T46N, R22W, Pettis County
UTM Coordinates: X= 472586, Y= 4291043
Receiving Stream: Unnamed tributary to Tributary to Little Muddy Creek
First Classified Stream and ID: Tributary to Little Muddy Creek (C) (3960)
USGS Basin & Sub-watershed No.: 10300103-0404

Permitted Feature #025– Tank wagon and subsurface injection sludge land application field
Area Number 12 – 13.3 Acres.

Legal Description: W½, SE¼, NE¼, Sec. 15, T46N, R22W, Pettis County
UTM Coordinates: X= 472243, Y= 4291157
Receiving Stream: Unnamed tributary to Tributary to Little Muddy Creek
First Classified Stream and ID: Tributary to Little Muddy Creek (C) (3960)
USGS Basin & Sub-watershed No.: 10300103-0404

Permitted Feature #026– Tank wagon and subsurface injection sludge land application field
Area Number 13 – 104.7 Acres.

Legal Description: NW¼, SE¼, Sec. 15, T46N, R22W, Pettis County
UTM Coordinates: X= 471957, Y= 4290624
Receiving Stream: Unnamed tributary to Tributary to Little Muddy Creek
First Classified Stream and ID: Tributary to Little Muddy Creek (C) (3960)
USGS Basin & Sub-watershed No.: 10300103-0404

FACILITY DESCRIPTION (continued)

Permitted Feature #027– Tank wagon and subsurface injection sludge land application field
Area Number 14 – 35.2 Acres.

Legal Description: NW¼, NE¼, Sec. 22, T46N, R22W, Pettis County
UTM Coordinates: X= 471964, Y= 4289849
Receiving Stream: Unnamed tributary to Tributary to Little Muddy Creek
First Classified Stream and ID: Tributary to Little Muddy Creek (C) (3960)
USGS Basin & Sub-watershed No.: 10300103-0404

Permitted Feature #028– Tank wagon and subsurface injection sludge land application field
Area Number 15 – 65.9 Acres.

Legal Description: NE¼, NW¼, Sec. 22, T46N, R22W, Pettis County
UTM Coordinates: X= 471583, Y= 4290091
Receiving Stream: Unnamed tributary to Tributary to Little Muddy Creek
First Classified Stream and ID: Tributary to Little Muddy Creek (C) (3960)
USGS Basin & Sub-watershed No.: 10300103-0404

Permitted Feature #029– Tank wagon and subsurface injection sludge land application field
Area Number 16 – 34.0 Acres.

Legal Description: SE¼, NW¼, Sec. 22, T46N, R22W, Pettis County
UTM Coordinates: X= 471424, Y= 4289507
Receiving Stream: Unnamed tributary to Tributary to Little Muddy Creek
First Classified Stream and ID: Tributary to Little Muddy Creek (C) (3960)
USGS Basin & Sub-watershed No.: 10300103-0404

Permitted Feature #030– Tank wagon and subsurface injection sludge land application field
Area Number 17 – 32.9 Acres.

Legal Description: SW¼, NE¼, Sec. 22, T46N, R22W, Pettis County
UTM Coordinates: X= 471856, Y= 4289488
Receiving Stream: Unnamed tributary to Tributary to Little Muddy Creek
Unnamed tributary to Muddy Creek
First Classified Stream and ID: Tributary to Little Muddy Creek (C) (3960)
Muddy Creek (P) (0853) 303(d) List
USGS Basin & Sub-watershed No.: 10300103-0404
10300103-0405

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

OUTFALL #001	TABLE A-1. INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS FOR WASTEWATER DISCHARGE					
	The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The interim effluent limitations shall become effective on February 1, 2016 , and remain in effect through January 31, 2019 . Such discharges shall be controlled, limited and monitored by the permittee as specified below:					
EFFLUENT PARAMETER(S)	UNITS	INTERIM EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Ammonia as N (April 1 – Sept 30) (Oct 1 – March 31)	mg/L	3.6 10.1		1.6 3.3	twice/week	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>MARCH 28, 2016</u> . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

OUTFALL #001	TABLE A-2. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS FOR WASTEWATER DISCHARGE					
	The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective on February 1, 2019 , and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:					
EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Ammonia as N (April 1 – Sept 30) (Oct 1 – March 31)	mg/L	2.5 10.1		1.4 2.7	twice/week	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>MARCH 28, 2016</u> . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

OUTFALL #001	TABLE A-3. INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS FOR WASTEWATER DISCHARGE					
	The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The interim effluent limitations shall become effective on February 1, 2016 , and remain in effect through January 31, 2021 . Such discharges shall be controlled, limited and monitored by the permittee as specified below:					
EFFLUENT PARAMETER(S)	UNITS	INTERIM EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Temperature	°F	*		*	once/day	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>MARCH 28, 2016</u> . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

OUTFALL #001	TABLE A-4. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS FOR WASTEWATER DISCHARGE					
	The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective on February 1, 2021 , and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:					
EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Temperature	°F	90		*	once/day	grab
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.						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

OUTFALL #001	TABLE A-5. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS FOR WASTEWATER DISCHARGE					
	The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective February 1, 2016 , and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:					
EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Flow	MGD	*		*	once/day	24 hr. total
Biochemical Oxygen Demand ₅	mg/L	26		16	twice/week	24 hr. composite**
Total Suspended Solids	mg/L	30		20	twice/week	24 hr. composite**
pH – Units	SU	***		***	twice/week	grab
<i>E. coli</i> (Note 1, Page 13)	#/100mL	1030		206	twice/week	grab
<i>Fecal Coliform</i>	#/100 mL	400		*	twice/week	grab
Total Residual Chlorine (Note 2, Page 13)	µg/L	17 (130ML)		8 (130ML)	twice/week	grab
Oil & Grease	mg/L	14		8	twice/week	grab
Total Nitrogen	mg/L	147		103	twice/week	24 hr. composite**
Chloride	mg/L	*		*	twice/week	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>MARCH 28, 2016</u> . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
EFFLUENT PARAMETER(S)	UNITS	DAILY MINIMUM	WEEKLY AVERAGE MINIMUM	MONTHLY AVERAGE MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Dissolved Oxygen	mg/L	*		*	once/month	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>MARCH 28, 2016</u> .						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

OUTFALL #001	TABLE A-6. WHOLE EFFLUENT TOXICITY FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS FOR WASTEWATER DISCHARGE					
	The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective on February 1, 2016 , and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:					
EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Acute Whole Effluent Toxicity	TU _a	*			once/year	24 hr. composite**
MONITORING REPORTS SHALL BE SUBMITTED <u>ANNUALLY</u> ; THE FIRST REPORT IS DUE <u>JUNE 28, 2016</u> .						

SM1 & SM2	TABLE A-7. INTERIM INSTREAM MONITORING REQUIREMENTS					
	The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The interim effluent limitations shall become effective on February 1, 2016 , and remain in effect through January 31, 2021 . Such discharges shall be controlled, limited and monitored by the permittee as specified below:					
EFFLUENT PARAMETER(S) (Note 3)	UNITS	INTERIM INSTREAM LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
<u>Stream Monitoring Location #1 (SM1) – Upstream</u>						
Temperature	°F	*		*	once/day	grab
<u>Stream Monitoring Location #2 (SM2) – Downstream</u>						
Temperature	°F	*		*	once/day	grab
Temperature (Delta T)	°F	*		*	once/day	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>MARCH 28, 2016</u> . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

EFFLUENT PARAMETER(S) (Note 3)	UNITS	FINAL INSTREAM LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Stream Monitoring Location #1 (SM1) – Upstream						
Temperature	°F	*		*	once/day	grab
Stream Monitoring Location #2 (SM2) – Downstream						
Temperature	°F	*		*	once/day	grab
Temperature (Delta T)	°F	± 5		*	once/day	grab

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.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

- * Monitoring requirement only.
- ** A 24-hour composite sample is composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device.
- *** pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.5-9.0 pH units.

Note 1 - Final limitations and monitoring requirements for *E. coli* 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.

Note 2 - This permit contains a Total Residual Chlorine (TRC) limit.

- (a) This effluent limit is below the minimum quantification level (ML) of the most common and practical EPA approved CLTRC methods. The Department has determined the current acceptable 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 permittee 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 unless the permit specifically states that “Final limitations and monitoring requirements for *E. coli* are applicable only during the recreational season from April 1 through October 31.” If your permit does not require disinfection during the non-recreational months, do not chlorinate in those months.
- (c) Do not chemically dechlorinate **if it is not needed to meet the limits in your permit**.
- (d) If no chlorine was used in a given sampling period, an actual analysis is not necessary. Simply report as “0 µg/L” TRC.

Note 3 - Instream sampling shall not occur during conditions that will put the permittee 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.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

EFFLUENT PARAMETER(S) (Note 1, Page 14)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
<p>The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective on February 1, 2016, and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:</p>						
Flow	MGD	*			once/quarter****	24 hr. estimate
Biochemical Oxygen Demand ₅	mg/L	**			once/quarter****	grab
Chemical Oxygen Demand	mg/L	**			once/quarter****	grab
Total Suspended Solids	mg/L	**			once/quarter****	grab
Settleable Solids	mL/L/hr	**			once/quarter****	grab
pH – Units	SU	***			once/quarter****	grab
Oil & Grease	mg/L	**			once/quarter****	grab
Precipitation (Note 2, Page 14)	Inches	*			once/quarter****	total
<p>MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u>; THE FIRST REPORT IS DUE <u>APRIL 28, 2016</u>. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.</p>						
<i>E. coli</i> – Monthly Rec. Season (Note 3, Page 15)	#/100mL	*			once/month	grab
<p>MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u>; THE FIRST REPORT IS DUE <u>JANUARY 28, 2017</u>. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.</p>						
<i>E. coli</i> – Geometric Mean (Note 3, Page 15)	#/100mL	*			once/year	calculated
<p>MONITORING REPORTS SHALL BE SUBMITTED <u>ANNUALLY</u>; THE FIRST REPORT IS DUE <u>NOVEMBER 28, 2017</u>. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.</p>						

- * Monitoring requirement only.
- ** Monitoring requirement associated with a benchmark value. See special condition #11.
- *** pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.5-9.0 pH units.
- **** See table below for quarterly sampling.

Minimum Sampling Requirements			
Quarter	Months	All Other Parameters Except <i>E. coli</i>	Report is Due
First	January, February, March	Sample at least once during any month of the quarter	April 28 th
Second	April, May, June	Sample at least once during any month of the quarter	July 28 th
Third	July, August, September	Sample at least once during any month of the quarter	October 28 th
Fourth	October, November, December	Sample at least once during any month of the quarter	January 28 th

Note 1 – All samples shall be collected from a discharge resulting from a precipitation event greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable precipitation event. If a precipitation event does not occur within the reporting period, report as no discharge. The total amount of precipitation should be noted from the event from which the samples were collected.

Note 2 – Sample the amount of precipitation at only one outfall location. Record that value on all Discharge Monitoring Reports (DMRs) for all outfalls.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

Note 3 – Monitoring requirements for *E. coli* are applicable only during the recreational season from April 1 through October 31. The monthly monitoring results for the months within the recreational season shall be reported on the 28 day of the following month. The recreational season geometric mean shall be calculated at the end of the recreational season based on those individual values and that calculated geometric mean shall be reported annually on November 28 of each year.

EFFLUENT PARAMETER(S)	UNITS	FINAL LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
PERMITTED FEATURE #011, #012, #013						
TABLE C-1. SLUDGE STORAGE LIMITATIONS AND MONITORING REQUIREMENTS						
The permittee is authorized to conduct land application of wastewater as specified in the application for this permit. The final limitations shall become effective on February 1, 2016 , and remain in effect until expiration of the permit. The land application of wastewater shall be controlled, limited and monitored by the permittee as specified below:						
Storage Basin Operational Monitoring						
Storage Basin Freeboard (Note 1)	Feet	*			once/month	measured
Precipitation	Inches	*			daily	total
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>JANUARY 28, 2017</u> .						

EFFLUENT PARAMETER(S)	UNITS	FINAL LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
PERMITTED FEATURE #014-#030						
TABLE C-2. LAND APPLICATION SYSTEM LIMITATIONS AND MONITORING REQUIREMENTS						
The permittee is authorized to conduct land application of wastewater as specified in the application for this permit. The final limitations shall become effective on February 1, 2016 , and remain in effect until expiration of the permit. The land application of wastewater shall be controlled, limited and monitored by the permittee as specified below:						
Sludge Land Applied (Note 2)						
Total Kjeldahl Nitrogen as N	mg/kg	*			once/quarter***	grab
Nitrate Nitrogen as N	mg/L	*			once/quarter***	grab
Total Phosphorus as P	mg/L	*			once/quarter***	grab
Percent Solids	%	*			once/quarter***	grab
pH – Units	SU	*			once/quarter***	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE <u>JANUARY 28, 2017</u> .						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

PERMITTED FEATURE #014-#030	TABLE C-3. LAND APPLICATION LIMITATIONS AND MONITORING REQUIREMENTS						
	EFFLUENT PARAMETER(S)	UNITS	FINAL LIMITATIONS			MONITORING REQUIREMENTS	
The permittee is authorized to conduct land application of wastewater as specified in the application for this permit. The final limitations shall become effective on February 1, 2016 , and remain in effect until expiration of the permit. The land application of wastewater shall be controlled, limited and monitored by the permittee as specified below:							
			DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Sludge Land Application Operational Monitoring							
Volume Applied	Gallons	*				daily	total
Application Area	Acres	*				daily	total
Application Rate	Inches	*				daily	total
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>JANUARY 28, 2017</u> .							
Soil Monitoring (Note 3)							
pH – Units	SU	*				once/5 years	composite**
Nitrate Nitrogen as N	mg/kg	*				once/5 years	composite**
Available Phosphorus as P (Bray 1-P Method)	mg/kg	*				once/5 years	composite**
MONITORING REPORTS SHALL BE SUBMITTED <u>ONCE PER PERMIT CYCLE</u> ; THE FIRST REPORT IS DUE BY <u>SEPTEMBER 28, 2020</u> .							

* Monitoring requirement only.

** See Land Application 6.(a) Soil Monitoring for additional guidance.

*** See table below for quarterly sampling

Minimum Sampling Requirements			
Quarter	Months	Parameters	Report is Due
First	January, February, March	Sample at least once during any month of the quarter	April 28 th
Second	April, May, June	Sample at least once during any month of the quarter	July 28th
Third	July, August, September	Sample at least once during any month of the quarter	October 28th
Fourth	October, November, December	Sample at least once during any month of the quarter	January 28th

Note 1 – Storage Basin freeboard shall be reported as Storage Basin water level in feet below the overflow level.

Note 2 – Sludge that is land applied shall be sampled at the storage basin or application vehicle. If no land application occurred during the report period, report as “No Application.”

Note 3 – Sample the upper 6 to 8 inches of soil. Composite samples shall be collected from each permitted land application site. See Land Application 6.(a) Soil Monitoring for additional guidance.

B. 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 March 1, 2015, respectively, are hereby incorporated as though fully set forth herein.

C. SPECIAL CONDITIONS

1. 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>.
2. This permit may be reopened and modified, or alternatively revoked and reissued, to:
 - (a) Comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a) (2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:
 - (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
 - (2) controls any pollutant not limited in the permit.
 - (b) Incorporate new or modified effluent limitations or other conditions, if the result of a waste load allocation study, toxicity test or other information indicates changes are necessary to assure compliance with Missouri's Water Quality Standards.
 - (c) Incorporate new or modified effluent limitations or other conditions if, as the result of a watershed analysis, a Total Maximum Daily Load (TMDL) limitation is developed for the receiving waters which are currently included in Missouri's list of waters of the state not fully achieving the state's water quality standards, also called the 303(d) list.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Clean Water Act then applicable.

3. All outfalls must be clearly marked in the field.
4. Water Quality Standards
 - (a) To the extent required by law, discharges to waters of the state shall not cause a violation of water quality standards rule under 10 CSR 20-7.031, including both specific and general criteria.
 - (b) General Criteria. The following general water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:
 - (1) 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;
 - (2) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;
 - (3) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;
 - (4) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;
 - (5) There shall be no significant human health hazard from incidental contact with the water;
 - (6) There shall be no acute toxicity to livestock or wildlife watering;
 - (7) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;
 - (8) 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, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247.
5. Changes in Discharges of Toxic Pollutant

In addition to the reporting requirements under §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) That 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;

C. SPECIAL CONDITIONS (continued)

- (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) That 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 §122.21(g)(7).
 - (4) The level established by the Director in accordance with §122.44(f).
6. Report as no-discharge when a discharge does not occur during the report period.
7. Reporting of Non-Detects:
- (a) An analysis conducted by the permittee or their contracted laboratory shall be conducted in such a way that the precision and accuracy of the analyzed result can be enumerated.
 - (b) The permittee shall not report a sample result as “Non-Detect” without also reporting the detection limit of the test. Reporting as “Non Detect” without also including the detection limit will be considered failure to report, which is a violation of this permit.
 - (c) The permittee shall provide the “Non-Detect” sample result using the less than sign and the minimum detection limit (e.g. <10).
 - (d) Where the permit contains a Minimum Level (ML) and the permittee is granted authority in the permit to report zero in lieu of the < ML for a specified parameter (conventional, priority pollutants, metals, etc.), then zero (0) is to be reported for that parameter.
 - (e) See Standard Conditions Part I, Section A, #4 regarding proper detection limits used for sample analysis.
8. It is a violation of the Missouri Clean Water Law to fail to pay fees associated with this permit (644.055 RSMo).
9. 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.
10. The permittee shall implement a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP must be prepared and implemented upon permit issuance. 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, if needed, every five (5) years or as site conditions change. The permittee shall select, install, use, operate, and maintain the Best Management Practices prescribed in the SWPPP in accordance with the concepts and methods described in the following document:
- Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators, (Document number EPA 833-B-09-002) published by the United States Environmental Protection Agency (USEPA) in February 2009.
- The SWPPP must include the following:
- (a) A listing of specific Best Management Practices (BMPs) and a narrative explaining how BMPs will be implemented to control and minimize the amount of potential contaminants that may enter stormwater.
 - (b) The SWPPP must include a schedule for monthly site inspections and brief written reports. The inspections must include observation and evaluation of BMP effectiveness. Deficiencies must be corrected within seven (7) days and the actions taken to correct the deficiencies shall be included with the written report, including photographs. Any corrective measure that necessitates major construction may also need a construction permit. 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.
 - (c) A provision for designating an individual to be responsible for environmental matters.
 - (d) A provision for providing training to all personnel involved in material handling and storage, and housekeeping of maintenance and cleaning areas. Proof of training shall be submitted on request of the department.
11. This permit stipulates pollutant benchmarks applicable to your discharge. 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 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 that pollutant in your stormwater discharge(s).

C. SPECIAL CONDITIONS (continued)

Stormwater Outfalls #002, #003, #004, #006, #007, & #008	
Parameter	Benchmark
Biochemical Oxygen Demand ₅	30 mg/L
Chemical Oxygen Demand	120 mg/L
Total Suspended Solids	100 mg/L
Settleable Solids	1.5 mL/L/hr
Oil & Grease	10 mg/L

Any time a benchmark exceedance occurs a Corrective Action Report (CAR) must be completed. A CAR is a document that records the efforts undertaken by the facility to improve BMPs to meet benchmarks in future samples. CARs must be retained with the SWPPP and 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 tangible progress towards achieving the benchmarks is a permit violation.

12. Permittee shall adhere to the following minimum Best Management Practices (BMPs):
 - (a) Prevent the spillage or loss of fluids, oil, grease, fuel, etc. from vehicle maintenance, equipment cleaning, or warehouse activities and thereby prevent the contamination of storm water from these substances.
 - (b) Provide collection facilities and arrange for proper disposal of waste products including but not limited to petroleum waste products, and solvents.
 - (c) Store all paint, solvents, petroleum products and petroleum waste products (except fuels), and storage containers (such as drums, cans, or cartons) so that these materials are not exposed to storm water or provide other prescribed BMPs such as plastic lids and/or portable spill pans to prevent the commingling of storm water 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.
 - (d) Provide good housekeeping practices on the site to keep trash from entry into waters of the state.
 - (e) Provide sediment and erosion control sufficient to prevent or control sediment loss off of the property. This could include the use of straw bales, silt fences, or sediment basins, if needed, to comply with effluent limits.

13. The purpose of the SWPPP and the BMPs listed herein is the prevention of pollution of waters of the state. A deficiency of a BMP means it was not effective in preventing pollution [10 CSR 20-2.010(56)] of waters of the state, and corrective actions means the facility took steps to eliminate the deficiency.

14. Before releasing water that has accumulated in secondary containment areas it must be examined for hydrocarbon odor and presence of a sheen. If the presence of hydrocarbons is indicated, this water must be tested for Total Petroleum Hydrocarbons (TPH). The suggested analytical method for testing TPH is non-Halogenated Organic by Gas Chromatography method 8015 (also known as OA1 and OA2). However, if the permittee so desires to use other approved testing methods (i.e. EPA 1664), they may do so. If the concentration for TPH exceeds 10mg/L, the water shall be taken to the Tyson Poultry Inc. – Sedalia Processing Plant wastewater treatment facility for treatment.

15. Release of a hazardous substance must be reported to the department in accordance with 10 CSR 24-3.010. A record of each reportable spill shall be retained with the SWPPP and made available to the department upon request.

16. Acute Whole Effluent Toxicity (WET) tests shall be conducted as follows:

SUMMARY OF ACUTE WET TESTING FOR THIS PERMIT					
OUTFALL	AEC	Acute Toxic Unit (TU_a)	FREQUENCY	SAMPLE TYPE	MONTH
001	100%	*	once/year	24 hr. composite**	Any

* Monitoring only

** A 24-hour composite sample is composed of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampling device.

C. SPECIAL CONDITIONS (continued)

Dilution Series						
100%	50%	25%	12.5%	6.25%	(Control) 100% upstream, if available	(Control) 100% Lab Water, also called synthetic water

(a) Freshwater Species and Test Methods

(1) Species and short-term test methods for estimating the acute toxicity of NPDES effluents are found in the fifth edition of *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* (EPA/821/R-02/012, 2002; Table IA, 40 CFR Part 136). The permittee shall concurrently conduct 48-hour static non-renewal toxicity tests with the following vertebrate species:

- The fathead minnow, *Pimephales promelas* (Acute Toxicity Test Method 2000.0).

And the following invertebrate species:

- The daphnid, *Ceriodaphnia dubia* (Acute Toxicity Test Method 2002.0).
- (2) Chemical and physical analysis of an 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, synthetic laboratory control water may be used.
- (3) Test conditions must meet all test acceptability criteria required by the EPA Method used in the analysis.
- (4) Any and all chemical or physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% Effluent concentration in addition to analysis performed upon any other effluent concentration.
- (5) All chemical analyses shall be performed and results shall be recorded in the appropriate field of the report form. The parameters for chemical analysis include Temperature (°C), pH (SU), Conductivity (µmohs/cm), Dissolved Oxygen (mg/L), Total Residual Chlorine (mg/L), Un-ionized Ammonia (mg/L), Total Alkalinity (mg/L), and Total Hardness (mg/L).

(b) Reporting of Acute Toxicity Monitoring Results

(1) WET test results shall be submitted to the Kansas City Regional Office, or by eDMR, with the permittee's Discharge Monitoring Reports annually by June 28th of each year. The submittal shall include:

- (a) A full laboratory report for all toxicity testing.
- (b) Copies of chain-of-custody forms.
- (c) The WET form provided by the Department upon permit issuance.

(2) The report must include a quantification of acute toxic units ($TU_a = 100/LC_{50}$) reported according to the test methods manual chapter on report preparation and test review. The Lethal Concentration, 50 Percent (LC_{50}) is the toxic or effluent concentration that would cause death in 50 percent of the test organisms over a specified period of time.

D. LAND APPLICATION

1. 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.
2. 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 to the berms.
3. Hazardous waste regulated under the Missouri Hazardous Waste Law and regulations shall not be land applied under this permit.
4. The facility shall ensure that adequate provisions are provided to prevent surface water intrusion into the storage basin(s) and to divert stormwater runoff around the storage basin(s) and protect embankments from erosion.
5. Land Application System.
 - (a) This special condition does not apply to fertilizer products that are exempted under the Missouri Clean Water Law and regulations, 10 CSR 20-6.015(3)(B)8.

D. LAND APPLICATION (continued)

- (b) Permitted Sites. This permit authorizes land application of sludge by the permittee to those sites listed in the “Facility Description” of this permit. Land application of sludge by a contract hauler to sites owned, rented, or leased by the permittee must also be listed in the “Facility Description” unless, the contract hauler is permitted. Land application by contract hauler to sites that are not owned, rented, or leased by the permitted are not required to be listed in this permit. Only those pollutants listed in the permit application may be land applied. Permittee requests for additional sites must follow permit modification procedures prior to land application. Additionally, the O&M Manual shall include all additional land application site(s) listed in this permit.
 - (c) Storage Basin Operating Levels. The minimum and maximum operating water levels for the storage basin(s) shall be clearly marked. Each storage basin shall be operated so that the maximum water elevation does not exceed upper operating level. Storage basins shall be lowered to the minimum operating level prior to November 30 each year.
6. Public Access Restrictions. This permit does not authorize application of sludge to areas to public use areas. Public access to storage areas and land application sites must be controlled by either positive barriers or remoteness of site.
- (a) Soil Monitoring.
 - (1) Composite soil samples shall be collected from each field listed in this permit where land application has occurred in the last 12 months or will occur in the next 12 months
 - (2) 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 tool to identify soil fertility fluctuations in larger fields due to past management practices, soil type, and variability of crop yields. There shall be at least one composite sample per 80 acres.
 - (3) 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.
7. Land Application Requirements.
- (a) Sludge shall be land applied at agronomic rates to ensure agricultural use of nutrients and prevent contamination of surface and ground water. Agronomic rate (i.e. fertilizer recommendation) is defined as the amount of nutrients needed by the planned crop to produce the expected yield. The volume of sludge applied is the amount of sludge needed to meet the agronomic rate.
 - (b) No land application shall occur during frozen, snow covered, or saturated soil conditions. There shall be no application during a precipitation event or if a precipitation event that is likely to create runoff is forecasted to occur within 24 hours of a planned application.
 - (c) Land application shall occur only during daylight hours.
 - (d) The perimeter of land application fields shall be checked daily during land application to check for runoff. Sites that utilize spray irrigation shall monitor for the drifting of spray across property lines.
 - (e) Setback distances from sensitive features. There shall be no land application within:
 - (1) 300 feet of any well, sinkhole, losing stream, wetland, or cave entrance, water supply impoundment or stream intake;
 - (2) 150 feet of an occupied residence, public building, or public use area;
 - (3) 50 feet of gaining perennial or intermittent stream, public or privately owned pond or lake;
 - (4) 50 feet of property line or public road.
 - (f) Slope limitation for application sites are as follows;
 - (1) A slope 0 to 6 percent has no rate limitation
 - (2) 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
 - (3) Slopes > 12, 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
 - (g) Application Equipment. The land 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 and shall be capable of applying the annual design flow during an application period of less than 100 days or 800 hours per year. Land application equipment shall be calibrated at least once annually.
8. Nutrient Management
Land application fields listed in this permit shall use the following protocols to determine the agronomic rates and sludge application rates to ensure appropriate agricultural utilization of nutrients.
- (a) Agronomic rate shall be based on the following:
 - (1) Crop nutrient removal rate estimates in MU Guide EQ202 Land Application Considerations for Animal Manure or from publications by other land grant universities in adjoining states,

D. LAND APPLICATION (continued)

- (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 current soil test.
 - (b) Sludge application rates shall be determined by one the following nutrient based management practices.
 - (1) Nitrogen based management 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 annual total nitrogen application shall not exceed the application rate as determined by one of the following methods.
 - (a) For non-legume crops, the application rate as determined by paragraphs 1 and 3 of this section shall be adjusted to account for nitrogen credits from a preceding legume crop and residual nitrogen from the previous year's application.
 - (b) 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 MU Guide EQ202 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.
 - (2) Phosphorus based management practice 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 phosphorus applied shall not exceed the planned crop's phosphorus removal estimate from MU Guide EQ822, or from publications by other land grant universities in adjoining states.
 - (3) No land application can occur if the P-index rating for a field is very high.
 - (c) Nitrogen based management application rate calculation.
 - (1) The application rates for nitrogen in any given year or growing season must be adjusted based on the most current sludge and soil test results, and the planned crop's nitrogen recommendation. Plant Available Nitrogen (PAN) from sludge must be calculated using the results of the most recent sludge analysis if the sludge exceeds 50,000 mg/kg of total nitrogen on a dry weight basis or if sludge application rate exceeds two tons/acre.
$$\text{PAN} = [\text{Ammonia Nitrogen} \times \text{volatilization factor}^*] + [\text{Organic Nitrogen} \times 0.2] + [\text{Nitrate Nitrogen}]$$

*Volatilization factor is 0.7 for surface application and 1 for subsurface application
 - (d) Phosphorus based management applications
 - (1) When phosphorus based management practice is required the amount of phosphorus applied is to be determined as described in paragraph b.(2) of this section.
 - (2) Multi-year phosphorus applications. When phosphorus based management is required, 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:
 - (a) application rate shall not exceed the nitrogen fertilizer recommendation or the estimated nitrogen removal capacity of the planned crop during the year of the application,
 - (b) the amount of phosphorus banked shall not exceed four years of the estimated crop removal rate for the planned crop rotation.
 - (c) the actual application rate shall not exceed the multi-year application rate
 - (d) no additional sludge applications shall occur until the applied phosphorus has been removed from the field by crop removal or harvest.
 - (e) Other Pollutant Limitations and Loading Rates
 - (1) Oil and grease application shall not exceed 10,000 pounds oil/acre/year for subsurface injection or soil incorporation. For surface application to growing vegetation, the sludge shall not exceed 15% oil & grease content and shall not exceed 1,000 pounds oil/acre. Avoid heavy application of oil and grease within 30 days before planting of row crops.
9. Record Keeping
- (a) A daily land application log shall be prepared and kept on file at the permittee office location for each application site showing dates of application, weather condition (sunny, overcast, raining, below freezing etc...), soil moisture condition, application method.
 - (b) A record of monthly visual storage structure inspections shall be maintained.
 - (c) A record of land application equipment inspections and calibrations as well as field perimeter inspections shall be maintained.
 - (d) A record of all PAN calculations.
 - (e) All records and monitoring results shall be maintained for at least five years and shall be made available to the department upon request.
10. Annual Report on Land Application.
- (a) An annual report is required in addition to other reporting requirements under Section A of this permit. The annual report shall be submitted by **January 28** of each year. The report shall include, but is not limited to, a summary of the following:

D. LAND APPLICATION (continued)

- (b) Record of maintenance and repairs during the year, average number of times per month the facility is checked to see if it is operating properly, and description of any unusual operating conditions encountered during the year.
- (c) The number of days the storage structure discharged during the year, the discharge flow, reason the discharge occurred and effluent analysis performed.
- (d) A summary for each field used for land application showing number of acres used number of days application occurred, crop grown and yield, and total amount of sludge applied (gal. or tons/acre)
- (e) For fields where the total nitrogen application exceeds 150 lbs./acre, submit PAN calculations to document that the applied nitrogen will be utilized.
- (f) The report shall include any soil test results. If none were taken during the reporting year, report the date samples were taken.
- (g) Narrative summary of any problems or deficiencies identified, corrective action taken and improvements planned.

E. SCHEDULE OF COMPLIANCE

Ammonia as N at Outfall #001

The facility shall attain compliance with final effluent limitations for ammonia as N as soon as reasonably achievable or no later than **three (3) years** of the effective date of this permit.

1. Within 1 year of the effective date of this permit, the permittee shall report progress made in attaining compliance with the final effluent limits.
2. The permittee shall submit interim progress reports detailing progress made in attaining compliance with the final effluent limits every 12 months from issuance date.
3. Within **3 years** of the effective date of this permit, the permittee shall attain compliance with the final effluent limits for ammonia as N.

Temperature at Outfall #001 and SM1 & SM2

The facility shall attain compliance with final effluent limitations for temperature of 90°F and instream limitations for change in temperature of $\pm 5^\circ\text{F}$ as soon as reasonably achievable or no later than **five (5) years** of the effective date of this permit.

1. Within 1 year of the effective date of this permit, the permittee shall report progress made in attaining compliance with the final effluent limits at Outfall #001 and shall submit a report detailing the results the temperature data from the new instream monitoring locations in the Little Muddy Creek (C) (0856). Please include any other water quality impact information you feel is relevant to complying with the instream temperature limitations. Upon submittal, the permittee shall request a meeting with the Department to discuss options for resolution.
2. The permittee shall submit interim status reports detailing progress made in attaining compliance with the final effluent limitations at Outfall #001 and the final instream limits every 12 months from issuance date. The permittee should report on progress with completing these specific actions as well as any additional actions taken to attain compliance with final instream limits.
3. Within **5 years** of the effective date of this permit, the permittee shall attain compliance with the final instream limits.

Please submit progress reports to the Missouri Department of Natural Resources, Kansas City Regional Office, 500 NE Colbern Road, Lee's Summit, Missouri, 64086. Please submit separate documents for each schedule discussed above, one progress report detailing compliance efforts with ammonia as N and one progress report detailing compliance efforts for temperature.

MISSOURI DEPARTMENT OF NATURAL RESOURCES
STATEMENT OF BASIS
MO-0115061
TYSON POULTRY, INC. – SEDALIA PROCESSING PLANT

This Statement of Basis (Statement) gives pertinent information regarding minor modification(s) to the above listed operating permit without the need for a public comment process.

A Statement is not an enforceable part of a Missouri State Operating Permit.

Part I – Facility Information

Facility Type: Industrial, Poultry Processing
Facility SIC Code(s): 2015

Facility Description:

This is a poultry processing complex consisting of slaughter, blood removal, defeathering, evisceration, washing, chilling, broilers, and further processing of meat. The complex includes a hatchery, feed mill, rendering and wastewater treatment facility. The wastewater treatment facility that treats the process wastewater also treats domestic wastewater that is routed from the factory and office restrooms.

Part II – Modification Rationale

This operating permit is hereby modified to reflect a change in the initial reporting due dates for several of the reporting requirements associated with several of the outfalls listed in the permit. The department is implementing a new electronic discharge monitoring report (eDMR) system that allows permittees to input their own reporting data into the department's compliance database. While the eDMR system collects data from the department's compliance database, known as Missouri Clean Water Information System (MoCWIS), there are still some inconsistencies between the two interfaces. This results in potential non-compliance with the MoCWIS. In order to fix the issue, the following changes were made to this permit and MoCWIS.

The initial reporting due date for submittal of *E. coli* data from Outfalls #002, #003, #004, #006, #007, and #008 has been revised. The reporting due dates for *E. coli* from Outfalls #002, #003, #004, #006, #007, and #008 found in eDMR did not match the due dates listed on the permit or in MoCWIS. This causes issues with compliance. If the permittee were to input data in accordance with the due dates found in eDMR, they would be out of compliance with the due dates listed on the permit or in MoCWIS. This is a problem. Unfortunately, there is no way to correct those dates generated in the eDMR system at this time.

The least complicated solution to this problem is to modify the dates in the permit and in MoCWIS to match the eDMR system. While this is not ideal, it will ensure that the permittee can submit data using the eDMR system without accruing violations in MoCWIS. The permit and MoCWIS will now contain an *E. coli* data initial reporting date of January 28, 2016. Additionally, the permittee will now be required to report the results monthly during the recreational season. This will also help prevent discrepancies between the reporting dates in the two databases. This is a minor modification that does not change the true compliance requirements associated with the monitoring condition. The permittee will still be required to comply with the monitoring and reporting of seasonal geometric mean for *E. coli* from Outfalls #002, #003, #004, #006, #007, and #008.

Like the *E. coli* condition, the land application reporting requirements for Outfalls #011-#030 have been revised. The permittee will now be required to report storage basin operational monitoring information associated with Outfalls #011-#013 and land application operation monitoring information associated with Outfalls #014-#030 monthly. The sludge monitoring requirements associated with Outfalls #014-#030 are required to be reported quarterly. All of these adjustments to the reporting requirements will prevent false violations for these data in MoCWIS.

The permittee has agreed to these changes. This will allow them to report data as they obtain it rather than holding the data for a period of time before reporting, which will also assist in compliance with reporting requirements from the user-end of the issue.

No other changes were made at this time.

Part III – 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.

DATE OF STATEMENT OF BASIS: NOVEMBER 15, 2016

COMPLETED BY:

**LOGAN COLE, ENVIRONMENTAL SPECIALIST
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
OPERATING PERMITS SECTION - DOMESTIC WASTEWATER UNIT
(573)751-5827
logan.cole@dnr.mo.gov**

MISSOURI DEPARTMENT OF NATURAL RESOURCES
STATEMENT OF BASIS
MO-0115061
TYSON POULTRY, INC. – SEDALIA PROCESSING PLANT

This Statement of Basis (Statement) gives pertinent information regarding minor modification(s) to the above listed operating permit without the need for a public comment process.

A Statement is not an enforceable part of a Missouri State Operating Permit.

Part I – Facility Information

Facility Type: Industrial, Poultry Processing
Facility SIC Code(s): 2015

Facility Description:

This is a poultry processing complex consisting of slaughter, blood removal, defeathering, evisceration, washing, chilling, broilers, and further processing of meat. The complex includes a hatchery, feed mill, rendering and wastewater treatment facility. The wastewater treatment facility that treats the process wastewater also treats domestic wastewater that is routed from the factory and office restrooms.

Part II – Modification Rationale

This operating permit is hereby modified to reflect a revision to the note discussing appropriate instream sampling requirements. This condition is listed on page 13 of the permit. Clarification is necessary for the permittee to properly implement compliance actions. The following highlights the revision.

Old language:

Note 3 - Instream sampling shall not occur during conditions that will put the permittee in harm of injury or loss of life, such as severe weather or flooding. If sampling does not occur on any given day, such conditions must be reported in place of numeric data.

New language:

Note 3 - Instream sampling shall not occur during conditions that will put the permittee 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.

This revision considers times of no flow and clarifies that the permittee is not required to conduct instream sampling during both severe weather and when there is no stream flow. This revision is considered a minor modification and does not require a public comment period.

No other changes were made at this time.

Part III – 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.

DATE OF STATEMENT OF BASIS: 08/01/2016

COMPLETED BY:

LOGAN COLE, ENVIRONMENTAL SPECIALIST
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
OPERATING PERMITS SECTION - DOMESTIC WASTEWATER UNIT
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Missouri Department of Natural Resources
FACT SHEET
FOR THE PURPOSE OF RENEWAL
OF
MO-0115061
TYSON POULTRY, INC. – SEDALIA PROCESSING PLANT

The Federal Water Pollution Control Act ("Clean Water Act" Section 402 Public Law 92-500 as amended) established the National Pollution 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 storm water from certain point sources. All such discharges are unlawful without a permit (Section 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" Section 644 as amended). MSOPs are issued for a period of five (5) years unless otherwise specified.

As per [40 CFR Part 124.8(a)] and [10 CSR 20-6.020(1)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 listed below.

A Factsheet is not an enforceable part of an operating permit.

This Factsheet is for an Industrial Facility.

Part I – Facility Information

Facility Type: Industrial, Poultry Processing
Facility SIC Code(s): 2015

Facility Description:

This is a poultry processing complex consisting of slaughter, blood removal, defeathering, evisceration, washing, chilling, broilers, and further processing of meat. The complex includes a hatchery, feed mill, rendering and wastewater treatment facility. The wastewater treatment facility that treats the process wastewater also treats domestic wastewater that is routed from the factory and office restrooms.

The permittee provided the following description for the wastewater treatment plant:

The wastewater treatment plant is an activated sludge plant with dissolved air flotation pretreatment. Wastewater is collected in a 322,000 gallon above-ground equalization basin, then passes through flocculation tubes where coagulant, cationic/anionic polymer are injected to flocculate waste particles. Then air bubbles are injected to float the particles in order to be skimmed off by the dissolved air flotation units. Next, a tricanter centrifuge separates wastewater into 3 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.

Have any changes occurred at this facility or in the receiving water body that effects effluent limit derivation?

- Yes; the permittee has completed the expansion project as approved in the Construction Permit #CP0001170. The addition anaerobic lagoon increased the size of the wastewater treatment facility to 2.16 MGD. The permit description for Outfall #001 reflects this expansion. Additionally, the permittee has requested the facility name be changed. The facility name is now Tyson Poultry, Inc. – Sedalia Processing Plant.

Application Date: 03/11/2013
Expiration Date: 08/28/2013
Last Inspection: 06/13/2013 In Compliance ; Non-Compliance

Justification for Rescinding June 4, 2015 Permit Renewal Issuance and Modifications to Permit:

The Department has hereby rescinded the MSOP issued on June 4, 2015 with an effective date of July 1, 2015. There are two reasons for this decision. These reasons are discussed below.

First, the permit synchronization date was not implemented correctly in the issued permit. The earliest that the permit is scheduled to be synchronized is the third calendar quarter of 2015. This is the earliest possible date that the permit can become effective; however, the Department is not prohibited from implementing any effective date after the first day of the calendar quarter. For this reason, the Department has decided to make the effective date the last day of the calendar quarter, September 30, 2015.

Second, this operating permit is hereby modified to provide a schedule of compliance for new final effluent limitations for temperature at Outfall #001. The permittee has been granted a schedule of compliance for the 90°F temperature limit on Outfall #001. The schedule of five years will allow the permittee to establish certain control measures in order to comply with the new temperature requirement. Since the permit has been rescinded for the permit synchronization schedule, the Department has decided to include this schedule of compliance for temperature as well.

No other changes have been made to the permit. All information, conditions and effluent limitations, other than the items discussed above, will remain the same.

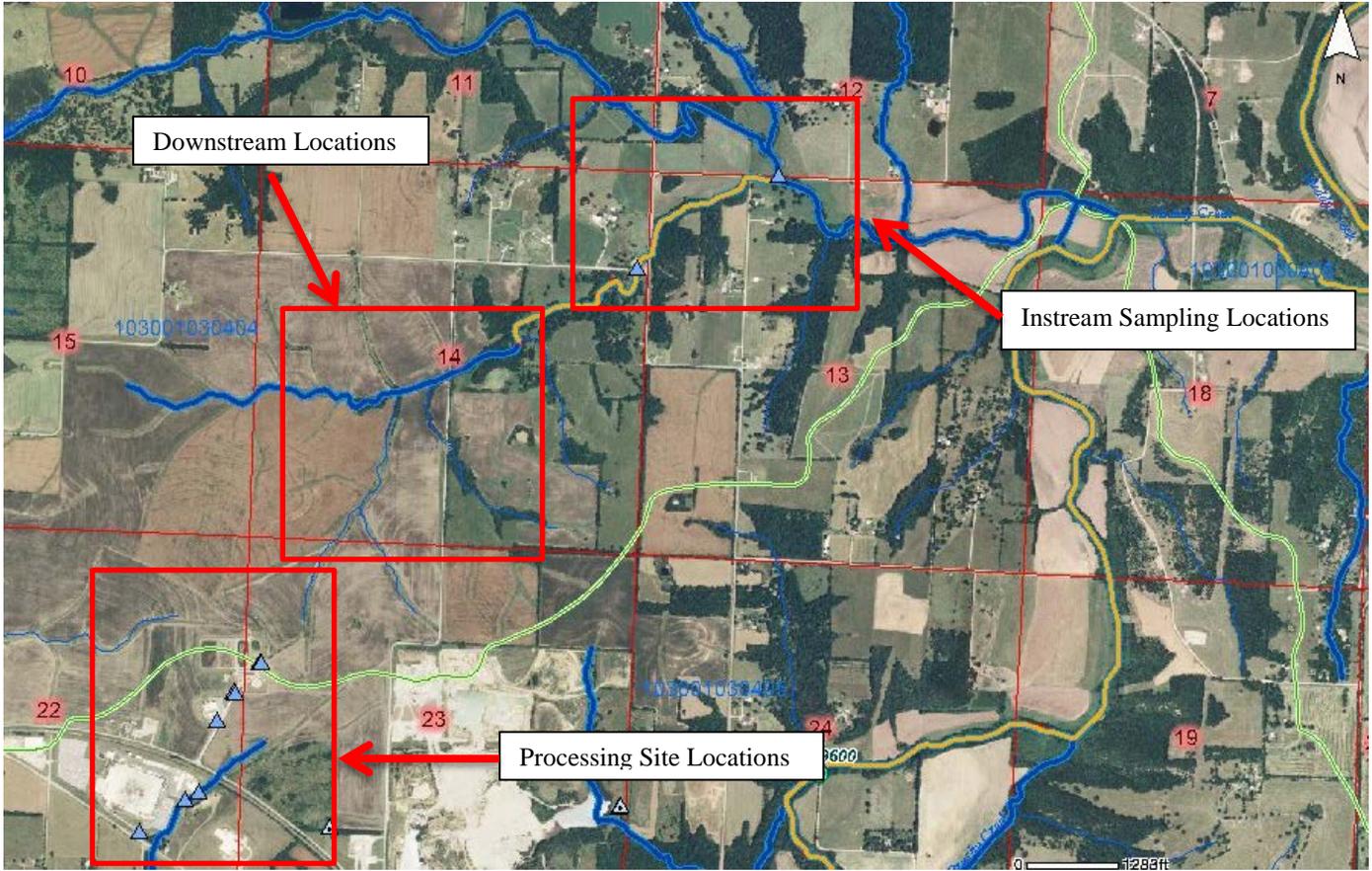
OUTFALL(S) TABLE:

PERMITTED FEATURE	OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	EFFLUENT TYPE
001	001	3.34	Secondary	Industrial
002	002	2.79	Best Management Practices (BMPs)	Stormwater
003	003	3.87	BMPs	Stormwater
004	004	1.93	BMPs	Stormwater
005	005	-	BMPs	Stormwater
006	006	0.20	BMPs	Stormwater
007	007	0.24	BMPs	Stormwater
008	008	0.06	BMPs	Stormwater
009	SM1	Instream Sampling		
010	SM2	Instream 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

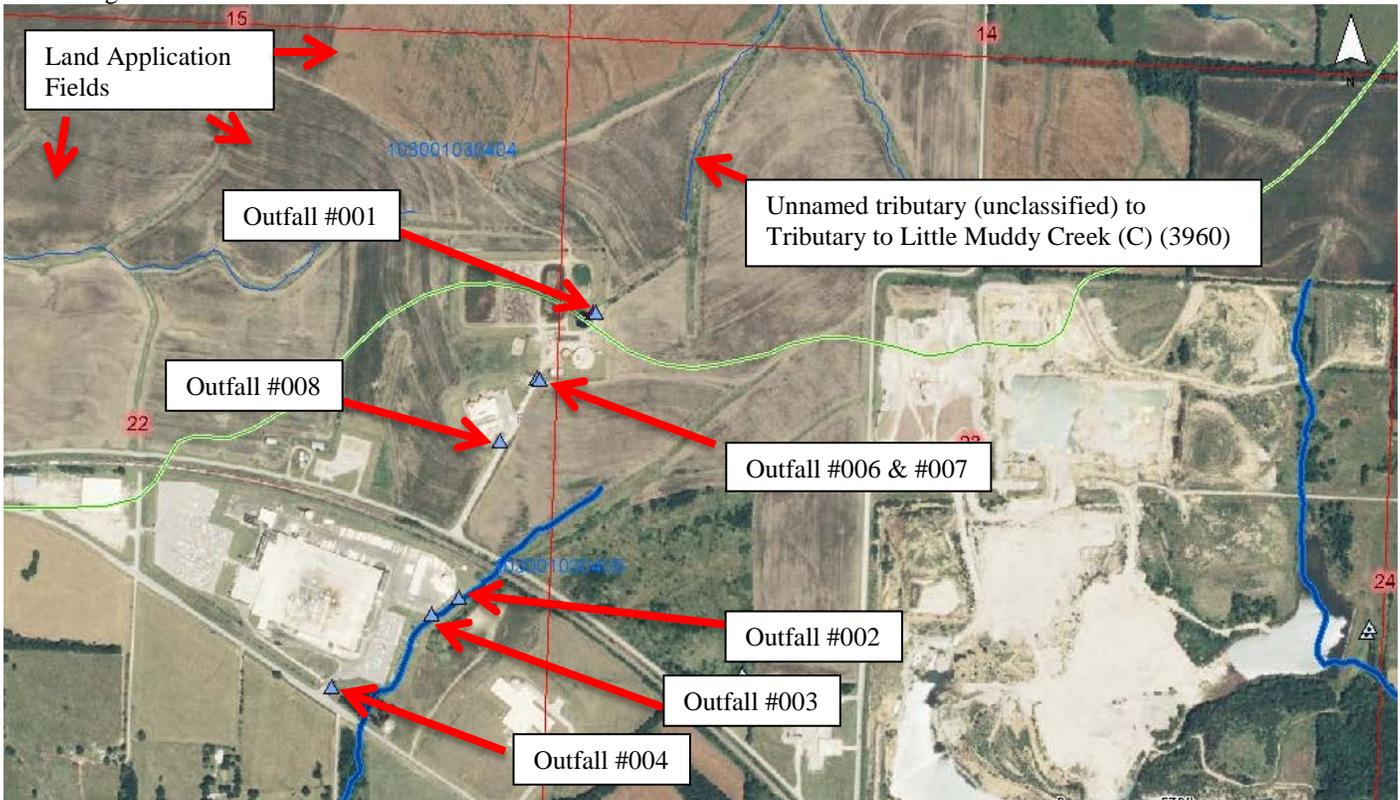
* PAN – Plant Available Nitrogen, sludge is land applied at agronomic rates based on crop type, acreage and soils.

Facility and Permitted Features Maps:

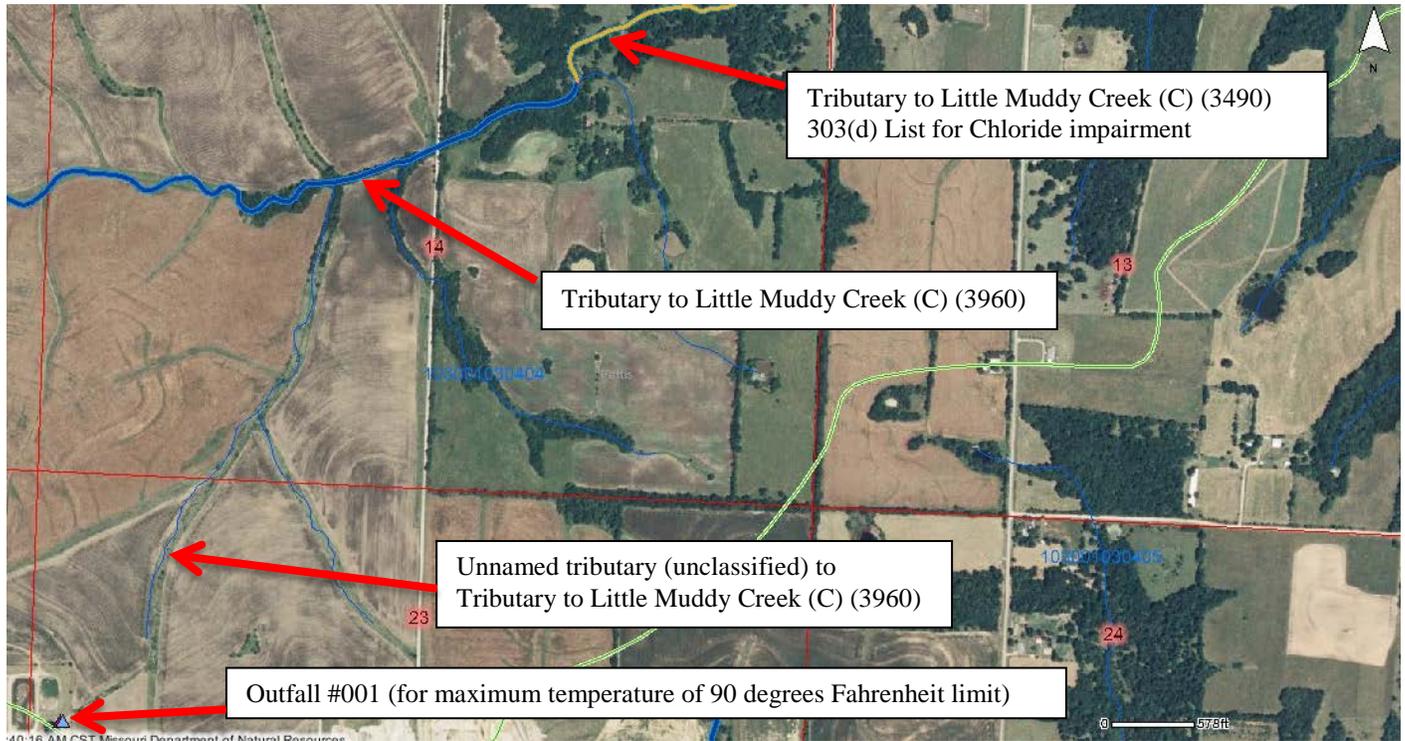
Permit Locations



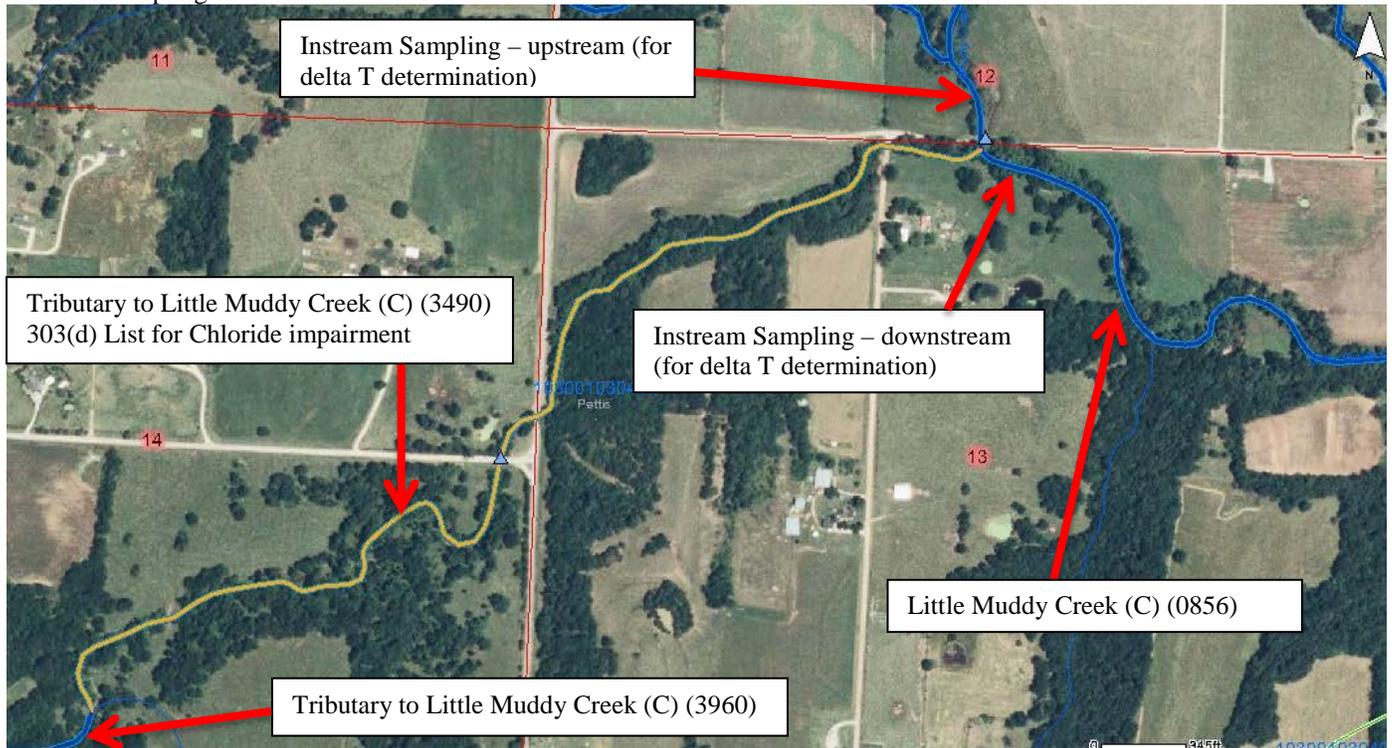
Processing Site Locations



Downstream Locations



Instream Sampling Locations



Facility Performance History & Comments:

The most recent routine site-inspection was conducted on June 13, 2013. The facility was found to be in compliance during the time of the inspection. However, the report from this inspection did note that the facility received 13 Letters of Warning (LOWs) for violating effluent limitations between May, 2009 and October, 2012.

Additionally, the facility has had difficulty complying with the requirement to not cause a change in temperature of 5 degrees Fahrenheit in the receiving stream in accordance with 10 CSR 20-7.031(5)(D) and the Total Maximum Daily Load (TMDL) determination discussed below. In order to return to compliance, the permittee submitted a 316(a) temperature variance request in 2008. After reviewing this initial submittal, the Department expressed concerns with the data that had been collected. The Department felt there was an inadequate amount of data to make a determination of the severity of the impact temperature fluctuation has on the aquatic life in the receiving stream. In 2010, the permittee developed a work plan for additional bioassessment, which contained a decision matrix for determining the use attainment of aquatic life in the receiving stream. In 2011, the permittee submitted this bioassessment work plan for Department review.

On April 22, 2014, the Department’s regional office staff conducted a Technical Assistance Visit (TAV) to review the sampling techniques being employed by the permittee for the instream temperature analyses. During this TAV, Department staff and the permittee agreed the sampling locations and method for collecting samples were not representative of the ambient stream conditions. On May 6, 2014, the Department and the permittee conducted a meeting to discuss this TAV and determine the best path forward to resolve this issue. It was decided that the Department would grant an additional year of temperature data collection, using representative sampling locations and sampling methods. These new instream sampling locations are listed in the permit. After a year’s worth of data has been collected, the Department and the permittee will meet again to determine if the facility is truly violating 10 CSR 20-7.031(5)(D). To the extent additional measures need to be taken to ensure the instream temperature does not fluctuate five degrees, the Department has developed a schedule for implementing certain control technologies to bring the facility into compliance.

For the reasons listed above, a new Schedule of Compliance (SOC) has been granted in the permit. This new SOC will allow the permittee to collect relevant and reliable data to determine compliance with instream temperature requirements. With better information and understanding of the situation, the Department has deemed the previous SOC invalid. That SOC has been voided and replaced with the new SOC.

The permittee/facility was under enforcement action between January 25, 2013 and June 4, 2014 due to violating water quality standards, causing pollution to water of the state and causing a fish kill. This was attributed to a drinking water line being severed. The facility is currently working with the Department to ensure the line is adequately fixed. This enforcement action will have no effect on this permit as it is not related to the wastewater treatment facility or Best Management Practices (BMPs) associated with stormwater control.

Part II – Receiving Stream Information

Receiving Water Body’s Water Quality

The Tributary to Little Muddy Creek (C) (3490) and Little Muddy Creek (C) (0856) are associated with a Total Maximum Daily Load (TMDL) determination for temperature. This TMDL identifies Tyson Foods, Inc. – Sedalia Processing Plant as the sole source of this temperature impairment. This temperature issue is being addressed in this permit. Please see the Facility Performance History & Comments section above for more details.

The Tributary to Little Muddy Creek (C) (3490) is on the 2012 EPA approved 303(d) List for chlorides. The source of this impairment has been identified as Tyson Foods, Inc. – Sedalia Processing Facility. This impairment has been addressed in the permit.

Currently, there are no stream surveys noted in the Department’s Water Quality Assessment System database. The Water Body Record for impairments is addressed in the TMDL discussed above.

APPLICABLE DESIGNATIONS OF WATERS OF THE STATE:

As per Missouri’s Effluent Regulations [10 CSR 20-7.015], the waters of the state are divided into the below listed seven (7) categories. Each category lists effluent limitations for specific parameters, which are presented in each outfall’s Effluent Limitation Table and further discussed in the Derivation & Discussion of Limits section.

- Missouri or Mississippi River [10 CSR 20-7.015(2)]:
- Lake or Reservoir [10 CSR 20-7.015(3)]:
- Lossing [10 CSR 20-7.015(4)]:
- Metropolitan No-Discharge [10 CSR 20-7.015(5)]:
- Special Stream [10 CSR 20-7.015(6)]:
- Subsurface Water [10 CSR 20-7.015(7)]:
- All Other Waters [10 CSR 20-7.015(8)]:

10 CSR 20-7.031 Missouri Water Quality Standards, the Department defines the Clean Water Commission water quality objectives in terms of "water uses to be maintained and the criteria to protect those uses." The receiving stream and 1st classified receiving stream's beneficial water uses to be maintained are located in the Receiving Stream Table located below in accordance with [10 CSR 20-7.031(3)].

RECEIVING STREAM(S) TABLE:

PERMITTED FEATURE #001 - OUTFALL #001

WATERBODY NAME	CLASS	WBID	DESIGNATED USES*	DISTANCE TO CLASSIFIED SEGMENT (MILES)	12-DIGIT HUC**
Unnamed tributary to Tributary to Little Muddy Creek	N/A	N/A	GEN	0.83 to segment 3960	10300103-0404
Tributary to Little Muddy Creek	C	3960	AQL, GEN, LWW, WBC-B		
Tributary to Little Muddy Creek	C	3490	AQL, GEN, LWW, WBC-B	1.19 to segment 3490	

* - Irrigation (IRR), Livestock & Wildlife Watering (LWW), Protection of Warm Water Aquatic Life and Human Health-Fish Consumption (AQL), Cool Water Fishery(CLF), Cold Water Fishery (CDF), Whole Body Contact Recreation (WBC), Secondary Contact Recreation (SCR), Drinking Water Supply (DWS), Industrial (IND), Groundwater (GRW), General (GEN). ** - Hydrologic Unit Code

PERMITTED FEATURE #002, #003, #004, #006, #007, #008 - OUTFALL #002, #003, #004, #006, #007, #008

WATERBODY NAME	CLASS	WBID	DESIGNATED USES*	PERMITTED FEATURE	DISTANCE TO CLASSIFIED SEGMENT (MILES)	12-DIGIT HUC**
Unnamed tributary to Muddy Creek	N/A	N/A	GEN	#002	0.00	10300103-0405
				#003	0.00	
				#004	0.03	
				#006	0.17	
				#007	0.17	
				#008	0.09	
Unnamed tributary to Muddy Creek	C	3960	AQL, GEN, LWW, WBC-B	N/A	N/A	
Muddy Creek	P	0853	AQL, GEN, LWW, WBC-B	N/A	N/A	

* - Irrigation (IRR), Livestock & Wildlife Watering (LWW), Protection of Warm Water Aquatic Life and Human Health-Fish Consumption (AQL), Cool Water Fishery(CLF), Cold Water Fishery (CDF), Whole Body Contact Recreation (WBC), Secondary Contact Recreation (SCR), Drinking Water Supply (DWS), Industrial (IND), Groundwater (GRW), General (GEN). ** - Hydrologic Unit Code

PERMITTED FEATURE #009, #010 – SM1 & SM2

WATERBODY NAME	CLASS	WBID	DESIGNATED USES*	PERMITTED FEATURE	DISTANCE TO CLASSIFIED SEGMENT	12-DIGIT HUC**
Little Muddy Creek	C	0856	AQL, GEN, LWW, WBC-B	#009	Upstream Location	10300103-0404
Little Muddy Creek	C	0856	AQL, GEN, LWW, WBC-B	#010	Downstream Location	

* - Irrigation (IRR), Livestock & Wildlife Watering (LWW), Protection of Warm Water Aquatic Life and Human Health-Fish Consumption (AQL), Cool Water Fishery(CLF), Cold Water Fishery (CDF), Whole Body Contact Recreation (WBC), Secondary Contact Recreation (SCR), Drinking Water Supply (DWS), Industrial (IND), Groundwater (GRW), General (GEN). ** - Hydrologic Unit Code

PERMITTED FEATURE #011 - #030 – LAND APPLICATION AREAS #1-17

WATERBODY NAME	CLASS	WBID	DESIGNATED USES*	PERMITTED FEATURE	DISTANCE TO CLASSIFIED SEGMENT	12-DIGIT HUC**
Unnamed tributary to Tributary to Little Muddy Creek	N/A	N/A	GEN	#011	Varies	10300103-0404
				#012	Varies	
				#013	Varies	
				#014	Varies	
Unnamed tributary to Muddy Creek	N/A	N/A	GEN	#014	Varies	10300103-0405
Unnamed tributary to Tributary to Little Muddy Creek	N/A	N/A	GEN	#015	Varies	10300103-0404
Unnamed tributary to Muddy Creek	N/A	N/A	GEN	#015	Varies	10300103-0405
Unnamed tributary to Tributary to Little Muddy Creek	N/A	N/A	GEN	#016	Varies	10300103-0404
				#017	Varies	
				#018	Varies	
Unnamed tributary to Muddy Creek	N/A	N/A	GEN	#018	Varies	10300103-0405
Unnamed tributary to Tributary to Little Muddy Creek	N/A	N/A	GEN	#019	Varies	10300103-0404
Unnamed tributary to Muddy Creek	N/A	N/A	GEN	#019	Varies	10300103-0405
Unnamed tributary to Tributary to Little Muddy Creek	N/A	N/A	GEN	#020	Varies	10300103-0404
				#021	Varies	
				#022	Varies	
				#023	Varies	
				#024	Varies	
				#025	Varies	
				#026	Varies	
				#027	Varies	
				#028	Varies	
				#029	Varies	
				#030	Varies	
Unnamed tributary to Muddy Creek	N/A	N/A	GEN	#030	Varies	10300103-0405

* - Irrigation (IRR), Livestock & Wildlife Watering (LWW), Protection of Warm Water Aquatic Life and Human Health-Fish Consumption (AQL), Cool Water Fishery (CLF), Cold Water Fishery (CDF), Whole Body Contact Recreation (WBC), Secondary Contact Recreation (SCR), Drinking Water Supply (DWS), Industrial (IND), Groundwater (GRW), General (GEN). ** - Hydrologic Unit Code

RECEIVING STREAM(S) LOW-FLOW VALUES TABLE:

PERMITTED FEATURE #001 - OUTFALL #001

RECEIVING STREAM (C, P)	LOW-FLOW VALUES (CFS)		
	1Q10	7Q10	30Q10
Unnamed tributary to Tributary to Little Muddy Creek	0.0	0.0	0.0

PERMITTED FEATURES #002, #003, #004, #006, #007, #008 - OUTFALL #002, #003, #004, #006, #007, #008

RECEIVING STREAM (C, P)	LOW-FLOW VALUES (CFS)		
	1Q10	7Q10	30Q10
Unnamed tributary to Muddy Creek	0.0	0.0	0.0

PERMITTED FEATURES #009 & #010 – SM1 & SM2

RECEIVING STREAM (C, P)	LOW-FLOW VALUES (CFS)		
	1Q10	7Q10	30Q10
Little Muddy Creek (C)	0.0	0.0	0.1

PERMITTED FEATURES #011 & #030 – LAND APPLICATION AREAS #1-#17

RECEIVING STREAM (C, P)	LOW-FLOW VALUES (CFS)		
	1Q10	7Q10	30Q10
Unnamed tributary to Tributary to Little Muddy Creek	0.0	0.0	0.0
Unnamed tributary to Muddy Creek	0.0	0.0	0.0

MIXING CONSIDERATIONS:

PERMITTED FEATURE #001 - OUTFALL #001

Mixing Zone: Not Allowed [10 CSR 20-7.031(4)(A)4.B.(I)(a)].
Zone of Initial Dilution: Not Allowed [10 CSR 20-7.031(4)(A)4.B.(I)(b)].

PERMITTED FEATURES #002, #003, #004, #006, #007, #008 - OUTFALL #002, #003, #004, #006, #007, #008

Mixing Zone: Not Allowed [10 CSR 20-7.031(4)(A)4.B.(I)(a)].
Zone of Initial Dilution: Not Allowed [10 CSR 20-7.031(4)(A)4.B.(I)(b)].

PERMITTED FEATURES #009 & #010 – SM1 & SM2

Permittee is monitoring instream temperature to determine compliance with 10 CSR 20-7.031(5)(D). The instream temperature limitations in the permit are not influence by mixing considerations.
Mixing Zone: Not Allowed [10 CSR 20-7.031(4)(A)4.B.(I)(a)].
Zone of Initial Dilution: Not Allowed [10 CSR 20-7.031(4)(A)4.B.(I)(b)].

PERMITTED FEATURES #011 & #030 – LAND APPLICATION AREAS #1-#17

Mixing Zone: Not Allowed [10 CSR 20-7.031(4)(A)4.B.(I)(a)].
Zone of Initial Dilution: Not Allowed [10 CSR 20-7.031(4)(A)4.B.(I)(b)].

Part III – Rationale and Derivation of Effluent Limitations & 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 does not discharge to a Losing Stream as defined by [10 CSR 20-2.010(36)] & [10 CSR 20-7.031(1)(N)], or is an existing facility.

ANTI-BACKSLIDING:

A provision in the Federal Regulations [CWA §303(d)(4); CWA §402(c); 40 CFR Part 122.44(I)] that requires a reissued permit to be as stringent as the previous permit with some exceptions.

- New facility, backsliding does not apply.

- All limits in this operating permit are at least as protective as those previously established; therefore, backsliding does not apply.

- Limitations in this operating permit for the reissuance of this permit conform to the anti-backsliding provisions of Section 402(o) of the Clean Water Act, and 40 CFR Part 122.44.

- The Department determines that technical mistakes or mistaken interpretations of law were made in issuing the permit under section 402(a)(1)(b).

In accordance with 40 CFR 432.112, effluent limitations shall be set at a Daily Maximum of 26 mg/L and a Monthly Average of 16 mg/L. The previous permit developed limits based on seasonal variation of BOD₅ in the discharge. There is no explanation in the previous permits or the most recent Water Quality and Anti-degradation Review of the reason for seasonal variation for this parameter. Seasonal variation is currently not being implemented for this parameter. Therefore, the permit writer has used best professional judgment to require compliance with the effluent limitations listed in 40 CFR 432.112.

Total Kjeldahl Nitrogen (TKN) and Nitrite + Nitrate Nitrogen are species of nitrogen associated with land application of either wastewater or sludge. TKN and Nitrite + Nitrate Nitrogen allow a permittee to determine how much nutrient uptake will occur depending upon applications to certain crops. The permittee does land apply sludge. It is not clear in the previous permits the reason for requiring monitoring for this parameter in the wastewater discharge. Any issues with discharges of excess nitrogen in the wastewater will be evaluated in the analysis of Total Nitrogen and Total Ammonia Nitrogen. Therefore, the permit writer has used best professional judgment to remove this requirement from the wastewater discharge. Specific requirements for the sludge land application system have been incorporated into the permit, including TKN and Nitrite + Nitrate Nitrogen monitoring in sludge samples.

The goal of the instream monitoring at SM1 & SM2 is to determine if the discharge is causing a change in the temperature by greater than 5 degree Fahrenheit. Although flow can impact rates of mixing, thus influencing temperature changes in the stream, the data collected at the former SM1 and SM2 monitoring locations did not allow the permittee or the Department to properly determine compliance with Delta T criterion. This permit established representative sampling locations for the permittee to measure upstream and downstream temperature, which will be used to determine compliance with 10 CSR 20-7.031(5)(D). Therefore, it is the permit writer's best professional judgment to revise the stream monitoring locations and the schedule of compliance associated with the Delta T criterion.

Due to the nature of the discharge from Outfalls #002, #003, #004, #006, #007 and #008, being stormwater, only a Daily Maximum effluent limitation or monitoring requirement will be implemented for each parameter listed in Table B-1 on page 13 of the permit. Stormwater events are acute occurrences that result in the greatest concentrations of pollutants being discharged in the first part of the runoff. This first flush can best be represented by a grab sample within the first hours of runoff. Additionally, stormwater events are highly variable. Recording a Monthly Average limit is not representative of the nature of these discharges. Additionally, the Department has determined that stormwater runoff from this site has no reasonable potential to exceed water quality standards. Thus, monitoring for temperature has been removed from these outfalls.

The extended Schedule of Compliance (SOC) granted in the permit is justified due to better information and understanding of the situation. It was determined that the permittee was sampling at locations that were not representative of the receiving stream conditions, and not relevant to the instream change in temperature requirements. Due to the lack of validity in the required sampling locations, the SOC was considered invalid. The new SOC has replaced the original SOC, which considered collection of quality data for review.

ANTIDegradation:

In accordance with Missouri’s Water Quality Standard [10 CSR 20-7.031(2)], the Department is to document by means of Antidegradation Review that the use of a water body’s available assimilative capacity is justified. Degradation is justified by documenting the socio-economic importance of a discharging activity after determining the necessity of the discharge.

- Renewal no degradation proposed and no further review necessary.

BIOSOLIDS & SEWAGE SLUDGE:

Biosolids are solid materials resulting from domestic wastewater treatment that meet federal and state criteria for beneficial uses (i.e. fertilizer). Sewage sludge is solids, semi-solids, 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 a 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. Additional information regarding biosolids and sludge is located at the following web address: <http://dnr.mo.gov/env/wpp/pub/index.html>, items WQ422 through WQ449.

- Permittee land applies biosolids in accordance with Standard Conditions III and a Department approved biosolids management plan.

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 permittee/facility is not currently under Water Protection Program enforcement action.

LAND APPLICATION SYSTEM:

The Missouri Soil Testing Association provides a list of accredited labs at <http://soilplantlab.missouri.edu/soil/msta.aspx>.

LAND APPLICATION REQUIREMENTS:

In accordance with [10 CSR 20 – 6.015(4)(C)], the permittee shall comply with all land application requirements to ensure protection of soils, crops, surface waters, groundwater, public health and the environment. Care must be taken to ensure proper application is occurring on the land application fields and proper nutrient loading rates are being applied to the land application fields.

NUTRIENT MANAGEMENT:

For more information or examples on calculating nitrogen application rates and PAN consult MU Guide 9186 Calculating Plant-Available Nitrogen and Residual Nitrogen Fertilizer Value in Manure.

Conversion Factors for laboratory testing results: [mg/L or mg/kg or ppm] x [conversion factor] = [pounds per Unit Volume]

<u>Unit Volume</u>	<u>Conversion Factors</u>
lbs./acre inch	0.226
lbs./1,000 gallons	0.0083
lbs./100 cubic feet	0.0062
lbs./ton (wet weight)	0.002

Oil and grease sludges with low nitrogen content, more than 20:1 Carbon to Nitrogen ratio, may require supplemental nitrogen application to provide proper decomposition of the oil content and prevent nitrogen deficiencies for the crop.

The Missouri P-Index is a tool to evaluate the potential for phosphorus loss from land application fields. It uses information from soil test phosphorus result, cropping practices, RUSLE, land cover, and distance to water to calculate a rating for phosphorus transport. The P-index is available at <http://www.nmplanner.missouri.edu/tools/>.

Agronomic rate can also be obtained by using the University of Missouri Extension online fertilizer recommendation calculator at <http://soilplantlab.missouri.edu/soil/scripts/manualentry.aspx>.

REASONABLE POTENTIAL ANALYSIS (RPA):

Federal regulation [40 CFR Part 122.44(d)(1)(i)] requires effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above narrative or numeric water quality standard.

In accordance with [40 CFR Part 122.44(d)(iii)] if the permit writer determines that any give pollutant has the reasonable potential to cause, or contribute to an in-stream excursion above the WQS, the permit must contain effluent limits for that pollutant.

Applicable; A RPA was conducted on appropriate parameters. Please see **APPENDIX A – RPA RESULTS**.

SCHEDULE OF COMPLIANCE (SOC):

A schedule of remedial measures included in a permit, including an enforceable sequence of interim requirements (actions, 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.

Applicable; The time given for effluent limitations of this permit listed under Interim Effluent Limitation and Final Effluent Limitations were established in accordance with [10 CSR 20-7.031(10)]. The facility has been given a schedule of compliance to meet final effluent limits for ammonia as N and the temperature cap of 90°F at Outfall #001 and to meet final instream limits for temperature (Delta T of 5 °F) at SM1 & SM2. The permittee has been granted a three year schedule for ammonia as N. The permittee has already installed and employed the use of mechanical treatment technologies to meet ammonia as N limitations. The three years will provide the permittee time to make any necessary operational or maintenance adjustments to ensure consistent compliance with the new effluent limitations. The permittee has been granted a five year schedule of compliance to evaluate and install technology to meet all temperature requirements (cap of 90°F and instream Delta T of 5 °F). This will allow the permittee to collect representative samples of ambient stream temperature to be able to accurately determine if the discharge impacts the fluctuations in stream temperature. It will provide time for the permittee to install and employ certain control technologies in order to attain compliance with the final temperature limits. The permit writer did not grant a SOC for *E. coli* limits because the permittee already disinfects to meet *Fecal Coliform* limits. The permit writer did not grant a SOC for the temperature cap as the facility has been identified as the source of the temperature impairment discussed in the TMDL for Little Muddy Creek and Tributary to Little Muddy Creek.

STORM WATER POLLUTION PREVENTION PLAN (SWPPP):

In accordance with 40 CFR 122.44(k) *Best Management Practices (BMPs)* to control or abate the discharge of pollutants when: (1) Authorized under section 304(e) of the Clean Water Act (CWA) for the control of toxic pollutants and hazardous substances from ancillary industrial activities; (2) Authorized under section 402(p) of the CWA for the control of storm water 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*, (Document number EPA 833-B-09-002) [published by the United States Environmental Protection Agency (USEPA) in February 2009], BMPs are measures or practices used to reduce the amount of pollution entering (regarding this operating permit) waters of the state. BMPs may take the form of a process, activity, or physical structure.

Additionally in accordance with the Storm Water 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.

Applicable; A SWPPP shall be developed and implemented for each site and shall incorporate required practices identified by the Department with jurisdiction, incorporate erosion control practices specific to site conditions, and provide for maintenance and adherence to the plan.

SPILL REPORTING:

Per 10 CSR 24-3.010, 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.

VARIANCE:

As 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 shall be 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.

Not Applicable; This operating permit is not drafted under premises of a petition for variance. Please see the Schedule of Compliance section and the facility history section for explanation of plan of action regarding the 316(a) Thermal Variance request noted in the previous permit factsheet.

WASTELOAD ALLOCATIONS (WLA) FOR LIMITS:

As per [10 CSR 20-2.010(78)], the amount of pollutant each discharger is allowed by the Department to release into a given stream after the Department has determined total amount of pollutant that may be discharged into that stream without endangering its water quality.

Applicable; Wasteload allocations were calculated where applicable using water quality criteria or water quality model results and the dilution equation below:

$$C = \frac{(C_s \times Q_s) + (C_e \times Q_e)}{(Q_e + Q_s)} \quad (\text{EPA/505/2-90-001, Section 4.5.5})$$

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

Chronic wasteload allocations 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). Acute wasteload allocations 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).

Water quality based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA’s “Technical Support Document For Water Quality-based Toxics Control” (EPA/505/2-90-001).

Number of Samples “n”:

Additionally, in accordance with the TSD for water quality-based permitting, effluent quality is determined by the underlying distribution of daily values, which is 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 distribution or treatment performance, which should be, at a minimum, be targeted to comply with the values dictated by the WLA. Therefore, it is recommended that the actual planned frequency of monitoring normally 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 using an assumed number of samples is “n = 4” at a minimum. For Total Ammonia as Nitrogen, “n = 30” is used.

WLA MODELING:

There are two general types of effluent limitations, technology-based effluent limits (TBELs) and water quality based effluent limits (WQBELs). If TBELs do not provide adequate protection for the receiving waters, then WQBEL must be used.

Not Applicable; A WLA study was either not submitted or determined not applicable by Department staff.

WATER QUALITY STANDARDS:

Per [10 CSR 20-7.031(3)], General Criteria shall be applicable to all waters of the state at all times including mixing zones. Additionally, [40 CFR 122.44(d)(1)] directs the Department to establish in each NPDES permit to include conditions to achieve water quality established under Section 303 of the Clean Water Act, including State narrative criteria for water quality.

WHOLE EFFLUENT TOXICITY (WET) TEST:

A WET test is a quantifiable method of determining if a discharge from a facility may be causing toxicity to aquatic life by itself, in combination with or through synergistic responses when mixed with receiving stream water.

Applicable;

Under the federal Clean Water Act (CWA) §101(a)(3), requiring WET testing is reasonably appropriate for site-specific Missouri State Operating Permits for discharges to waters of the state issued under the National Pollutant Discharge Elimination System (NPDES). WET testing is also required by 40 CFR 122.44(d)(1). WET testing ensures that the provisions in the 10 CSR 20-6.010(8)(A)7. and the Water Quality Standards 10 CSR 20-7.031(3)(D),(F),(G),(I)2.A & B are being met. Under [10 CSR 20-6.010(8)(A)4], the Department may require other terms and conditions that it deems necessary to assure compliance with the Clean Water Act and related regulations of the Missouri Clean Water Commission. In addition the following MCWL apply: §§644.051.3 requires the Department to set permit conditions that comply with the MCWL and CWA; 644.051.4 specifically references toxicity as an item we must consider in writing permits (along with water quality-based effluent limits, pretreatment, etc...); and 644.051.5 is the basic authority to require testing conditions. WET test will be required by all facilities meeting the following criteria:

- Facility is a designated Major.
- Facility continuously or routinely exceeds its design flow.
- Facility that exceeds its design population equivalent (PE) for BOD₅ whether or not its design flow is being exceeded.
- Facility (whether primarily domestic or industrial) that alters its production process throughout the year.
- Facility handles large quantities of toxic substances, or substances that are toxic in large amounts.
- Facility has Water Quality-based Effluent Limitations for toxic substances (other than NH₃)
- Facility is a municipality with a Design Flow ≥ 22,500 gpd.
- Other – please justify.

303(d) LIST & TOTAL MAXIMUM DAILY LOAD (TMDL):

Section 303(d) of the federal Clean Water Act requires that each state identify waters that are 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 waters that are impaired but not addressed by normal water pollution control programs.

A TMDL is a calculation of the maximum amount of a given pollutant that a body of water can absorb before its water quality is affected. If a water body is determined to be impaired as listed on the 303(d) list, then a watershed management plan will be developed that shall include the TMDL calculation.

Applicable;

Tributary to Little Muddy Creek (C) (3490) and Little Muddy Creek (C) (0856) are not currently listed on the Missouri 303(d) List. However, a TMDL has been established for temperature on these streams, with the pollutant source being this facility.

Tributary to Little Muddy Creek (C) (3490) is listed on the 2006 Missouri 303(d) List for chloride.

- This facility is considered to be a source of or has the potential to contribute to the above listed pollutant(s). A TMDL for the temperature has been developed and is considered in this permit. Once a TMDL is developed for chloride, the permit will be modified to include WLAs from the TMDL.

Part IV –2013 Water Quality Criteria for Ammonia

Upcoming changes to the Water Quality Standard for ammonia may require significant upgrades to wastewater treatment facilities.

On August 22, 2013, the U.S. Environmental Protection Agency (EPA) finalized new water quality criteria for ammonia, based on toxicity studies of mussels and gill breathing snails. Missouri's current ammonia criteria are based on toxicity testing of several species, but did not include data from mussels or gill breathing snails. Missouri is home to 69 of North America's mussel species, which are spread across the state. According to the Missouri Department of Conservation nearly two-thirds of the mussel species in Missouri are considered to be "of conservation concern". Nine species are listed as federally endangered, with an additional species currently proposed as endangered and another species proposed as threatened.

The adult forms of mussels which are seen in rivers, lakes, and streams are sensitive to pollutants because they are sedentary filter feeders. They vacuum up many pollutants with the food they bring in and cannot escape to new habitats, so they can accumulate toxins in their bodies and die. But very young mussels, called glochidia, are exceptionally sensitive to ammonia in water. As a result of a citizen suit, the EPA was compelled to conduct toxicity testing and develop ammonia water quality criteria that would be protective if young mussels may be present in a waterbody. These new criteria will apply to any discharge with ammonia levels that may pose a reasonable potential to violate the standards. Nearly all discharging domestic wastewater treatment facilities (cities, subdivisions, mobile home parks, etc.), as well as certain industrial and stormwater dischargers with ammonia in their effluent, will be affected by this change in the regulations.

When new water quality criteria are established by the EPA, states must adopt them into their regulations in order to keep their authorization to issue permits under the National Pollutant Discharge Elimination System (NPDES). States are required to review their water quality standards every three years, and if new criteria have been developed they must be adopted. States may be more protective than the Federal requirements, but not less protective. Missouri does not have the resources to conduct the studies necessary for developing new water quality standards, and therefore our standards mirror those developed by the EPA; however, we will utilize any available flexibility based on actual species of mussels that are native to Missouri and their sensitivity to ammonia.

Many treatment facilities in Missouri are currently scheduled to be upgraded to comply with the current water quality standards. But these new ammonia standards may require a different treatment technology than the one being considered by the permittee. It is important for permittees discuss any new and upcoming requirements with their consulting engineers to ensure their treatment systems are capable of complying with the new requirements. The Department encourages permittees to construct treatment technologies that can attain effluent quality that supports the EPA ammonia criteria.

Ammonia toxicity varies by temperature and by pH of the water. Assuming a stable pH value, but taking into account winter and summer temperatures, Missouri includes two seasons of ammonia effluent limitations. Current effluent limitations in this permit are:

Summer – 2.5 mg/L daily maximum, 1.4 mg/L monthly average.

Winter – 10.1 mg/L daily maximum, 2.7 mg/L monthly average.

Under the new EPA criteria, where mussels of the family Unionidae are present or expected to be present, the estimated effluent limitations for a facility in a location such as this that discharges to a receiving stream with no mixing will be:

Summer – 1.7 mg/L daily maximum, 0.6 mg/L monthly average.

Winter – 5.6 mg/L daily maximum, 2.1 mg/L monthly average.

Actual effluent limits will depend in part on the actual performance of the facility.

Operating permits for facilities in Missouri must be written based on current statutes and regulations. Therefore permits will be written with the existing effluent limitations until the new standards are adopted. To aid permittees in decision making, an advisory will be added to permit Fact Sheets notifying permittees of the expected effluent limitations for ammonia. When setting schedules of compliance for ammonia effluent limitations, consideration will be given to facilities that have recently constructed upgraded facilities to meet the current ammonia limitations.

For more information on this topic feel free to contact the Missouri Department of Natural Resources, Water Protection Program, Water Pollution Control Branch, Operating Permits Section at (573) 751-1300.

Part V – Effluent Limits Determination

Outfall #001 – Main Facility Outfall

Effluent limitations derived and established in the below Effluent Limitations Table are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supersede the terms and conditions, including effluent limitations, of this operating permit.

The following effluent limitations have been derived from a combination of state and federal regulations. State regulations [10 CSR 20-7] detail water quality standards being implemented in the State of Missouri. Federal regulations [40 CFR 432] detail effluent limitations for poultry processing facilities. In accordance with 40 CFR 122.44(b)(1) and 40 CFR 122.44(d) the permit must contain the most stringent requirement for a parameter. Therefore, the permit writer has chosen the more stringent requirement for each parameter and has cited the regulation under each derivation discussion below.

EFFLUENT LIMITATIONS TABLE:

PARAMETER	UNIT	Basis for Limits	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
FLOW	MGD	1	*		*	NO	*/*
BOD ₅	MG/L	1	26		16	YES	SUMMER - 10/* WINTER - 15/*
TSS	MG/L	1	30		20	NO	30/20
PH	SU	1	6.5-9.0		6.5-9.0	NO	6.5-9.0
ESCHERICHIA COLI	***	1, 3	1030		206	YES	FECAL 400/*
CHLORINE, TOTAL RESIDUAL	MG/L	1, 3	0.017		0.008	NO	0.017/0.008
CHLORIDE	MG/L	1, 3, 6	*		*	YES	****
DISSOLVED OXYGEN**	MG/L	1, 6	*		*	YES	****
OIL & GREASE (MG/L)	MG/L	1	14		8	NO	14/8
TEMPERATURE	°F	1	90		*	YES	*/*
TOTAL NITROGEN	MG/L	1	147		103	NO	147/103
AMMONIA AS N (APRIL 1 – SEPT 30)	MG/L	2, 3, 5	2.5		1.4	YES	3.6/1.6
AMMONIA AS N (OCT 1 – MARCH 31)	MG/L	2, 3, 5	10.1		2.7	YES	7.5/3.3
TOTAL KJEHLDAHL NITROGEN	MG/L	6	*****		*****	YES	*/*
NITRITE + NITRATE NITROGEN	MG/L	6	*****		*****	YES	*/*
WHOLE EFFLUENT TOXICITY (WET) TEST	TU _a	8	*			YES	PASS/FAIL

* - Monitoring requirement only.

** - For DO the Daily Maximum is a Daily Minimum and the Monthly Average is a Monthly Average Minimum.

*** - # of colonies/100mL; the Monthly Average for *E. coli* is a geometric mean.

**** - Parameter not established in previous state operating permit.

***** - Parameter removed from state operating permit.

Basis for Limitations Codes:

- | | |
|--|-----------------------------------|
| 1. State or Federal Regulation/Law | 5. Water Quality Model |
| 2. Water Quality Standard (includes RPA) | 6. Best Professional Judgment |
| 3. Water Quality Based Effluent Limits | 7. TMDL or Permit in lieu of TMDL |
| 4. Antidegradation Review/Policy | 8. WET Test Policy |

OUTFALL #001 – DERIVATION AND DISCUSSION OF LIMITS:

- **Flow.** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the Department, which may require the submittal of an operating permit modification.
- **Biochemical Oxygen Demand (BOD₅).** In accordance with 40 CFR 432.112, effluent limitations shall be set at a Daily Maximum of 26 mg/L and a Monthly Average of 16 mg/L. The previous permit developed limits based on seasonal variation of BOD₅ in the discharge. There is no explanation in the previous permits or the most recent Water Quality and Anti-degradation Review of the reason for seasonal variation for this parameter. Seasonal variation is currently not being implemented for this parameter. Therefore, the permit writer has used best professional judgment to require compliance with the effluent limitations listed in 40 CFR 432.112. After reviewing the facility performance history, in the form of Discharge Monitoring Reports (DMRs) submitted to the Department, the technology currently being employed has proven to be capable of meeting these limits. The data ranges from 1.9 to 14 mg/L.
- **Total Suspended Solids (TSS).** In accordance with 40 CFR 432.112, effluent limitations shall be set at a Daily Maximum of 30 mg/L and a Monthly Average of 20 mg/L. Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of these standards. After reviewing the facility performance history, in the form of Discharge Monitoring Reports (DMRs) submitted to the Department, the technology currently being employed has proven to be capable of meeting these limits. Therefore, effluent limitations have been retained from previous state operating permit. The data ranges from 2.2 to 20 mg/L.
- **pH.** – 6.5-9.0 SU. Technology based effluent limitations of 6.0-9.0 SU [10 CSR 20-7.015] are not protective of the Water Quality Standard, which states that water contaminants shall not cause pH to be outside the range of 6.5-9.0 SU. No mixing zone is allowed due to the classification of the receiving stream, therefore the water quality standard must be met at the outfall.
- **Escherichia coli (E. coli).** Monthly average of 206 per 100 ml as a geometric mean and Daily Maximum of 1030 during the recreational season (April 1 – October 31), to protect Whole Body Contact Recreation (B) designated use of the receiving stream, as per 10 CSR 20-7.031(4)(C). An effluent limit for both monthly average and daily maximum is required by 40 CFR 122.45(d).

E. coli was established as a water quality based effluent limitation in accordance with 10 CSR 20-7.031(4)(C).

- **Fecal Coliform.** Effluent limitations from the previous state operating permit have been reassessed and determined to be in compliance with current federal effluent limitation guidelines for meat and poultry processing facilities. Therefore, the permit writer has used best professional judgment to continue a daily maximum of 400 most probable number (MPN)/100mL and monitoring only for the monthly average.

Fecal Coliform was continued as an effluent limitation guideline in accordance with 40 CFR 432.112 & 432.122.

- **Total Residual Chlorine (TRC).** Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream's Water Quality. In addition to no mixing allowance, a minimum quantification level of 130 µg/L has been established. Previous performance data reported below the ML cannot be used to accurately characterize the waste stream, therefore default assumptions apply. Warm-water Protection of Aquatic Life CCC = 10 µg/L, CMC = 19 µg/L [10 CSR 20-7.031, Table A]. Background TRC = 0.0 µg/L.

Chronic WLA: $C_e = ((3.34 + 0.0)10 - (0.0 * 0.0))/3.34$
 $C_e = 10 \mu\text{g/L}$

Acute WLA: $C_e = ((3.34 + 0.0)19 - (0.0 * 0.0))/3.34$
 $C_e = 19 \mu\text{g/L}$

$LTA_c = 10 (0.527) = 5.3 \mu\text{g/L}$
 $LTA_a = 19 (0.321) = 6.1 \mu\text{g/L}$

[CV = 0.6, 99th Percentile]
[CV = 0.6, 99th Percentile]

Use most protective number of LTA_c or LTA_a.

MDL = 5.3 (3.11) = 16.5 µg/L
AML = 5.3 (1.55) = 8.2 µg/L

[CV = 0.6, 99th Percentile]
[CV = 0.6, 95th Percentile, n = 4]

- **Chloride.** This parameter is a pollutant causing impairment to the receiving stream, with this facility identified as the source. Due to lack of data, the permit writer cannot accurately calculate effluent limitations for this parameter. Therefore, it is the permit writer’s best professional judgment to require monitoring only during this permit cycle in order to collect sufficient data for analysis. During the following permit renewal, the data will be used to determine reasonable potential to exceed applicable water quality standards.
- **Dissolved Oxygen.** Dechlorination systems impact the available dissolved oxygen in the receiving stream. Therefore, it is the permit writer’s best professional judgment to require monitoring only for this parameter. Monitoring for dissolved oxygen is included to determine whether the discharge has a reasonable potential to exceed water quality standards.
- **Oil & Grease.** In accordance with 40 CFR 432.112, effluent limitations shall be set at a Daily Maximum of 14 mg/L and a Monthly Average of 8 mg/L. Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of these standards. After reviewing the facility performance history, in the form of Discharge Monitoring Reports (DMRs) submitted to the Department, the technology currently being employed has proven to be capable of meeting these limits. The data ranges from 0.9 to 2.0 mg/L.
- **Temperature.** In accordance with 10 CSR 20-7.031(4)(D) and (G), the permit writer is using best professional judgment to apply a limit for this parameter at the discharge point. Discharges shall not contain substances or conditions in sufficient amounts to cause toxicity in aquatic life and shall not cause physical changes that will impair the natural biological community. In order to protect the general criteria referenced above, a limit of ninety degrees Fahrenheit (90 °F) will be applied to the permit. This is the temperature at which conditions result in toxicity to aquatic life and these physical changes can impair stream habitat and the nature biological community. Additionally, the receiving stream has a TMDL for temperature impairment. This limit is consistent with TMDL implementation.
- **Total Nitrogen.** In accordance with 40 CFR 432.113, effluent limitations shall be set at a Daily Maximum of 147 mg/L and a Monthly Average of 103 mg/L. Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of these standards. Therefore, effluent limitations have been carried over from the previous permit.
- **Total Ammonia Nitrogen.** The Environmental Protection Agency (EPA) has set effluent limitation guidelines (ELGs) for poultry processing facilities, which include this parameter. Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(4)(B)7.C. & Table B3] default pH 7.8 SU. Background total ammonia nitrogen = 0.01 mg/L. No mixing considerations allowed; therefore, WLA is the appropriate criterion.

Season	Temp (°C)	pH (SU)	Total Ammonia Nitrogen CCC (mg/L)	Total Ammonia Nitrogen CMC (mg/L)
Summer	26	7.8	1.5	12.1
Winter	6	7.8	3.1	12.1

Summer: April 1 – September 30

Chronic WLA: $C_e = ((3.34 + 0.0)1.5 - (0.0 * 0.01))/3.34$
 $C_e = 1.5 \text{ mg/L}$

Acute WLA: $C_e = ((3.34 + 0.0)12.1 - (0.0 * 0.01))/3.34$
 $C_e = 12.1 \text{ mg/L}$

$LTA_c = 1.5 \text{ mg/L} (0.881) = \mathbf{1.32 \text{ mg/L}}$
 $LTA_a = 12.1 \text{ mg/L} (0.526) = 6.37 \text{ mg/L}$

[CV = 0.3, 99th Percentile, 30 day avg.]
 [CV = 0.3, 99th Percentile]

Use most protective number of LTA_c or LTA_a .

MDL = 1.32 mg/L (1.90) = 2.5 mg/L
 AML = 1.32 mg/L (1.09) = 1.4 mg/L

[CV = 0.3, 99th Percentile]
 [CV = 0.3, 95th Percentile, n = 30]

Winter: October 1 – March 31

Chronic WLA: $C_e = ((3.34 + 0.0)3.1 - (0.0 * 0.01))/3.34$
 $C_e = 3.1 \text{ mg/L}$

Acute WLA: $C_e = ((3.34 + 0.0)12.1 - (0.0 * 0.01))/3.34$
 $C_e = 12.1 \text{ mg/L}$

$LTA_c = 3.1 \text{ mg/L} (0.668) = \mathbf{2.07 \text{ mg/L}}$

[CV = 1.0, 99th Percentile, 30 day avg.]

$LTA_a = 12.1 \text{ mg/L} (0.205) = 2.48 \text{ mg/L}$

[CV = 1.0, 99th Percentile]

Use most protective number of LTA_c or LTA_a .

$MDL = 2.07 \text{ mg/L} (4.88) = 10.1 \text{ mg/L}$

[CV = 1.0, 99th Percentile]

$AML = 2.07 \text{ mg/L} (1.32) = 2.7 \text{ mg/L}$

[CV = 1.0, 95th Percentile, n =30]

- **Total Kjehldahl Nitrogen.** TKN is a species of nitrogen associated with land application of either wastewater or sludge. TKN allows a permittee to determine how much nutrient uptake will occur depending upon applications to certain crops. The permittee does land apply sludge. However, nutrient management for sludge should comply with requirements from Standard Conditions Part III. It is not clear in the previous permits the reason for requiring monitoring for this parameter in the wastewater discharge. Any issues with discharges of excess nitrogen in the wastewater will be evaluated in the analysis of Total Nitrogen and Total Ammonia Nitrogen. Therefore, the permit writer has used best professional judgment to remove this requirement from the permit.
- **Nitrite + Nitrate Nitrogen.** Nitrite + Nitrate is a species of nitrogen associated with land application of either wastewater or sludge. Nitrite + Nitrate allows a permittee to determine how much nutrient uptake will occur depending upon applications to certain crops. The permittee does land apply sludge. However, nutrient management for sludge should comply with requirements from Standard Conditions Part III. It is not clear in the previous permits the reason for requiring monitoring for this parameter in the wastewater discharge. Any issues with discharges of excess nitrogen in the wastewater will be evaluated in the analysis of Total Nitrogen and Total Ammonia Nitrogen. Therefore, the permit writer has used best professional judgment to remove this requirement from the permit.
- **WET Test.** WET Testing schedules and intervals are established in accordance with the Department’s Permit Manual; Section 5.2 *Effluent Limits / WET Testing for Compliance Bio-monitoring*. It is recommended that WET testing be conducted during the period of lowest stream flow.
 - Acute
 - No less than **ONCE/YEAR:**
 - Facility is designated as a Major facility or has a design flow ≥ 1.0 MGD.
 - Facility continuously or routinely exceeds their design flow.
 - Facility exceeds its design population equivalent (PE) for BOD₅ whether or not its design flow is being exceeded.
 - Facility has Water Quality-based effluent limitations for toxic substances (other than NH₃).

Minimum Sampling and Reporting Frequency Requirements.

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
Flow	once/day	once/month
BOD ₅	twice/week	once/month
TSS	twice/week	once/month
pH	twice/week	once/month
<i>E. coli</i>	twice/week	once/month
<i>Fecal Coliform</i>	twice/week	once/month
Total Residual Chlorine	twice/week	once/month
Chloride	twice/week	once/month
Oil & Grease	twice/week	once/month
Temperature	once/day	once/month
Total Nitrogen	twice/week	once/month
Ammonia as N	twice/week	once/month

Sampling Frequency Justification:

Sampling and Reporting Frequency was retained from previous permit. These frequencies were established in the Water Quality and Anti-degradation Review completed in 2011. Due to the size of the facility and the nature of the discharge, the permit writer has used best professional judgment to continue these frequencies to ensure adequate protection of water quality.

Sampling Type Justification

Sampling Type was retained from the previous permit. Due to the size of the facility and the type of technology being employed, the permit writer has used best professional judgment to continue requiring sample types as they have been established in the previous permit. As per 10 CSR 20-7.015, BOD₅, TSS, Total Nitrogen and WET test samples collected for mechanical plants shall be a 24 hour composite sample. Grab samples, however, must be collected for pH, Ammonia as N, *E. coli*, TRC, chloride, Oil & Grease, and Temperature. This is due to the holding time restriction for *E. coli*, the volatility of Ammonia and TRC, and the fact that pH and temperature cannot be preserved and must be sampled in the field. As Ammonia and Oil & Grease samples must be immediately preserved with acid, these samples are to be collected as a grab.

SM1 & SM2 – Instream monitoring locations to determine compliance with 10 CSR 20-7.031(5)(D), not to exceed a change in temperature of ± 5 °F in the receiving stream.

Effluent limitations derived and established in the below Effluent Limitations Table are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supersede the terms and conditions, including effluent limitations, of this operating permit.

EFFLUENT LIMITATIONS TABLE:

PARAMETER	UNIT	Basis for Limits	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
FLOW	MGD	1	*****		****	NO	*/*
TEMPERATURE (DELTA T OF 5°F)	°F	1, 6	± 5		*	YES	*/*
TEMPERATURE (CAP)	°F	1, 6	*****		*****	YES	90/90

* - Monitoring requirement only.

** - For DO the Daily Maximum is a Daily Minimum and the Monthly Average is a Monthly Average Minimum.

*** - # of colonies/100mL; the Monthly Average for *E. coli* is a geometric mean.

**** - Parameter not previously established in previous state operating permit.

***** - Parameter removed from state operating permit.

Basis for Limitations Codes:

- | | |
|--|-----------------------------------|
| 1. State or Federal Regulation/Law | 5. Water Quality Model |
| 2. Water Quality Standard (includes RPA) | 6. Best Professional Judgment |
| 3. Water Quality Based Effluent Limits | 7. TMDL or Permit in lieu of TMDL |
| 4. Antidegradation Review/Policy | 8. WET Test Policy |

SM1 & SM2 – DERIVATION AND DISCUSSION OF LIMITS:

- **Flow.** The goal of the instream monitoring is to determine if the discharge is causing a change in the temperature by greater than 5 degree Fahrenheit. Although flow can impact rates of mixing, thus influencing temperature changes in the stream, collecting this data provides little use to measuring the temperature at each stream monitoring location. The temperature is to be measured at each location, which will be used to determine compliance with 10 CSR 20-7.031(4)(D). Therefore, it is the permit writer’s best professional judgment to remove this parameter from these stream monitoring locations.
- **Temperature (Delta T of 5°F).** In accordance with 10 CSR 20-7.031(4)(D), for warm water habitats beyond the mixing zone, water contaminant sources and physical alteration of the water course shall not raise or lower the temperature of a stream more than five degrees Fahrenheit (5 °F) or two and seven-ninths degrees Celsius (2 7/9 °C). In order to reduce confusion and duplicative monitoring or reporting requirements, the permit will only require that temperature be monitored and reported in degrees Fahrenheit. It is not necessary to report in both Celsius and Fahrenheit. Additionally, the receiving stream has a TMDL for temperature impairment. This limit is consistent with TMDL implementation.
- **Temperature (Cap).** The temperature effluent limitation has been implemented on the Tributary to Little Muddy Creek (C) (3490). The discharge flows approximately 2.15 miles into the Little Muddy Creek (C) (0856). Due to the fact that this temperature cap is being implemented on the receiving stream and if the facility is in compliance from the discharge point, it can be assumed that the distance will allow time for the temperature to equilibrate. Thus, an excursion above 90 °F at these stream monitoring locations is unlikely. Therefore, it is the permit writer’s best professional judgment to remove this parameter from these stream monitoring locations.

Minimum Sampling and Reporting Frequency Requirements.

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
Temperature (Delta T of 5 °F)	once/day	once/month

Sampling Frequency Justification:

Sampling and Reporting Frequency were retained from previous permit. Due to the compliance issue and extended schedule to obtain sufficient data to determine the severity of the impact the discharge has on the temperature fluctuation in the Little Muddy Creek (C), the permit writer has used best professional judgment to continue this frequency.

Sampling Type Justification

Sampling Type was retained from the previous permit. Temperature must be measured instream, therefore will be identified as a grab sample.

Outfall #002, #003, #004, #006, #007, #008 – Stormwater Outfalls

Effluent limitations derived and established in the below Effluent Limitations Table are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supersede the terms and conditions, including effluent limitations, of this operating permit.

Due to the nature of the discharges from these outfalls being stormwater, only a Daily Maximum effluent limitation or monitoring requirement will be implemented for each parameter listed below. Stormwater events are acute occurrences that result in the greatest concentrations of pollutants being discharged in the first part of the runoff. This first flush can best be represented by a grab sample within the first hours of runoff. Additionally, stormwater events are highly variable. Recording a Monthly Average limit is not representative of the nature of these discharges.

EFFLUENT LIMITATIONS TABLE:

PARAMETER	UNIT	Basis for Limits	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
FLOW	MGD	1	*			NO	*/*
BOD ₅	MG/L	6	**			NO	*/*
COD	MG/L	6	**			NO	*/*
TSS	MG/L	6	**			NO	*/*
SETTLABLE SOLIDS	ML/L/HR	6	1.5			NO	1.5/1.0
PH	SU	6	6.5-9.0			NO	6.5-9.0
<i>E. COLI</i>	**	1	*			YES	***
OIL & GREASE (MG/L)	MG/L	6	15			NO	15/10
TEMPERATURE	°F	6	****			NO	*/*
PRECIPITATION	INCHES	6	*			NO	*/*

- * - Monitoring requirement only.
- ** - Monitoring requirement only.
- *** - # of colonies/100mL; the Monthly Average for *E. coli* is a geometric mean.
- **** - Parameter not previously established in previous state operating permit.
- ***** - Parameter removed from permit.

Basis for Limitations Codes:

- | | |
|--|-----------------------------------|
| 1. State or Federal Regulation/Law | 5. Water Quality Model |
| 2. Water Quality Standard (includes RPA) | 6. Best Professional Judgment |
| 3. Water Quality Based Effluent Limits | 7. TMDL or Permit in lieu of TMDL |
| 4. Antidegradation Review/Policy | 8. WET Test Policy |

OUTFALL #002, #003, #004, #006, #007, #008 – DERIVATION AND DISCUSSION OF LIMITS:

- **Flow.** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the Department, which may require the submittal of an operating permit modification.
- **Biochemical Oxygen Demand (BOD₅).** Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream’s Water Quality. However, the EPA has developed benchmark values in the Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity (MGSP) for food processing facilities similar to this facility. Therefore, the permit writer has used best professional judgment to continue requiring monitoring

only with a benchmark value of 30 mg/L. This value is consistent with permits issued to other facilities owned by Tyson Foods, Inc. The discharge monitoring report (DMR) data support the use of a benchmark value to control pollution of stormwater.

Outfall #002: DMR data: 1.9 – 49 mg/L (two values above 30 mg/L)
Outfall #003: DMR data: 5 – 75 mg/L (ten values above 30 mg/L)
Outfall #004: DMR data: 1.9 – 53 mg/L (one values above 30 mg/L)
Outfall #006: DMR data: 1.9 – 18 mg/L
Outfall #007: DMR data: 1.9 – 24 mg/L
Outfall #008: DMR data: 14 mg/L

- **Chemical Oxygen Demand (COD)**. Effluent limitations from the previous state operating permit have been reassessed and verified they are still protective of the receiving stream’s Water Quality. However, the EPA has developed benchmark values in the Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity (MGSP) for food processing facilities similar to this facility. Therefore, the permit writer has used best professional judgment to continue requiring monitoring only with a benchmark value of 120 mg/L. This value is consistent with permits issued to other facilities owned by Tyson Foods, Inc. The discharge monitoring report (DMR) data support the use of a benchmark value to control pollution of stormwater.

Outfall #002: DMR data: 4.9 – 109 mg/L
Outfall #003: DMR data: 23.9 – 281 mg/L (ten values above 120 mg/L)
Outfall #004: DMR data: 7.9 – 122 mg/L (one values above 120 mg/L)
Outfall #006: DMR data: 4.9 – 54.2 mg/L
Outfall #007: DMR data: 11 – 225 mg/L (one value above 120 mg/L)
Outfall #008: DMR data: 26.5 mg/L

- **Total Suspended Solids (TSS)**. Effluent limitations from the previous state operating permit have been reassessed and verified they are still protective of the receiving stream’s Water Quality. However, the EPA has developed benchmark values in the Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity (MGSP) for food processing facilities similar to this facility. Therefore, the permit writer has used best professional judgment to continue requiring monitoring only with a benchmark value of 100 mg/L. This value is consistent with permits issued to other facilities owned by Tyson Foods, Inc. The discharge monitoring report (DMR) data support the use of a benchmark value to control pollution of stormwater.

Outfall #002: DMR data: 1 – 261 mg/L (two values above 100 mg/L)
Outfall #003: DMR data: 10 – 408 mg/L (six values above 100 mg/L)
Outfall #004: DMR data: 5 – 290 mg/L (two values above 100 mg/L)
Outfall #006: DMR data: 4 – 502 mg/L (six values above 100 mg/L)
Outfall #007: DMR data: 21 – 872 mg/L (fifteen values above 30 mg/L)
Outfall #008: DMR data: 36 mg/L

- **Settleable Solids (SS)**. Effluent limitations from the previous state operating permit have been removed and replaced with monitoring only associated with a benchmark value. This is consistent with other industrial stormwater permits issued in the State of Missouri. The permit writer has used best professional judgment to establish the benchmark value at 1.5 mL/L/hr. This value is consistent with permits issued to other facilities owned by Tyson Foods, Inc. The discharge monitoring report (DMR) data support the use of a benchmark value to control pollution of stormwater.

Outfall #002: DMR data: 0.09 – 0.5 mL/L/hr
Outfall #003: DMR data: 0.09 – 0.8 mL/L/hr
Outfall #004: DMR data: 0.09 – 0.6 mL/L/hr
Outfall #006: DMR data: 0.09 – 0.5 mL/L/hr
Outfall #007: DMR data: 0.09 – 1.8 mL/L/hr (one value above 1.5 mL/L/hr)
Outfall #008: DMR data: 0.1 mL/L/hr

- **pH**. – 6.5-9.0 SU. Technology based effluent limitations of 6.0-9.0 SU [10 CSR 20-7.015] are not protective of the Water Quality Standard, which states that water contaminants shall not cause pH to be outside the range of 6.5-9.0 SU. No mixing zone is allowed due to the classification of the receiving stream, therefore the water quality standard must be met at the outfall.

- **Escherichia coli (E. coli)**. Monitoring only requirement. The receiving streams have recently been reclassified. Now, all stormwater discharges are within two miles of a classified stream segment supporting whole body contact recreation. In accordance with [10 CSR 20-7.015(9)(B)1] and [10 CSR 20-7.031(5)(C)] *E. coli* will be monitored as an indicator bacteria used to determine compliance with whole body contact recreation. This parameter will indicate any stormwater contact with the shipment of live chicken or poultry processing conducted at this facility. Data collected will be evaluated during the following permit renewal to determine if benchmark values are necessary to ensure protection of stream quality.

- **Oil & Grease.** Effluent limitations from the previous state operating permit have been removed and replaced with monitoring only associated with a benchmark value. This is consistent with other industrial stormwater permits issued in the State of Missouri. The permit writer has used best professional judgment to establish the benchmark value at the criteria for protection of aquatic life of 10 mg/L [10 CSR 20-7.031 Table A]. This value is consistent with permits issued to other facilities owned by Tyson Foods, Inc. The discharge monitoring report (DMR) data support the use of a benchmark value to control pollution of stormwater.

Outfall #002: DMR data: 0.9 – 9.2 mg/L
 Outfall #003: DMR data: 0.9 – 8 mg/L
 Outfall #004: DMR data: 0.9 – 1.9 mg/L
 Outfall #006: DMR data: 0.9 – 2.3 mg/L
 Outfall #007: DMR data: 0.09 – 1.9 mg/L
 Outfall #008: DMR data: 3.5 mg/L

- **Temperature.** Effluent limitations from the previous state operating permit have been reassessed and verified that they are not necessary to protect the receiving stream’s Water Quality. Due to the nature of the discharge being stormwater, it has been determined that these discharges have no reasonable potential to exceed water quality standards for temperature. Therefore, it is the permit writer’s best professional judgment to remove this parameter from the permit.
- **Precipitation.** Effluent limitations from the previous state operating permit have been reassessed and verified that they are still protective of the receiving stream’s Water Quality. It is the permit writer’s best professional judgment to continue requiring monitoring for this parameter, as the discharge relies on stormwater runoff.

Minimum Sampling and Reporting Frequency Requirements.

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
Flow	once/quarter	once/quarter
BOD ₅	once/quarter	once/quarter
COD	once/quarter	once/quarter
TSS	once/quarter	once/quarter
Settleable Solids	once/quarter	once/quarter
pH	once/quarter	once/quarter
<i>E. coli</i>	once/quarter	once/quarter
Oil & Grease	once/quarter	once/quarter
Temperature	once/quarter	once/quarter
Precipitation	once/quarter	once/quarter

Sampling Frequency Justification:

Sampling and Reporting Frequency was retained from previous permit. Due to the nature of the discharge being stormwater, this frequency will provide adequate data on the quality of stormwater runoff.

Sampling Type Justification

Sampling Type was retained from the previous permit. Due to the nature of the discharge being stormwater, grab samples will provide representative sampling for each discharge event.

PERMITTED FEATURE #011 - #013 – SLUDGE STORAGE SYSTEM

Sludge Land Application limitations derived and established in the below Irrigation Limitations Table are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supersede the terms and conditions, including effluent limitations, of this operating permit.

SLUDGE STORAGE LIMITATIONS TABLE:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
FREEBOARD	FEET	1	*			YES	**
PRECIPITATION	INCHES	1	*			YES	**

* - Monitoring requirement only.

** - Parameter not previously established in previous state operating permit.

Basis for Limitations Codes:

- | | |
|--|-----------------------------------|
| 1. State or Federal Regulation/Law | 5. Water Quality Model |
| 2. Water Quality Standard (includes RPA) | 6. Best Professional Judgment |
| 3. Water Quality Based Effluent Limits | 7. TMDL or Permit in lieu of TMDL |
| 4. Antidegradation Review/Policy | 8. WET Test Policy |

PERMITTED FEATURE #011 - #013 – DERIVATION AND DISCUSSION OF LIMITS:

- **Freeboard.** Monitoring requirement only.
- **Precipitation.** Monitoring requirement only.

Minimum Sampling and Reporting Frequency Requirements.

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
Freeboard	once/month	once/year
Precipitation	once/day	once/year

Sampling Frequency Justification:

Freeboard monitoring shall be conducted once per month. Precipitation monitoring shall be conducted once per day. The frequencies are consistent with other operating permits utilizing land application systems.

Sampling Type Justification

Freeboard and precipitation should be measured. This is the most representative method for these parameters. These sample types are consistent with other operating permits utilizing land application systems.

PERMITTED FEATURE #014 - #030 – SLUDGE LAND APPLICATION SYSTEM

SLUDGE LAND APPLIED LIMITATIONS TABLE:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
TOTAL KJELDAHL NITROGEN AS N	MG/KG	1	*			YES	**
NITRATE NITROGEN AS N	MG/L	1	*			YES	**
TOTAL PHOSPHORUS AS P	MG/L	1	*			YES	**
PERCENT SOLIDS	%	6	*			YES	**
pH	SU	6	*			YES	**

* - Monitoring requirement only.

** - Parameter not previously established in previous state operating permit.

Basis for Limitations Codes:

- | | |
|--|-----------------------------------|
| 1. State or Federal Regulation/Law | 5. Water Quality Model |
| 2. Water Quality Standard (includes RPA) | 6. Best Professional Judgment |
| 3. Water Quality Based Effluent Limits | 7. TMDL or Permit in lieu of TMDL |
| 4. Antidegradation Review/Policy | 8. WET Test Policy |

DERIVATION AND DISCUSSION OF LIMITS:

- **Total Kjeldahl Nitrogen.** Monitoring requirement only. Monitoring for Total Kjeldahl Nitrogen as N is included to determine nutrient loading rates on the land application fields. [10 CSR 20-8.020(15)(F)7.]
- **Nitrate Nitrogen as N.** Monitoring requirement only. Monitoring for Nitrate Nitrogen as N is included to determine nutrient loading rates on the land application fields. [10 CSR 20-8.020(15)(F)7.]
- **Total Phosphorus as P.** Monitoring requirement only. Monitoring for Available Phosphorus as P is included to determine nutrient loading rates on the land application fields. [10 CSR 20-8.020(15)(F)7.]
- **Percent Solids.** Monitoring requirement only. Monitoring for the percent solids of the sludge is included to determine if proper application is occurring on the land application fields.
- **pH.** Monitoring requirement only. Monitoring for pH is included to determine nutrient loading rates on the land application fields. [10 CSR 20-8.020(15)(F)7.]

Minimum Sampling and Reporting Frequency Requirements.

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
Total Kjeldahl Nitrogen as N	once/quarter	once/year
Nitrate Nitrogen as N	once/quarter	once/year
Total Phosphorus as P	once/quarter	once/year
Percent Solids	once/quarter	once/year
pH	once/quarter	once/year

Sampling Frequency Justification:

Sludge testing shall be performed once per quarter. This will provide sufficient monitoring to determine nutrient loading rates on the land application fields.

Sampling Type Justification

Sludge samples shall be grab samples. Due to the fact that this is a monitoring requirement to help determine nutrient loading rates, grab samples have been deemed representative of the sludge being land applied.

SLUDGE LAND APPLICATION OPERATIONAL MONITORING LIMITATIONS TABLE:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
VOLUME OF SLUDGE APPLIED	GALLONS	1	*			YES	**
APPLICATION AREA	ACRES	1	*			YES	**
APPLICATION RATE	INCHES	1	*			YES	**

* - Monitoring requirement only.

** - Parameter not previously established in previous state operating permit.

Basis for Limitations Codes:

- | | |
|--|-----------------------------------|
| 1. State or Federal Regulation/Law | 5. Water Quality Model |
| 2. Water Quality Standard (includes RPA) | 6. Best Professional Judgment |
| 3. Water Quality Based Effluent Limits | 7. TMDL or Permit in lieu of TMDL |
| 4. Antidegradation Review/Policy | 8. WET Test Policy |

DERIVATION AND DISCUSSION OF LIMITS:

- **Volume of Sludge Applied.** Monitoring requirement only. Monitoring for the Volume Irrigated is included to determine if proper application is occurring on the land application fields.
- **Application Area.** Monitoring requirement only. Monitoring for the Application Area is included to determine if proper application is occurring on the land application fields.
- **Application Rate.** Monitoring requirement only. Monitoring for the Application Rate is included to determine if proper application is occurring on the land application fields.

Minimum Sampling and Reporting Frequency Requirements.

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
Amount Applied	daily	once/year
Application Area	daily	once/year
Application Rate	daily	once/year

Sampling Frequency Justification:

Operational monitoring shall occur daily during land application. Daily monitoring will ensure the sludge is being land applied at the proper loading rates determined by the sludge sampling.

Sampling Type Justification

The total amount, area and rate shall be recorded. This will assist in the assurance that sludge is being land applied at the proper loading rates determined by the sludge sampling.

SOIL MONITORING LIMITATIONS TABLE:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
NITRATE NITROGEN AS N	MG/KG	1	*			YES	**
AVAILABLE PHOSPHORUS AS P (BRAY 1-P METHOD)	MG/KG	1	*			YES	**
pH	SU	6	*			YES	**

* - Monitoring requirement only.

** - Parameter not previously established in previous state operating permit.

Basis for Limitations Codes:

- | | |
|--|-----------------------------------|
| 1. State or Federal Regulation/Law | 5. Water Quality Model |
| 2. Water Quality Standard (includes RPA) | 6. Best Professional Judgment |
| 3. Water Quality Based Effluent Limits | 7. TMDL or Permit in lieu of TMDL |
| 4. Antidegradation Review/Policy | 8. WET Test Policy |

PERMITTED FEATURE #014 - #030 – DERIVATION AND DISCUSSION OF LIMITS:

- **Nitrate Nitrogen as N.** Monitoring requirement only. Monitoring for Nitrate Nitrogen as N is included to determine nutrient loading rates on the land application fields. [10 CSR 20-8.020(15)(F)7.]
- **Available Phosphorus as P.** Monitoring requirement only. Monitoring for Available Phosphorus as P is included to determine nutrient loading rates on the land application fields. [10 CSR 20-8.020(15)(F)7.]
- **pH.** Monitoring requirement only. Monitoring for pH is included to determine nutrient loading rates on the land application fields. [10 CSR 20-8.020(15)(F)7.]

Minimum Sampling and Reporting Frequency Requirements.

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
Nitrate Nitrogen as N	once/5 years	once/5 years
Available Phosphorus as P	once/5 years	once/5 years
pH	once/5 years	once/5 years

Sampling Frequency Justification:

Soil testing shall occur once every five years to ensure that the soils are still healthy and able to produce sufficient crops to take up the nutrient loading from the sludge land application.

Sampling Type Justification

Composite sampling will provide a more representative sample of the soils, as crop rotation and application rates can vary the soils characteristics from year to year.

Part VI– 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:

The Department of Natural Resources is currently undergoing a synchronization process for operating permits. Permits are normally issued on a five-year term, but to achieve synchronization many permits will need to be issued for less than the full five years allowed by regulation. The intent is that all permits within a watershed will move through the Watershed Based Management (WBM) cycle together will all expire in the same fiscal year. This will allow further streamlining by placing multiple permits within a smaller geographic area on public notice simultaneously, thereby reducing repeated administrative efforts. This will also 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 three years old, that 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.

PUBLIC NOTICE:

The Department shall give public notice that 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 and water quality 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 permittee must be notified of the denial in writing.

The Department must issue public notice of a pending operating permit or of a new or reissued statewide general 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 wanting to submit comments regarding this proposed operating permit, then 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.

- The Public Notice period for this operating permit began on March 20, 2015 and ended on April 20, 2015. The permittee submitted comments during this period. The following list summarizes the comments and the Department's responses.

1. The permittee noted several minor errors in the permit and the factsheet including incorrect owner name, discussion of the facility performance history in the factsheet, discussion of the schedules of compliance in the factsheet, the appropriate distances between stream segments in the factsheet, clarification on anti-backsliding language as well as the information regarding compliance and enforcement. The Department has updated the permit to reflect the correct owner name and has revised the factsheet language to clarify points of concern.
2. The permittee requested that the ammonia calculations be revised to incorporate an "n" value that mirrors the sampling frequency established in the permit. The Department did not grant this request, as the "n" value for calculating effluent limitations for ammonia is not related to the sampling frequency of the permit. State regulation 10 CSR 20-7.031(5)(B)7 state that the daily maximum limit shall be based on a one day exposure period while the average monthly limit shall be based on a thirty day exposure period. This means that "n" must equal 30 in order to appropriately consider long-term impacts to aquatic life.
3. The permittee expressed several concerns over the temperature requirements in the permit. These concerns were mainly related to two issues: the location of compliance for the temperature cap and the mixing allowance for the change in instream temperature requirement. The Department provided detailed clarification in the response letter to the permittee. These concerns did not result in any changes to the permit.

Additionally, the permit writer corrected a typographical error. The permit listed the November 1, 2013 version of Standard Conditions Part I. However, the permit was placed on Public Notice with the correct and most update version dated August 1, 2014. The permit has been revised to reflect the correct date.

The Department rescinded the permit renewal issued June 4, 2015 with an effective date of July 1, 2015. The reasons are discussed on page 2 of the factsheet. After the permit was rescinded, modifications were made that prompted an additional Public Notice period. This Public Notice period began on July 24, 2015 and ended on August 24, 2015. The permittee submitted comments during this Public Notice period as well. The following list summarizes the comments and the Department's responses.

1. The permittee noted several minor errors in the permit and the factsheet regarding effective dates of certain permit conditions and references to the schedule of compliance for temperature and the correct timeframe for those schedules. The Department has corrected all of these errors in the permit and the factsheet.
2. The permittee again commented on the temperature requirements in the permit, specifically the location of the instream

sampling points, the mixing zone allowance for that condition, and the temperature requirement at the discharge point. The Department provided the same feedback regarding these comments, again trying to emphasize the Departments interpretation of the regulations. These comments and responses did not result in any major changes to the permit; however, the temperature requirements are maximum allowances in the regulations, so only a daily maximum limit will apply. The monthly average limit will be revised to monitoring only for consistency with the regulations. These are minor revisions to the permit that do not impact compliance limits or reporting. An additional Public Notice period is not required for this permit.

Additionally, the permit writer corrected an error in the permit. Special Condition 5 did not completely list the federal requirements for changes in discharges of toxic pollutants. This condition was updated with appropriately language that captures all of the requirements. Since this is not a new condition or requirement, the permit does not need to be placed on Public Notice again. Additionally, the permit writer corrected an error for the instream sampling requirements. The flow monitoring requirement should not have been included in the table. The factsheet explains the reasoning for removal of instream flow monitoring. As this was adequately represented in the factsheet, the permit does not need to be placed on Public Notice again.

DATE OF FACT SHEET: MAY 20, 2015

COMPLETED BY:

**LOGAN COLE, ENVIRONMENTAL SPECIALIST
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
OPERATING PERMITS SECTION - INDUSTRIAL PERMITS UNIT
(573) 751-5827
logan.cole@dnr.mo.gov**

APPENDIX A – RPA RESULTS:

Parameter	CMC*	RWC Acute*	CCC*	RWC Chronic*	n**	Range max/min	CV***	MF	RP Yes/No
Total Ammonia as Nitrogen (Summer) mg/L	12.1	2.02	1.5	2.02	31.00	1.4/0.3	0.30	1.44	YES
Total Ammonia as Nitrogen (Winter) mg/L	12.1	15.03	3.1	15.03	33.00	5.6/0.3	1.00	2.68	YES

N/A – Not Applicable

* - Units are (µg/L) unless otherwise noted.

** - If the number of samples is 10 or greater, then the CV value must be used in the WQBEL for the applicable constituent.

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

RWC – Receiving Water Concentration. It is the concentration of a toxicant or the parameter toxicity in the receiving water after mixing (if applicable).

n – Is the number of samples.

MF – Multiplying Factor. 99% Confidence Level and 99% Probability Basis.

RP – Reasonable Potential. It is where 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).

Reasonable Potential Analysis is conducted as per (TSD, EPA/505/2-90-001, Section 3.3.2). A more detailed version including calculations of this RPA is available upon request.



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 permittees 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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REVISED
AUGUST 1, 2014

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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MISSOURI CLEAN WATER COMMISSION
March 1, 2015

**PART III – SLUDGE AND BIOSOLIDS FROM DOMESTIC AND INDUSTRIAL WASTEWATER
TREATMENT FACILITIES**

SECTION A – GENERAL REQUIREMENTS

1. This permit pertains to sludge requirements under the Missouri Clean Water Law and regulation for domestic wastewater and industrial process wastewater. This permit also incorporates applicable federal sludge disposal requirements under 40 CFR 503 for domestic wastewater. The Environmental Protection Agency (EPA) has principal authority for permitting and enforcement of the federal sludge regulations under 40 CFR 503 for domestic wastewater. EPA has reviewed and accepted these standard sludge conditions. EPA may choose to issue a separate sludge addendum to this permit or a separate federal sludge permit at their discretion to further address the federal requirements.
2. These PART III Standard Conditions apply only to sludge and biosolids generated at domestic wastewater treatment facilities, including public owned treatment works (POTW), privately owned facilities and sludge or biosolids generated at industrial facilities.
3. Sludge and Biosolids Use and Disposal Practices:
 - a. The permittee is authorized to operate the sludge and biosolids treatment, storage, use, and disposal facilities listed in the facility description of this permit.
 - b. The permittee shall not exceed the design sludge volume listed in the facility description and shall not use sludge disposal methods that are not listed in the facility description, without prior approval of the permitting authority.
 - c. The permittee is authorized to operate the storage, treatment or generating sites listed in the Facility Description section of this permit.
4. Sludge Received from other Facilities:
 - a. Permittees may accept domestic wastewater sludge from other facilities including septic tank pumpings from residential sources as long as the design sludge volume is not exceeded and the treatment facility performance is not impaired.
 - b. The permittee shall obtain a signed statement from the sludge generator or hauler that certifies the type and source of the sludge
5. These permit requirements do not supersede nor remove liability for compliance with county and other local ordinances.
6. These permit requirements do not supersede nor remove liability for compliance with other 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 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, the Department may include sludge limitations in the special conditions portion or other sections of a site specific permit.
9. Alternate Limits in the Site Specific Permit.

Where deemed appropriate, the Department may require an individual site specific permit in order to authorize alternate limitations:

 - a. A site specific permit must be obtained for each operating location, including application sites.
 - b. To request a site specific permit, an individual permit application, permit fee, and supporting documents shall be submitted for each operating location. This shall include a detailed sludge/biosolids management plan or engineering report.
10. Exceptions to these Standard Conditions may be authorized on a case-by-case basis by the Department, as follows:
 - a. The Department will prepare a permit modification and follow permit notice provisions as applicable under 10 CSR 20-6.020, 40 CFR 124.10, and 40 CFR 501.15(a)(2)(ix)(E). This includes notification of the owner of the property located adjacent to each land application site, where appropriate.
 - b. Exceptions cannot be granted where prohibited by the federal sludge regulations under 40 CFR 503.

SECTION B – DEFINITIONS

1. Best Management Practices include agronomic loading rates, soil conservation practices 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 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 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 (PFRP) in accordance with 40 CFR 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. Industrial wastewater means any wastewater, also known as process water, not defined as domestic wastewater. Per 40 CFR Part 122, process water 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.
8. Mechanical treatment plants are wastewater treatment facilities that use mechanical devices to treat wastewater, including septic tanks, sand filters, extended aeration, activated sludge, contact stabilization, trickling filters, rotating biological discs, and other similar facilities. It does not include wastewater treatment lagoons and constructed wetlands for wastewater treatment.
9. Operating location as defined in 10 CSR 20-2.010 is all contiguous lands owned, operated or controlled by one (1) person or by two (2) or more persons jointly or as tenants in common.
10. Plant Available Nitrogen (PAN) is the nitrogen that will be available to plants during the growing seasons after biosolids application.
11. 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.
12. 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)
13. Sludge lagoon is part of a mechanical wastewater treatment facility. A sludge lagoon is an earthen 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.
14. Septage is the material pumped from residential septic tanks and similar treatment works (with a design population of less than 150 people). The standard for biosolids from septage is different from other sludges.

SECTION C – MECHANICAL WASTEWATER TREATMENT FACILITIES

1. Sludge shall be routinely removed from wastewater treatment facilities and handled according to the permit facility description and sludge conditions of this permit.
2. The permittee shall operate the facility so that there is no sludge discharged to waters of the state.
3. Mechanical treatment plants shall have separate sludge storage compartments in accordance with 10 CSR 20, Chapter 8. Failure to remove sludge from these storage compartments on the required design schedule is a violation of this permit.

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

1. This section applies to permittees that haul sludge to another treatment facility for disposal or use contract haulers to remove and dispose of sludge.
2. Permittees that use contract haulers are responsible for compliance with all the terms of this permit including final disposal, unless the hauler has a separate permit for sludge or biosolids disposal issued by the Department; or the hauler transports the sludge to another permitted treatment facility.
3. Haulers who land apply septage must obtain a state permit.
4. Testing of sludge, other than total solids content, is not required if sludge is hauled to a municipal wastewater treatment facility or other permitted wastewater treatment facility, unless it is required by the accepting facility.

SECTION E – INCINERATION OF SLUDGE

1. Sludge incineration facilities shall comply with the requirements of 40 CFR 503 Subpart E; air pollution control regulations under 10 CSR 10; and solid waste management regulations under 10 CSR 80.
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, quantity of sludge incinerated, quantity of ash generated, quantity of ash stored, and ash used or disposal method, quantity, and location. Permittee shall also provide the name of the disposal facility and the applicable permit number.

SECTION F – SURFACE DISPOSAL SITES AND SLUDGE LAGOONS

1. Surface disposal sites of domestic facilities shall comply with the requirements in 40 CFR 503 Subpart C; air pollution control regulations under 10 CSR 10; and solid waste management regulations under 10 CSR 80.
2. 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 sludge storage lagoons as storage facilities, accumulated 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 sludge removed will be dependent on sludge generation and accumulation in the facility. Enough 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 sludge on the bottom of the lagoon, upon prior approval of the Department; or
 - b. Permittee shall close the lagoon in accordance with Section H.

SECTION G – LAND APPLICATION

1. The permittee shall not land apply sludge or biosolids unless land application is authorized in the facility description or the special conditions of the issued NPDES permit.
2. Land application sites within a 20 miles radius of the wastewater treatment facility are authorized under this permit when biosolids are applied for beneficial use in accordance with these standard conditions unless otherwise specified in a site specific permit. If the permittee's land application site is greater than a 20 mile radius of the wastewater treatment facility, approval must be granted from the Department.
3. Land application shall not adversely affect a threatened or endangered species or its designated critical habitat.
4. Biosolids shall not be applied unless authorized in this permit or exempted under 10 CSR 20, Chapter 6.
 - a. This permit does not authorize the land application of domestic sludge except for when sludge meets the definition of biosolids.
 - b. This permit authorizes "Class A or B" biosolids derived from domestic wastewater and/or process water sludge 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.
5. Public Contact Sites:

Permittees who wish to apply Class A biosolids to public contact sites must obtain approval from the Department after two years of proper operation with acceptable testing documentation that shows the biosolids meet Class A criteria. A shorter length of testing will be allowed with prior approval from the Department. Authorization for land applications must be provided in the special conditions section of this permit or in a separate site specific permit.

 - a. After Class B biosolids have been land applied, public access must be restricted for 12 months.
 - b. Class B biosolids are only land applied to root crops, home gardens or vegetable crops whose edible parts will not be for human consumption.
6. Agricultural and Silvicultural Sites:

Septage – Based on Water Quality guide 422 (WQ422) published by the University of Missouri

 - a. Haulers that land apply septage must obtain a state permit
 - b. Do not apply more than 30,000 gallons of septage per acre per year.
 - c. Septage 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 other mechanical type treatment facilities.
 - d. To meet Class B sludge requirements, maintain septage at 12 pH for at least thirty (30) minutes before land application. 50 pounds of hydrated lime shall be added to each 1,000 gallons of septage in order to meet pathogen and vector stabilization for septage biosolids applied to crops, pastures or timberland.
 - e. 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.

Biosolids - Based on Water Quality guide 423, 424, and 425 (WQ423, WQ424, WQ425) published by the University of Missouri;

- a. Biosolids shall be monitored to determine the quality for regulated pollutants
- b. The number of samples taken is directly related to the amount of sludge produced by the facility (See Section I of these Standard Conditions). Report as dry weight unless otherwise specified in the site specific permit. 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 reach the maximum concentration of pollutants allowed.
- c. Table 1 gives the maximum concentration allowable to protect water quality standards

TABLE 1

Biosolids ceiling concentration ¹	
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

¹ Land application is not allowed if the sludge concentration exceeds the maximum limits for any of these pollutants

- d. The low metal concentration biosolids has reduced requirements because of its higher quality and can safely be applied for 100 years or longer at typical agronomic loading rates. (See Table 2)

TABLE 2

Biosolids Low Metal Concentration ¹	
Pollutant	Milligrams per kilogram dry weight
Arsenic	41
Cadmium	39
Copper	1,500
Lead	300
Mercury	17
Nickel	420
Selenium	36
Zinc	2,800

¹ You may apply low metal biosolids without tracking cumulative metal limits, provided the cumulative application of biosolids does not exceed 500 dry tons per acre.

- e. Each pollutant in Table 3 has an annual and a total cumulative loading limit, based on the allowable pounds per acre for various soil categories.

TABLE 3

Pollutant	CEC 15+		CEC 5 to 15		CEC 0 to 5	
	Annual	Total ¹	Annual	Total ¹	Annual	Total ¹
Arsenic	1.8	36.0	1.8	36.0	1.8	36.0
Cadmium	1.7	35.0	0.9	9.0	0.4	4.5
Copper	66.0	1,335.0	25.0	250.0	12.0	125.0
Lead	13.0	267.0	13.0	267.0	13.0	133.0
Mercury	0.7	15.0	0.7	15.0	0.7	15.0
Nickel	19.0	347.0	19.0	250.0	12.0	125.0
Selenium	4.5	89.0	4.5	44.0	1.6	16.0
Zinc	124.0	2,492.0	50.0	500.0	25.0	250.0

¹ Total cumulative loading limits for soils with equal or greater than 6.0 pH (salt based test) or 6.5 pH (water based test)

TABLE 4 - Guidelines for land application of other trace substances ¹

Cumulative Loading	
Pollutant	Pounds per acre
Aluminum	4,000 ²
Beryllium	100
Cobalt	50
Fluoride	800
Manganese	500
Silver	200
Tin	1,000
Dioxin	(10 ppt in soil) ³
Other	⁴

¹ Design of land treatment systems for Industrial Waste, 1979. Michael Ray Overcash, North Carolina State University and Land Treatment of Municipal Wastewater, EPA 1981.)

² This applies for a soil with a pH between 6.0 and 7.0 (salt based test) or a pH between 6.5 to 7.5 (water based test). Case-by-case review is required for higher pH soils.

³ Total Dioxin Toxicity Equivalents (TEQ) in soils, based on a risk assessment under 40 CFR 744, May 1998.

⁴ Case by case review. Concentrations in sludge should not exceed the 95th percentile of the National Sewage Sludge Survey, EPA, January 2009.

Best Management Practices – Based on Water Quality guide 426 (WQ426) published by the University of Missouri

- a. Use best management practices when applying biosolids.
- b. Biosolids cannot discharge from the land application site
- c. Biosolid application is subject to the Missouri Department of Agriculture State Milk Board concerning grazing restrictions of lactating dairy cattle.
- d. Biosolid application must be in accordance with section 4 of the Endangered Species Act.
- e. Do not apply more than the agronomic rate of nitrogen needed.
- f. The applicator must document the Plant Available Nitrogen (PAN) loadings, available nitrogen in the soil, and crop removal 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.
 - i. PAN can be determined as follows and is in accordance with WQ426
(Nitrate + nitrite nitrogen) + (organic nitrogen x 0.2) + (ammonia nitrogen x volatilization factor¹).
¹Volatilization factor is 0.7 for surface application and 1 for subsurface application.
- g. Buffer zones are as follows:
 - i. 300 feet of a water supply well, sinkhole, lake, pond, 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 if dwellings;
 - iv. 100 feet of wetlands or permanent flowing streams;
 - v. 50 feet of a property line or other waters of the state, including intermittent flowing streams.
- h. Slope limitation for application sites are as follows;
 - i. A slope 0 to 6 percent has 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.
- i. No biosolids may be land applied in an area that it is reasonably certain that pollutants will be transported into waters of the state.
- j. Do not apply biosolids to sites with soil that is snow covered, frozen or saturated with liquid without prior approval by the Department.
- k. Biosolids / sludge applicators must keep detailed records up to five years.

SECTION H – CLOSURE REQUIREMENTS

1. This section applies to all wastewater facilities (mechanical, industrial, and lagoons) and sludge or biosolids storage and treatment facilities and incineration ash ponds. 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 residues, including sludge, biosolids. Mechanical plants, sludge lagoons, ash ponds and other storage structures must obtain approval of a closure plan from the Department. 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. Residuals 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. Residuals shall meet the monitoring and land application limits for agricultural rates as referenced in Section H of these standard conditions.
 - 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.
 - 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.
4. When closing a domestic wastewater treatment lagoon with a design treatment capacity equal or less than 150 persons, the residuals are considered “septage” under the similar treatment works definition. See Section B of these standard conditions. 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. Residuals left within the domestic lagoon shall be mixed with soil on at least a 1 to 1 ratio, 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.
6. Lagoons and/or earthen structure and/or ash pond 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 and/or industrial process wastewater plant; all 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. Per 10 CSR 20-6.015(4)(B)6, Hazardous Waste shall not be land applied or disposed during industrial and mechanical plant closures unless in accordance with Missouri Hazardous Waste Management Law and Regulations under 10 CSR 25.
 - c. After demolition of the mechanical plant / industrial plant, the site must only contain clean fill defined in RSMo 260.200 (5) 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 or other beneficial use. Other solid wastes must be removed.
8. If sludge from the domestic lagoon or mechanical treatment plant exceeds agricultural rates under Section G and/or H, 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 503, Subpart C.

SECTION I – MONITORING FREQUENCY

- At a minimum, sludge or biosolids 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

Design Sludge Production (dry tons per year)	Monitoring Frequency (See Notes 1, 2, and 3)			
	Metals, Pathogens and Vectors	Nitrogen TKN ¹	Nitrogen PAN ²	Priority Pollutants and TCLP ³
0 to 100	1 per year	1 per year	1 per month	1 per year
101 to 200	biannual	biannual	1 per month	1 per year
201 to 1,000	quarterly	quarterly	1 per month	1 per year
1,001 to 10,000	1 per month	1 per month	1 per week	-- ⁴
10,001 +	1 per week	1 per week	1 per day	-- ⁴

¹ Test total Kjeldahl nitrogen, if biosolids application is 2 dry tons per acre per year or less.

² 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.

³ Priority pollutants (40 CFR 122.21, Appendix D, Tables II and III) and toxicity characteristic leaching procedure (40 CFR 261.24) is required only for permit holders that must have a pre-treatment program.

⁴ One sample for each 1,000 dry tons of sludge.

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: Total Phosphorus: Total phosphorus and total potassium shall be tested at the same monitoring frequency as metals.

Note 3: Table 5 is not applicable for incineration and permit holders that landfill their sludge.

- If you own a wastewater treatment lagoon or sludge lagoon that is cleaned out once a year or less, you may choose to sample only when the sludge is removed or the lagoon is closed. Test one composite sample for each 100 dry tons of sludge or biosolids removed from the lagoon during the year within the lagoon at closing. Composite sample must represent various areas at one-foot depth.
- Additional testing may be required in the special conditions or other sections of the permit. Permittees receiving industrial wastewater may be required to conduct additional testing upon request from the Department.
- At this time, the Department recommends monitoring requirements shall be performed in accordance with, "POTW Sludge Sampling and Analysis Guidance Document," United States Environmental Protection Agency, August 1989, and the subsequent revisions.

SECTION J – RECORD KEEPING AND REPORTING REQUIREMENTS

- The permittee shall maintain records on file at the facility for at least five years for the items listed in these standard conditions and any additional items in the Special Conditions section of this permit. This shall include dates when the sludge facility is checked for proper operation, records of maintenance and repairs and other relevant information.
- Reporting period
 - By January 28th of each year, an annual report shall be submitted for the previous calendar year period for all mechanical wastewater treatment facilities, sludge lagoons, and sludge or biosolids disposal facilities.
 - Permittees with wastewater treatment lagoons shall submit the above annual report only when sludge or biosolids are removed from the lagoon during the report period or when the lagoon is closed.
- Report Forms. The annual report shall be submitted on report forms provided by the Department or equivalent forms approved by the Department.
- Reports shall be submitted as follows:

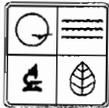
Major facilities (those serving 10,000 persons or 1 million gallons per day) shall report to both the Department and EPA. Other facilities need to report only to the Department. Reports shall be submitted to the addresses listed as follows:

DNR regional office listed in your permit
(see cover letter of permit)
ATTN: Sludge Coordinator

EPA Region VII
Water Compliance Branch (WACM)
Sludge Coordinator
11201 Renner Blvd.
Lenexa, KS 66219

5. Annual report contents. The annual report shall include the following:
- a. Sludge and biosolids testing performed. Include a copy or summary of all test results, even if not required by the permit.
 - b. Sludge or biosolids quantity shall be reported as dry tons for quantity generated by the wastewater treatment facility, the quantity stored on site at the end of the year, and the quantity used 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, 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 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 sludge or biosolids 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 $\frac{1}{4}$, $\frac{1}{4}$, 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, CEC, and phosphorus. If none was tested during the year, report the last date when tested and results.



MISSOURI DEPARTMENT OF NATURAL RESOURCES
 WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH.
**FORM A - APPLICATION FOR CONSTRUCTION OR OPERATING PERMIT
 UNDER MISSOURI CLEAN WATER LAW**

C11099
 MAR 11 2013 AP14779

FOR AGENCY USE ONLY	
CHECK NUMBER	
DATE RECEIVED	FEE SUBMITTED
3/11/13	0.00

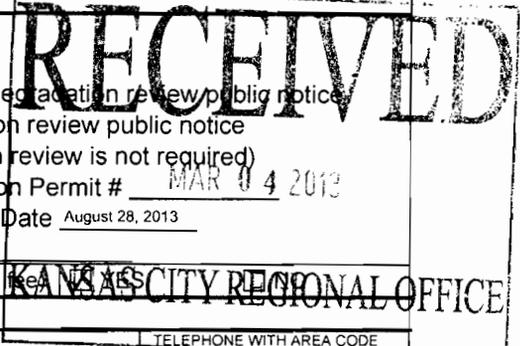
Note PLEASE READ THE ACCOMPANYING INSTRUCTIONS BEFORE COMPLETING THIS FORM.

1. This application is for:

- An operating permit and antidegradation review public notice
- A construction permit following an appropriate operating permit and antidegradation review public notice
- A construction permit and concurrent operating permit and antidegradation review public notice
- A construction permit (submitted before Aug. 30, 2008 or antidegradation review is not required)
- An operating permit for a new or unpermitted facility
- An operating permit renewal: permit # MO- 0115061
- An operating permit modification: permit # MO-

Construction Permit # MAR 04 2013
 Expiration Date August 28, 2013
 Reason:

1.1 Is the appropriate fee included with the application? (See instructions for appropriate fee.) YES NO



2. FACILITY

NAME Tyson Foods Inc. - Sedalia Processing Plant		TELEPHONE WITH AREA CODE (660) 827-8820	
ADDRESS (PHYSICAL) 19571 Whitfield Rd		CITY Sedalia	STATE ZIP CODE MO 65301

3. OWNER

NAME Tyson Foods Inc.		E-MAIL ADDRESS john.couch@tyson.c	TELEPHONE WITH AREA CODE (479) 290-2035
ADDRESS (MAILING) 2210 Oaklawn Dr.		CITY Springdale	FAX (479) 290-1366
		STATE AR	ZIP CODE 72762

3.1 Request review of draft permit prior to public notice? YES NO

4. CONTINUING AUTHORITY

NAME Same as above		TELEPHONE WITH AREA CODE	
ADDRESS (MAILING) Same as above		CITY Same as above	STATE ZIP CODE

5. OPERATOR

NAME Wendell Dawson		CERTIFICATE NUMBER 7251	TELEPHONE WITH AREA CODE (660) 826-3233
ADDRESS (MAILING) 20001 Menefee Rd		CITY Sedalia	FAX (660) 827-9841
		STATE MO	ZIP CODE 65301

6. FACILITY CONTACT

NAME Jason McCauley		TITLE Complex Environmental Manager	TELEPHONE WITH AREA CODE (660) 827-8820
			FAX (660) 826-0659

7. ADDITIONAL FACILITY INFORMATION

7.1 Legal Description of Outfalls. (Attach additional sheets if necessary.)

001 _____ 1/4 _____ 1/4 Sec _____ T _____ R _____ County _____
 UTM Coordinates Easting (X): _____ Northing (Y): _____
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

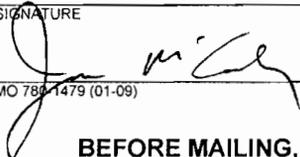
002 _____ 1/4 _____ 1/4 Sec _____ T _____ R _____ County _____
 UTM Coordinates Easting (X): _____ Northing (Y): _____

003 _____ 1/4 _____ 1/4 Sec _____ T _____ R _____ County _____
 UTM Coordinates Easting (X): _____ Northing (Y): _____

004 _____ 1/4 _____ 1/4 Sec _____ T _____ R _____ County _____
 UTM Coordinates Easting (X): _____ Northing (Y): _____

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

001 - SIC 2015 _____ and NAICS 311615 _____ 002 - SIC 2077 _____ and NAICS 311613 _____
 003 - SIC 2048 _____ and NAICS 311119 _____ 004 - SIC 0254 _____ and NAICS 112340 _____

8. ADDITIONAL FORMS AND MAPS NECESSARY TO COMPLETE THIS APPLICATION (Complete all forms that are applicable.)			
A.	Is your facility a manufacturing, commercial, mining or silviculture waste treatment facility? If yes, complete Form C (unless storm water only, then complete U.S. Environmental Protection Agency Form 2F per Item C below).	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>
B.	Is your facility considered a "Primary Industry" under EPA guidelines: If yes, complete Forms C and D.	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
C.	Is application for storm water discharges only? If yes, complete EPA Form 2F.	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
D.	Attach a map showing all outfalls and the receiving stream at 1" = 2,000' scale.		
E.	Is wastewater land applied? If yes, complete Form I.	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
F.	Is sludge, biosolids, ash or residuals generated, treated, stored or land applied? If yes, complete Form R.	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>
9. DOWNSTREAM LANDOWNER(S) Attach additional sheets as necessary. See Instructions. (PLEASE SHOW LOCATION ON MAP. SEE 8.D ABOVE).			
NAME See Attached			
ADDRESS		CITY	STATE ZIP CODE
10. I certify that I am familiar with the information contained in the application, that to the best of my knowledge and belief such information is true, complete and accurate, and if granted this permit, I agree to abide by the Missouri Clean Water Law and all rules, regulations, orders and decisions, subject to any legitimate appeal available to applicant under the Missouri Clean Water Law to the Missouri Clean Water Commission.			
NAME AND OFFICIAL TITLE (TYPE OR PRINT)		TELEPHONE WITH AREA CODE	
Jason McCauley		(660) 827-8820	
SIGNATURE		DATE SIGNED	
		2/27/13	

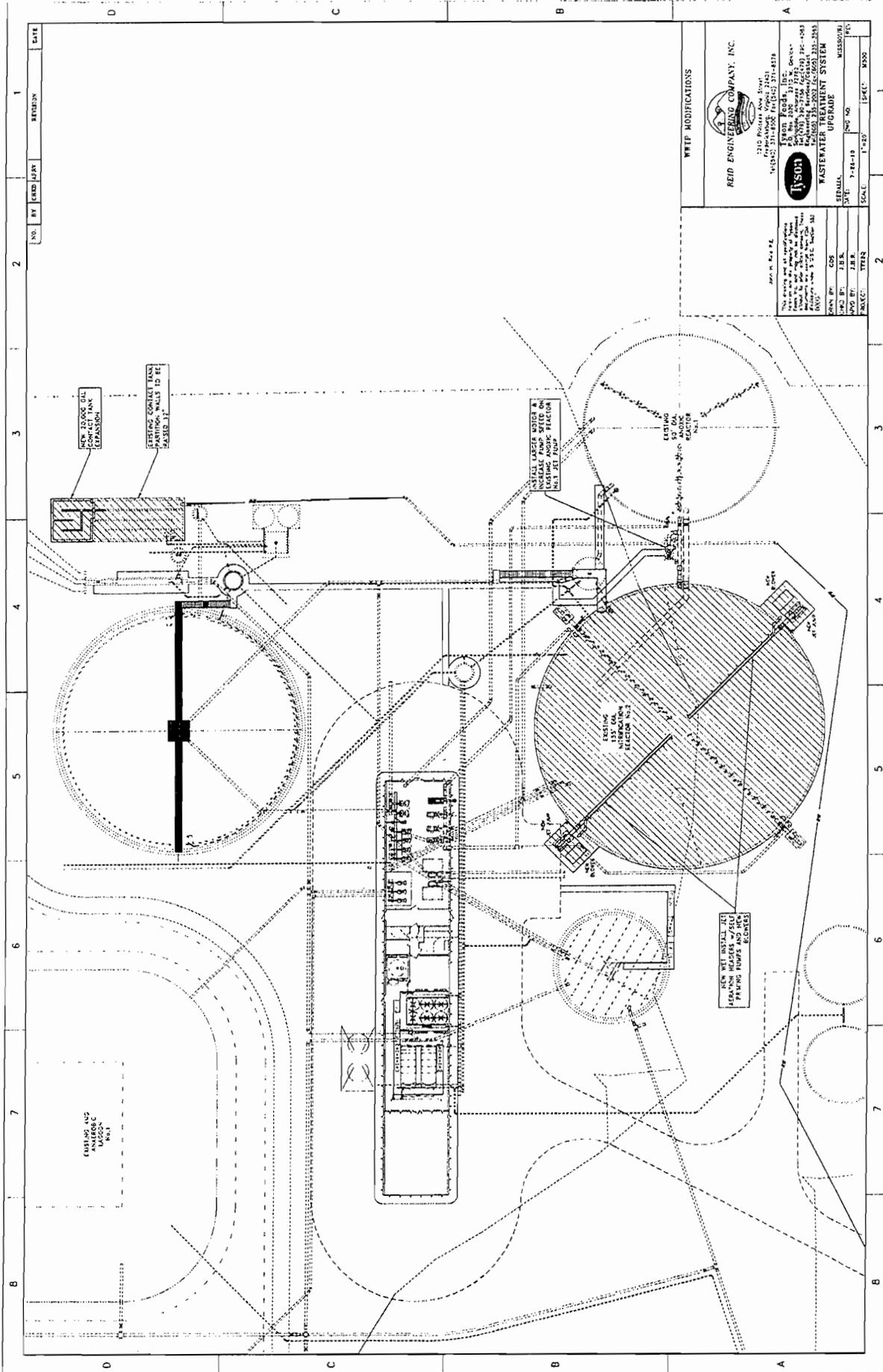
MO 789-1479 (01-09)

BEFORE MAILING, PLEASE ENSURE ALL SECTIONS ARE COMPLETED AND ADDITIONAL FORMS, IF APPLICABLE, ARE INCLUDED.

Submittal of an incomplete application may result in the application being returned.

HAVE YOU INCLUDED:

- Appropriate Fees?
- Map at 1" = 2000' scale?
- Signature?
- Form C, if applicable?
- Form D, if applicable?
- Form 2F, if applicable?
- Form I (Irrigation), if applicable?
- Form R (Sludge), if applicable?



NO. BY DATE

REVISION DATE

1

2

3

4

5

WRTP MODIFICATIONS

REID ENGINEERING COMPANY, INC.
 210 Peoria Ave. East
 Peoria, IL 61602-3147
 TEL: (312) 371-4378

FERON Fluids, Inc.
 500 W. 13th Street
 Peoria, IL 61602-3147
 TEL: (312) 371-4378

WASTEWATER TREATMENT SYSTEM UPGRADE

PROJECT NO. 1503

DATE: 12-20-19

SCALE: 1"=30'

DESIGNER: J.B.K.

CHECKER: J.B.K.

DATE: 12-20-19

PROJECT: MISSOURI

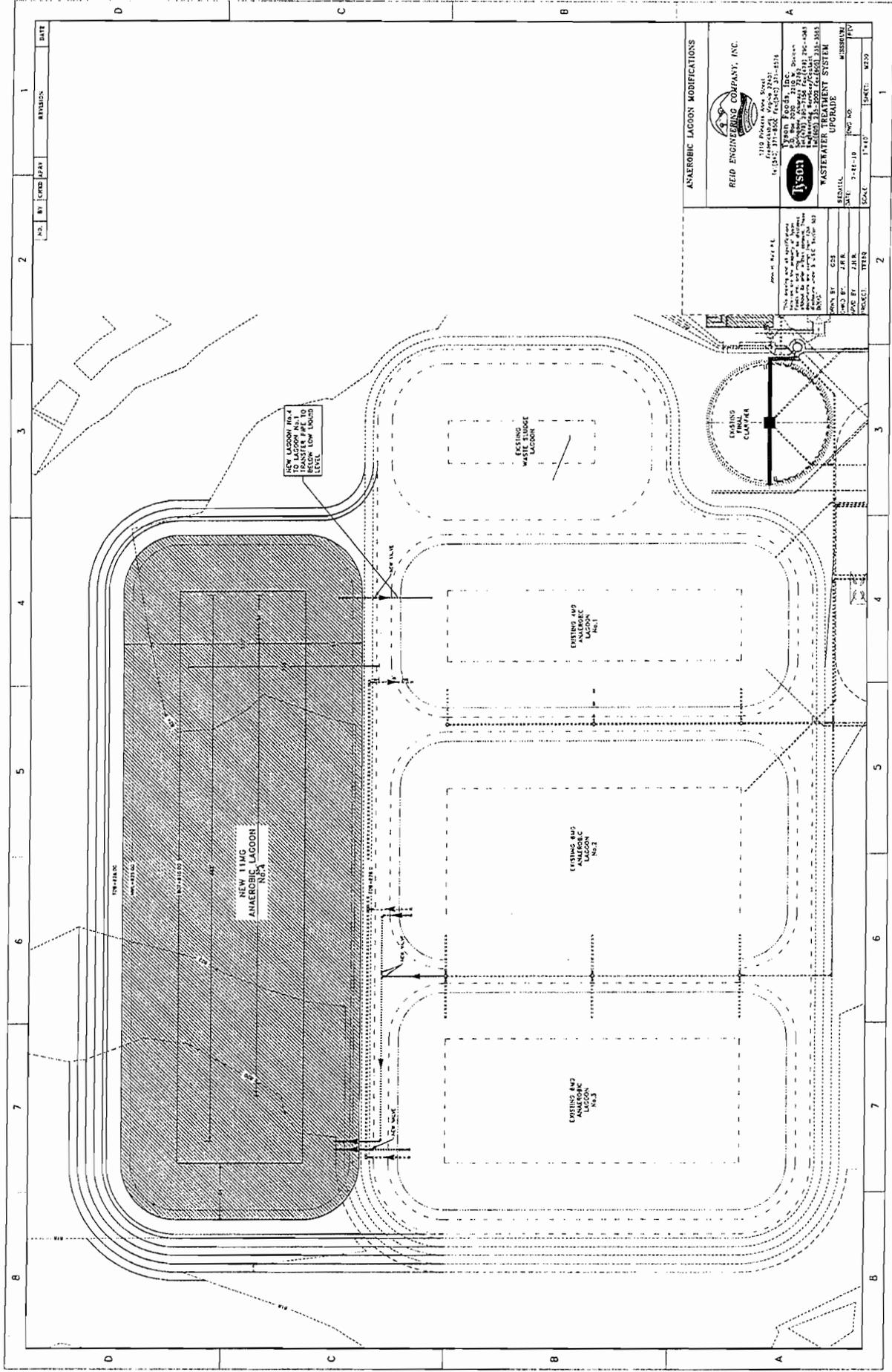
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ANEROBIC LAGOON MODIFICATIONS

REID ENGINEERING COMPANY, INC.

1110 P. O. BOX 1000
 GREENSBORO, N.C. 27402
 TEL: (336) 331-8000 FAX: (336) 331-8518

Tyson

1110 P. O. BOX 1000
 GREENSBORO, N.C. 27402
 TEL: (336) 331-8000 FAX: (336) 331-8518

WASTEWATER TREATMENT SYSTEM
 UPGRADE

DESIGNED BY: GSE
 CHECKED BY: JLR
 DATE: 7-27-10
 SCALE: 1"=40'

PROJECT: 111113
 SHEET: 111113-01

NO.	BY	DATE	REVISION
1			

1	2	3	4	5	6	7	8
A	B	C	D				

- A. 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 flows between intakes, operations, treatment units, 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.
- B. For each outfall, provide a description of 1. All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water and storm water runoff. 2. The average flow contributed by each operation. 3. The treatment received by the wastewater. Continue on additional sheets if necessary.

1. OUTFALL NO. (LIST)	2. OPERATION(S) CONTRIBUTING FLOW		3. TREATMENT	
	A. OPERATION (LIST)	B. AVERAGE FLOW (INCLUDE UNITS) (MAXIMUM FLOW)	A. DESCRIPTION	B. LIST CODES FROM TABLE A
001	Processing Plant	2.07 MGD		
	Rendering	85,000 GPD		
	Hatchery	30,000 GPD		
	Feed Mill	15,000 GPD		
002	Plant Stormwater	1.85 MGD		
003	Plant Stormwater	2.5 MGD		
004	Plant Stormwater	1.15 MGD		
006	WWTP Stormwater	126,000 GPD		
007	WWTP Stormwater	156,000 GPD		
008	Rendering Stormwater	40,000 GPD		

2.40 CONTINUED

C. EXCEPT FOR STORM RUNOFF, LEAKS, OR SPILLS, ARE ANY OF THE DISCHARGES DESCRIBED IN ITEMS A OR B INTERMITTENT OR SEASONAL?
 YES (COMPLETE THE FOLLOWING TABLE) NO (GO TO SECTION 2.50)

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

2.50 MAXIMUM PRODUCTION

A. DOES AN EFFLUENT GUIDELINE LIMITATION PROMULGATED BY EPA UNDER SECTION 304 OF THE CLEAN WATER ACT APPLY TO YOUR FACILITY?
 YES (COMPLETE B.) NO (GO TO SECTION 2.60)

B. ARE THE LIMITATIONS IN THE APPLICABLE EFFLUENT GUIDELINE EXPRESSED IN TERMS OF PRODUCTION (OR OTHER MEASURE OF OPERATION)?
 YES (COMPLETE C.) NO (GO TO SECTION 2.60)

C. IF YOU ANSWERED "YES" TO B. LIST THE QUANTITY THAT REPRESENTS 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.

1. MAXIMUM QUANTITY			2. AFFECTED OUTFALLS <i>(list outfall numbers)</i>
A. QUANTITY PER DAY	B. UNITS OF MEASURE	C. OPERATION, PRODUCT, MATERIAL, ETC. <i>(specify)</i>	
1,491,380	lb	Poultry First Processing	001
1,236,800	lb	Poultry Further Processing	001
110,000	lb	Poultry Rendering (meat meal)	001
100,000	lb	Poultry Rendering / Feather meal	001

2.60 IMPROVEMENTS

A. ARE YOU NOW 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 THAT 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 3.00)

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

B. OPTIONAL: YOU MAY ATTACH ADDITIONAL SHEETS DESCRIBING ANY ADDITIONAL WATER POLLUTION CONTROL PROGRAMS (OR OTHER ENVIRONMENTAL PROJECTS WHICH MAY AFFECT YOUR DISCHARGES) YOU NOW HAVE UNDER WAY OR WHICH YOU PLAN. INDICATE WHETHER EACH PROGRAM IS NOW UNDER WAY OR PLANNED, AND INDICATE YOUR ACTUAL OR PLANNED SCHEDULES FOR CONSTRUCTION.
 MARK "X" IF DESCRIPTION OF ADDITIONAL CONTROL PROGRAMS IS ATTACHED.

PLEASE PRINT OR TYPE. You may report some or all of this information on separate sheets (use the same format) instead of completing these pages.
SEE INSTRUCTIONS.

FORM C
TABLE 1 FOR 3.00 ITEM A AND B

INTAKE AND EFFLUENT CHARACTERISTICS (continued from page 3 of Form 2-C)												OUTFALL NO.			
PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.												001			
1. POLLUTANT	2. EFFLUENT				3. UNITS (specify if blank)				4. INTAKE (optional)						
	A. MAXIMUM DAILY VALUE (if applicable)		B. MAXIMUM 30 DAY VALUE (if applicable)		C. LONG TERM AVRG. VALUE (if applicable)		D. NO. OF ANALYSES		A. CONCENTRATION		B. MASS		A. LONG TERM AVRG. VALUE (1) CONCENTRATION (2) MASS		B. NO. OF ANALYSES
A. Biochemical Oxygen Demand (BOD)	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) ANALYSES	(2) ANALYSES	mg/L		lb				
B. Chemical Oxygen Demand (COD)									mg/L		lb				
C. Total Organic Carbon (TOC)															
D. Total Suspended Solids (TSS)									mg/L		lb				
E. Ammonia (as N)									mg/L		lb				
F. Flow	VALUE		VALUE		VALUE		VALUE				MGD				
G. Temperature (winter)	VALUE		VALUE		VALUE		VALUE		°C						
H. Temperature (summer)	VALUE		VALUE		VALUE		VALUE		°C						
I. pH	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	STANDARD UNITS										

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2-a for any pollutant, you must provide the results of at least one analysis for that pollutant. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT				4. UNITS				5. INTAKE (optional)			
	A. BE- LIEVED PRE- SENT	B. BE- LIEVED AB- SENT	A. MAXIMUM DAILY VALUE (1) CONCENTRATION	B. MAXIMUM 30 DAY VALUE (1) CONCENTRATION	C. LONG TERM AVRG. VALUE (1) CONCENTRATION	D. NO. OF ANALYSES	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE (1) CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE (1) CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE (2) MASS	B. NO. OF ANALYSES
A. Bromide (24959-67-9)		X												
B. Chlorine Total Residual	X		0.13	2.72	0.02	0.39	104	mg/L	lb					
C. Color		X												
D. Fecal Coliform	X		810		20.	104	#/100ml							
E. Fluoride (16984-48-8)		X												
F. Nitrate-Nitrite (as N)	X		116	1544.09	28.2	452.95	104	mg/L	lb					

CONTINUED FROM FRONT

1. POLLUTANT AND CAS NUMBER <i>(if available)</i>	2. MARK "X"		3. EFFLUENT				4. UNITS			5. INTAKE <i>(optional)</i>		B. NO. OF ANAL. YSES
	A. BE- LIEVED PRE- SENT	B. BE- LIEVED AB- SENT	A. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	B. MAXIMUM 30 DAY VALUE <i>(if available)</i> (1) CONCENTRATION	(2) MASS	C. LONG TERM AVRG. VALUE <i>(if available)</i> (1) CONCENTRATION	(2) MASS	A. CONCENTRATION	(1) CONCENTRATION	(2) MASS	
G. Nitrogen Total Organic (as N)	X		118	1593.20			30.84	194.66	mg/L		1b	104
H. Oil and Grease	X		3.3	66.96			0.96	15.42	mg/L		1b	104
I. Phosphorus (as P) Total (7723-14-0)	X		47	671.85					mg/L		1b	
J. RADIOACTIVITY												
(1) Alpha Total												
(2) Beta Total												
(3) Radium Total												
(4) Radium 226 Total												
K. Sulfate (as SO ₄) (14808-79-8)												
L. Sulfide (as S)												
M. Sulfite (as SO ₃) (14265-45-3)												
N. Surfactants												
O. Aluminum Total (7429-90-5)												
P. Barium Total (7440-39-3)												
Q. Boron Total (7440-42-8)												
R. Cobalt Total (7440-48-4)												
S. Iron total (7439-89-6)												
T. Magnesium Total (7439-95-4)												
U. Molybdenum Total (7439-98-7)												
V. Manganese Total (7439-96-5)												
W. Tin Total (7440-31-5)												
X. Titanium Total (7440-32-6)												

FORM C

2.10

Legal Description of Outfalls

Outfall #001 - W 1/2, 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 #006 - SE 1/4, NE 1/4, Sec. 22, T46N, R22W, Pettis County

X = 472419, Y = 4289480

Outfall #007 - SE 1/4, NE 1/4, Sec. 22, T46N, R22W, Pettis County

X = 472424, Y = 4289477

Outfall #008 - SE 1/4, NE 1/4, Sec. 22, T46N, R22W, Pettis County

X = 472346, Y = 4289360

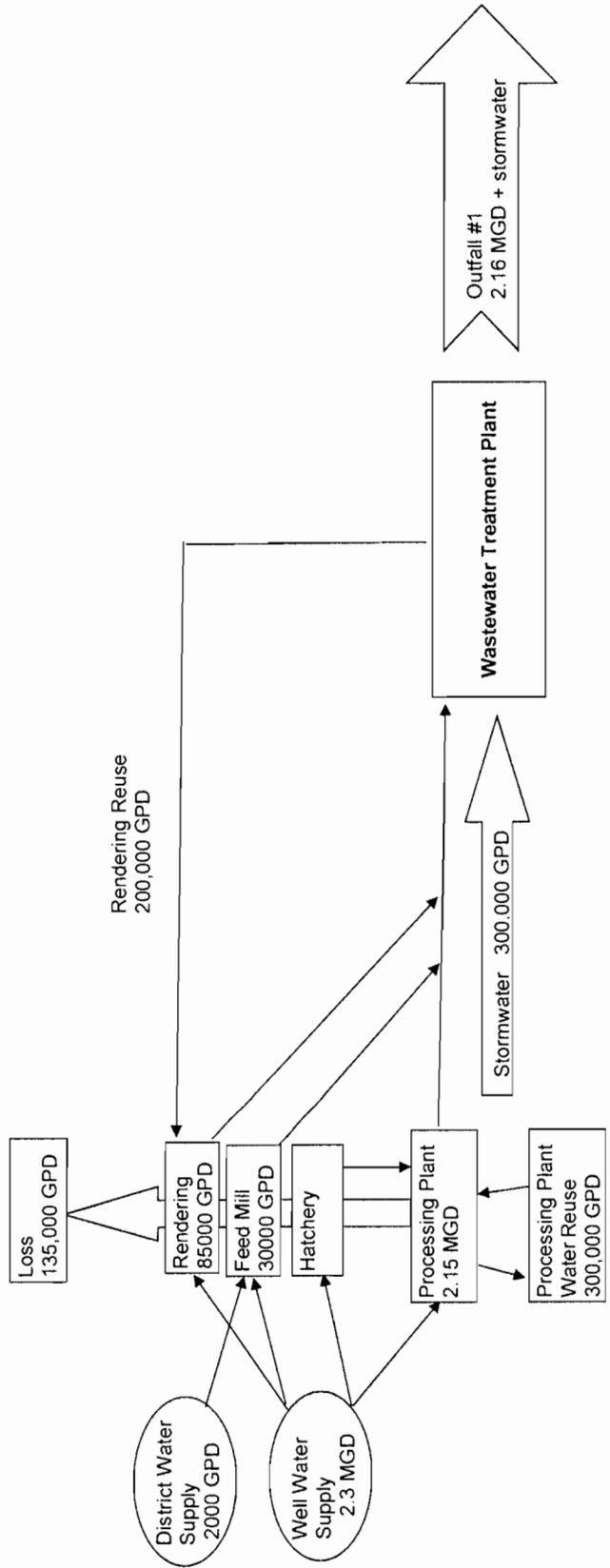
Outfall SM1 - Background Ambient Temperature Measurement Point:

SE ¼, SW ¼, Sec. 12, T46N, R22W, Pettis County

Outfall SM2 - Temperature Compliance Point:

SE ¼, NE ¼, Sec. 14, T46, R22W, Pettis County

2.40 A
 Tyson Foods, Inc.
 Sedalia Complex Water Flow



2.40 B

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 an anoxic basin (3-D) then into a 2.3 million gallon Complete Mix Aeration System, which uses induced air jet aeration for activated sludge growth (3-A & 3-D). Wastewater gravity flows to one final 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.

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, which flows to a tributary of Little Muddy Creek.



Sedalia Complex
Wastewater Data

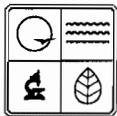
Date	Flow	pH	BOD	TSS	O&G	TKN	NO3	NO2	Total N	Fecal	NH3	Cl res.	Temp (C°)	COD
1-Jan-12	1.511												22.6	76
2-Jan-12	1.075												22.9	54
3-Jan-12	1.047	7.39	2	8.0	1.9	4.5	25.6	0.004	30.1	9	0.6	0.01	19.2	68
4-Jan-12	1.395												18.7	44
5-Jan-12	1.531	7.14	2	6.0	0.9	4.5	35.7	0.004	40.2	20	0.3	0	20.0	68
6-Jan-12	1.836												20.5	64
7-Jan-12	1.999												21.4	19
8-Jan-12	2.260												21.9	23
9-Jan-12	2.279												22.5	63
10-Jan-12	2.286	7.09	4	15.0	0.9	3.4	50.1	0.004	53.5	9	0.3	0.03	23.6	20
11-Jan-12	2.208												24.4	43
12-Jan-12	2.322	7.03	2	1.0	0.9	1.1	15.8	0.004	16.9	9	0.2	0.02	22.4	42
13-Jan-12	2.328												22.3	13
14-Jan-12	2.226												22.6	35
15-Jan-12	1.686												22.8	22
16-Jan-12	1.620												22.7	5
17-Jan-12	1.971	7.33	2	0.9	0.9	2.2	6.8	0.004	9.0	9	0.3	0.01	22.5	30
18-Jan-12	2.256												24.0	22
19-Jan-12	2.306	7.35	2	2.0	0.9	2.2	15.1	0.004	17.3	9	0.3	0	24.3	57
20-Jan-12	2.348												24.0	59
21-Jan-12	2.300												24.0	33
22-Jan-12	1.890												22.9	24
23-Jan-12	1.857												22.4	15
24-Jan-12	1.986	7.39	2	7.0	0.9	3.4	9.8	0.004	13.2	9	0.8	0	23.1	15
25-Jan-12	2.044												23.0	42
26-Jan-12	2.262	7.33	2	3.0	0.9	2.2	10.8	0.004	13.0	9	0.3	0	23.6	23

1-Mar-12	2.344	7.66	5	3.0	0.9	2.2	9.6	0.004	11.8	9	0.3	0	24.9	48
2-Mar-12	2.390												25.5	48
3-Mar-12	2.375												25.3	47
4-Mar-12	1.888												25.9	43
5-Mar-12	1.840												24.8	52
6-Mar-12	1.763	7.82	3	7.0	0.9	2.2	12.3	0.004	14.5	9	0.2	0	24.4	64
7-Mar-12	1.650												24.3	39
8-Mar-12	1.921	7.81	2	4.0	0.9	2.2	10.7	0.004	12.9	9	0.3	0	23.7	61
9-Mar-12	2.145												24.5	32
10-Mar-12	1.829												25.3	21
11-Mar-12	1.425												25.6	18
12-Mar-12	1.196												25.4	22
13-Mar-12	1.391	7.78	3	6.0	0.9	3.4	12.7	0.004	16.1	9	0.3	0	25.7	31
14-Mar-12	2.037												26.6	53
15-Mar-12	2.267	7.86	2	8.0	0.9	2.2	10.1	0.004	12.3	20	0.6	0	27.5	53
16-Mar-12	2.381												28.7	72
17-Mar-12	2.359												29.1	36
18-Mar-12	2.227												29.3	27
19-Mar-12	2.271												28.9	44
20-Mar-12	2.313	7.71	2	4.0	0.9	3.4	14.5	0.004	17.9	9	0.3	0	28.0	32
21-Mar-12	2.342												27.6	69
22-Mar-12	2.315	7.72	2	0.9	0.9	2.2	15.3	0.004	17.5	9	0.2	0	27.8	54
23-Mar-12	2.414												28.2	61
24-Mar-12	2.399												27.5	37
25-Mar-12	1.420												27.9	56
26-Mar-12	0.821												27.3	43
27-Mar-12	1.608												27.7	58
28-Mar-12	1.806	7.21	13	18.0	0.9	4.5	6.5	0.004	11.0	9	0.3	0.01	28.3	57
29-Mar-12	2.309	7.19	6	8.0	0.9	3.4	15.1	0.004	18.5	9	0.3	0.02	28.1	32
30-Mar-12	2.536												27.8	43
31-Mar-12	2.422												28.1	28
1-Apr-12	2.416												28.9	29
2-Apr-12	2.459												29.9	47
3-Apr-12	2.527	7.03	2	2.0	0.9	2.8	20.2	0.004	23.0	9	0.6	0	29.7	42

25-Oct-12	1.481	7.56	6	9.0	0.9	0.9	0.9	73.2	0.034	73.2	9	0.3	0	27.2	62
26-Oct-12	1.656													25.3	52
27-Oct-12	1.525													24.8	48
28-Oct-12	1.725													24.8	46
29-Oct-12	1.550													25.1	41
30-Oct-12	1.549	7.32	3	6.0	0.9	0.9	0.9	104.0	0.059	104.0	9	3.1	0	24.9	53
31-Oct-12	1.549													24.9	61
1-Nov-12	1.721	7.57	3	6.0	0.9	0.9	6.7	104.0	0.102	111.0	9	5.6	0	25.1	45
2-Nov-12	1.531													25.2	40
3-Nov-12	2.002													24.3	57
4-Nov-12	1.965													24.2	55
5-Nov-12	2.037													24.5	52
6-Nov-12	1.704	6.81	5	11.0	0.9	0.9	0.9	110.0	0.050	110.0	9	0.6	0	24.3	51
7-Nov-12	1.676													23.6	45
8-Nov-12	1.596	6.94	4	13.0	0.9	0.9	2.2	116.0	0.004	118.0	9	0.3	0	23.5	40
9-Nov-12	1.481													23.5	53
10-Nov-12	1.470													23.9	46
11-Nov-12	1.463													23.7	59
12-Nov-12	1.358													22.0	44
13-Nov-12	1.360	6.98	3	11.0	0.9	0.9	3.4	113.0	0.004	113.0	9	0.3	0	21.6	32
14-Nov-12	1.443													22.0	21
15-Nov-12	1.495	6.83	3	10.0	0.9	0.9	2.2	109.0	0.004	111.0	9	0.3	0.07	22.3	28
16-Nov-12	1.413													22.5	29
17-Nov-12	1.499													22.7	42
18-Nov-12	1.495													22.4	33
19-Nov-12	1.506													22.3	35
20-Nov-12	1.468	6.93	2	5.0	0.9	0.9	1.1	107.0	0.004	108.0	9	0.3	0.05	22.3	35
21-Nov-12	1.348	7.10	2	5.0	0.9	0.9	2.2	96.2	0.004	98.4	9	0.2	0.02	22.6	31
22-Nov-12	1.291													22.3	24
23-Nov-12	1.287													21.7	55
24-Nov-12	1.193													21.3	25
25-Nov-12	1.107													20.9	32
26-Nov-12	1.053													20.5	50
27-Nov-12	1.062	6.80	2	2.0	0.9	0.9	1.1	53.0	0.004	54.1	9	0.2	0.01	19.5	51

Count	366	104	104	104	104	104	104	104	104	104	104	104	104	365	365	
Avg.	1.923293	7.38962	3.27212	6.43462	0.96154	2.87404	28.23838	0.01049	0.194	118.000	30.83846	20.10577	0.445192	0.024038	26.5000822	42.51233
Max	2.609	7.880	14.000	20.000	3.300	10.000	116.000	0.194	0.004	4.400	118.000	810.000	5.600	0.130	33.600	100.000
Min.	0.213	6.800	1.900	0.900	0.900	0.900	0.262	0.004	0.004	4.400	4.400	9.000	0.200	0.000	10.900	3.000
Mass			242.044	350.055	66.961		1563.25	3.684095	1593.199		494.657		80.37758	2.722426		1805.919
Mass Avg.			52.4856	103.213	15.4233								7.141001	0.385583		681.9088

Max Summer	33.6
Avg. Summer	29.4
Max Winter	30.0
Avg. Winter	23.56



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 & 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

1.10 Facility Name

TYSON FOODS, INC. - SEDALIA PROCESSING PLANT

1.20 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

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

1.40 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. 001 _____

2.00 STORAGE BASINS

2.10 Number of storage basins: 3 Type of basin: Steel Concrete Fiberglass Earthen
 Earthen with membrane liner

2.20 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 248 Width 148 Depth 18 Freeboard 2 Berm Width 8 FT % Slope 10
 Basin #2: Length 39' D Width _____ Depth 24' H Freeboard _____ Berm Width _____ % Slope _____

2.21 Storage basin volumes (gallons): Permanent volume means two foot water depth for seal protection, and any required treatment volume capacity.
 Basin #1: Gallons: 97,500 Permanent Volume + 1,475,000 Storage = _____ Total volume (gallons) 1,775,000
 Basin #2: Gallons: _____ Permanent Volume + _____ Storage = _____ Total volume (gallons) 210,000 x 2

2.30 Storage Basin operating levels (report as feet below emergency overflow level)
 Basin #1: Maximum water level 16 ft. Minimum operating water level 2 ft.
 Basin #2: Maximum water level 24 ft. Minimum operating water level 0 ft.

2.40 Storage Basin design storage capacity: (storage between minimum and maximum operating levels for 1-in10 year storm water flows.)
 Basin #1: 210 days Basin #2: 20 days Basin #3: 20 days

2.50 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.

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

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

3.00 LAND APPLICATION SYSTEM

3.10 Number of application sites 17 Total Available Acres 849 Minimum & Maximum % field slopes <5%
 Location: ___ ¼ ___ ¼ ___ ¼ ___ Sec. ___ T ___ R ___ County ___ Acres
 Location: ___ ¼ ___ ¼ ___ ¼ ___ Sec. ___ T ___ R ___ County ___ Acres
 Attach extra sheets as necessary.

3.12 Type of vegetation: Grass hay Pasture Timber Row crops Other (describe) _____
 Specific Crops and Yields/acre: Goal: 200 BU/AC CORN, 60 B/AC BEANS, 75 B/AC WHEAT
 Actual for last five years: 100 BU/AC CORN, 30 BU/AC BEANS, 45 BU AC WHEAT

3.20 Annual sludge production (gallons per year): 5259596 Actual 6562750 Design
(dry tons per year): 658 Actual 821 Design
Human Population Equivalent: _____ Actual 306618 Design

3.21 Land Application rate per acre:
Design: _____ dry ton/year _____ dry ton/application _____ No. applications/year
Actual: 2.44 dry ton/year .55 dry ton/application 1196 No. applications/year
Total amount land applied each year (total all sites) Design 821 dry ton/year Actual 658 dry ton/year
Actual months used for land application: Jan Feb Mar Apr May Jun Jul Aug Sep
 Oct Nov Dec

3.22 Land Application Rate is based on:
 Nutrient Management Plan (N&P) PAN Conservative
 Hydraulic Loading Limiting Pollutant (Specify) _____
 Other (describe) _____

3.30 Equipment type: Tank wagon Tank truck Subsurface injection Slinger spreader Dry spreader
 Other (describe) _____
Equipment Capacity: 10250 Gallons (cubic feet) per hour 300 Total hours of operation per year

3.40 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.
N/A

3.50 Separation distance (in feet) from the outside edge of the biosolids application area to down gradient features:
100 FT Permanent flowing stream 300 FT Losing Stream 100 FT Intermittent (wet weather) stream 100 FT Lake or pond
50 FT Property boundary 150 FT Dwellings 300 FT Water supply well _____ Other (describe) _____

3.60 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 ARISBURG SILT LOAM Depth of bedrock >25 Feet Depth to water table 20 Feet
Soil Infiltration rate in inches/hour (in/hr) for most restrictive layer within the following soil depth ranges:
N/A In/hr for 0-12 inch soil depth _____ In/hr for 12-24 inch soil depth _____ In/hr for 24-60 inch soil depth

3.70 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.

3.80 Geologic Investigation: _____ Date of most recent Geologic Report by Department's Division of Geology and Land Survey.

3.81 Ground Water Monitoring Wells: (Attach Groundwater Monitoring Plan when required by department)
 NONE EXISTING PLANNED NUMBER: _____ Monitoring Wells _____ Lysimeters

3.90 Attach a current copy of the Operation and Maintenance (O&M) Plan for the land application system. Date of O&M Plan: _____

3.91 Attach a site map showing topography, storage basins, land application sites, property boundary, streams, wells, roads, dwellings and other pertinent features.

3.92 Attach a facility sketch showing treatment units, storage basins, pipelines, application sites and other features.

4.00 INDUSTRIAL PROCESS INFORMATION

4.10 Brief description of treatment processes prior to land application and note any changes made in last five years. (Attach extra sheets as necessary.)

4.11 Detailed description of industrial production processes. Also indicate any changes made in last five years. (attach extra sheets as necessary)
See Attached

4.20 List of raw materials, chemicals, additives, products, and by-products (Attach extra sheets as necessary)
SEE ATTACHED

4.31 Attach 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.

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

4.40 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.)

4.50 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, Inc.; EPA Methods; or other methods approved by the department. Attach extra sheets as necessary.

Total area sampled is 847 acres. Each composite sample covers 20 acres. Each composite consists of 20 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	3	70	12.7		54	2011
Phosphorus as P (Bray 1P)	17	230	83.7		207	2011
Exchangeable Sodium %						2011
Organic Matter (percent)	2.2	4.3	3.1		207	2011
Cation Exchange Capacity	10.2	32.5	18.5		207	2011
pH (standard units)	5.3	7.8	6.8		207	2011

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

POTASSIUM	79	334	158.8		207	2011
CALCIUM	1491	5807	2814.15		207	2011
MAGNESIUM	158	860	384.80		207	2011
ZINC	0.9	11.6	2.62		207	2011
SULFUR	1	64	13.10		207	2011

6.00 LAND LIMITING CONSTITUENTS FOR LAND APPLICATION

6.10 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 5 years and a minimum of 4 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	57.4	183	120		COMP	4	DAF	3/08-12/12
Arsenic	<0.5	0.7	0.48		COMP	9	DAF	3/08-12/12
Beryllium	4	<5	4		COMP	4	DAF	3/08-12/12
Cadium	<0.5	<0.5	<0.5		COMP	9	DAF	3/08-12/12
Chromium	3.8	47.3	10.69		COMP	9	DAF	3/08-12/12
Copper	14.2	60.1	23.59		COMP	9	DAF	3/08-12/12
Fluoride	4.5	<10.5	7.63		COMP	4	DAF	3/08-12/12
Lead	<0.5	2.5	0.78		COMP	9	DAF	3/08-12/12
Manganese	108	126	118		COMP	4	DAF	3/08-12/12
Mercury	<0.3	<0.3	<0.3		COMP	9	DAF	3/08-12/12
Molybdenum	<10	<10	<10		COMP	9	DAF	3/08-12/12
Nickel	2.2	<10	4.40		COMP	9	DAF	3/08-12/12
Selenium	<0.5	19.2	3.02		COMP	9	DAF	3/08-12/12
Silver	<0.3	0.5	0.28		COMP	4	DAF	3/08-12/12
Tin	<100	<100	<100		COMP	4	DAF	3/08-12/12
Zinc	57.5	106	68.71		COMP	9	DAF	3/08-12/12

6.20 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	2800	40500	22815		COMP	40	DAF	3/08-12/12
Ammonia Nitrogen as N	4310	97700	12614		COMP	40	DAF	3/08-12/12
Nitrate Nitrogen as N	21.6	230	39.33		COMP	40	DAF	3/08-12/12
Total Nitrogen as N	60628	102055	76505		COMP	22	DAF	3/08-12/12
Plant Available Nitrogen (PAN)	8021	102350	17216		COMP	40	DAF	3/08-12/12
Total Phosphorus as P	4680	9820	6499		COMP	10	DAF	3/08-12/12
Boron	<10	<10	<10		COMP	9	DAF	3/08-12/12

Chlorides	721	2660	1637		COMP	10	DAF	3/08-12/12
Sodium	735	2910	1312		COMP	10	DAF	3/08-12/12
COD					COMP		DAF	3/08-12/12
TPH					COMP		DAF	3/08-12/12
Total Suspended Solids					COMP		DAF	3/08-12/12
Oil & Grease	180000	1100000	712455		COMP	11	DAF	3/08-12/12
Sodium Absorption Ration (SAR)	2.6	3.7	3.05		COMP	4	DAF	3/08-12/12
pH (standard units)	5	5.1	5.08		COMP	4	DAF	3/08-12/12

6.00 LAND LIMITING CONSTITUENTS FOR LAND APPLICATION

6.10 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 5 years and a minimum of 4 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	17200	22800	20180		COMP	5	WAS	3/07- 11/12
Arsenic	1.1	<8.0	2.88		COMP	12	WAS	3/07- 11/12
Beryllium	<5	<5	4		COMP	5	WAS	3/07- 11/12
Cadium	<0.5	3.5	0.89		COMP	12	WAS	3/07- 11/12
Chromium	3.6	24.6	9.38		COMP	12	WAS	3/07- 11/12
Copper	36.3	130	66.67		COMP	12	WAS	3/07- 11/12
Fluoride	15	175	105.04		COMP	5	WAS	3/07- 11/12
Lead	0.9	3.2	1.73		COMP	12	WAS	3/07- 11/12
Manganese	1270	3870	2762		COMP	5	WAS	3/07- 11/12
Mercury	<0.3	0.5	0.22		COMP	11	WAS	3/07- 11/12
Molybdenum	<10.0	12.6	9.53		COMP	12	WAS	3/07- 11/12
Nickel	6.2	33.5	13.21		COMP	12	WAS	3/07- 11/12
Selenium	0.6	6.8	2.58		COMP	12	WAS	3/07- 11/12
Silver	<0.3	0.5	0.28		COMP	5	WAS	3/07- 11/12
Tin	<100	<100	<1000		COMP	5	WAS	3/07- 11/12
Zinc	112	344	162.67		COMP	12	WAS	3/07- 11/12

6.20 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	50800	107000	63209		COMP	32	WAS	3/07- 11/12
Ammonia Nitrogen as N	9000	47700	18589		COMP	32	WAS	3/07- 11/12
Nitrate Nitrogen as N	9.0	76	25		COMP	32	WAS	3/07- 11/12
Total Nitrogen as N	67721	138039	84181		COMP	15	WAS	3/07- 11/12
Plant Available Nitrogen (PAN)	21590	58615	31256		COMP	32	WAS	3/07- 11/12
Total Phosphorus as P	31600	67600	54367		COMP	15	WAS	3/07- 11/12
Boron	15	56.9	39.47		COMP	14	WAS	3/07- 11/12

Chlorides	600	14900	8450		COMP	15	WAS	3/07-11/12
Sodium	6390	11500	8963		COMP	15	WAS	3/07-11/12
COD	839500	1100000	946625		COMP	4	WAS	3/07-11/12
TPH	<3300	22000	10759		COMP	5	WAS	3/07-11/12
Total Suspended Solids	20900	28600	25175		COMP	4	WAS	3/07-11/12
Oil & Grease	3700	2800000	391213		COMP	15	WAS	3/07-11/12
Sodium Absorption Ration (SAR)	10.4	13.6	12.3		COMP	5	WAS	3/07-11/12
pH (standard units)	6.6	7.1	7		COMP	5	WAS	3/07-11/12

FORM R
 3.10
 LAND APPLICATION SYSTEM

Area No.	Calculated Area (acres)							
		1/4	1/4	1/4	Sec.	T	R	County
1	27.4		SE	NE	22	46N	22W	Pettis
2	32.2		NW	SW	23	46N	22W	Pettis
3	26.6		SW	NW	23	46N	22W	Pettis
4	27.0		NE	SW	23	46N	22W	Pettis
5	64.0		SE	NW	23	46N	22W	Pettis
6	36.6	SW	NW	NE	23	46N	22W	Pettis
7	48.8		SE	SW	14	46N	22W	Pettis
8	152.1		SW	SW	14	46N	22W	Pettis
9	2.6	NE	NE	SW	14	46N	22W	Pettis
10	44.4		SE	NW	14	46N	22W	Pettis
11	101.0		SW	NW	14	46N	22W	Pettis
12	13.3	W 1/2	SE	NE	15	46N	22W	Pettis
13	123.6		NW	SE	15	46N	22W	Pettis
14	35.2		NW	NE	22	46N	22W	Pettis
15	47.0		NE	NW	22	46N	22W	Pettis
16	34.0		SE	NW	22	46N	22W	Pettis
17	32.9		SW	NE	22	46N	22W	Pettis
Total	848.8							

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 Flootation (DAF) units (1200 gpm). A portion of the solids are skimmed and ran through a tricanter cenfrifuge 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. Waste Activated Sludge pumped from the clarifier is stored in a WAS lagoon and is land applied as necessary.

4.11

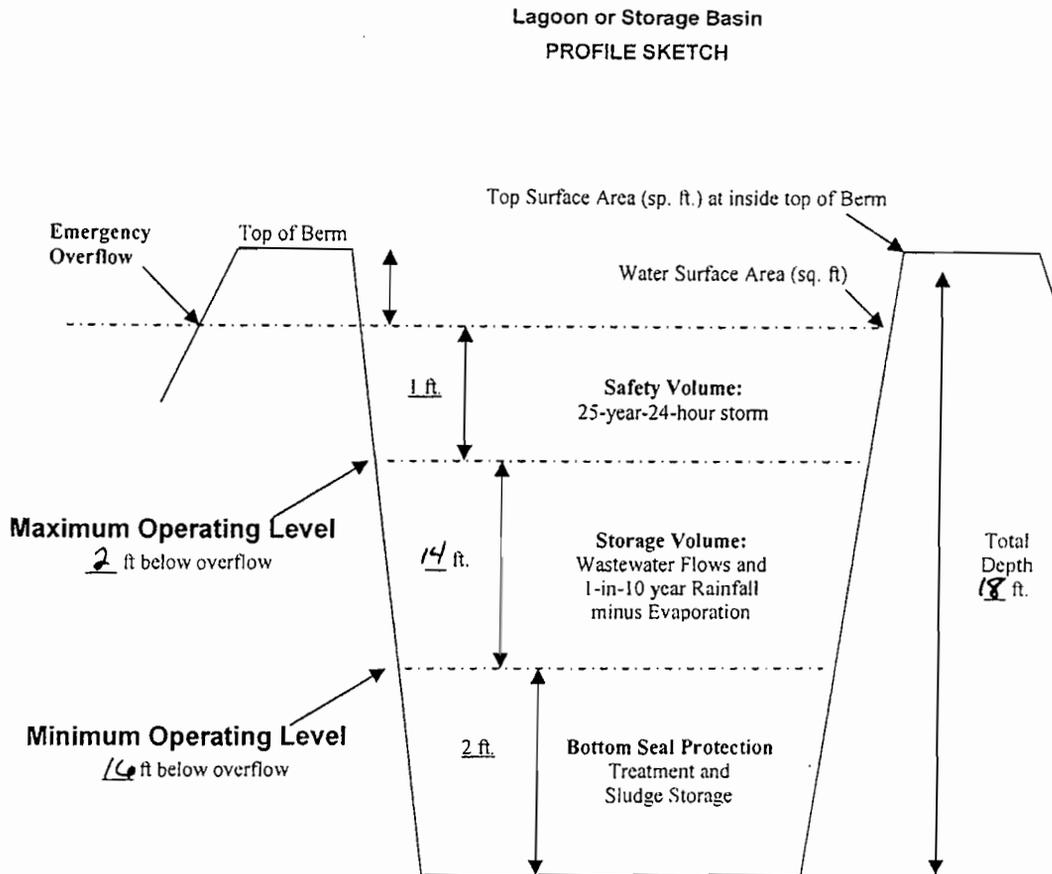
Poultry slaughter and further production facility with approximately 1.3 million chickens being processed a week. Complex includes Processing Plant, Feed Mill, Hatchery, and Rendering Facility.

4.20

Chicken, vegetable oil, marinates, corn, soybeans, feathers, offal, egg shells, blood, hydraulic oils and lubes, misc. feed minerals and vitamins, NaOCl, NaOH, CO₂, NH₃, sulfuric acid.

ATTACHMENT A

(To be included with Form I and Form R)



DEFINITION OF TERMS (REFER TO THE PROFILE SKETCH ABOVE).

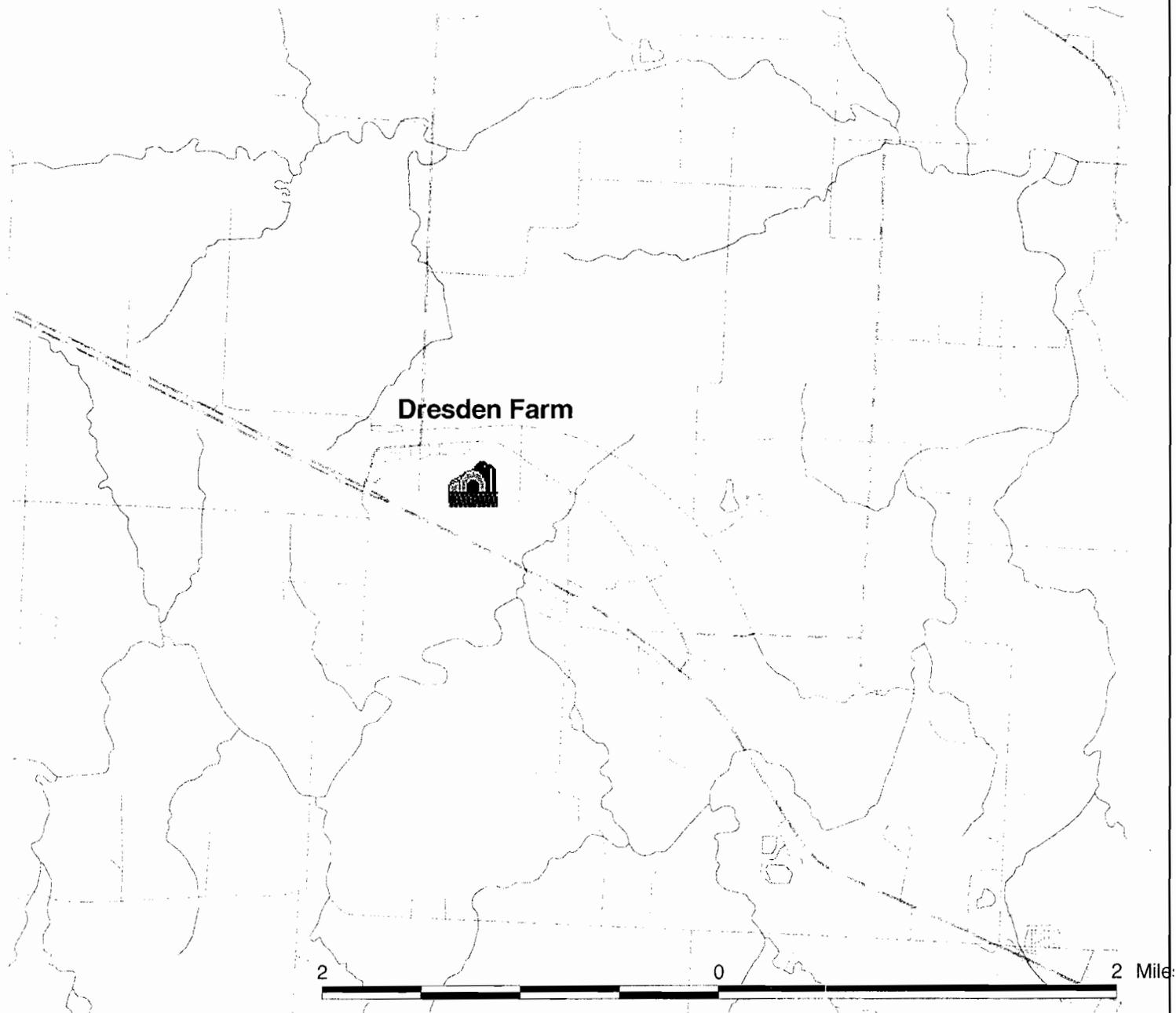
- a. Freeboard is depth from top of berm to emergency spillway (minimum 1 foot);
- b. Safety Volume is depth for 25-year, 24-hour storm (minimum of 1 foot);
- c. Maximum Operating Level is at bottom of the safety volume (minimum of 2 feet below top of berm).
- d. Minimum Operating Level is 2 feet above 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.

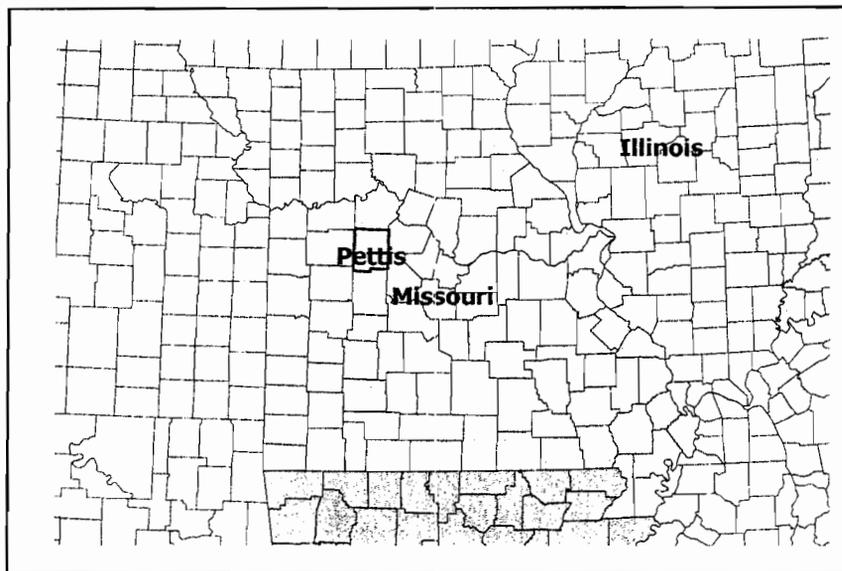
Storage Volume and days storage are based on the volume between Minimum and Maximum Operating Levels.

.. Total Depth is from top of berm to bottom of basin including freeboard.

Seda-Tyson Farms - Pettis County

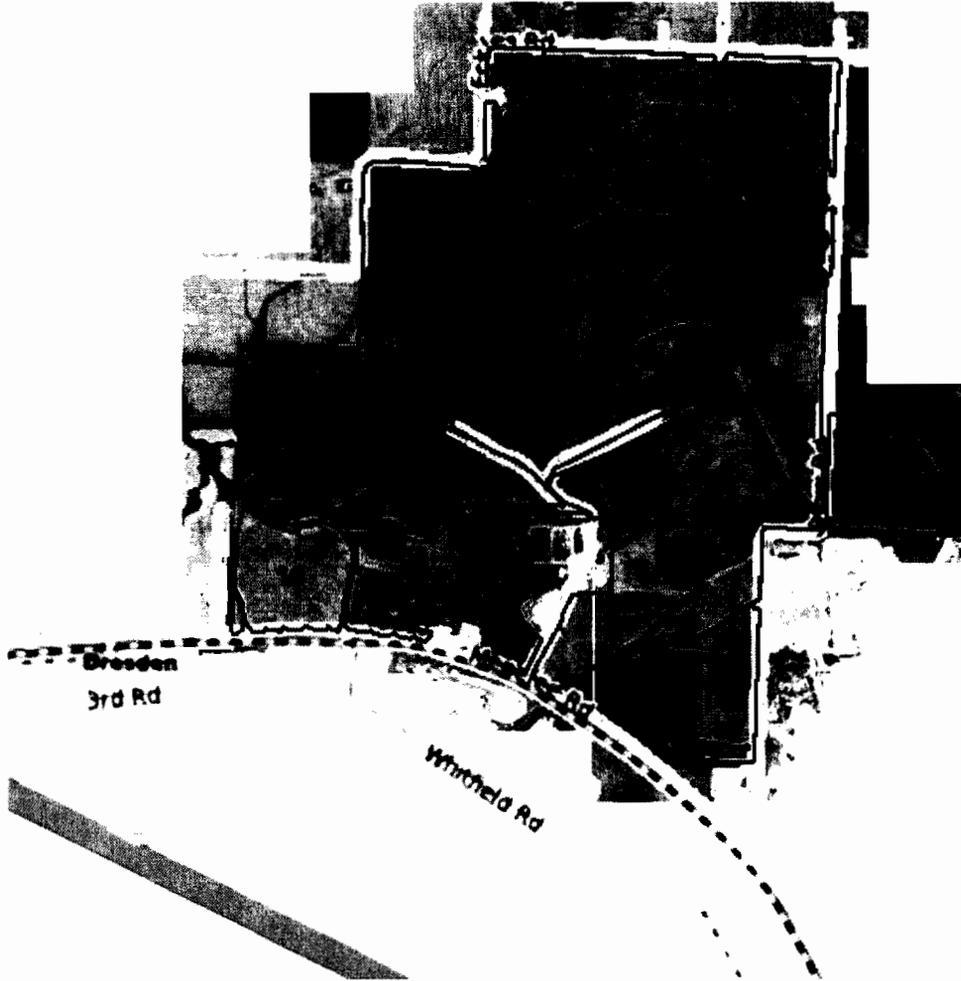


-  Pettis Streams
-  Pettis Roads
-  Pettis Highways
-  Pettis Cities
-  Pettis Sections
-  Pettis County

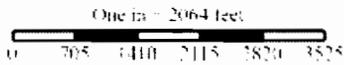


Dresden Farm

6



Date: 1/31/2011
Farm: Dresden Farm
Grower: Seda-Tyson Farms
Area: 802.61 ac



■ Dresden Farm (802.61 ac)



Sedalia Complex
2012 Crops Harvested & Yields

Field #	Crop	Acres
1	Beans	27.4
3	Beans	26.6
7	Beans	48.8
9	Beans	2.6
10	Beans	44.4
16	Beans	34
17	Beans	32.9
18	Beans	18.1

Total Acres 234.8
Total Bushels 4550
Bushels/Acre 19.38

Field #	Crop	Acres
2	Corn	32.2
4	Corn	27
5	Corn	64
6	Corn	36.6
8	Corn	152.1
11	Corn	101
12	Corn	13.3
13	Corn	104.7
14	Corn	35.2
15	Corn	65.9

Total Acres 632
Total Bushels 17385
Bushels/Acre 27.51

Summary

Crop	Acres	Bushels	Bushels/Acre
Beans	234.8	4550	19.38
Wheat	0	0	0.00
Corn	632	17385	27.51



Land Application and Sludge Management

Sedalia, Missouri Complex

Missouri State Operating Permit
No.: MO-0115061

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1.0 INTRODUCTION

1.1 INTRODUCTION

This provides a summary of biosolids sludge management activities performed at the Tyson Foods, 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 two high-capacity dissolved air floatation (DAF) units which operate in parallel followed by four anaerobic treatment lagoons which have the ability to operate in series or parallel, and Anoxic Zone, a complete mix activated sludge basin (CMAS basin), a clarifier, and a chlorination contact chamber which leads to a Parshall flume for de-chlorination. Final effluent discharges to an unnamed tributary of the Little Muddy Creek. Sludge management and operation of the WWTP is conducted consistent with the requirements of Missouri State Operating Permit No. MO-0115061 (the Permit).

Two types of sludge are generated at the WWTP including sludge from the DAF units (DAF sludge) and waste activated sludge (WAS sludge). WAS sludge is that sludge discharged from the final clarifier to the WAS lagoon. Sludge generated by the WWTP is utilized as an agronomic soil amendment on farmland, owned by Tyson Foods, Inc., located adjacent to the Sedalia Complex (on-site). Sludge generated from the WWTP is also utilized as a soil amendment by both Sedalia Complex farmland and off-site private landowners in Missouri and Arkansas. Off-site sludge management activities are performed by Terra Renewal Services, Inc. and Schibi Farms under applicable state permits. Historically, WAS sludge is utilized as an on-site soil amendment, whereas, DAF sludge is utilized both as an on-site and off-site soil amendment.

* * * * *

2.0 LAND APPLICATION AND SLUDGE MANAGEMENT PROGRAM

2.1 ON-SITE SLUDGE APPLICATION SITES

The Sedalia Complex owns approximately 848 acres of land available for on-site sludge application under the provisions of the Permit. The land is divided into 17 fields physically separated from one another by drainage ways, topographic highs, terraces, fence lines and/or roads. Figure 1 presents the location of Fields 1 through 17.

2.2 SOIL SAMPLING METHODOLOGY

Soil sampling is performed by MFA Agri Services, Precision Advantage Services. All samples are taken in accordance to the Sedalia Complex permit (C. Special Conditions, 7. Land Application of Industrial Sludge). The Permit requires two soil samples from each location (0 to 6 inches below grade and 6 to 12 inches below grade). Performed as outlined in University of Missouri-Columbia Publication No. G-9110, composite soil samples were collected from approximately 15 to 20 discrete locations representing the same depth interval. Composite samples were collected in a manner to characterize field sizes of 20 acres or less. The geographic location of each discrete sample location is recorded using a Global Positioning System (GPS) device and recorded in a field sampling logbook.

Collected soil samples are submitted to Midwest Laboratories, Inc. for testing. Those results are keyed into the University of Missouri Extension Soil Test Report in order to calculate nutrient requirements for crop yields planted on Tyson owned adjacent crop grounds. As required in the Permit, prior to land application of sludge, collected soil samples were analyzed for the following parameters including: nitrate nitrogen, soil pH, percent organic matter, cation exchange capacity and available phosphorus as P (Bray P-1 test method).

2.3 SLUDGE SAMPLING METHODOLOGY

A composite sludge sample is collected once per day during land application activities and analyzed for percent moisture and percent total solids, (SOP-Land Application Solids-Percentage Calculation). Moisture and total solids tests are performed at the WWTP laboratory using standard laboratory methods. Sludge samples are collected for ammonia-nitrogen, nitrate-nitrogen and oil & grease testing at a rate of one per 100 dry tons of sludge applied. Sludge samples were collected at a rate of one per 500 dry tons sludge applied and analyzed for sodium, total phosphorus, potassium, chloride, oil & grease and for metals including arsenic, boron, cadmium, chromium, copper, lead, mercury, molybdenum, nickel,

selenium, and zinc. As a standard practice, sludge samples are collected as composite samples representative of the sludge volume applied during each sludge application day. With the exception of daily moisture and total solids tests, sludge samples are analyzed by Engineering Surveys and Services Testing Laboratories located in Columbia, Missouri.

2.4 ON-SITE SLUDGE APPLICATION METHODOLOGY

All sludge applied on-site was subsurface injected to a depth of ranging from 0.5 – 1.0 feet below grade. Tyson equipment and staff is utilized to subsurface inject DAF sludge on-site, whereas, Kreisel Nutrient Management is utilized to subsurface inject WAS sludge by subsurface injection.

The Permit specifies sludge application loading limits for nitrogen specific to the agronomic requirements of the crops planted. The Permit also specifies land application loading limits with oil & grease, metals, sodium, chloride and boron.

2.5 AGRICULTURAL PRACTICES

Under contract, the on-site land is cultivated by Kriesel Farms, Inc. (also known as Kreisel Nutrient Management, LLC). The on-site land is cultivated using a typical crop rotation program of wheat, corn and soybeans.

2.6 OFF-SITE LAND APPLICATION

Under applicable State-specific operating permits issued in Missouri and Arkansas, Terra Renewal Services, Inc. provides for off-site land application of sludge generated at the Sedalia WWTP. Terra Renewal Services, Inc.'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. Terra Renewal Services, Inc. applies sludge solely through subsurface injection.

DAF solids that have undergone the TriCanter application which partially removes moisture and oil from the solids produced by the DAF unit are hauled offsite by Schibi Farms. Schibi Farms has a signed agreement with Tyson Foods, Inc. to apply these solids in accordance to Missouri applicable laws and regulations.



Tyson Foods, Inc.

**Sedalia Complex
On-Site Sludge Application Summary**

Field I.D.	2	PAN limit/acre	220
Total Field Acreage	32.2	PAN limit/field	6,050
Set Backs (acres)	4.7	CI limit/acre	500
Acreage (net set backs)	27.5	CI limit/field	13,750
		O&G limit/acre	10,000
		O&G limit/field	275,000

Date	DAF	18.78	1/11/2012	43.0	1/11/2012	4.41	1,165	45617	81000	12.57	12.57	5.02
01/16/12	DAF	17.77	1/11/2012	43.0	1/11/2012	4.41	1,165	25557	45000	7.04	19.61	4.71
01/24/12	DAF	16.97	1/19/2012	42.6	1/11/2012	4.41	1,165	15331	27000	4.22	23.83	4.5
01/25/12	DAF	14.11	1/25/2012	46.9	1/11/2012	4.41	1,165	10224	18000	2.82	26.65	3.74

01/11/12	DAF	18.78	216	2715	22	278	5852	73545				
01/16/12	DAF	17.77	203	4142	21	425	5491	112206				
01/24/12	DAF	16.97	192	4952	20	509	5245	134359				
01/25/12	DAF	14.11	176	5446	17	555	4360	146638				



Tyson Foods, Inc.

**Sedalia Complex
On-Site Sludge Application Summary**

Field I.D.	4	PAN limit/acre	230
Total Field Acreage	27	PAN limit/field	4,554
Set Backs (acres)	7.2	Cl limit/acre	500
Acreage (net set backs)	19.8	Cl limit/field	9,900
		O&G limit/acre	10,000
		O&G limit/field	198,000

Date	DAF	17.51	1/11/2012	43.0	1/11/2012	4.41	1,165	6693	12000	1.84	1.84	4.73
01/17/12	DAF	17.47	1/11/2012	43.0	1/11/2012	4.41	1,165	16637	30000	4.58	6.43	4.75
01/18/12	DAF	17.96	1/19/2012	42.6	1/11/2012	4.41	1,165	31752	60000	8.75	15.17	5.11
01/19/12	DAF	16.28	1/19/2012	42.6	1/11/2012	4.41	1,165	4993	9000	1.38	16.55	4.42
01/23/12	DAF	16.97	1/19/2012	42.6	1/11/2012	4.41	1,165	11650	21000	3.21	19.76	4.61

01/17/12	DAF	17.51	203	375	21	38	5510	10159				
01/18/12	DAF	17.47	204	1310	21	134	5529	35498				
01/19/12	DAF	17.96	218	3215	23	332	5956	87597				
01/23/12	DAF	16.28	188	3474	19	358	5150	94681				
01/24/12	DAF	16.97	196	4104	20	424	5369	111910				



**Sedalia Complex
On-Site Sludge Application Summary**

Field I.D.	5	PAN limit/acre	250
Total Field Acreage	64	PAN limit/field	13,625
Set Backs (acres)	9.5	CI limit/acre	500
Average (net set backs)	54.5	CI limit/field	27,250
		O&G limit/acre	10,000
		O&G limit/field	545,000

01/23/12	DAF	16.28	1/19/2012	42.6	1/11/2012	4.41	1.165	15286	30000	4.21	4.21	4.81
01/25/12	DAF	14.11	1/25/2012	46.9	1/11/2012	4.41	1.165	6112	12000	1.68	5.89	4.17
01/30/12	DAF	16.17	1/25/2012	46.9	1/11/2012	4.41	1.165	20439	45000	5.63	11.53	5.36
02/01/12	DAF	19.68	1/25/2012	46.9	1/11/2012	4.41	1.165	25906	57000	7.14	18.66	6.52
02/14/12	DAF	21.71	2/14/2012	32.7	1/11/2012	4.41	1.165	10670	21000	2.94	21.6	6.44
02/20/12	DAF	23.83	2/14/2012	32.7	1/11/2012	4.41	1.165	22075	39000	6.08	27.68	6.34
02/28/12	DAF	22.12	2/14/2012	32.7	1/11/2012	4.41	1.165	12982	21000	3.58	31.26	5.39
03/05/12	DAF	11.68	2/14/2012	32.7	1/11/2012	4.41	1.165	22955	36000	6.32	37.58	2.76
01/03/00	DAF	16.90	3/6/2012	76.9	1/11/2012	4.41	1.165	22948	36000	6.32	43.9	3.99
03/07/12	DAF	21.73	3/6/2012	76.9	1/11/2012	4.41	1.165	10161	21000	2.80	46.7	6.77
04/02/12	DAF	22.39	3/6/2012	76.9	1/11/2012	4.41	1.165	18089	42000	4.98	51.69	7.83
04/03/12	DAF	22.26	4/3/2012	77.5	1/11/2012	4.41	1.165	22309	45000	6.15	57.83	6.76

01/23/12	DAF	16.28	205	863	21	89	5607	23613				
01/25/12	DAF	14.11	196	1193	18	120	4862	31799				
01/30/12	DAF	16.17	252	2609	24	254	6248	66979				
02/01/12	DAF	19.68	306	4796	29	459	7599	121213				
02/14/12	DAF	21.71	210	5411	28	542	7499	143256				
02/20/12	DAF	23.83	207	6672	28	712	7389	188188				
02/28/12	DAF	22.12	176	7303	24	797	6280	210647				
03/05/12	DAF	11.68	90	7873	12	874	3215	230976				
01/03/00	DAF	16.90	307	9815	18	986	4653	260390				
03/07/12	DAF	21.73	520	11271	30	1069	7882	282453				
04/02/12	DAF	22.39	602	14272	35	1241	9124	327918				
04/03/12	DAF	22.26	524	17494	30	1425	7880	376348				



Tyson Foods, Inc.

**Sedalia Complex
On-Site Sludge Application Summary**

Field I.D.	6	PAN limit/acre	250
Total Field Acreage	36.6	PAN limit/field	6,400
Set Backs (acres)	11.0	CI limit/acre	500
Acreage (net set backs)	25.6	CI limit/field	12,800
		O&G limit/acre	10,000
		O&G limit/field	256,000

04/10/12	DAF	21.09	4/3/2012	77.50	1/11/2012	4.41	1,165	24508	24000	6.75	6.75	3.11
04/11/12	DAF	20.89	4/11/2012	72.10	4/11/2012	4.28	1,778	21437	18000	5.91	12.66	2.64
04/23/12	DAF	22.02	4/11/2012	72.10	4/11/2012	4.28	1,778	29236	30000	8.05	20.71	3.4
04/24/12	DAF	20.99	4/11/2012	72.10	4/11/2012	4.28	1,788	17539	18000	4.83	25.54	3.25

04/10/12	DAF	21.09	241	1628	14	93	3625	24472
04/11/12	DAF	20.89	191	2753	11	159	4698	52217
04/23/12	DAF	22.02	245	4730	15	277	6052	100961
04/24/12	DAF	20.99	234	5860	14	344	5770	128839



Tyson Foods, Inc.

**Sedalia Complex
On-Site Sludge Application Summary**

Field I.D.	7	PAN limit/acre	215
Total Field Acreage	48.8	PAN limit/field	8,170
Set Backs (acres)	10.8	Cl limit/acre	500
Acreage (net set backs)	38.0	Cl limit/field	19,000
		O&G limit/acre	10,000
		O&G limit/field	380,000

Date	Sludge Limit	Sludge Solids (%)	Date of Application	Commodity (lb/acre)	Date of Application	Sludge Applied (lb/acre)	Commodity Applied (lb/acre)	Date of O&G	O&G Applied (lb/acre)	Date of Application	Sludge Applied (lb/acre)	Date of Application	Commodity Applied (lb/acre)	Date of Application	Sludge Applied (lb/acre)
05/24/12	WAS	2.73	5/24/2012	56.8	5/24/2012	19.60	142.7				34200		318420		9.42
05/25/12	WAS	2.73	5/24/2012	56.8	5/24/2012	19.60	142.7				34200		318420		9.42
05/29/12	WAS	2.4	5/24/2012	56.8	5/24/2012	19.60	142.7				34200		318420		9.42
05/30/12	WAS	2.4	5/30/2012	62.1	5/24/2012	19.6	142.7				34200		318420		9.42

Date	Sludge Limit	Sludge Solids (%)	Date of Application	Commodity (lb/acre)	Date of Application	Sludge Applied (lb/acre)	Commodity Applied (lb/acre)	Date of O&G	O&G Applied (lb/acre)	Date of Application	Sludge Applied (lb/acre)	Date of Application	Commodity Applied (lb/acre)	Date of Application	Sludge Applied (lb/acre)
05/24/12	WAS	2.73	217	2049		75	707		546		5148				
05/25/12	WAS	2.73	217	4098		75	1414		546		10296				
05/29/12	WAS	2.4	191	5900		66	2036		480		14822				
05/30/12	WAS	2.4	209	7869		66	2657		480		19347				



Tyson Foods, Inc.

Sedalia Complex

On-Site Sludge Application Summary

Field I.D.	8	PAN limit/acre	220
Total Field Acreage	152.1	PAN limit/field	29,018
Set Backs (acres)	20.2	CI limit/acre	500
Acreage (net set backs)	131.9	CI limit/field	65,950
		O&G limit/acre	10,000
		O&G limit/field	1,319,000

Date	Sludge Solids (%)	Last Analyzed Date	PAH (ppb)	Last Analyzed Date	Chloride (lbs/acre)	O&G (lbs/acre)	Daily Sludge Applied (tons)	Daily Sludge Applied (acres)	Daily Sludge Applied (acres)	Commutative Area Applied	Daily Sludge Applied per Acre
01/09/12	3.09	1/9/2012	53.1	1/9/2012	19.40	32.70	68310	479071	18.82	18.82	3.26
01/10/12	2.97	1/9/2012	53.1	1/9/2012	19.40	32.70	68310	479071	18.82	37.64	3.14
01/11/12	2.99	1/11/2012	49.7	1/9/2012	19.40	32.70	68310	479071	18.82	56.45	3.16
01/16/12	2.78	1/11/2012	49.7	1/9/2012	19.40	32.70	68310	479071	18.82	75.27	2.94
01/23/12	2.99	1/11/2012	49.7	1/9/2012	19.40	32.70	68310	479071	18.82	94.09	3.16
01/24/12	2.99	1/24/2012	47.5	1/9/2012	19.40	32.70	68310	479071	18.82	112.91	3.16
01/25/12	2.81	1/24/2012	47.5	1/9/2012	19.40	32.70	68310	479071	18.82	131.73	2.97

Date	Sludge Solids (%)	Daily PAH Applied (lbs/acre)	Commutative PAH Applied (lbs)	Daily Chloride Applied (lbs/acre)	Commutative Chloride Applied (lbs)	Daily O&G Applied (lbs/acre)	Commutative O&G Applied (lbs)
01/09/12	3.09	173	3262	63	1192	107	2009
01/10/12	2.97	167	6398	61	2337	103	3940
01/11/12	2.99	157	9352	61	3491	103	5884
01/16/12	2.78	146	12099	57	4563	96	7691
01/23/12	2.99	157	15053	61	5716	103	9635
01/24/12	2.99	150	17877	61	6869	103	11579
01/25/12	2.81	141	20531	58	7953	97	13406



Tyson Foods, Inc.

**Sedalia Complex
On-Site Sludge Application Summary**

Field I.D.	10	PAN limit/acre	250
Total Field Acreage	44.4	PAN limit/field	9,475
Set Backs (acres)	6.5	CI limit/acre	500
Acreage (net set backs)	37.9	CI limit/field	18,950
		O&G limit/acre	10,000
		O&G limit/field	379,000

05/14/12	DAF	18.66	5/11/2012	72.7	4/11/2012	4.28	1,778	8700	9000	2.40	2.4	2.91
05/15/12	DAF	20.63	5/11/2012	72.7	4/11/2012	4.28	1,778	34800	36000	9.59	11.98	3.21
05/16/12	DAF	20.22	5/11/2012	72.7	4/11/2012	4.28	1,778	20300	21000	5.59	17.58	3.15
06/14/12	DAF	26.15	6/1/2012	27.7	4/11/2012	4.28	1,778	22400	24000	6.17	23.75	4.22
06/15/12	DAF	21.16	6/1/2012	27.7	4/11/2012	4.28	1,778	14000	15000	3.86	27.6	3.42
06/18/12	DAF	14.75	6/8/2012	27.4	4/11/2012	4.28	1,778	33600	36000	9.26	36.86	2.38

05/14/12	DAF	18.66	211	507	12	30	5170	12392
05/15/12	DAF	20.63	234	2747	14	162	5716	67192
05/16/12	DAF	20.22	229	4028	13	237	5603	98523
06/14/12	DAF	26.15	117	4750	18	349	7504	144832
06/15/12	DAF	21.16	95	5115	15	405	6072	168252
06/18/12	DAF	14.75	65	5719	10	499	4233	207433



Tyson Foods, Inc.

**Sedalia Complex
On-Site Sludge Application Summary**

Field ID.	16	PAN limit/acre	215
Total Field Acreage	34	PAN limit/field	6,042
Set Backs (acres)	5.9	CI limit/acre	500
Acreage (net set backs)	28.1	CI limit/field	14,050
		O&G limit/acre	10,000
		O&G limit/field	281,000

Date	ET	18.66	5/11/2012	72.7	4/11/2012	4.28	1,778	3300	3000	0.91	0.91	2.56
05/14/12	ET	18.66	5/11/2012	72.7	4/11/2012	4.28	1,778	3300	3000	0.91	0.91	2.56
05/30/12	WAS	2.40	5/30/2012	62.1	5/24/2012	19.60	143	36300	265770	10.00	10.91	2.65
06/04/12	WAS	2.06	6/4/2012	68.9	5/24/2012	19.60	143	56265	412424	15.50	26.41	2.27

Date	ET	18.66	186	169	11	10	4544	4131
05/14/12	ET	18.66	186	169	11	10	4544	4131
05/30/12	WAS	2.40	164	1813	52	529	378	7908
06/04/12	WAS	2.06	157	4242	45	1220	325	12939



Tyson Foods, Inc.

**Sedalina Complex
On-Site Sludge Application Summary**

Field I.D.	17	PAN limit/acre	220
Total Field Acreage	32.9	PAN limit/field	6,248
Set Backs (acres)	4.5	CI limit/acre	500
Acreage (net set backs)	28.4	CI limit/field	14,200
		O&G limit/acre	10,000
		O&G limit/field	284,000

Date	Sludge Dose (lb/acre)	Sludge Solids (%)	Application Date	Rate (lb/acre)											
04/24/12	DAF	20.99	4/11/2012	72.1	4/11/2012	4.28	1,778	9916	9000	2.73	2.73	2.87			
04/25/12	DAF	21.04	4/11/2012	72.1	4/11/2012	4.28	1,778	56177	51000	15.48	18.21	2.88			
05/11/12	DAF	21.75	5/11/2012	72.7	4/11/2012	4.28	1,778	13200	12000	3.64	21.84	2.98			
05/14/12	DAF	18.66	5/11/2012	72.7	4/11/2012	4.28	1,778	23100	21000	6.36	28.21	2.56			

Date	Sludge Dose (lb/acre)	Sludge Solids (%)	Application Date	Rate (lb/acre)											
04/24/12	DAF	20.99	207	565	12	34	5103	13939							
04/25/12	DAF	21.04	207	3776	12	224	5116	93116							
05/11/12	DAF	21.75	217	4563	13	271	5296	112374							
05/14/12	DAF	18.66	186	5746	11	340	4544	141288							

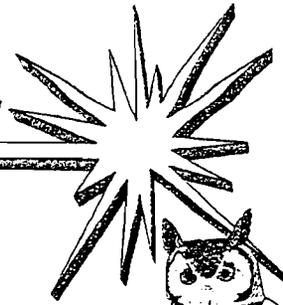
DAF Sludge Analytical

	Aluminum	Arsenic	Beryllium	Cadmium	Chromium	Copper	Fluoride	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Tin	Zinc
Min	57.4	0.4	4	0.4	3.8	14.2	4.5	0.4	108	0.2	9	2.2	0.4	0.2	99	57.5
Max	183	0.7	4	0.4	47.3	60.1	9.5	2.5	126	0.2	9	9	19.2	0.5	99	106
AVG	119.95	0.48	4.00	0.40	10.69	23.59	7.63	0.78	118.00	0.20	9.00	4.40	3.02	0.28	99.00	68.71
Count	4	9	4	9	9	9	4	9	4	9	9	9	9	4	4	9

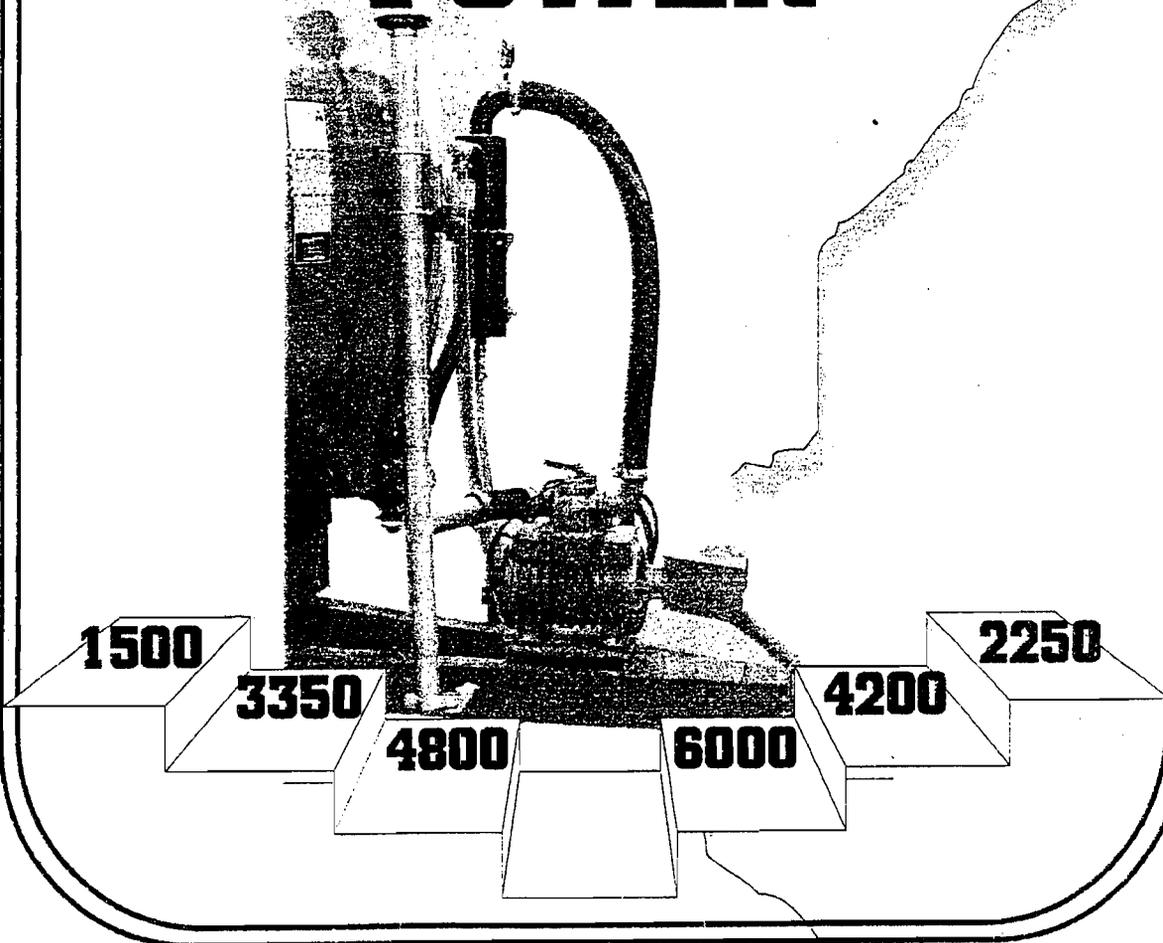
WAS Sludge Analytical

Aluminum	Arsenic	Beryllium	Cadmium	Chromium	Copper	Fluoride	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Tin	Zinc
17200	1.1	4	3.3	3.6	36.3	15	0.9	1270	7570	10.1	6.2	0.6	0.2	99	112
18200	1.2	4	3.5	3.9	39.4	100	1.0	3220	4320	10.6	6.3	0.9	0.3	99	113
21200	1.2	4	0.2	4.1	42.4	63.2	1.2	1790	7930	12.6	7.8	1.2	0.2	99	116
21500	1.6	4	0.4	4.9	51.5	175	1.2	3870	11200	9.0	8.0	2.0	0.5	99	116
22800	2.4	4	0.4	4.9	51.7	172	1.2	3660	10300	9.0	8.4	2.2	0.2	99	122
	2.4		0.4	7.0	52.8		1.5			9.0	11.6	2.3			124
	2.6		0.4	8.5	54.0		1.5			9.0	11.6	2.5			125
	2.8		0.4	10.5	63.8		1.8			9.0	11.9	2.6			153
	3.0		0.4	11.5	85.7		2.0			9.0	15.7	2.6			186
	0.4		0.4	13.3	91.4		2.4			9.0	17.7	4.3			209
	7.9		0.4	15.8	101.0		2.9			9.0	19.8	6.8			232
	7.9		0.4	24.6	130.0		3.2			9.0	33.5	3.0			344
Min	0.4	4	0.2	3.6	36.3	15	0.9	1270	4320	9	6.2	0.6	0.2	99	112
Max	7.9	4	3.5	24.6	130	175	3.2	3870	11200	12.6	33.5	6.8	0.5	99	344
AVG	2.875	4	0.883333	9.383333	66.66667	105.04	1.733333	2762	8264	9.525	13.20833	2.583333	0.28	99	162.6667
Count	5	12	5	12	12	5	12	5	5	12	12	12	5	5	12

BALZER INC.



VACUUM POWER



**OWNER'S MANUAL
FOR INSTALLATION, OPERATION & MAINTENANCE**



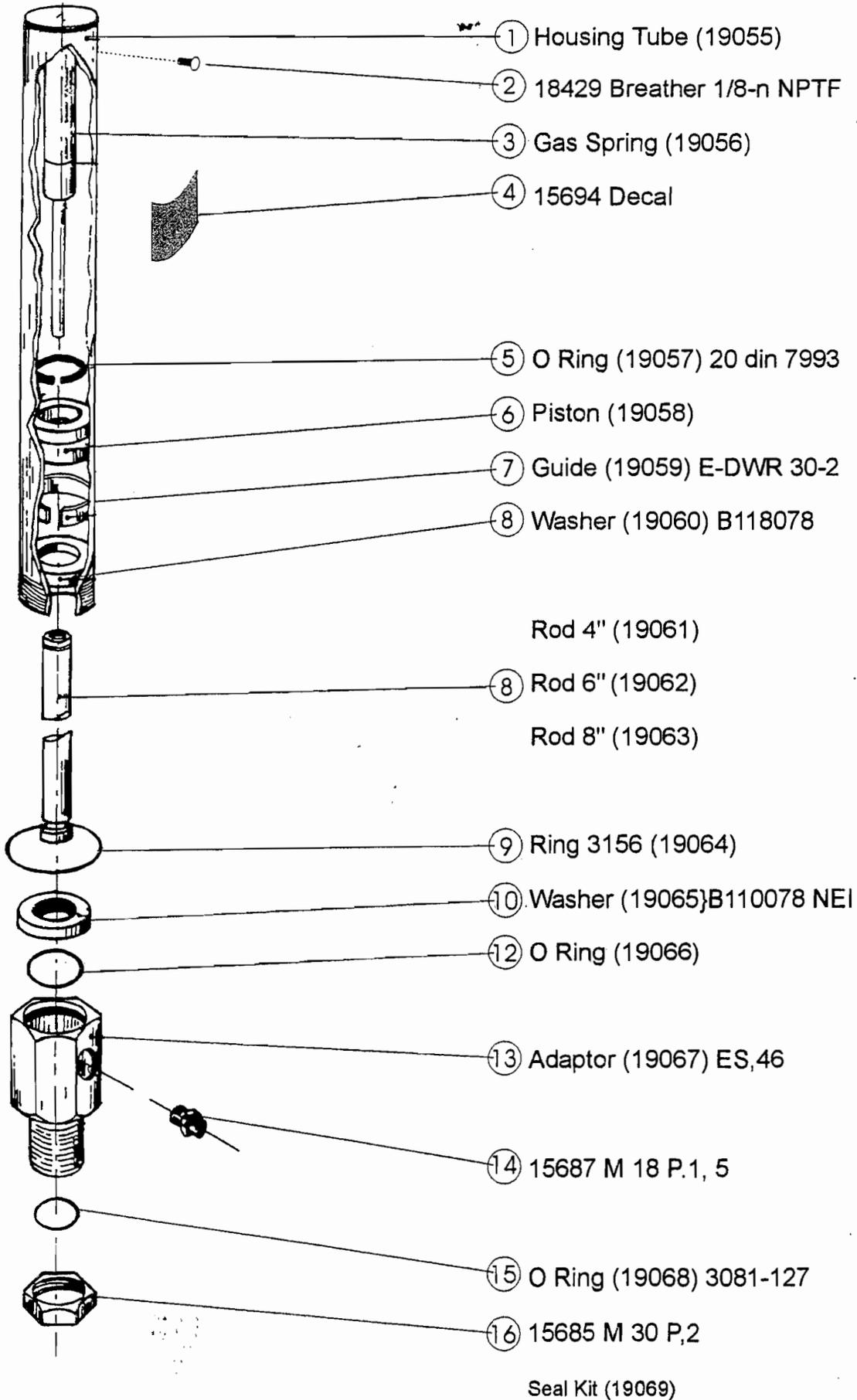
MOUNTAIN LAKE



LOAD PORT ASSEMBLY

ITEM	QTY	P/N	DESCRIPTION
1	1	15691	Clevis
2	1	15690	Valve Rod 6"
3	6	15683	Soc Hd. Cap screw
4	1	15689	Bushing Nut
5	1	15684	Seal
6	1	15682	Valve, Upper Body
7	1	15681	Gasket 6"
8	1	15680	Valve Gate 6"
9	1	15679	Valve Lower Body
~10	2	15621	O-Ring 6" Valve
~11	1	15564	Female Coupler w/Flange
~12	1	11979	O-Ring 6"
13	1	15618	Lever 6" Valve
14	1	15619	Connector Bar 6"
15	1	15620	Lock, 6" Valve
16	4	2496	Nut Hex HD 3/8
17	3	1206	Bolt Hex HD 3/8 x 1
18	2	2082	Nut Hex HD 3/8
19	2	1598	Washer 3/8
20	2	1208	Bolt Hex HD 3/8 x 1 1/2

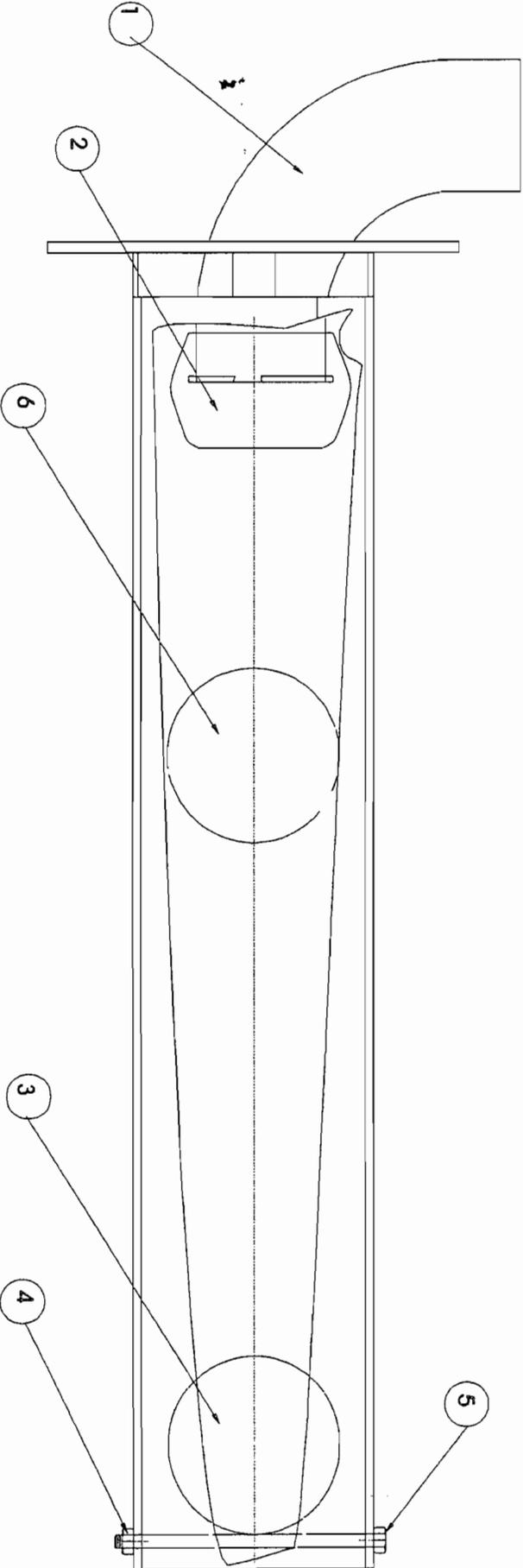
Valve Actuator Assembly



Primary Shutoff

DATE	REVISION	ECO
12 7 92	REDRAWN TO COMPUTER W CHANGES	2956
12/93	1950P WAS 17345-NOTE 3100 PRODUCTION HAS BEEN DOING THIS WAY...	
7/95 81/96	EXTEND TUBE 12" & USE #27256 TILL #27291 827292 COME IN FROM ITALY...	3213 3213

ITEM	QTY	PART NO.	DESCRIPTION	18564
1	1	19169	PORTAL COVER (WELD)	
2	1	10866	BALL SEAT	
3	1	27291	BALL 4" 13.6 OZ RUBBER COATED WOOD	
4	1	2613	NUT, HEX - (TOPLOCK) 5.S.	
5	1	19170	BOLT, HEX HD. 5/16 X 6" 5.S.	
6	1	27292	BALL 4" 21.5 OZ SOLID RUBBER NON FLOAT	

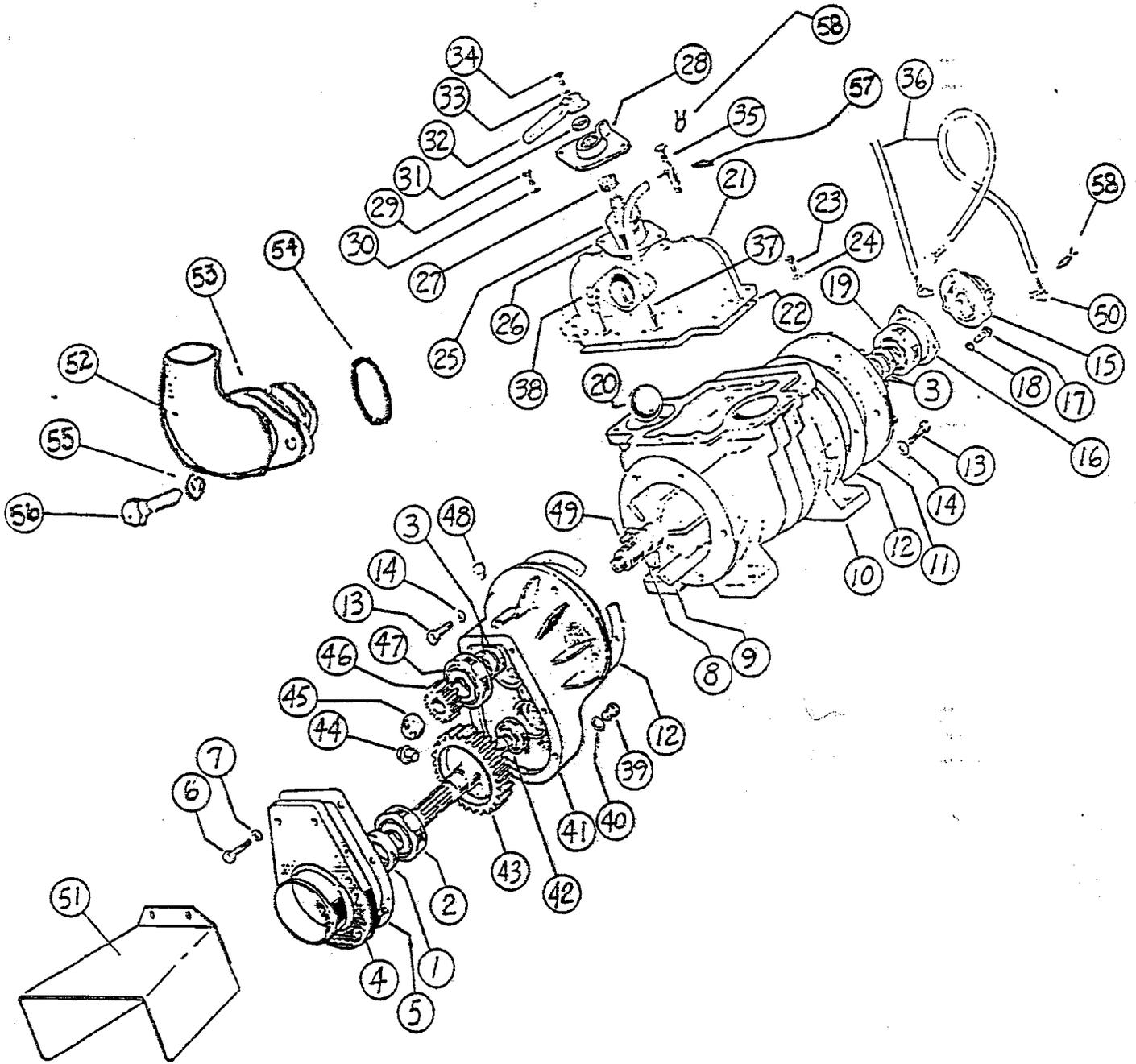


ITEM	QTY	PART NO.	DESCRIPTION	18564
1	1	19169	PORTAL COVER (WELD)	
2	1	10866	BALL SEAT	
3	1	27291	BALL 4" 13.6 OZ RUBBER COATED WOOD	
4	1	2613	NUT, HEX - (TOPLOCK) 5.S.	
5	1	19170	BOLT, HEX HD. 5/16 X 6" 5.S.	
6	1	27292	BALL 4" 21.5 OZ SOLID RUBBER NON FLOAT	

OPERATION INSTRUCTIONS	KEEP FOR TANK ASM ASSEMBLY
UNDESIGN OR LENS	
WARRANTY	
ECO NO.	

MAINT CODE	MAINT SIZE	LISTED
STANDARD	FA8 1/32 1/2 1/2	
PL UNLESS	WELD 1/16 1/16 1/16	
OPERATION INSTRUCTIONS		
UNDESIGN OR LENS		
WARRANTY		
ECO NO.		

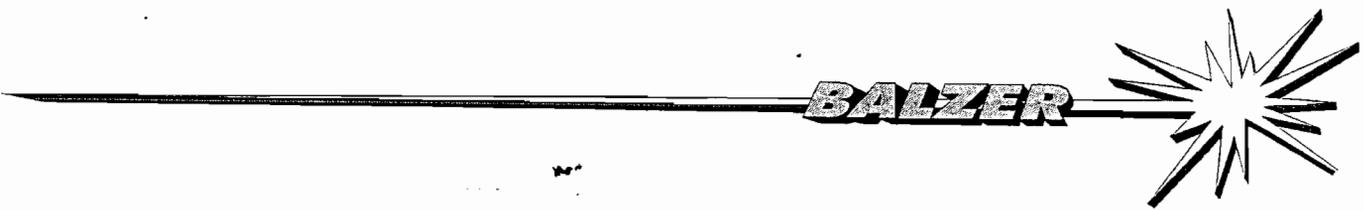
PART NAME	PRIMARY ASM FOR VACS
DATE	12 7 92
CHECKED	BB
DRAWN	RLH
PART NO.	18564



See page 35 

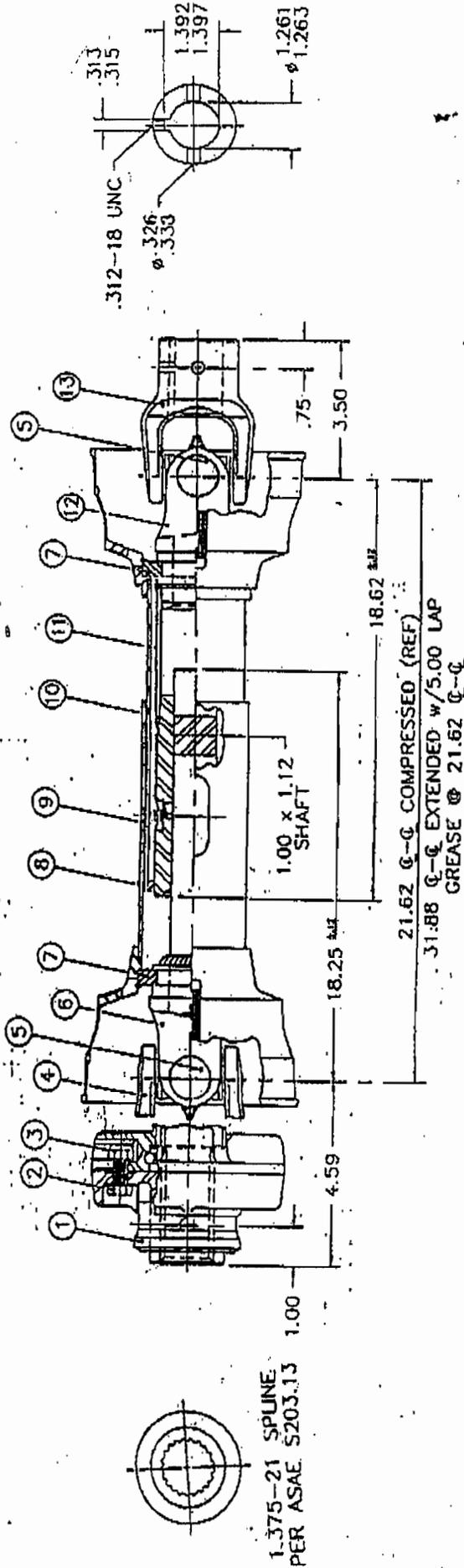
PUMP 2 PORT 540 RPM

ITEM	QTY	5000	8500	3000	DESCRIPTION
1	1		16671-AM27		Seal
2	1		16668-AM12		Bearing
3	4		16715-AM18		Seal
4	1		16729-AM29		Cover
5	1		16727-AM28		Gasket
6	6		3021-AM34		Bolt m8x25
7	6		3061-AM35		Washer m8
8	1	16692	16695	16698	Rotor AM5/D AMEC5/D AME5/D
9	7	16704	16705	16706	Vane AM7 AMEC7 AME7
10	1	16677	16678	16679	Cylinder AM1 AMEC1 AME1
11	1		16683-AM3		Cover
12	2		16685-AM4		Gasket
13	12		3034-AM16		Bolt m10x30
14	12		3062-AM17		Washer m10
15	1		16713-RIF17		Oil Pump Kt
16	1		16666-AM13		Gasket
17	3		3009-RIF9		Bolt m6x20
18	3		3059-RIF10		Washer m6
19	1		16674-AM48		Bearing
20	1		16749-AM41		Non-Return Ball
21	1		16745-AM38N		Valve Housing
22	1		16987-AM39N		Gasket
23	8		3021-AM34		Bolt m8x25
24	8		3061-AM35		Washer m8
25	1		16761-AM47N		Valve Plug
26	1		16753-AM42N		Gasket
27	1		16756-AM45		Spring
28	1		16737-AM31N		Valve Cover
29	2		3034-AM16		Bolt m10x30
30	2		3062-AM17		Washer m10
31	1		16747-AM40		Seal
32	1		16721-AM22N		Handle
33	1		3061-AM35		Washer m8
34	1		3020-AM11		Bolt m8x20
35	1		16754-RIF12		Dripper
36	1		16757-RIF18		Oil Line (3 ft.)
37	1		16708-RIF13		Fitting
38	1		16712-AM10		Dipstick
39	1		16723-AM23		Drain Plug
40	1		16725-AM24		Washer
41	1		16681-AM2		Gear Housing
42	1		16658-AM25		Bearing
43	1	16653		16654	Input Shaft & Gear AM26 AMEC26
44	1		16731-AM30		Plug - Oil Level
45	1	16659		16661	Locknut AM32 AMEC32
46	1	16738		16740	Gear AM38 AMEC38
47	1		16674-AM48		Bearing
48	1		16717-AM21		Plug - Oil Fill
49	1		16701-AM6		Key
50	3		16707-RIF11		Fitting 90°
51	1		15697		Shield
52	1		6951		Elbow 90° AM57
53	1		6932		Flange AM59
54	1		6933		O-Ring Gasket AM37N
55	2		3062		Washer m10 AM17
56	2		3037		Bolt m10x45 AM16
57	1		18568		Washer
58	4		17598		Hose Clamps



WEASLER 1000 P.O FOR VAC PUMP

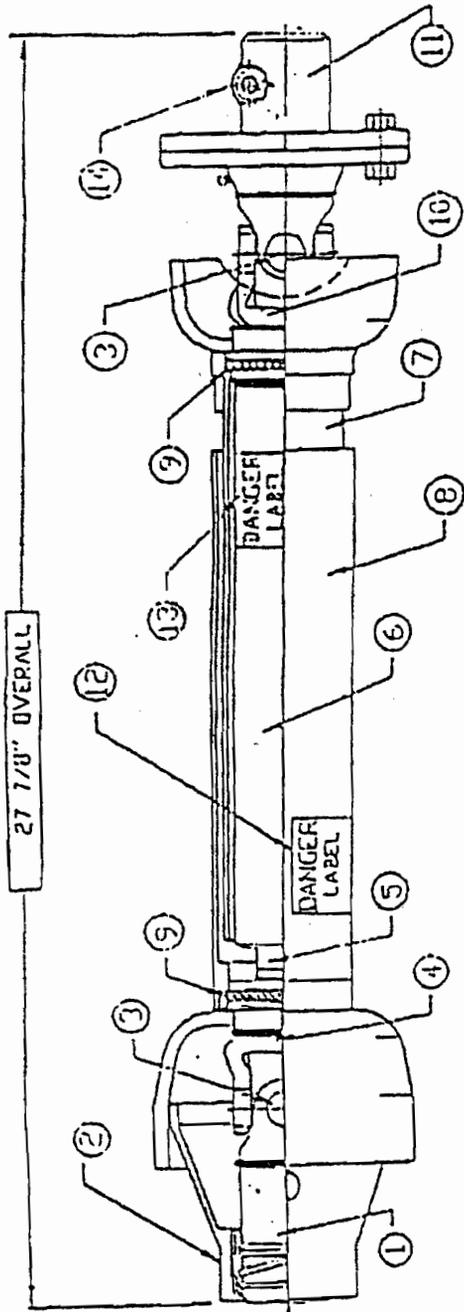
19-23005 Balls in shear yoke



ITEM	PART#	QTY	DESCRIPTION	ITEM	PART#	QTY	DESCRIPTION
1	27165	1	SPRING-LOCK REPAIR KIT	9	27316	1	OUTER GUARD
2	28825	1	BOLT 3/8 X 1.00" GRD 5	10	27317	1	INNER GUARD
3	2496	1	NUT 3/8"	11	15295	1	SAFETY SIGN
4	27314	1	BALL SHEAR ASSEMBLY 27314	12	27318	1	YOKE, TUBE & SLIP SLEEVE
5	27303	2	12 R CROSS BEARING KIT	13	27319	1	O. D. YOKE
6	27315	1	YOKE & SHAFT				
7	27305	2	NYLON REPAIR KIT	REF	27310	1	TR. 1/2 W/ SHIELD
8	11040	1	SAFETY SIGN	REF	27312	1	IMP 1/2 W/SHIELD

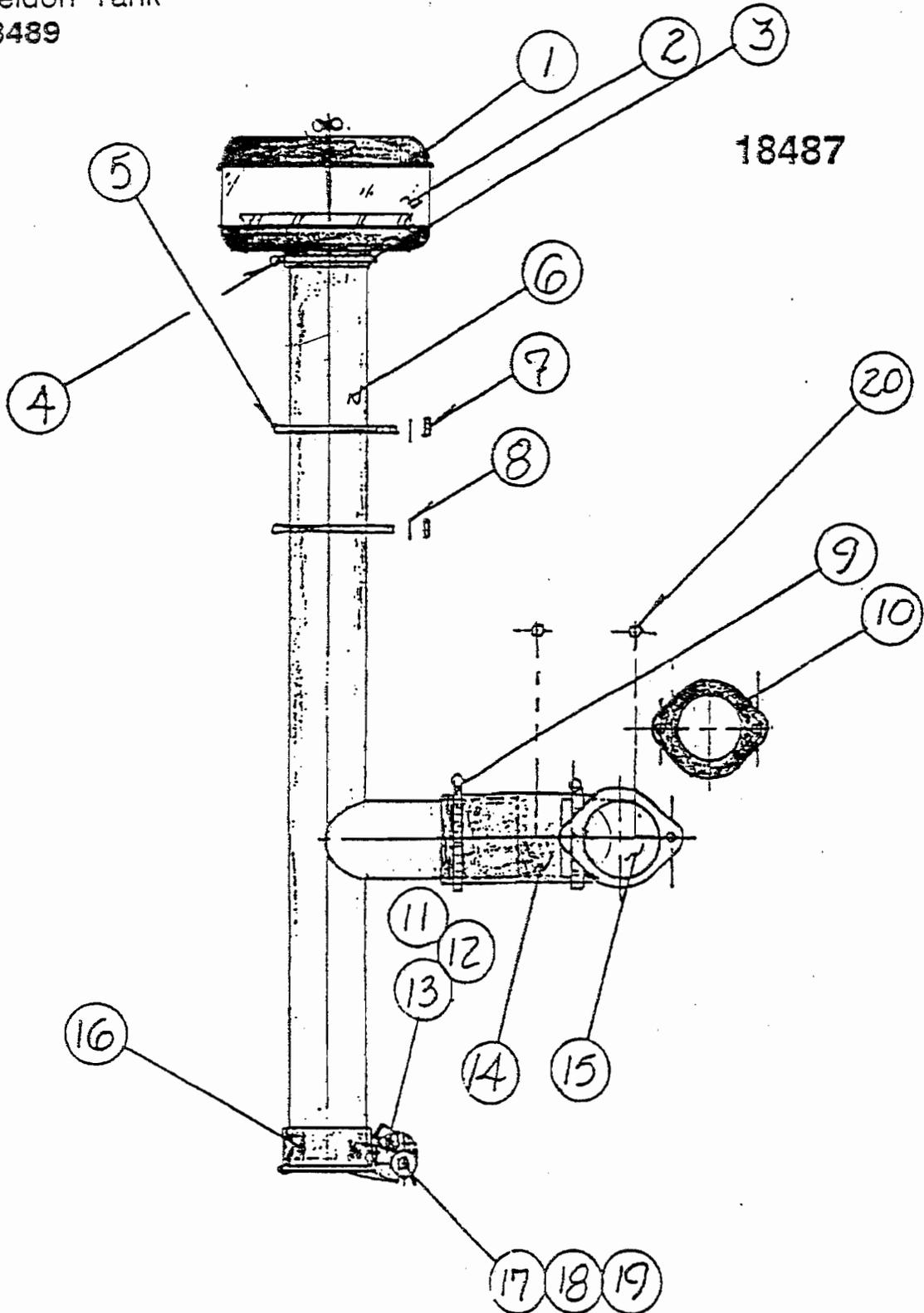
COMPLETE PTO=27296

ITEM	QTY	5000	5500	8000	DESCRIPTION
1	1		16673-AM53		Seal
2	1		16674-AM48		Bearing
3	4		16715-AM18		Seal
4	1		16686-AM3/P		Cover
5	1		16685-AM4		Gasket
6	6		3034-AM16		Bolt m10x30
7	6		3062-AM17		Washer m10
8	1	16693	16696	16699	Rotor AM5/P AMEC5/P AME5/P
9	7	16704	16705	16706	Vane AM7 AMEC7 AME7
10	1	16677	16678	16679	Cylinder AM1 AMEC1 AME1
11	1		16683-AM3		Cover
12	1		16685-AM4		Gasket
13	6		3034-AM16		Bolt m10x30
14	6		3062-AM17		Washer m10
15	1		16713-RIF17		Oil Pump Kit
16	2		16666-AM13		Gasket
17	3		3009-RIF9		Bolt
18	3		3059-RIF10		Washer
19	1		16674-AM48		Bearing
20	1		16749-AM41		Non-Return Ball
21	1		16745-AM38N		Valve Housing
22	1		16987-AM39N		Gasket
23	8		3021-AM34		Bolt m8x25
24	8		3061-AM35		Washer m8
25	1		16761-AM47N		Valve Plug
26	1		16753-AM42N		Gasket
27	1		16756-AM45		Spring
28	1		16737-AM31N		Valve Cover
29	2		3034-AM16		Bolt m10x30
30	2		3062-AM17		Washer m10
31	1		16747-AM40		Seal
32	1		16721-AM22N		Handle
33	1		3061-AM35		Washer m8
34	1		3020-AM11		Bolt m8x20
35	1		16751-RIF12CCW		Dripper
36	1		16757-RIF18		Oil Line (3 ft.)
37	1		16708-RIF13		Fitting
38	1		16712-AM10		Dipstick
39	1		15667-AM77		Front Bearing Cover
40	3		3026-AM56		Bolt m8x50
41	3		3061-AM35		Washer m8
42	1		16692-AM49		Grease Fitting
43	1		16669-AM55		Bearing Front
44					
45					
46					
47					
48	1		16763-AM52		Key
49					
50	2		16706-RIF11N		Fitting 90°-Straight Small
51			14180		Shield
52	1		6931		Elbow 90° AM57
53	1		6932		Flange AM59
54	1		6933		O-Ring Gasket AM37N
55	2		3062		Washer m10 AM17
56	2		3037		Bolt m10x45 AM16
57	4		17593		Hose Clamp
58	1		18568		Washer



26445	Complete P.T.O. 1000 R.P.M.					
26015	Complete P.T.O. 540 R.P.M. (Replaces Lighter P.T.O. #18599)					
19671	Tractor 1/2 Complete - 540 R.P.M.					
19642	Implement 1/2 Complete - 540 R.P.M.					
19627	1 18230606	1-3/8 X 6 Spline Ball Snap Hitch Yoke For 540 RPM With Uni-Shield			Shaft Length	15 5/8"
19628	2 304-C600	Uni-Shield With Ball Type Snap Hitch Repair Kit			Tube Length	14 1/8"
19629	3 302-C600	PTO Repair Kit (Complete)			Inner Shield Length	12 5/8"
19630	4 177-C600	Bar Weld Yoke For 3/4 X 7/8 Rectangular Shaft			Outer Shield Length	12 5/8"
19631	5 138-1214	3/4 X 7/8 Rectangular Shafing				
19632	6 134-1214	3/4 X 7/8 Rectangular Tubing				
19633	7 30010627	2-3/8 Ø Inner Plastic Shield With Small Notched Bell				
19634	8 30300627	2-11/16 Ø Outer Plastic Shield With Large Bell				
19635	9 128-C600	Bearing Shield Kit (Nylon Bearing Snap Ring & Thrust Washer)				
19636	10 180-C600	Tube Weld Yoke				
19637	11 195-0606	1-3/8 X 6 Spline Snap Hitch Ball Shear Yoke With 1/4 Ø Grade 2 Shear Bolt For 540 RPM				
19638	12 30000000	Danger Warning Label For Outside Shield				
19639	13 30000001	Inside Danger Warning Label				
19640	14 02010106	1-3/8 X 6 Spline Snap Hitch Pin Kit				
26451	Tractor 1/2 Complete - 1000 R.P.M.					
26452	Implement 1/2 Complete - 1000 R.P.M.					

Bracket to
Weldon Tank
18489



Exhaust Manifold Assy.

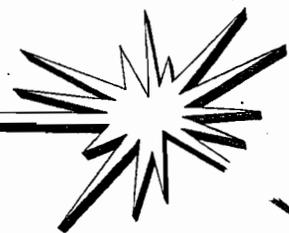
EXHAUST MANIFOLD ASSY.

20	2	3033	Hex HD Bolt M10 X 25
19	4	1600	Washer, Flat 1/2
18	1	1249	Bolt Hex HD 1/2 X 1 1/4
17	1	2084	Hex HD Nut Wizlock 1/2
-16	1	18408	Rain Cap (Reworked) Assy 18555
15	1	18505	Pipe Flange weld
14	1	18490	Hose 7" Blk 3" ID
13	1	1186	Hex HD Bolt 5/16 - 1 1/4
12	2	2081	Hex HD Wizlock 5/16
11	1	18513	Brake, Rain Cap
10	1	15625	Gasket
9	2	15695	Clamp 86 - 91
8	2	18512	Plate U Bolt Assy 18510
7	4	1691	Nut Hex 5/16 Assy 18510
6	1	18488	Exhaust Tube Weld
5	2	18511	U Bolt Assy 18510
4	1	15691	Clamp 3 1/2 - 9 - 16 Assy 18496
3	1	18499	Base Ref NA Assy 18496
2	1	18498	Bowl Ref #P020227 Assy 18496
1	1	18497	Cover Ref #P020648 Assy 18496

Item	Qty.	Part No.	Description
Tolerances (Except As Noted)			Decimal ± Fractional: ± Angular ±
			BALZER MFG. CORP.
			MOUNTAIN LAKE, MN 56159
			PHONE 427-3133
			Part Name Exhaust Manifold Assy
			Material Scale
			Drawn By Date
			Ch. By 18487
Date	Revision		Eco Sups.

Hydraulic drive

BALZER



ITEM	P/N	DESCRIPTION
1	15774	DRIVE MOUNT HYD RH
2	15777	DRIVE MOUNT HYD LH
3	2084	NUT, HEX HD 1/2 SERATED
4	1618	WASHER, FLAT 1/2 SAE
5	1187	BOLT, HEX HD 5/16x1 1/2
6	1597	WASHER, FLAT 5/16
7	8214	CLAMP, PIPE
8	13406	STAND-OFF HOSE
9	2081	NUT, HEX HD 5/16 SERATED
10	1252	BOLT, HEX HD 1/2x2
11	8154	DECAL "KEEP SHIELDS IN PLACE"
12	1183	BOLT, HEX HD 5/16x3/4
13	20141	SHIELD MOUNT
14	20140	MOTOR MOUNT
15	1250	BOLT, HEX HD 1/2x1 1/2
16	20474	MOTOR HYDRAULIC (GEAR)
17	10034	HOSE, HYDRAULIC 1/2x18
18	10037	HOSE, HYDRAULIC 1/2x96
19	8613	ELBOW STREET 1/2NPTx90
20	11543	TEE SERVICE 1/2NPT
21	8622	BUSHING, HEX REDUCER 3/4x1/2NPT
22	10459	CHECK VALVE 1/2NPT
23	8604	NIPPLE, CLOSE 1/2NPT
24	15982	SPROCKET 50-16 1"BORE
25	20142	SPROCKET 50-18 32mm BORE
26	15985	CONNECTOR, CHAIN #50
27	15984	CHAIN DOUBLE #50
28	15986	SHIELD HYDRAULIC DRIVE

BALZER SLUDGE TANK MAINTENANCE SCHEDULE OF TASKS

DAILY

*General overall inspection

10 HOUR LUBE

*PTO shaft-2 fittings

*Load level indicator

*Axles-4 fittings

*Injector assembly-4 fittings

50 HOUR LUBE

*Wheel bearings-all-6 fittings

MONTHLY

*Diesel clean pump

*Torque wheel bearings & axle bolts

*Check tire pressure

4 MONTH

*Pump shaft

SERVICE INTERVALS

EVERY 10 HOURS

- Check engine oil level
- Check coolant level
- Check transmission-hydraulic oil level
- Drain fuel tank sump
- Lubricate rear axle bearings*
- Lubricate front wheel bearings*
- Lubricate axle pivot pin, steering spindles, and tie rods*
- Lubricate drive-line U-joints and steering knuckles*
- Lubricate MFWD king-pins and axle pivot*
- Lubricate wide-swing drawbar
- Check all tires
- Lubricate front draft-link pins when using hitch

*Only necessary when operating in extremely wet and muddy conditions.

EVERY 250 HOURS

- Change engine oil and filter
- Check MFWD drive axle housing and wheel hub oil level
- Service batteries
- Check tension of alternator and compressor belts.
- Wash breather filter
- Inspect for loose bolts
- Check neutral start system
- Check brake accumulator
- Inspect fire extinguisher
- Clean SOUND-GARD body air filter
- Clean recirculated air filter
- Lubricate 3-point hitch
- Lubricate axle pivot pin, steering spindles and tie rods
- Lubricate MFWD king-pins, steering knuckles, drive line U-joints and pivot pin
- Lubricate tie rods (MFWD)
- Clean water pump drain hole
- Clean MFWD breather

EVERY 750 HOURS

- Lubricate rear axle bearings
- Check air intake system
- Check engine idle speeds
- Adjust engine valve clearance
- Add coolant conditioner
- Replace coolant conditioner filter
- Have your John Deere dealer check nitrogen precharge of shift accumulators

EVERY 1500 HOURS

- Change transmission-hydraulic oil
- Clean charge pump suction screen
- Change MFWD hub and axle housing lubricant
- Clean and repack front wheel bearings
- Check fuel injection nozzles

ANNUALLY

- Replace transmission filter element
- Replace primary and secondary air cleaner elements
- Replace hydraulic filter element

EVERY 2 YEARS

- Drain, flush, and refill cooling system
- Replace thermostats
- Replace coolant conditioner filter

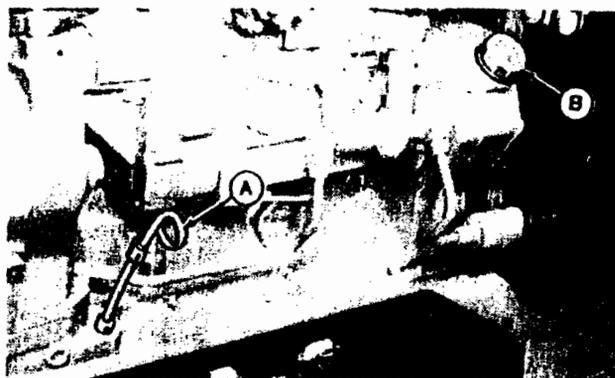
SERVICE AS REQUIRED

- Replace transmission and hydraulic filter
- Replace fuel filter
- Service prefilter
- Service air cleaner
- Check engine compartment
- Clean radiator and oil-cooler-condenser
- Have your John Deere dealer:
 - Check nitrogen precharge of seat accumulator
 - Inspect engine crankshaft damper

Lubrication and Maintenance/10 Hour

CHECK ENGINE OIL LEVEL

With tractor parked on level ground, remove dipstick (A) and check oil level. If needed, remove filler cap (B) and add oil recommended in Fuels, Lubricants, and Coolant section.



RX,H342,90 -19-27OCT88

CHECK COOLANT LEVEL

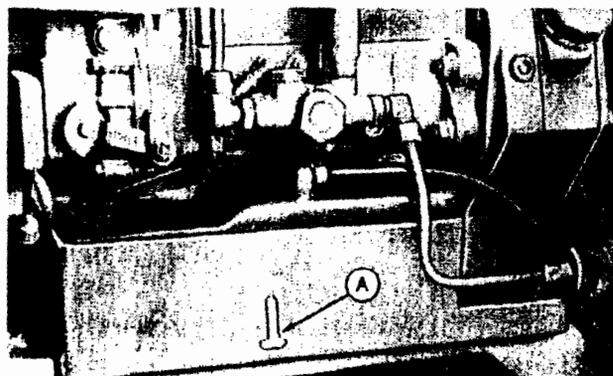
⚠ CAUTION: Remove radiator cap only when coolant temperature is below boiling point. (Temperature gauge should be in blue zone.)

When using John Deere Coolant Conditioner, observe precautions list on container.

Check coolant level (A). If more coolant is needed, remove radiator cap and add soft water, antifreeze mixture specified in Fuels, Lubricants and Coolant section.

Coolant level should be at bottom of filler neck when engine is cold or visible in coolant recovery tank. If coolant level is low, check for any signs of leakage and repair if necessary. Check all hose clamps for tightness.

IMPORTANT: Add 1/8 to 1/4 qt (120 to 240 mL) of John Deere Coolant Conditioner for every 1 gal (3.8 L) of coolant added. Do not add coolant conditioner to a tractor equipped with an optional filter conditioner kit. (See Engine Coolant Conditioner in Fuels, Lubricants, and Coolant section.)



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JUN-98DEC88
RW14344
JUN-98OCT89

JOHN DEERE TRACTOR MAINTENANCE SCHEDULE OF TASKS

DAILY

*General overall check

10 HOUR

*Lube fittings

*Check transmission fluid

*Check oil & coolant

250 HOURS

*Change oil & filter

*Check hub oil

*Service battery

*Check belts

*Clean air filters

*

750 HOURS

*

*

1500 HOURS

*

*

ANNUALLY

*

*

2 YEARS

*

*

Sludge Buggy and Tractor daily Inspection

MONTH:

YEAR:

DATE	TIME	OPERATOR	INSP + LUBE CURRENT	
			YES	NO
1				
2				
3				
4				
5				
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31				

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11230

**MFA ASIL-LAB
 RICK GREENE**

**MFA AGRI SERVICE
 GRID ACCOUNT/JEFF REHMER
 2200 CLINTON RD
 SEDALIA MO 65301-7902**

**SEDA-TYSON FARMS
 DRESDEN FARM
 8**

MO

SOIL ANALYSIS REPORT

LAB NUMBER	SAMPLE IDENTIFICATION	ORGANIC MATTER L.O.I. percent RATE	PHOSPHORUS			NEUTRAL AMMONIUM ACETATE (EXCHANGEABLE)			SODIUM Na ppm RATE	POTASSIUM K ppm RATE	MAGNESIUM Mg ppm RATE	CALCIUM Ca ppm RATE	PH SOIL pH 1:1	BUFFER INDEX	CATION EXCHANGE CAPACITY meq/100g C.E.C.	PERCENT BASE SATURATION (COMPUTED)			
			P ₁ (WEAK BRAY) 1:7 ppm RATE	P ₂ (STRONG BRAY) 1:7 ppm RATE	OLSEN P BICARBONATE P ppm RATE	% K	% Mg	% Ca								% H	% Na		
245																			
99570	535	2.7 M	113 VH	116 VH		134 M	357 VH	2556 H				6.3	6.7	18.0	1.9	16.5	71.0	10.6	
99571	537	2.6 M	83 VH	129 VH		125 M	347 VH	2754 H				6.9		17.0	1.9	17.0	81.1	0.0	
99572	536	2.5 L	138 VH	143 VH		136 M	456 VH	3088 H				6.6	6.8	20.8	1.7	18.3	74.2	5.8	
99573	538	2.7 M	96 VH	125 VH		115 L	422 VH	2876 H				6.5	6.8	19.7	1.5	17.9	73.0	7.6	
99574	532	2.6 M	64 VH	117 VH	45 VH	154 L	677 VH	3718 H				7.0		24.6	1.6	22.9	75.5	0.0	
99575	531	2.6 M	95 VH	142 VH		103 L	389 VH	2696 H				6.3	6.7	19.0	1.4	17.1	70.9	10.6	
99576	533	2.3 L	133 VH	165 VH		141 L	666 VH	3440 H				6.9		23.1	1.6	24.0	74.4	0.0	
99577	534	2.4 L	95 VH	118 VH		132 L	556 VH	3134 H				6.3	6.7	23.0	1.5	20.1	68.1	10.3	
99578	530	2.1 L	83 VH	114 VH		88 L	350 VH	2237 H				6.4	6.8	15.7	1.4	18.6	71.2	8.8	

LAB NUMBER	NITRATE-N (FIA)						SULFUR S ICAP ppm RATE	ZINC Zn DTPA ppm RATE	MANGANESE Mn DTPA ppm RATE	IRON Fe DTPA ppm RATE	COPPER Cu DTPA ppm RATE	BORON B SOBB. DTPA ppm RATE	SOLUBLE SALTS mmhos/ cm RATE
	SURFACE		SUBSOIL 1		SUBSOIL 2								
	ppm	depth (in)	ppm	depth (in)	ppm	depth (in)							
245													
99570	63	227 0-12					14 M	2.1 M					
99571	25	90 0-12					12 L	1.9 M					
99572	46	166 0-12					14 M	2.0 M					
99573	54	194 0-12					13 M	1.8 M					
99574	38	137 0-12					13 M	2.3 M					
99575	45	162 0-12					15 M	2.5 M					
99576	33	119 0-12					15 M	1.6 M					
99577	45	162 0-12					15 M	1.1 M					
99578	39	140 0-12					14 M	1.5 M					

REV. 1203

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IDENTIFICATION
 SEDA-TYSON FARMS
 DRESDEN FARM
 15
 MO

SOIL ANALYSIS REPORT

INFO SHEET: 21556

LAB NUMBER	SAMPLE IDENTIFICATION	ORGANIC MATTER L.O.I. percent RATE	PHOSPHORUS			POTASSIUM			CALCIUM			SODIUM			SOIL pH 1:1	PH BUFFER INDEX	CATION EXCHANGE CAPACITY CEC meq/100g	PERCENT BASE SATURATION (COMPUTED)			
			P ₁ (WEAK BRAY) 1:7 ppm RATE	P ₂ (STRONG BRAY) 1:7 ppm RATE	OLSEN BICARBONATE P ppm RATE	K ppm RATE	Mg ppm RATE	Ca ppm RATE	Na ppm RATE	% K	% Mg	% Ca	% H	% Na							
99560	521	2.4 L	29 H	48 H		128 M	432 VH	2755 H		6.6	6.8	18.8	1.7	19.1	73.3	5.9					
99561	522	2.8 M	11 L	52 H		95 L	304 VH	2413 H		6.5	6.8	16.0	1.5	15.8	75.4	7.3					
99562	523	2.1 L	10 L	24 M	8 L	109 L	322 VH	2570 H		7.1		15.8	1.8	17.0	81.2	0.0					
99563	525	2.8 M	68 VH	125 VH		107 L	329 VH	2866 VH		6.9		17.3	1.6	15.8	82.6	0.0					
99564	524	2.5 L	57 VH	90 VH		107 L	384 VH	2743 H		6.7		17.2	1.6	18.6	79.8	0.0					
99565	526	2.7 M	79 VH	124 VH		116 L	427 VH	3352 H		6.8		20.6	1.4	17.3	81.3	0.0					
99566	527	2.6 M	120 VH	149 VH	72 VH	105 L	383 VH	2960 H		7.0		18.3	1.5	17.4	81.1	0.0					

LAB NUMBER	SURFACE				NITRATE-N (FIA)				SULFUR S ICAP ppm RATE	ZINC Zn DTPA ppm RATE	MANGANESE Mn DTPA ppm RATE	IRON Fe DTPA ppm RATE	COPPER Cu DTPA ppm RATE	BORON B SORB. DTPA ppm RATE	PRESSURE RATE	SOLUBLE SALTS mmhos/ cm 1:1 RATE	
	ppm	lbs/A	depth (in)	ppm	SUBSOIL 1		SUBSOIL 2										
					ppm	depth (in)	lbs/A	depth (in)									Total lbs/A
245																	
99560	19	68	0-12	68				12 L	1.9 M								
99561	13	47	0-12	47				13 M	1.3 M								
99562	16	58	0-12	58				11 L	0.7 L								
99563	29	104	0-12	104				11 L	1.2 M								
99564	28	101	0-12	101				11 L	1.3 M								
99565	39	140	0-12	140				13 M	1.7 M								
99566	35	126	0-12	126				12 L	1.8 M								

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 DRESDEN FARM
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 RICK GREENE**

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SOIL ANALYSIS REPORT

LAB NUMBER	SAMPLE IDENTIFICATION	ORGANIC MATTER L.O.I. percent RATE	PHOSPHORUS				NEUTRAL AMMONIUM ACETATE (EXCHANGEABLE)				pH	CATION EXCHANGE CAPACITY C.E.C. meq/100g	PERCENT BASE SATURATION				SOLUBLE SALTS	
			P ₁ (WEAK BRAY) 1:7 ppm RATE	P ₂ (STRONG BRAY) 1:7 ppm RATE	OLSEN BICARBONATE P ppm RATE	K ppm RATE	Mg ppm RATE	Ca ppm RATE	Na ppm RATE	% K			% Mg	% Ca	% H	% Na	ppm	depth (in)
245																		
99546	507	2.6 M	29 H	42 H	20 H	135 L	570 VH	3656 H	7.0	23.4	1.5	20.3	78.2	0.0				
99547	509	2.5 L	14 L	23 M	130 L	600 VH	3558 H	6.5	25.0	1.3	20.0	71.2	7.5					
99548	508	2.5 L	20 M	29 M	148 M	621 VH	3422 H	6.9	22.7	1.7	22.8	75.5	0.0					

LAB NUMBER	SURFACE		SUBSOIL 1		SUBSOIL 2		SULFUR S ICAP ppm RATE	ZINC Zn DTPA ppm RATE	MANGANESE Mn DTPA ppm RATE	IRON Fe DTPA ppm RATE	COPPER Cu DTPA ppm RATE	BORON B SORB. DTPA ppm RATE	EXCESS LIME RATE	SOLUBLE SALTS mmhos/cm RATE
	ppm	depth (in)	ppm	depth (in)	ppm	depth (in)								
245														
99546	56	202	0-12				11 L	1.1 M						
99547	54	194	0-12				10 L	1.0 L						
99548	28	101	0-12				11 L	0.8 L						

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2200 CLINTON RD
SEDALIA MO 65301-7902

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SOIL ANALYSIS REPORT

LAB NUMBER	SAMPLE IDENTIFICATION	ORGANIC MATTER L.O.I. percent RATE	PHOSPHORUS				NEUTRAL AMMONIUM ACETATE (EXCHANGEABLE)				PH	CATION EXCHANGE CAPACITY C.E.C. meq/100g	PERCENT BASE SATURATION (COMPUTED)			
			P ₁ (WEAK BRAY) 1:7 ppm RATE	P ₂ (STRONG BRAY) 1:7 ppm RATE	OLSEN BICARBONATE P ppm RATE	K ppm RATE	Mg ppm RATE	Ca ppm RATE	Na ppm RATE	% K			% Mg	% Ca	% H	% Na
99541	503	2.5 L	19 M	34 M		129 L	539 VH	2736 M		6.1	21.5	1.5	20.9	63.6	14.0	
99542	502	2.2 L	22 H	52 H		107 L	469 VH	2721 H		6.7	17.8	1.5	22.0	76.5	0.0	

LAB NUMBER	NITRATE-N (FIA)				SULFUR S ICAP ppm RATE	ZINC Zn DTPA ppm RATE	MANGANESE Mn DTPA ppm RATE	IRON Fe DTPA ppm RATE	COPPER Cu DTPA ppm RATE	BORON B SORB. DTPA ppm RATE	SOLUBLE SALTS 1:1 mmhos/cm RATE
	SURFACE	SUBSOIL 1	SUBSOIL 2	Total lbs/A							
ppm	depth (in)	depth (in)	depth (in)	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
245	36	130	0-12	130	12 L	3.3 H					
99541	30	108	0-12	108	11 L	1.3 M					

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SOIL ANALYSIS REPORT

LAB NUMBER	SAMPLE IDENTIFICATION	ORGANIC MATTER L.O.I. percent	PHOSPHORUS			POTASSIUM		CALCIUM		SODIUM		pH	CATION EXCHANGE CAPACITY C.E.C. meq/100g	PERCENT BASE SATURATION (COMPUTED)			
			P ₁ (WEAK BRAY) 1:7 ppm	P ₂ (STRONG BRAY) 1:7 ppm	OLSEN BICARBONATE P ppm	K ppm	Mg ppm	Ca ppm	Na ppm	% K	% Mg			% Ca	% H	% Na	
99539	500	2.5 L	64 VH	117 VH	31 VH	97 L	348 VH	2681 H			7.2	16.6	1.5	17.5	81.0	0.0	
99540	501	2.6 M	55 VH	108 VH	29 VH	126 L	463 VH	2881 H			7.0	18.6	1.7	20.7	77.6	0.0	

LAB NUMBER	SURFACE		SUBSOIL 1		SUBSOIL 2		SULFUR S ICAP ppm	ZINC Zn DTPA ppm	MANGANESE Mn DTPA ppm	IRON Fe DTPA ppm	COPPER Cu DTPA ppm	BORON B SORBI. DTPA ppm	SOLUBLE SALTS 1:1 mmhos/ cm
	ppm	lbs/A	depth (in)	ppm	depth (in)	lbs/A							
245	40	144	0-12			144	11 L	2.1 M					
99539	40	144	0-12			144	11 L	2.1 M					
99540	33	119	0-12			119	13 M	1.2 M					

REV. 12/03

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Soil Test Report

Soil Testing Laboratory
23 Mumford Hall, MU
Columbia, Mo 65211
Phone 573-882-0623
Fax 573-884-4288

Soil Testing Laboratory
P.O. Box 160
Portageville, MO 63873
Phone 573-379-5431
Fax 573-379-5875

FIELD INFORMATION		
Field Id		Sample No
ACRES 23.93	Last Limed Unknown	Irrigated No
Last Crop 115 SOYBEANS (30-70)		

County Name Pettis	Region 5
Current Date 10/5/2011	

Soil sample submitted by:

This report is for:

Tyson Foods WWTP
20001 Menefee Road
Sedalia MO 65301

Soil Test Information			Rating					
			Very Low	Low	Medium	High	Very High	Excess
pH _s	(salt pH)	6.07	*****	*****	*****	*		
Phosphorus	(P)	149.34 lbs/A	*****	*****	*****	*****	*****	*****
Potassium	(K)	302.8 lbs/A	*****	*****	*****			
Calcium	(Ca)	5321.4 lbs/A	*****	*****	*****	****		
Magnesium	(Mg)	827.56 lbs/A	*****	*****	*****	****		
Sulfur	(SO ₄ -S)	14.89 ppm	*****	*****	*****	****		
Zinc	(Zn)	3.17 ppm	*****	*****	*****	*****		
Manganese	(Mn)							
Iron	(Fe)							
Copper	(Cu)							
Organic Matter 3.09%			Neutralizable Acidity 3.2 meq/100g			Cation Exch. Capacity 20.31 meq/100g		
pH in water			Electrical Conductivity mmho/cm			Sodium (Na) lbs/a		
Nitrate(NO3-N)	topsoil ppm	subsoil 43 ppm	sampling depth		top 0 inches	subsoil 12 inches		

NUTRIENT REQUIREMENTS

Cropping Options	Yield Goal	Pounds per acre					LIMESTONE SUGGESTIONS
		N	P ₂ O ₅	K ₂ O	Zn	S	
103 CORN (GRAIN)	80 bu/A	105	0	30	0	0	Effective Neutralizing Material (ENM) 650
115 SOYBEANS	60 bu/A	0	0	90	0	0	
103 CORN (GRAIN)	200 bu/A	250	0	65	0	0	Effective Magnesium (EMg) 0
119 WHEAT	75 bu/A	110	0	30	0	0	

Comments:

---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 6.57 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
 ---Nitrogen requirements may be reduced by 30 pounds per acre for the first crop following soybeans. Not applicable for wheat.
 ---The cation exchange capacity of this soil would suggest very low potential for sulfur response. Monitor the crop by plant analyses for potential need for sulfur.
 ---To determine limestone needed in tons/acre, divide your ENM requirement by the guarantee of your limestone dealer.

Regional Agronomy Specialist Joni Harper Phone 660-827-0591 Signature _____
 University of Missouri, Lincoln University, U.S. Department of Agriculture & Local University Extension Councils Cooperating
 Equal Opportunity Institution



Soil Test Report

Soil Testing Laboratory
23 Mumford Hall, MU
Columbia, Mo 65211
Phone 573-882-0623
Fax 573-884-4288

Soil Testing Laboratory
P.O. Box 160
Portageville, MO 63873
Phone 573-379-5431
Fax 573-379-5875

FIELD INFORMATION		
Field Id	2	Sample No
ACRES 30.55	Last Limed Unknown	Irrigated No
Last Crop 115 SOYBEANS (30-70)		

County Name Pettis	Region 5
Current Date 10/5/2011	

Soil sample submitted by:

This report is for:

Tyson Foods WWTP
20001 Menefee Road
Sedalia MO 65301

Soil Test Information			Rating					
			Very Low	Low	Medium	High	Very High	Excess
pH _s	(salt pH)	6.68	*****	*****	*****	**		
Phosphorus	(P)	102 lbs/A	*****	*****	*****	*****	***	
Potassium	(K)	344.5 lbs/A	*****	*****	*****			
Calcium	(Ca)	5847.5 lbs/A	*****	*****	*****	****		
Magnesium	(Mg)	990.66 lbs/A	*****	*****	*****	****		
Sulfur	(SO ₄ -S)	12.57 ppm	*****	*****	*****	****		
Zinc	(Zn)	3.72 ppm	*****	*****	*****	****		
Manganese	(Mn)							
Iron	(Fe)							
Copper	(Cu)							

Organic Matter 3.21%	Neutralizable Acidity 1.1 meq/100g	Cation Exch. Capacity 20.29 meq/100g
pH in water	Electrical Conductivity mmho/cm	Sodium (Na) lbs/a
Nitrate(NO ₃ -N)	topsoil ppm	subsoil 7.5 ppm
	sampling depth	top 0 inches
		subsoil 12 inches

NUTRIENT REQUIREMENTS							
Cropping Options	Yield Goal	Pounds per acre					LIMESTONE SUGGESTIONS
		N	P ₂ O ₅	K ₂ O	Zn	S	
103 CORN (GRAIN)	80 bu/A	105	0	20	0	0	Effective Neutralizing Material (ENM) 0
115 SOYBEANS	60 bu/A	0	0	75	0	0	
103 CORN (GRAIN)	200 bu/A	250	0	50	0	0	Effective Magnesium (EMg) 0
119 WHEAT	75 bu/A	110	0	20	0	0	

Comments:

- Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 7.18 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
- Nitrogen requirements may be reduced by 30 pounds per acre for the first crop following soybeans. Not applicable for wheat.
- The cation exchange capacity of this soil would suggest very low potential for sulfur response. Monitor the crop by plant analyses for potential need for sulfur.

Regional Agronomy Specialist ___Joni Harper___ Phone___ 660-827-0591___ Signature_____

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Soil Test Report

Soil Testing Laboratory
23 Mumford Hall, MU
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Fax 573-884-4288

Soil Testing Laboratory
P.O. Box 160
Portageville, MO 63873
Phone 573-379-5431
Fax 573-379-5875

FIELD INFORMATION		
Field Id 2	Sample No	
ACRES 32.2	Last Limed Unknown	Irrigated No
Last Crop 103 CORN (GRAIN) (80-300)		

County Name Pettis	Region 5
Current Date 12/17/2012	

Soil sample submitted by:

This report is for:

Tyson Foods
20001 Menefee Road
Sedalia MO 65301

Soil Test Information			Rating					
			Very Low	Low	Medium	High	Very High	Excess
pH _s	(salt pH)	6.4	*****	*****	*****	**		
Phosphorus	(P)	41 lbs/A	*****	*****	*****			
Potassium	(K)	236 lbs/A	*****	*****	***			
Calcium	(Ca)	5457 lbs/A	*****	*****	*****	****		
Magnesium	(Mg)	1008 lbs/A	*****	*****	*****	****		
Sulfur	(SO ₄ -S)	11.5 ppm	*****	*****	*****	****		
Zinc	(Zn)	2.3 ppm	*****	*****	*****	****		
Manganese	(Mn)							
Iron	(Fe)							
Copper	(Cu)							

Organic Matter 2.35%	Neutralizable Acidity 1.5 meq/100g	Cation Exch. Capacity 19.65 meq/100g
pH in water	Electrical Conductivity mmho/cm	Sodium (Na) lbs/a
Nitrate(NO ₃ -N)	topsoil 33 ppm	subsoil 33 ppm
	sampling depth	top 0 inches
		subsoil 12 inches

NUTRIENT REQUIREMENTS							
Cropping Options	Yield Goal	Pounds per acre					LIMESTONE SUGGESTIONS
		N	P ₂ O ₅	K ₂ O	Zn	S	
115 SOYBEANS	60 bu/A	0	55	110	0	0	Effective Neutralizing Material (ENM) 0
103 CORN (GRAIN)	200 bu/A	255	95	85	0	0	
103 CORN (GRAIN)	80 bu/A	110	40	45	0	0	Effective Magnesium (EMg) 0
119 WHEAT	75 bu/A	110	50	45	0	0	

Comments:
 ---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 6.9. Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
 ---Nitrogen requirements may be reduced by 30 pounds per acre for the first crop following soybeans. Not applicable for wheat.
 ---The cation exchange capacity of this soil would suggest very low potential for sulfur response. Monitor the crop by plant analyses for potential need for sulfur.

Regional Agronomy Specialist Joni Harper Phone 660-827-0591 Signature _____
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FIELD INFORMATION		
Field Id	3	Sample No
ACRES 22.36	Last Limed Unknown	Irrigated No
Last Crop 115 SOYBEANS (30-70)		

County Name Pettis	Region 5
Current Date 10/5/2011	

Soil sample submitted by:

This report is for:

Tyson Foods WWTP
 20001 Menefee Road
 Sedalia MO 65301

Soil Test Information			Rating					
			Very Low	Low	Medium	High	Very High	Excess
pH _s	(salt pH)	5.83	*****	*****	*****			
Phosphorus	(P)	195.34 lbs/A	*****	*****	*****	*****	*****	*****
Potassium	(K)	364.22 lbs/A	*****	*****	*****			
Calcium	(Ca)	5281.56 lbs/A	*****	*****	*****	****		
Magnesium	(Mg)	1008.22 lbs/A	*****	*****	*****	****		
Sulfur	(SO ₄ -S)	14.78 ppm	*****	*****	*****	****		
Zinc	(Zn)	2.2 ppm	*****	*****	*****	****		
Manganese	(Mn)							
Iron	(Fe)							
Copper	(Cu)							

Organic Matter 3.1%	Neutralizable Acidity 4.4 meq/100g	Cation Exch. Capacity 22.23 meq/100g
pH in water	Electrical Conductivity mmho/cm	Sodium (Na) lbs/a
Nitrate(NO ₃ -N)	topsoil ppm	subsoil 38.5 ppm
	sampling depth	top 0 inches
		subsoil 12 inches

NUTRIENT REQUIREMENTS

Cropping Options	Yield Goal	Pounds per acre					LIMESTONE SUGGESTIONS
		N	P ₂ O ₅	K ₂ O	Zn	S	
103 CORN (GRAIN)	80 bu/A	105	0	20	0	0	Effective Neutralizing Material (ENM) 1110
115 SOYBEANS	60 bu/A	0	0	70	0	0	
103 CORN (GRAIN)	200 bu/A	250	0	50	0	0	Effective Magnesium (EMg) 0
119 WHEAT	75 bu/A	110	0	20	0	0	

Comments:

---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 6.33 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
 ---Nitrogen requirements may be reduced by 30 pounds per acre for the first crop following soybeans. Not applicable for wheat.
 ---The cation exchange capacity of this soil would suggest very low potential for sulfur response. Monitor the crop by plant analyses for potential need for sulfur.
 ---To determine limestone needed in tons/acre, divide your ENM requirement by the guarantee of your limestone dealer.

Regional Agronomy Specialist Joni Harper Phone 660-827-0591 Signature _____
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FIELD INFORMATION		
Field Id	4	Sample No
ACRES 26.44	Last Limed Unknown	Irrigated No
Last Crop 115 SOYBEANS (30-70)		

County Name Pettis	Region 5
Current Date 10/5/2011	

Soil sample submitted by:

This report is for:

Tyson Foods WWTP
 20001 Menefee Road
 Sedalia MO 65301

Soil Test Information			Rating					
			Very Low	Low	Medium	High	Very High	Excess
pH _s	(salt pH)	7.26	*****	*****	*****	*****		
Phosphorus	(P)	147.2 lbs/A	*****	*****	*****	*****	*****	*****
Potassium	(K)	311.4 lbs/A	*****	*****	*****			
Calcium	(Ca)	6488.4 lbs/A	*****	*****	*****	****		
Magnesium	(Mg)	648.8 lbs/A	*****	*****	*****	***		
Sulfur	(SO ₄ -S)	12.6 ppm	*****	*****	*****	****		
Zinc	(Zn)	2.1 ppm	*****	*****	*****	****		
Manganese	(Mn)							
Iron	(Fe)							
Copper	(Cu)							

Organic Matter 2.84%	Neutralizable Acidity -1.1 meq/100g	Cation Exch. Capacity 18.21 meq/100g
pH in water	Electrical Conductivity mmho/cm	Sodium (Na) lbs/a
Nitrate(NO ₃ -N)	topsoil ppm	subsoil 6.5 ppm
	sampling depth	top 0 inches
		subsoil 12 inches

NUTRIENT REQUIREMENTS

Cropping Options	Yield Goal	Pounds per acre					LIMESTONE SUGGESTIONS
		N	P ₂ O ₅	K ₂ O	Zn	S	
103 CORN (GRAIN)	80 bu/A	110	0	25	0	0	Effective Neutralizing Material (ENM) 0
115 SOYBEANS	60 bu/A	0	0	85	0	0	
103 CORN (GRAIN)	200 bu/A	250	0	60	0	0	Effective Magnesium (EMg) 0
119 WHEAT	75 bu/A	110	0	20	0	0	

Comments:

---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 7.76 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
 ---Nitrogen requirements may be reduced by 30 pounds per acre for the first crop following soybeans. Not applicable for wheat.
 ---The cation exchange capacity of this soil would suggest very low potential for sulfur response. Monitor the crop by plant analyses for potential need for sulfur.

Regional Agronomy Specialist Joni Harper Phone 660-827-0591 Signature _____

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FIELD INFORMATION		
Field Id 4	Sample No	
ACRES 27	Last Limed Unknown	Irrigated No
Last Crop 103 CORN (GRAIN) (80-300)		

County Name Pettis	Region 5
Current Date 12/17/2012	

Soil sample submitted by:

This report is for:

Tyson Foods
20001 Menefee Road
Sedalia MO 65301

Soil Test Information			Rating					
			Very Low	Low	Medium	High	Very High	Excess
pH _s	(salt pH)	7.1	*****	*****	*****	*****		
Phosphorus	(P)	119 lbs/A	*****	*****	*****	*****	*****	
Potassium	(K)	223 lbs/A	*****	*****	***			
Calcium	(Ca)	5562 lbs/A	*****	*****	*****	****		
Magnesium	(Mg)	811 lbs/A	*****	*****	*****	****		
Sulfur	(SO ₄ -S)	12 ppm	*****	*****	*****	****		
Zinc	(Zn)	1.65 ppm	*****	*****	*****	***		
Manganese	(Mn)							
Iron	(Fe)							
Copper	(Cu)							

Organic Matter 2.55%	Neutralizable Acidity 0.0 meq/100g	Cation Exch. Capacity 17.6 meq/100g
pH in water	Electrical Conductivity mmho/cm	Sodium (Na) lbs/a
Nitrate(NO3-N)	topsoil 36.5 ppm	subsoil 36.5 ppm
	sampling depth	top 0 inches
		subsoil 12 inches

NUTRIENT REQUIREMENTS							
Cropping Options	Yield Goal	Pounds per acre					LIMESTONE SUGGESTIONS
		N	P ₂ O ₅	K ₂ O	Zn	S	
115 SOYBEANS	60 bu/A	0	0	110	0	0	Effective Neutralizing Material (ENM) 0
103 CORN (GRAIN)	200 bu/A	230	0	85	0	0	
103 CORN (GRAIN)	80 bu/A	85	0	50	0	0	Effective Magnesium (EMg) 0
119 WHEAT	75 bu/A	110	0	45	0	0	

Comments:
 ---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 7.6 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
 ---Nitrogen requirements may be reduced by 30 pounds per acre for the first crop following soybeans. Not applicable for wheat.
 ---The cation exchange capacity of this soil would suggest very low potential for sulfur response. Monitor the crop by plant analyses for potential need for sulfur.

Regional Agronomy Specialist Joni Harper.. Phone 660-827-0591 Signature _____
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FIELD INFORMATION		
Field Id	5	Sample No
ACRES 64.01	Last Limed Unknown	Irrigated No
Last Crop 115 SOYBEANS (30-70)		

County Name Pettis	Region 5
Current Date 10/5/2011	

Soil sample submitted by:

This report is for:

Tyson Foods WWTP
 20001 Menefee Road
 Sedalia MO 65301

Soil Test Information			Rating					
			Very Low	Low	Medium	High	Very High	Excess
pH _s	(salt pH)	7.07	*****	*****	*****	*****		
Phosphorus	(P)	116.08 lbs/A	*****	*****	*****	*****	*****	
Potassium	(K)	338.08 lbs/A	*****	*****	*****			
Calcium	(Ca)	5934.32 lbs/A	*****	*****	*****	****		
Magnesium	(Mg)	795.92 lbs/A	*****	*****	*****	****		
Sulfur	(SO ₄ -S)	12.56 ppm	*****	*****	*****	****		
Zinc	(Zn)	2.46 ppm	*****	*****	*****	****		
Manganese	(Mn)							
Iron	(Fe)							
Copper	(Cu)							
Organic Matter 3.15%			Neutralizable Acidity 0.1 meq/100g			Cation Exch. Capacity 18.7 meq/100g		
pH in water			Electrical Conductivity mmho/cm			Sodium (Na) lbs/a		
Nitrate(NO ₃ -N) topsoil ppm		subsoil 8.3 ppm	sampling depth		top 0 inches	subsoil 12 inches		

NUTRIENT REQUIREMENTS

Cropping Options	Yield Goal	Pounds per acre						LIMESTONE SUGGESTIONS
		N	P ₂ O ₅	K ₂ O	Zn	S		
103 CORN (GRAIN)	80 bu/A	105	0	20	0	0	Effective Neutralizing Material (ENM)	0
115 SOYBEANS	60 bu/A	0	0	75	0	0		
103 CORN (GRAIN)	200 bu/A	250	0	50	0	0	Effective Magnesium (EMg)	0
119 WHEAT	75 bu/A	110	0	20	0	0		

Comments:

---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 7.57 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
 ---Nitrogen requirements may be reduced by 30 pounds per acre for the first crop following soybeans. Not applicable for wheat.
 ---The cation exchange capacity of this soil would suggest very low potential for sulfur response. Monitor the crop by plant analyses for potential need for sulfur.

Regional Agronomy Specialist ___ Joni Harper.. ___ Phone__ 660-827-0591__ Signature _____
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 Phone 573-379-5431
 Fax 573-379-5875

FIELD INFORMATION		
Field Id 5	Sample No	
ACRES 64	Last Limed Unknown	Irrigated No
Last Crop 103 CORN (GRAIN) (80-300)		

County Name Pettis	Region 5
Current Date 12/17/2012	

Soil sample submitted by:

This report is for:

Tyson Foods
 20001 Menefee Road
 Sedalia MO 65301

Soil Test Information			Rating					
			Very Low	Low	Medium	High	Very High	Excess
pH _s	(salt pH)	6.83	*****	*****	*****	***		
Phosphorus	(P)	54 lbs/A	*****	*****	*****	***		
Potassium	(K)	236 lbs/A	*****	*****	***			
Calcium	(Ca)	5812 lbs/A	*****	*****	*****	****		
Magnesium	(Mg)	1015.4 lbs/A	*****	*****	*****	*****		
Sulfur	(SO ₄ -S)	10 ppm	*****	*****	*****	****		
Zinc	(Zn)	1.2 ppm	*****	*****	*****	***		
Manganese	(Mn)							
Iron	(Fe)							
Copper	(Cu)							

Organic Matter 2.34%	Neutralizable Acidity 0.3 meq/100g	Cation Exch. Capacity 19.4 meq/100g
pH in water	Electrical Conductivity mmho/cm	Sodium (Na) lbs/a
Nitrate(NO ₃ -N)	topsoil 34.3 ppm	subsoil 34.3 ppm
	sampling depth	top 0 inches
		subsoil 12 inches

NUTRIENT REQUIREMENTS								
Cropping Options	Yield Goal	Pounds per acre					LIMESTONE SUGGESTIONS	
		N	P ₂ O ₅	K ₂ O	Zn	S		
115 SOYBEANS	60 bu/A	0	30	110	0	0	Effective Neutralizing Material (ENM)	0
103 CORN (GRAIN)	200 bu/A	255	55	85	0	0	Effective Magnesium (EMg)	0
103 CORN (GRAIN)	80 bu/A	115	20	45	0	0		
119 WHEAT	75 bu/A	110	25	45	0	0		

Comments:

- Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 7.33 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
- Nitrogen requirements may be reduced by 30 pounds per acre for the first crop following soybeans. Not applicable for wheat.
- The cation exchange capacity of this soil would suggest very low potential for sulfur response. Monitor the crop by plant analyses for potential need for sulfur.

Regional Agronomy Specialist Joni Harper.. Phone 660-827-0591 Signature _____
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FIELD INFORMATION		
Field Id	6	Sample No
ACRES 33.04	Last Limed Unknown	Irrigated No
Last Crop 115 SOYBEANS (30-70)		

County Name Pettis	Region 5
Current Date 10/5/2011	

Soil sample submitted by:

This report is for:

Tyson Foods WWTP
 20001 Menefee Road
 Sedalia MO 65301

Soil Test Information			Rating					
			Very Low	Low	Medium	High	Very High	Excess
pH _s	(salt pH)	7.23	*****	*****	*****	*****		
Phosphorus	(P)	88.14 lbs/A	*****	*****	*****	*****		
Potassium	(K)	286.58 lbs/A	*****	*****	*****			
Calcium	(Ca)	6203 lbs/A	*****	*****	*****	****		
Magnesium	(Mg)	763.14 lbs/A	*****	*****	*****	****		
Sulfur	(SO ₄ -S)	10.43 ppm	*****	*****	*****	****		
Zinc	(Zn)	1.81 ppm	*****	*****	*****	***		
Manganese	(Mn)							
Iron	(Fe)							
Copper	(Cu)							
Organic Matter 3.08%			Neutralizable Acidity 0.0 meq/100g			Cation Exch. Capacity 19.06 meq/100g		
pH in water			Electrical Conductivity mmho/cm			Sodium (Na) lbs/a		
Nitrate(NO ₃ -N) topsoil ppm		subsoil 6.33 ppm		sampling depth		top 0 inches		subsoil 12 inches

NUTRIENT REQUIREMENTS

Cropping Options	Yield Goal	Pounds per acre						LIMESTONE SUGGESTIONS
		N	P ₂ O ₅	K ₂ O	Zn	S		
103 CORN (GRAIN)	80 bu/A	105	0	30	0	0	Effective Neutralizing Material (ENM)	0
115 SOYBEANS	60 bu/A	0	0	95	0	0		
103 CORN (GRAIN)	200 bu/A	250	0	70	0	0	Effective Magnesium (EMg)	0
119 WHEAT	75 bu/A	110	0	30	0	0		

Comments:

---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 7.73 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
 ---Nitrogen requirements may be reduced by 30 pounds per acre for the first crop following soybeans. Not applicable for wheat.
 ---The cation exchange capacity of this soil would suggest very low potential for sulfur response. Monitor the crop by plant analyses for potential need for sulfur.

Regional Agronomy Specialist Joni Harper Phone 660-827-0591 Signature _____

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FIELD INFORMATION		
Field Id 6	Sample No	
ACRES 36.6	Last Limed Unknown	Irrigated No
Last Crop 103 CORN (GRAIN) (80-300)		

County Name Pettis	Region 5
Current Date 12/17/2012	

Soil sample submitted by:

This report is for:

Tyson Foods
 20001 Menefee Road
 Sedalia MO 65301

Soil Test Information			Rating					
			Very Low	Low	Medium	High	Very High	Excess
pH _s	(salt pH)	6.8	*****	*****	*****	**		
Phosphorus	(P)	42 lbs/A	*****	*****	*****			
Potassium	(K)	275.4 lbs/A	*****	*****	*****			
Calcium	(Ca)	7090.6 lbs/A	*****	*****	*****	****		
Magnesium	(Mg)	1194 lbs/A	*****	*****	*****	*****		
Sulfur	(SO ₄ -S)	10.7 ppm	*****	*****	*****	****		
Zinc	(Zn)	0.97 ppm	*****	*****	*****			
Manganese	(Mn)							
Iron	(Fe)							
Copper	(Cu)							

Organic Matter 2.53%	Neutralizable Acidity 0.6 meq/100g	Cation Exch. Capacity 23.7 meq/100g
pH in water	Electrical Conductivity mmho/cm	Sodium (Na) lbs/a
Nitrate(NO ₃ -N)	topsoil 46 ppm	subsoil 46 ppm
	sampling depth	top 0 inches
		subsoil 12 inches

NUTRIENT REQUIREMENTS							
Cropping Options	Yield Goal	Pounds per acre					LIMESTONE SUGGESTIONS
		N	P ₂ O ₅	K ₂ O	Zn	S	
115 SOYBEANS	60 bu/A	0	55	105	0	0	Effective Neutralizing Material (ENM) 0
103 CORN (GRAIN)	200 bu/A	255	95	75	5	0	
103 CORN (GRAIN)	80 bu/A	110	40	40	5	0	Effective Magnesium (EMg) 0
119 WHEAT	75 bu/A	110	50	40	0	0	

Comments:
 ---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 7.3 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
 ---Nitrogen requirements may be reduced by 30 pounds per acre for the first crop following soybeans. Not applicable for wheat.
 ---Zinc recommendations are for inorganic fertilizer sources like zinc sulfate or oxide. If using a chelated zinc source, apply only 1/3 the recommended amount per acre as a soil treatment.
 ---The cation exchange capacity of this soil would suggest very low potential for sulfur response. Monitor the crop by plant analyses for potential need for sulfur.

Regional Agronomy Specialist Joni Harper Phone 660-827-0591 Signature _____
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FIELD INFORMATION		
Field Id	7	
ACRES	48.8	
Last Limed	Unknown	
Irrigated No		
Last Crop 105 WHEAT/SOYBEANS (30-120)		

County Name	Pettis	Region	5
Current Date	12/28/2011		

Soil sample submitted by:

This report is for:

Tyson Foods WWTP
20001 Menefee Road
Sedalia MO 65301

Soil Test Information			Rating					
			Very Low	Low	Medium	High	Very High	Excess
pH _s	(salt pH)	6.77	*****	*****	*****	**		
Phosphorus	(P)	160.22 lbs/A	*****	*****	*****	*****	*****	*****
Potassium	(K)	300.94 lbs/A	*****	*****	*****			
Calcium	(Ca)	5284.22 lbs/A	*****	*****	*****	****		
Magnesium	(Mg)	832.1 lbs/A	*****	*****	*****	****		
Sulfur	(SO ₄ -S)	9.05 ppm	*****	*****	*****	****		
Zinc	(Zn)	1.64 ppm	*****	*****	*****	***		
Manganese	(Mn)							
Iron	(Fe)							
Copper	(Cu)							

Organic Matter 3.13%	Neutralizable Acidity 0.6 meq/100g	Cation Exch. Capacity 17.65 meq/100g
pH in water	Electrical Conductivity mmho/cm	Sodium (Na) lbs/a
Nitrate(NO3-N)	topsoil ppm	subsoil 4 ppm
	sampling depth	top 0 inches
		subsoil 12 inches

NUTRIENT REQUIREMENTS								
Cropping Options	Yield Goal	Pounds per acre						LIMESTONE SUGGESTIONS
		N	P ₂ O ₅	K ₂ O	Zn	S		
105 WHEAT/SOYBEANS	60 bu/A	95	0	65	0	0	Effective Neutralizing Material (ENM)	0
103 CORN (GRAIN)	200 bu/A	215	0	60	0	0		
103 CORN (GRAIN)	80 bu/A	75	0	25	0	0	Effective Magnesium (EMg)	0
119 WHEAT	75 bu/A	110	0	25	0	0		

Comments:
 ---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 7.27 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
 ---P2O5 and K2O requirements shown above for double cropping include the needs for both crops. No additional P2O5 or K2O should be necessary for the second crop in this double crop system. Nitrogen requirements are for wheat only.
 ---The cation exchange capacity of this soil would suggest very low potential for sulfur response. Monitor the crop by plant analyses for potential need for sulfur.

Regional Agronomy Specialist ___Joni Harper___ Phone ___660-827-0591___ Signature _____
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Soil Test Report

Soil Testing Laboratory
23 Mumford Hall, MU
Columbia, Mo 65211
Phone 573-882-0623
Fax 573-884-4288

Soil Testing Laboratory
P.O. Box 160
Portageville, MO 63873
Phone 573-379-5431
Fax 573-379-5875

FIELD INFORMATION		
Field Id	8	Sample No
ACRES	144.82	Last Limed Unknown
		Irrigated No
Last Crop 103 CORN (GRAIN) (80-300)		

County Name Pettis	Region 5
Current Date 10/5/2011	

Soil sample submitted by:

This report is for:

Tyson Foods WWTP
20001 Menefee Road
Sedalia MO 65301

Soil Test Information			Rating					
			Very Low	Low	Medium	High	Very High	Excess
pH _s	(salt pH)	6.53	*****	*****	*****	**		
Phosphorus	(P)	244.26 lbs/A	*****	*****	*****	*****	*****	*****
Potassium	(K)	324.56 lbs/A	*****	*****	*****			
Calcium	(Ca)	5397.96 lbs/A	*****	*****	*****	****		
Magnesium	(Mg)	760 lbs/A	*****	*****	*****	****		
Sulfur	(SO ₄ -S)	14.23 ppm	*****	*****	*****	****		
Zinc	(Zn)	3.12 ppm	*****	*****	*****	*****		
Manganese	(Mn)							
Iron	(Fe)							
Copper	(Cu)							

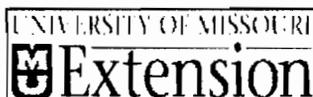
Organic Matter 3.23%	Neutralizable Acidity 1.3 meq/100g	Cation Exch. Capacity 18.34 meq/100g
pH in water	Electrical Conductivity mmho/cm	Sodium (Na) lbs/a
Nitrate(NO ₃ -N)	topsoil ppm	subsoil 24.9 ppm
	sampling depth	top 0 inches
		subsoil 12 inches

NUTRIENT REQUIREMENTS							
Cropping Options	Yield Goal	Pounds per acre					LIMESTONE SUGGESTIONS
		N	P ₂ O ₅	K ₂ O	Zn	S	
103 CORN (GRAIN)	80 bu/A	105	0	20	0	0	Effective Neutralizing Material (ENM) 0
115 SOYBEANS	60 bu/A	0	0	80	0	0	
103 CORN (GRAIN)	200 bu/A	250	0	55	0	0	Effective Magnesium (EMg) 0
119 WHEAT	75 bu/A	110	0	20	0	0	

Comments:
 ---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 7.03 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
 ---Nitrogen requirements may be reduced by 30 pounds per acre for the first crop following soybeans. Not applicable for wheat.
 ---The cation exchange capacity of this soil would suggest very low potential for sulfur response. Monitor the crop by plant analyses for potential need for sulfur.

Regional Agronomy Specialist ___Joni Harper___ Phone ___660-827-0591___ Signature_____

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Columbia, Mo 65211
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P.O. Box 160
Portageville, MO 63873
Phone 573-379-5431
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FIELD INFORMATION		
Field Id 8	Sample No	
ACRES 152.1	Last Limed Unknown	Irrigated No
Last Crop 103 CORN (GRAIN) (80-300)		

County Name Pettis	Region 5
Current Date 12/17/2012	

Soil sample submitted by:

This report is for:

Tyson Foods
20001 Menefee Road
Sedalia MO 65301

Soil Test Information			Rating					
			Very Low	Low	Medium	High	Very High	Excess
pH _s	(salt pH)	6.58	*****	*****	*****	**		
Phosphorus	(P)	200 lbs/A	*****	*****	*****	*****	*****	*****
Potassium	(K)	250.6 lbs/A	*****	*****	*****			
Calcium	(Ca)	5888.6 lbs/A	*****	*****	*****	****		
Magnesium	(Mg)	937.8 lbs/A	*****	*****	*****	****		
Sulfur	(SO ₄ -S)	13.9 ppm	*****	*****	*****	****		
Zinc	(Zn)	1.87 ppm	*****	*****	*****	***		
Manganese	(Mn)							
Iron	(Fe)							
Copper	(Cu)							
Organic Matter 2.5%			Neutralizable Acidity 1.1 meq/100g			Cation Exch. Capacity 20.1 meq/100g		
pH in water			Electrical Conductivity mmho/cm			Sodium (Na) lbs/a		
Nitrate(NO3-N)	topsoil 43.1 ppm	subsoil 43.1 ppm	sampling depth		top 0 inches	subsoil 12 inches		

NUTRIENT REQUIREMENTS

Cropping Options	Yield Goal	Pounds per acre					LIMESTONE SUGGESTIONS
		N	P ₂ O ₅	K ₂ O	Zn	S	
115 SOYBEANS	60 bu/A	0	0	105	0	0	Effective Neutralizing Material (ENM) 0
103 CORN (GRAIN)	200 bu/A	255	0	80	0	0	
103 CORN (GRAIN)	80 bu/A	110	0	45	0	0	Effective Magnesium (EMg) 0
119 WHEAT	75 bu/A	110	0	40	0	0	

Comments:

---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 7.08 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
 ---Nitrogen requirements may be reduced by 30 pounds per acre for the first crop following soybeans. Not applicable for wheat.
 ---The cation exchange capacity of this soil would suggest very low potential for sulfur response. Monitor the crop by plant analyses for potential need for sulfur.

Regional Agronomy Specialist Joni Harper Phone 660-827-0591 Signature _____
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Phone 573-379-5431
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FIELD INFORMATION		
Field Id	10	
ACRES	44.4	
Last Limed	Unknown	
Irrigated No		
Last Crop	105 WHEAT/SOYBEANS (30-120)	

County Name	Pettis	Region	5
Current Date	12/28/2011		

Soil sample submitted by:

This report is for:

Tyson Foods WWTP
20001 Menefee Road
Sedalia MO 65301

Soil Test Information			Rating					
			Very Low	Low	Medium	High	Very High	Excess
pH _s	(salt pH)	7.375	*****	*****	*****	*****		
Phosphorus	(P)	58.25 lbs/A	*****	*****	*****	***		
Potassium	(K)	300 lbs/A	*****	*****	*****			
Calcium	(Ca)	6092.12 lbs/A	*****	*****	*****	****		
Magnesium	(Mg)	686.75 lbs/A	*****	*****	*****	****		
Sulfur	(SO ₄ -S)	8.75 ppm	*****	*****	*****	****		
Zinc	(Zn)	1.53 ppm	*****	*****	*****	***		
Manganese	(Mn)							
Iron	(Fe)							
Copper	(Cu)							

Organic Matter 3.019%	Neutralizable Acidity 0.0 meq/100g	Cation Exch. Capacity 18.48 meq/100g
pH in water	Electrical Conductivity mmho/cm	Sodium (Na) lbs/a
Nitrate(NO3-N)	topsoil ppm	subsoil 4.5 ppm
	sampling depth	top 0 inches
		subsoil 12 inches

NUTRIENT REQUIREMENTS

Cropping Options	Yield Goal	Pounds per acre					LIMESTONE SUGGESTIONS
		N	P ₂ O ₅	K ₂ O	Zn	S	
105 WHEAT/SOYBEANS	60 bu/A	95	25	65	0	0	Effective Neutralizing Material (ENM) 0
103 CORN (GRAIN)	200 bu/A	250	35	65	0	0	
103 CORN (GRAIN)	80 bu/A	105	20	25	0	0	Effective Magnesium (EMg) 0
119 WHEAT	75 bu/A	110	20	25	0	0	

Comments:
 ---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 7.875. Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
 ---P2O5 and K2O requirements shown above for double cropping include the needs for both crops. No additional P2O5 or K2O should be necessary for the second crop in this double crop system. Nitrogen requirements are for wheat only.
 ---The cation exchange capacity of this soil would suggest very low potential for sulfur response. Monitor the crop by plant analyses for potential need for sulfur.

Regional Agronomy Specialist Joni Harper Phone 660-827-0591 Signature _____
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 Phone 573-379-5431
 Fax 573-379-5875

FIELD INFORMATION		
Field Id 11	Sample No	
ACRES 101	Last Limed Unknown	Irrigated No
Last Crop 103 CORN (GRAIN) (80-300)		

County Name Pettis	Region 5
Current Date 12/17/2012	

Soil sample submitted by:

This report is for:

Tyson Foods
 20001 Menefee Road
 Sedalia MO 65301

Soil Test Information			Rating					
			Very Low	Low	Medium	High	Very High	Excess
pH _s	(salt pH)	7.5	*****	*****	*****	*****		
Phosphorus	(P)	39.66 lbs/A	*****	*****	*****			
Potassium	(K)	228.6 lbs/A	*****	*****	***			
Calcium	(Ca)	6289 lbs/A	*****	*****	*****	***		
Magnesium	(Mg)	915.6 lbs/A	*****	*****	*****	***		
Sulfur	(SO ₄ -S)	10.3 ppm	*****	*****	*****	***		
Zinc	(Zn)	0.9 ppm	*****	*****	*****			
Manganese	(Mn)							
Iron	(Fe)							
Copper	(Cu)							

Organic Matter 2.4%	Neutralizable Acidity 0.1 meq/100g	Cation Exch. Capacity 19.98 meq/100g
pH in water	Electrical Conductivity mmho/cm	Sodium (Na) 398 lbs/a
Nitrate(NO3-N)	topsoil 21.7 ppm	subsoil 21.7 ppm
	sampling depth	top 0 inches
		subsoil 12 inches

NUTRIENT REQUIREMENTS								
Cropping Options	Yield Goal	Pounds per acre					LIMESTONE SUGGESTIONS	
		N	P ₂ O ₅	K ₂ O	Zn	S		
115 SOYBEANS	60 bu/A	0	55	115	0	0	Effective Neutralizing Material (ENM)	0
103 CORN (GRAIN)	200 bu/A	255	95	85	5	0	Effective Magnesium (EMg)	0
103 CORN (GRAIN)	80 bu/A	110	40	50	5	0		
119 WHEAT	75 bu/A	110	50	50	0	0		

Comments:
 ---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 8 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
 ---Nitrogen requirements may be reduced by 30 pounds per acre for the first crop following soybeans. Not applicable for wheat.
 ---Zinc recommendations are for inorganic fertilizer sources like zinc sulfate or oxide. If using a chelated zinc source, apply only 1/3 the recommended amount per acre as a soil treatment.
 ---The cation exchange capacity of this soil would suggest very low potential for sulfur response. Monitor the crop by plant analyses for potential need for sulfur.

Regional Agronomy Specialist Joni Harper Phone 660-827-0591 Signature _____
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 Phone 573-379-5431
 Fax 573-379-5875

FIELD INFORMATION		
Field Id 12	Sample No	
ACRES 13.3	Last Limed Unknown	Irrigated No
Last Crop 103 CORN (GRAIN) (80-300)		

County Name Pettis	Region 5
Current Date 12/17/2012	

Soil sample submitted by:

This report is for:

Tyson Foods
 20001 Menefee Road
 Sedalia MO 65301

Soil Test Information			Rating					
			Very Low	Low	Medium	High	Very High	Excess
pH _s	(salt pH)	6.8	*****	*****	*****	**		
Phosphorus	(P)	76 lbs/A	*****	*****	*****	*****		
Potassium	(K)	186 lbs/A	*****	*****	*			
Calcium	(Ca)	4512 lbs/A	*****	*****	*****	****		
Magnesium	(Mg)	608 lbs/A	*****	*****	*****	****		
Sulfur	(SO ₄ -S)	10 ppm	*****	*****	*****	****		
Zinc	(Zn)	1.8 ppm	*****	*****	*****	***		
Manganese	(Mn)							
Iron	(Fe)							
Copper	(Cu)							

Organic Matter 2.8%	Neutralizable Acidity 0.0 meq/100g	Cation Exch. Capacity 14.1 meq/100g
pH in water	Electrical Conductivity mmho/cm	Sodium (Na) lbs/a
Nitrate(NO ₃ -N)	topsoil 26 ppm	subsoil 26 ppm
	sampling depth	top 0 inches
		subsoil 12 inches

NUTRIENT REQUIREMENTS							
Cropping Options	Yield Goal	Pounds per acre					LIMESTONE SUGGESTIONS
		N	P ₂ O ₅	K ₂ O	Zn	S	
115 SOYBEANS	60 bu/A	0	0	120	0	0	Effective Neutralizing Material (ENM) 0
103 CORN (GRAIN)	200 bu/A	225	0	90	0	0	
103 CORN (GRAIN)	80 bu/A	80	0	55	0	0	Effective Magnesium (EMg) 0
119 WHEAT	75 bu/A	110	0	55	0	0	

Comments:
 ---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 7.3 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
 ---Nitrogen requirements may be reduced by 30 pounds per acre for the first crop following soybeans. Not applicable for wheat.
 ---The cation exchange capacity of this soil would suggest very low potential for sulfur response. Monitor the crop by plant analyses for potential need for sulfur.

Regional Agronomy Specialist Joni Harper Phone 660-827-0591 Signature _____
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Phone 573-379-5431
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FIELD INFORMATION		
Field Id 13	Sample No	
ACRES 123.6	Last Limed Unknown	Irrigated No
Last Crop 103 CORN (GRAIN) (80-300)		

County Name Pettis	Region 5
Current Date 12/17/2012	

Soil sample submitted by:

This report is for:

Tyson Foods
20001 Menefee Road
Sedalia MO 65301

Soil Test Information			Rating					
			Very Low	Low	Medium	High	Very High	Excess
pH _s	(salt pH)	6.9	*****	*****	*****	***		
Phosphorus	(P)	188 lbs/A	*****	*****	*****	*****	*****	*****
Potassium	(K)	212 lbs/A	*****	*****	***			
Calcium	(Ca)	5889.6 lbs/A	*****	*****	*****	****		
Magnesium	(Mg)	790.6 lbs/A	*****	*****	*****	****		
Sulfur	(SO ₄ -S)	14.75 ppm	*****	*****	*****	****		
Zinc	(Zn)	2.13 ppm	*****	*****	*****	****		
Manganese	(Mn)							
Iron	(Fe)							
Copper	(Cu)							

Organic Matter 2.53%	Neutralizable Acidity 0.3 meq/100g	Cation Exch. Capacity 18.55 meq/100g
pH in water	Electrical Conductivity mmho/cm	Sodium (Na) lbs/a
Nitrate(NO3-N)	topsoil 43.3 ppm	subsoil 43.3 ppm
	sampling depth	top 0 inches
		subsoil 12 inches

NUTRIENT REQUIREMENTS							
Cropping Options	Yield Goal	Pounds per acre					LIMESTONE SUGGESTIONS
		N	P ₂ O ₅	K ₂ O	Zn	S	
115 SOYBEANS	60 bu/A	0	0	115	0	0	Effective Neutralizing Material (ENM) 0
103 CORN (GRAIN)	200 bu/A	255	0	90	0	0	
103 CORN (GRAIN)	80 bu/A	110	0	55	0	0	Effective Magnesium (EMg) 0
119 WHEAT	75 bu/A	110	0	50	0	0	

Comments:

---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 7.4 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
 ---Nitrogen requirements may be reduced by 30 pounds per acre for the first crop following soybeans. Not applicable for wheat.
 ---The cation exchange capacity of this soil would suggest very low potential for sulfur response. Monitor the crop by plant analyses for potential need for sulfur.

Regional Agronomy Specialist Joni Harper. Phone 660-827-0591 Signature _____
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Phone 573-379-5431
Fax 573-379-5875

FIELD INFORMATION		
Field Id	4	Sample No
ACRES 34.87	Last Limed Unknown	Irrigated No
Last Crop 103 CORN (GRAIN) (80-300)		

County Name Pettis	Region 5
Current Date 10/5/2011	

Soil sample submitted by:

This report is for:

Tyson Foods WWTP
20001 Menefee Road
Sedalia MO 65301

Soil Test Information			Rating					
			Very Low	Low	Medium	High	Very High	Excess
pH _s	(salt pH)	7.09	*****	*****	*****	*****		
Phosphorus	(P)	166 lbs/A	*****	*****	*****	*****	*****	*****
Potassium	(K)	287.84 lbs/A	*****	*****	*****			
Calcium	(Ca)	5574 lbs/A	*****	*****	*****	****		
Magnesium	(Mg)	629.24 lbs/A	*****	*****	*****	****		
Sulfur	(SO ₄ -S)	17.31 ppm	*****	*****	*****	****		
Zinc	(Zn)	2.81 ppm	*****	*****	*****	****		
Manganese	(Mn)							
Iron	(Fe)							
Copper	(Cu)							
Organic Matter 2.9%			Neutralizable Acidity 0.0 meq/100g			Cation Exch. Capacity 16.93 meq/100g		
pH in water			Electrical Conductivity mmho/cm			Sodium (Na) lbs/a		
Nitrate(NO3-N)	topsoil ppm	subsoil 4 ppm	sampling depth		top 0 inches	subsoil 12 inches		

NUTRIENT REQUIREMENTS

Cropping Options	Yield Goal	Pounds per acre					LIMESTONE SUGGESTIONS
		N	P ₂ O ₅	K ₂ O	Zn	S	
103 CORN (GRAIN)	80 bu/A	80	0	30	0	0	Effective Neutralizing Material (ENM) 0
115 SOYBEANS	60 bu/A	0	0	90	0	0	
103 CORN (GRAIN)	200 bu/A	220	0	65	0	0	Effective Magnesium (EMg) 0
119 WHEAT	75 bu/A	110	0	25	0	0	

Comments:

---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 7.59 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
 ---Nitrogen requirements may be reduced by 30 pounds per acre for the first crop following soybeans. Not applicable for wheat.
 ---The cation exchange capacity of this soil would suggest very low potential for sulfur response. Monitor the crop by plant analyses for potential need for sulfur.

Regional Agronomy Specialist ___Joni Harper___ Phone___ 660-827-0591___ Signature_____

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FIELD INFORMATION		
Field Id 14	Sample No	
ACRES 35.2	Last Limed Unknown	Irrigated No
Last Crop 103 CORN (GRAIN) (80-300)		

County Name Pettis	Region 5
Current Date 12/17/2012	

Soil sample submitted by:

This report is for:

Tyson Foods
 20001 Menefee Road
 Sedalia MO 65301

Soil Test Information			Rating					
			Very Low	Low	Medium	High	Very High	Excess
pH _s	(salt pH)	6.55	*****	*****	*****	**		
Phosphorus	(P)	196 lbs/A	*****	*****	*****	*****	*****	*****
Potassium	(K)	190 lbs/A	*****	*****	*			
Calcium	(Ca)	5136 lbs/A	*****	*****	*****	****		
Magnesium	(Mg)	655 lbs/A	*****	*****	*****	****		
Sulfur	(SO ₄ -S)	15.5 ppm	*****	*****	*****	****		
Zinc	(Zn)	1.6 ppm	*****	*****	*****	***		
Manganese	(Mn)							
Iron	(Fe)							
Copper	(Cu)							
Organic Matter 2.45%			Neutralizable Acidity 0.9 meq/100g			Cation Exch. Capacity 16.7 meq/100g		
pH in water			Electrical Conductivity mmho/cm			Sodium (Na) lbs/a		
Nitrate(NO ₃ -N)	topsoil 64 ppm	subsoil 64 ppm	sampling depth		top 0 inches	subsoil 12 inches		

NUTRIENT REQUIREMENTS							
Cropping Options	Yield Goal	Pounds per acre					LIMESTONE SUGGESTIONS
		N	P ₂ O ₅	K ₂ O	Zn	S	
115 SOYBEANS	60 bu/A	0	0	120	0	0	Effective Neutralizing Material (ENM) 0
103 CORN (GRAIN)	200 bu/A	230	0	95	0	0	
103 CORN (GRAIN)	80 bu/A	85	0	60	0	0	Effective Magnesium (EMg) 0
119 WHEAT	75 bu/A	110	0	55	0	0	

Comments:
 ---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 7.05 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
 ---Nitrogen requirements may be reduced by 30 pounds per acre for the first crop following soybeans. Not applicable for wheat.
 ---The cation exchange capacity of this soil would suggest very low potential for sulfur response. Monitor the crop by plant analyses for potential need for sulfur.

Regional Agronomy Specialist Joni Harper Phone 660-827-0591 Signature _____
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		<h2 style="margin: 0;">Soil Test Report</h2>	Soil Testing Laboratory 23 Mumford Hall, MU Columbia, Mo 65211 Phone 573-882-0623 Fax 573-884-4288	Soil Testing Laboratory P.O. Box 160 Portageville, MO 63873 Phone 573-379-5431 Fax 573-379-5875					
FIELD INFORMATION			County Name Pettis	Region 5					
Field Id 15	Sample No		Current Date 12/17/2012						
ACRES 47	Last Limed Unknown	Irrigated No							
Last Crop 103 CORN (GRAIN) (80-300)									
This report is for: <div style="text-align: center;"> Tyson Foods 20001 Menefee Road Sedalia MO 65301 </div>									
Soil Test Information			Rating						
			Very Low	Low	Medium	High	Very High	Excess	
pH _s	(salt pH)	6.8	*****	*****	*****	**			
Phosphorus	(P)	106.86 lbs/A	*****	*****	*****	*****	***		
Potassium	(K)	219.2 lbs/A	*****	*****	***				
Calcium	(Ca)	5616 lbs/A	*****	*****	*****	****			
Magnesium	(Mg)	737.4 lbs/A	*****	*****	*****	****			
Sulfur	(SO ₄ -S)	11.86 ppm	*****	*****	*****	****			
Zinc	(Zn)	1.41 ppm	*****	*****	*****	***			
Manganese	(Mn)								
Iron	(Fe)								
Copper	(Cu)								
Organic Matter 2.56%			Neutralizable Acidity 0.3 meq/100g		Cation Exch. Capacity 17.7 meq/100g				
pH in water			Electrical Conductivity mmho/cm		Sodium (Na) lbs/a				
Nitrate(NO ₃ -N)	topsoil	25.6 ppm	subsoil	25.6 ppm	sampling depth	top 0 inches	subsoil 12 inches		
NUTRIENT REQUIREMENTS									
Cropping Options		Yield Goal	Pounds per acre					LIMESTONE SUGGESTIONS	
			N	P ₂ O ₅	K ₂ O	Zn	S		
115 SOYBEANS		60 bu/A	0	0	110	0	0	Effective Neutralizing Material (ENM)	0
103 CORN (GRAIN)		200 bu/A	230	0	85	0	0		
103 CORN (GRAIN)		80 bu/A	85	0	50	0	0	Effective Magnesium (EMg)	0
119 WHEAT		75 bu/A	110	0	50	0	0		
Comments: ---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 7.3 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below. ---Nitrogen requirements may be reduced by 30 pounds per acre for the first crop following soybeans. Not applicable for wheat. ---The cation exchange capacity of this soil would suggest very low potential for sulfur response. Monitor the crop by plant analyses for potential need for sulfur.									
Regional Agronomy Specialist <u>Joni Harper</u>			Phone <u>660-827-0591</u>			Signature _____			
University of Missouri, Lincoln University, U.S. Department of Agriculture & Local University Extension Councils Cooperating Equal Opportunity Institution									



Soil Test Report

Soil Testing Laboratory
23 Mumford Hall, MU
Columbia, Mo 65211
Phone 573-882-0623
Fax 573-884-4288

Soil Testing Laboratory
P.O. Box 160
Portageville, MO 63873
Phone 573-379-5431
Fax 573-379-5875

FIELD INFORMATION		
Field Id	10	Sample No
ACRES 34.14	Last Limed Unknown	Irrigated No
Last Crop 103 CORN (GRAIN) (80-300)		

County Name Pettis	Region 5
Current Date 10/5/2011	

Soil sample submitted by:

This report is for:

Tyson Foods WWTP
20001 Menefee Road
Sedalia MO 65301

Soil Test Information			Rating					
			Very Low	Low	Medium	High	Very High	Excess
pH _s	(salt pH)	6.91	*****	*****	*****	***		
Phosphorus	(P)	182.86 lbs/A	*****	*****	*****	*****	*****	*****
Potassium	(K)	322.14 lbs/A	*****	*****	*****			
Calcium	(Ca)	5189.14 lbs/A	*****	*****	*****	****		
Magnesium	(Mg)	679.86 lbs/A	*****	*****	*****	****		
Sulfur	(SO ₄ -S)	16.43 ppm	*****	*****	*****	****		
Zinc	(Zn)	3.57 ppm	*****	*****	*****	****		
Manganese	(Mn)							
Iron	(Fe)							
Copper	(Cu)							

Organic Matter 3.18%	Neutralizable Acidity 0.5 meq/100g	Cation Exch. Capacity 16.67 meq/100g
pH in water	Electrical Conductivity mmho/cm	Sodium (Na) lbs/a
Nitrate(NO ₃ -N)	topsoil ppm	subsoil 4.67 ppm
	sampling depth	top 0 inches
		subsoil 12 inches

NUTRIENT REQUIREMENTS

Cropping Options	Yield Goal	Pounds per acre					LIMESTONE SUGGESTIONS
		N	P ₂ O ₅	K ₂ O	Zn	S	
103 CORN (GRAIN)	80 bu/A	70	0	20	0	0	Effective Neutralizing Material (ENM)
115 SOYBEANS	60 bu/A	0	0	75	0	0	0
103 CORN (GRAIN)	200 bu/A	215	0	55	0	0	Effective Magnesium (EMg)
119 WHEAT	75 bu/A	110	0	20	0	0	0

Comments:
 ---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 7.41 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
 ---Nitrogen requirements may be reduced by 30 pounds per acre for the first crop following soybeans. Not applicable for wheat.
 ---The cation exchange capacity of this soil would suggest very low potential for sulfur response. Monitor the crop by plant analyses for potential need for sulfur.

Regional Agronomy Specialist ___Joni Harper___ Phone ___660-827-0591___ Signature_____
 University of Missouri, Lincoln University, U.S. Department of Agriculture & Local University Extension Councils Cooperating
 Equal Opportunity Institution



Soil Test Report

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 P.O. Box 160
 Portageville, MO 63873
 Phone 573-379-5431
 Fax 573-379-5875

FIELD INFORMATION		
Field Id	7	Sample No
ACRES 31.89	Last Limed Unknown	Irrigated No
Last Crop 115 SOYBEANS (30-70)		

County Name Pettis	Region 5
Current Date 10/5/2011	

Soil sample submitted by:

This report is for:

Tyson Foods WWTP
 20001 Menefee Road
 Sedalia MO 65301

Soil Test Information			Rating					
			Very Low	Low	Medium	High	Very High	Excess
pH _s	(salt pH)	6.77	*****	*****	*****	**		
Phosphorus	(P)	238.16 lbs/A	*****	*****	*****	*****	*****	*****
Potassium	(K)	312.76 lbs/A	*****	*****	*****			
Calcium	(Ca)	5406 lbs/A	*****	*****	*****	****		
Magnesium	(Mg)	695.84 lbs/A	*****	*****	*****	****		
Sulfur	(SO ₄ -S)	14.31 ppm	*****	*****	*****	****		
Zinc	(Zn)	2.61 ppm	*****	*****	*****	****		
Manganese	(Mn)							
Iron	(Fe)							
Copper	(Cu)							

Organic Matter 3.06%	Neutralizable Acidity 0.9 meq/100g	Cation Exch. Capacity 17.67 meq/100g
pH in water	Electrical Conductivity mmho/cm	Sodium (Na) lbs/a
Nitrate(NO3-N)	topsoil ppm	subsoil 38 ppm
	sampling depth	top 0 inches
		subsoil 12 inches

NUTRIENT REQUIREMENTS							
Cropping Options	Yield Goal	Pounds per acre					LIMESTONE SUGGESTIONS
		N	P ₂ O ₅	K ₂ O	Zn	S	
103 CORN (GRAIN)	80 bu/A	75	0	25	0	0	Effective Neutralizing Material (ENM) 0
115 SOYBEANS	60 bu/A	0	0	85	0	0	
103 CORN (GRAIN)	200 bu/A	220	0	60	0	0	Effective Magnesium (EMg) 0
119 WHEAT	75 bu/A	110	0	20	0	0	

Comments:
 ---Some herbicide labels list restrictions based on soil pH in water. This sample has an estimated pH in water of 7.27 . Use this estimated pH in water as a guide. If you wish to have soil pH in water analyzed, contact your dealer or Extension specialist listed below.
 ---Nitrogen requirements may be reduced by 30 pounds per acre for the first crop following soybeans. Not applicable for wheat.
 ---The cation exchange capacity of this soil would suggest very low potential for sulfur response. Monitor the crop by plant analyses for potential need for sulfur.

Regional Agronomy Specialist Joni Harper Phone 660-827-0591 Signature _____
 University of Missouri, Lincoln University, U.S. Department of Agriculture & Local University Extension Councils Cooperating
 Equal Opportunity Institution

Relevant NRCS Soil Survey Information for your Farm

SOIL SURVEY OF PETTIS COUNTY, MISSOURI

Arisburg silt loam, 1 to 5 percent slopes --(11B).

This very deep, very gently sloping and gently sloping, somewhat poorly drained soil commonly is on the summits of ridges in the uplands. Individual areas are long and narrow and range from 5 to more than 100 acres in size.

The typical sequence, depth, and composition of the layers of this soil are as follows

Surface layer:	0 to 8 inches, very dark gray, very friable silt loam
Subsurface layer:	8 to 19 inches, very dark gray, friable silt loam and firm silty clay loam
Subsoil:	19 to 56 inches, dark grayish brown and grayish brown, mottled, very firm silty clay loam and silty clay
Stratum:	56 to 60 inches, grayish brown, mottled, firm silty clay loam

In some areas the very dark gray surface layer and subsurface layer are less than 16 inches thick. In places the subsoil contains less clay.

Included with this soil in mapping are small areas of Leslie and Wakenda soils. Leslie soils have a dark grayish brown subsurface layer. They are in depressional areas. Wakenda soils are well drained and are in the higher convex areas. Included soils make up about 10 percent of the unit.

Important properties of the Arisburg soil

Permeability:	Moderately slow
Surface runoff:	Slow or medium
Available water capacity:	High
Organic matter content:	Moderate
Seasonal high water table:	Perched at a depth of 1.5 to 2.5 feet
Shrink-swell potential:	High

Most areas are used for cultivated crops. A few small areas are used for hay and pasture crops. This soil is well suited to corn, soybeans, grain sorghum, and winter wheat. If cultivated crops are grown, the hazard of erosion is a concern. Measures that help to control erosion include conservation tillage systems that leave a protective cover of crop residue on the surface, winter cover crops, terraces combined with grassed waterways or tile outlets, and conservation cropping systems that include rotations of pasture, hay, or winter wheat. Nearly all areas have slopes that are long enough to be terraced and farmed on the contour. Returning crop residue to the soil or regularly adding other organic material improves fertility and increases the rate of water infiltration.

Growing pasture or hay crops helps to control erosion. This soil is well suited to most of the commonly grown legumes, such as ladino clover and lespedeza; to cool-season grasses, such as tall fescue and timothy; and to warm-season grasses, such as big bluestem, indiangrass, and switchgrass. It is

moderately suited to alfalfa, orchardgrass, and smooth brome grass. Species that are tolerant of wetness should be selected. Controlling erosion during seedbed preparation is the main management concern. Timely tillage and a quickly established ground cover help to minimize soil loss.

This soil can be used for building site development or onsite waste disposal systems, but the high shrink-swell potential and the wetness are limitations on sites for dwellings. Constructing footings, foundations, and basement walls with adequately reinforced concrete and backfilling with sand or gravel help to prevent the damage caused by shrinking and swelling of the soil. Installing drainage tile around the footings helps to prevent damage to foundations and basements. The soil is unsuitable as a site for conventional septic tank absorption fields because of the restricted permeability and the wetness. Sewage lagoons function adequately, but sealing the berms and bottom of the lagoon with slowly permeable material helps to prevent the contamination of ground water.

Low strength, the shrink-swell potential, the wetness, and the potential for frost action limit the use of this soil as a site for local roads and streets. Adding crushed rock or other suitable material strengthens the base material. Grading the roads and streets so that they shed water, constructing adequate roadside ditches, and installing culverts help to prevent the damage caused by shrinking and swelling, wetness, and frost action.

The land capability classification is IIe. No woodland ordination symbol is assigned.

Arisburg silt loam, 2 to 5 percent slopes, eroded --(11B2).

This very deep, gently sloping, somewhat poorly drained soil commonly is on the back slopes of ridges in the uplands. Erosion has removed 25 to 75 percent of the original surface layer. The present surface layer is mixed with the upper part of the subsoil. Individual areas of this soil are irregular in shape and range from 5 to 50 acres in size.

The typical sequence, depth, and composition of the layers of this soil are as follows

Surface layer:	0 to 8 inches, very dark gray, friable silt loam
Subsoil:	8 to 11 inches, very dark gray, firm silty clay loam
	11 to 26 inches, dark grayish brown, mottled, firm silty clay loam and silty clay
	26 to 50 inches, grayish brown, mottled, firm silty clay loam
Substratum:	50 to 60 inches, grayish brown, mottled, firm silty clay loam

In places the very dark gray surface layer and the upper part of the subsoil are less than 10 inches thick. In some areas the surface layer is silty clay loam as a result of erosion.

Included with this soil in mapping are small areas of Clafork soils. These soils have a dense layer at a depth of 20 to 40 inches. They are in the steeper areas. They make up about 5 to 10 percent of the unit.

Important properties of the Arisburg soil

Permeability:	Moderately slow
Surface runoff:	Medium
Available water capacity:	High
Organic matter content:	Moderate
Seasonal high water table:	Perched at a depth of 1.5 to 2.5 feet
Shrink-swell potential:	High



Agriculture Systems Information Lab

201 Ray Young Drive Columbia, MO 65201
Phone: (573) 876-5383 Fax: (573) 876-5515



Most areas are used for cultivated crops. A few areas are used for hay and pasture crops. This soil is suited to corn, soybeans, grain sorghum, and winter wheat. If cultivated crops are grown, the hazard of further erosion is a concern. Measures that help to control erosion include conservation tillage systems that leave a protective cover of crop residue on the surface, winter cover crops, terraces and grassed waterways or tile outlets, contour farming, and a conservation cropping system that includes rotations of pasture, hay, or wheat. Grassed waterways generally require some type of grade-stabilization structure. Some areas are wet and seepy, but properly placed tile drains help to minimize this problem. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, and increases the rate of water infiltration.

Growing pasture or hay helps to control erosion. This soil is well suited to most of the commonly grown legumes, such as ladino clover and lespedeza; to coolseason grasses, such as tall fescue and timothy; and to warm-season grasses, such as Caucasian bluestem, indiagrass, and switchgrass. It is moderately suited to alfalfa, orchardgrass, and smooth brome grass. Species that are tolerant of wetness should be selected. Controlling erosion during seedbed preparation is the main management concern. Timely tillage and a quickly established ground cover help to control erosion.

This soil can be used for building site development or onsite waste disposal systems, but the shrink-swell potential and the wetness are severe limitations on sites for dwellings. Constructing footings, foundations, and basement walls with adequately reinforced concrete and backfilling with sand or gravel help to prevent the damage caused by shrinking and swelling of the soil. Installing drainage tile around the footings helps to prevent damage to foundations and basements. The soil is generally unsuitable as a site for conventional septic tank absorption fields because of the restricted permeability and the wetness. Sewage lagoons function adequately, but sealing the bottom and berms of the lagoon with slowly permeable material helps to prevent the contamination of ground water.

Low strength, the shrink-swell potential, the wetness, and the potential for frost action limit the use of this soil as a site for local roads and streets. Adding crushed rock or other suitable material strengthens the base material. Grading the roads and streets so that they shed water, constructing adequate roadside ditches, and installing culverts help to prevent the damage caused by shrinking and swelling, wetness, and frost action.

The land capability classification is IIe. No woodland ordination symbol is assigned.

42-Dameron silt loam.

This very deep, nearly level, well drained soil is on small flood plains. It is frequently flooded. Individual areas are long and narrow and range from about 10 to 100 acres in size.

The typical sequence, depth, and composition of the layers of this soil are as follows

Surface soil:	0 to 23 inches; very dark grayish brown, friable silt loam
	23 to 32 inches; very dark grayish brown, friable silty clay loam
Substratum:	32 to 60 inches; very dark grayish brown, firm very gravelly silty clay loam

In some places the depth to a very gravelly layer is more than 40 inches.
Important soil properties

Permeability:	Moderate
Surface runoff:	Slow
Available water capacity:	Moderate
Organic matter content:	High

Shrink-swell potential: Moderate

Most areas are used for hay, pasture, or woodland. This soil is suited to corn, soybeans, small grain, and grasses and legumes. Access is limited because the areas are small and commonly are bordered by soils that are less suited to cultivation. Flooding, ditchbank erosion, and runoff from the adjacent uplands are management concerns. Timely planting of short-season varieties helps to prevent damage from flooding during the growing season. Careful maintenance of permanent vegetation along stream channels helps to stabilize ditchbanks. Diversions help to control runoff from the adjacent uplands. Flood-control structures reduce flood damage and crop loss. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, and increases the rate of water infiltration.

This soil is well suited to switchgrass, alfalfa, ladino clover, red clover, orchardgrass, tall fescue, and timothy. It is moderately well suited to big bluestem and indiangrass. Grazing should be restricted to periods when flooding is not likely.

This soil is suited to trees. Numerous small areas support walnut and other native hardwoods. No major hazards or limitations affect planting or harvesting.

This soil is unsuited to building site development because of the frequent flooding.

The land capability classification is 1lw. The woodland ordination symbol is 5A.

28B2-Greenton silt loam, 2 to 5 percent slopes, eroded.

This very deep, gently sloping, somewhat poorly drained soil is on side slopes and in concave areas at the upper part of drainageways in the uplands. Erosion has removed some of the original surface layer. Rills are common in cultivated areas after intense rains. Individual areas of this soil are irregular in shape and range from about 5 to 150 acres in size.

The typical sequence, depth, and composition of the layers of this soil are as follows

Surface layer:	0 to 8 inches; very dark grayish brown, friable silt loam
Subsoil:	8 to 19 inches; dark grayish brown, mottled, firm silty clay loam
	19 to 31 inches; dark grayish brown and grayish brown, mottled, firm silty clay
	31 to 55 inches; mottled yellowish brown, grayish brown, and light brownish gray, firm silty clay
Substratum:	55 to 60 inches; mottled yellowish brown and light brownish gray, firm silty clay

In some areas the very dark grayish brown surface soil is more than 10 inches thick. In other areas the depth to soft shale is less than 60 inches.

Important soil properties

Permeability:	Slow
Surface runoff:	Medium
Available water capacity:	Moderate
Organic matter content:	Moderate
Shrink-swell potential:	High
Seasonal high water table:	Perched at a depth of 1 to 3 feet



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Most areas are used for row crops, hay, or pasture. This soil is suited to corn, soybeans, small grain, and grasses and legumes in proper crop rotations. The hazard of further erosion is severe if the soil is used for cultivated crops. A combination of conservation practices helps to prevent excessive soil loss. A system of conservation tillage, such as no-till farming, that leaves a protective cover of crop residue on the surface helps to control erosion. Many areas have smooth slopes and are large enough to be terraced and farmed on the contour. The clayey subsoil exposed by terracing cannot be easily tilled, is low in fertility and available water, and may require special management practices. Topsoil from adjacent areas can be added to the exposed channel after construction. Contour stripcropping alternates strips of permanent grasses or legumes with strips of row crops planted on the contour. The grass-legume strips minimize erosion and reduce the runoff rate. Returning crop residue to the soil or regularly adding other organic material improves fertility, minimizes crusting, and increases the rate of water infiltration.

Growing grasses and legumes for pasture and hay is effective in controlling erosion. Deep-rooted legumes, such as alfalfa, do not grow well because of the seasonal high water table. This soil is well suited to ladino clover. It is moderately well suited to big bluestem, indiangrass, switchgrass, alsike clover, tall fescue, and timothy. It is moderately suited to red clover and orchardgrass. When new seedlings are established, tilling on the contour, planting nurse crops, or leaving crop residue on the surface helps to prevent excessive erosion.

This soil is suited to building site development and onsite waste disposal systems if proper design and installation practices are used. Constructing foundations, footings, and basement walls with adequately reinforced concrete helps to prevent the structural damage caused by shrinking and swelling. Installing tile drains around footings helps to prevent the damage caused by excessive wetness. Properly constructed sewage lagoons can function adequately. The slope is a moderate limitation. It can be overcome by grading the area.

The shrink-swell potential, low strength, wetness, and the potential for frost action are limitations on sites for local roads and streets. Strengthening the subgrade with crushed rock or other suitable material helps to prevent the damage caused by low strength. Constructing roadside ditches and installing culverts for drainage can minimize the damage caused by shrinking and swelling, wetness, and frost action.

The land capability classification is IIIe. No woodland ordination symbol is assigned.