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-0101729
Owner:	Kyowa Hakko Bio
Address:	P.O. Box 1550, Cape Girardeau, MO 63702
Continuing Authority:	Biokyowa Inc.
Address:	5469 Nash Road, Cape Girardeau, MO 63702
Facility Name:	Biokyowa Inc.
Facility Address:	5469 Nash Road, Cape Girardeau, MO 63702
Legal Description:	See Pages 2-8
UTM Coordinates:	See Pages 2-8
Receiving Stream:	See Pages 2-8
First Classified Stream and ID:	See Pages 2-8
USGS Basin & Sub-watershed No.:	See Pages 2-8

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 2-8

This permit authorizes only wastewater or stormwater 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.

December 1, 2019
Effective Date

Edward B. Galbraith, Director, Division of Environmental Quality

June 30, 2024
Expiration Date

Chris Wieberg, Director, Water Protection Program

FACILITY DESCRIPTION (continued)

Manufacturer of Amino Acids, SIC Codes #2099 and #2048. The crude grade amino acids are used by others as food additives and supplements, animal food, and as raw material by other chemical manufacturers. Domestic waste is discharged to Cape Girardeau Industrial Park WWTF (MO0053821).

Outfall #001 – Wastewater Treatment facility consist of a one million gallon flow equalization basin, pH adjustment, two activated sludge basins, secondary clarifiers, post settling aeration tanks, and hollow fiber membrane filtration. Wastewater is then discharged through a high-rate diffuser located in the Mississippi River. Samples are to be collected at the wastewater treatment plant prior to entering the pipeline. Waste activated sludge is thickened using centrifuges and is land applied, disposed of in a landfill, or composted. Three (3) sludge storage tanks located at the wastewater treatment plant have storage capacity of 467,917 gallons. Roll-off containers may also be used to provide additional storage.

Underground Injection Wells – Aerated water is injected into the aquifer to immobilize Iron and Manganese. Hydrochloric Acid and Sodium Hypochlorite are injected as cleaning agents and disinfectants. This solution is extracted from the aquifer and disposed of via a permitted waste water treatment facility.

Design flow is 2.0 MGD
Actual flow is 1.37 MGD
Legal description: NW ¼, SE ¼, Sec. 20, T30N, R14E, Cape Girardeau County
UTM Coordinates: X= 809292, Y= 4128553
Receiving Stream: Mississippi River (P)
First Classified Stream and ID: Mississippi River (P)(3701) 303(d)
USGS Basin & Sub-watershed No.: 07140105-0503

Outfall #002 –Non-contact cooling water, barometric condenser water, reverse osmosis (RO) reject water, and stormwater collected in a stormwater basin. Outfall sampling location is at the discharge point into the diversion channel.
Design flow is 9.135 MGD
Actual flow is 4.4 MGD
Legal description: Land Grant 3282, Cape Girardeau County
UTM Coordinates: X= 801440, Y= 4127614
Receiving Stream: Headwater Division Channel (P)
First Classified Stream and ID: Headwater Division Channel (P) (2196) 303(d)
USGS Basin & Sub-watershed No.: 07140107-0604

Permitted Feature #003 - #004 – Removed from permit.
No-discharge, land application system of sludge for Permitted Features #005 - #035.
Application rate: Plant Available Nitrogen (PAN) calculation.
Design sludge production: 16,070 gallons/day at 10% solids or 2,467 dry tons/year.
Design Application rates: 1-2 dry tons/acre or 2,344 – 6,665 gallons/acre.
Vegetation: hay and row crops.

Permitted Feature #005 – Land Application Site, Green, 498.2 acres
Legal description: Sec. 12, 13, T27N, R14E, and Sec.7, 18T27N, R15E, Scott County
UTM Coordinates: X= 812798, Y= 4100434
Receiving Stream: Tributary to Blue Ditch
First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.: 08020201-0303

Permitted Feature #006 – Land Application Site, Headlight, 515.0 acres
Legal description: S ½, Sec. 1, T27N, R14E, Scott County
UTM Coordinates: X= 812239, Y= 4102726
Receiving Stream: Tributary to Blue Ditch
First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.: 08020201-0303

FACILITY DESCRIPTION (continued)

Permitted Feature #007 – Land Application Site, Plant Site, 85.9 acres
Legal description: SW ¼, Sec. 27, T30N, R13E, Cape Girardeau County
UTM Coordinates: X= 801860, Y= 4126480
Receiving Stream: Tributary to Ditch #1
First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.: 08080204-0102

Permitted Feature #008 – Land Application Site, Barn Hill, 176.2 acres
Legal description: S ½, Sec. 36, T26N, R16E, Mississippi County
UTM Coordinates: X= 832308, Y= 4085025
Receiving Stream: Tributary to James Bayou
First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.: 08020201-0202

Permitted Feature #009 – Land Application Site, Dirk Lower, 107.7 acres
Legal description: Sec. 35, T26N, R17E, Mississippi County
UTM Coordinates: X= 840023, Y= 4085694
Receiving Stream: 8-20-13 MUDD V1.0 (C)
First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (7630)
USGS Basin & Sub-watershed No.: 08020201-0201

Permitted Feature #010 – Land Application Site, Dirk Upper, 240.3 acres
Legal description: W ½, SW ¼, Sec. 25, T26N, R17E, Mississippi County
UTM Coordinates: X= 840968, Y= 4086654
Receiving Stream: Tributary to Glory Bayou
First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.: 08020201-0201

Permitted Feature #011 – Land Application Site, Dogwood Lower, 311.9 acres
Legal description: W ½, Sec. 13 T25N, R14E, New Madrid County
UTM Coordinates: X= 812471, Y= 4079687
Receiving Stream: Tributary to Ash Ditch
First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.: 08020201-0308

Permitted Feature #012 – Land Application Site, Dogwood Upper, 318.3 acres
Legal description: W ½, Sec. 12 T25N, R14E, New Madrid County
UTM Coordinates: X= 812431, Y= 4081239
Receiving Stream: Tributary to Ash Ditch
First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.: 08020201-0308

Permitted Feature #013 – Land Application Site, Dowling site, 198.2 acres
Legal description: NW ¼, Sec. 21 T26N, R16E, Mississippi County
UTM Coordinates: X= 826576, Y= 4088742
Receiving Stream: Tributary to Wolf Hole Lateral
First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.: 08020201-0103

Permitted Feature #014 – Land Application Site, Evans Site, 363.4 acres
Legal description: Sec. 2, T26N, R14E, Scott County
UTM Coordinates: X= 811004, Y= 4092536
Receiving Stream: Tributary to Blue Ditch
First Classified Stream and ID: 8 -20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.: 08020201-0303

FACILITY DESCRIPTION (continued)

Permitted Feature #015 – Land Application Site, Fox Meadow Lower, 608.9 acres
Legal description: E ½, Sec. 19, T27N, R15E, Scott County
UTM Coordinates: X= 814200, Y= 4097615
Receiving Stream: Tributary to Blue Ditch
First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.: 08020201-0303

Permitted Feature #016– Land Application Site, Fox Meadow Upper, 228.4 acres
Legal description: SE ¼, Sec. 18, T27N, R15E, Scott County
UTM Coordinates: X= 814318, Y= 4099238
Receiving Stream: Tributary to Blue Ditch
First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.: 08020201-0303

Permitted Feature #017– Land Application Site, Gilmore Site, 196.3 acres
Legal description: E ½, Sec. 3, T25N, R16E, Mississippi County
UTM Coordinates: X= 829313, Y= 4083338
Receiving Stream: Tributary to Spillway Ditch
First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.: 08020201-0103

Permitted Feature #018 – Land Application Site, Gravel Ridge Site, 150.7 acres
Legal description: SW ¼, Sec. 35, T26N, R16E, Mississippi County
UTM Coordinates: X= 830156, Y= 4084929
Receiving Stream: Tributary to Spillway Ditch
First Classified Stream and ID: Spillway Ditch (C) (3809)
USGS Basin & Sub-watershed No.: 08020201-0103

Permitted Feature #019 – Land Application Site, Grigsby Site, 78.9 acres
Legal description: E ½, NW ¼, Sec. 14, T26N, R16E, Mississippi County
UTM Coordinates: X= 830616, Y= 4090749
Receiving Stream: Stevenson Bayou (C)
First Classified Stream and ID: Stevenson Bayou (C) (3135) 303(d)
USGS Basin & Sub-watershed No.: 08020201-0102

Permitted Feature #020 – Land Application Site, Headquarters Site, 474.5 acres
Legal description: W ½, Sec. 13, T27N, R14E, Scott County
UTM Coordinates: X= 811375, Y= 4099144
Receiving Stream: Tributary to Blue Ditch
First Classified Stream and ID: Blue Ditch (C) (3147)
USGS Basin & Sub-watershed No.: 08020201-0303

Permitted Feature #021– Land Application Site, Henson Site, 157.0 acres
Legal description: SE ¼, Sec. 32, T26N, R17E, Mississippi County
UTM Coordinates: X= 835735, Y= 4085165
Receiving Stream: Tributary to Lateral #1
First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.: 08020201-0202

Permitted Feature #022 – Land Application Site, Morrow Farm Site, 264.9 acres
Legal description: E ½, Sec. 18, T27N, R15E, Scott County
UTM Coordinates: X= 813303, Y= 4099228
Receiving Stream: Tributary to Blue Ditch
First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.: 08020201-0303

FACILITY DESCRIPTION (continued)

Permitted Feature #023 – Land Application Site, Office Site, 296.4 acres
Legal description: W ½, Sec. 27, T26N, R16E, Mississippi County
UTM Coordinates: X= 828469, Y= 4086850
Receiving Stream: Tributary to Spillway Ditch
First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.: 08020201-0103

Permitted Feature #024 – Land Application Site, Paul's Site, 308.3 acres
Legal description: S ½, Sec. 34, T26N, R16E, Mississippi County
UTM Coordinates: X= 828983, Y= 4085650
Receiving Stream: Tributary to Spillway Ditch
First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.: 08020201-0103

Permitted Feature #025 – Land Application Site, Powell/Moore Site, 408.6 acres
Legal description: S ½, Sec. 32, T27N, R15E, Scott County
UTM Coordinates: X= 815486, Y= 4094036
Receiving Stream: Tributary to North Cut Ditch
First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.: 08020201-0303

Permitted Feature #026 – Land Application Site, Shelby North Site, 39.2 acres
Legal description: SW ¼, SE ¼, Sec. 27, T26N, R16E, Mississippi County
UTM Coordinates: X= 828943, Y= 4086404
Receiving Stream: Tributary to Spillway Ditch
First Classified Stream and ID: Spillway Ditch (C) (3809)
USGS Basin & Sub-watershed No.: 08020201-0103

Permitted Feature #027 – Land Application Site, Shelby South Site, 70.8 acres
Legal description: N ½,, NE ¼, Sec. 4, T25N, R16E, Mississippi County
UTM Coordinates: X= 827820, Y= 4084160
Receiving Stream: Tributary to Spillway Ditch
First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.: 08020201-0103

Permitted Feature #028 – Land Application Site, Shelby West Site, 77.5 acres
Legal description: N ½, NW ¼, Sec. 33, T26N, R16E, Mississippi County
UTM Coordinates: X= 827940, Y= 4085969
Receiving Stream: Tributary to Wolf Hole Lateral
First Classified Stream and ID: Wolf Hole Lateral (C) (3166)
USGS Basin & Sub-watershed No.: 08020201-0103

Permitted Feature #029 – Land Application Site, Showmaker Site, 74.1 acres
Legal description: N ½, NW ¼, Sec. 3, T25N, R16E, Mississippi County
UTM Coordinates: X= 828639, Y= 4084197
Receiving Stream: Tributary to Spillway Ditch
First Classified Stream and ID: Spillway Ditch (C) (3809)
USGS Basin & Sub-watershed No.: 08020201-010

Permitted Feature #030– Land Application Site, Stewart Site, 328.3 acres
Legal description: Sec. 7, T25N, R16E, Mississippi County
UTM Coordinates: X= 824187, Y= 4081784
Receiving Stream: Tributary to Spillway Ditch
First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.: 08020201-0104

FACILITY DESCRIPTION (continued)

Permitted Feature #031 Land Application Site, Brown Site, 306.6 acres
Legal description: S ½, Sec. 12, T25N, R16E, Mississippi County
UTM Coordinates: X= 832298, Y= 4081778
Receiving Stream: Tributary to James Bayou
First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.: 08020201-0202

Permitted Feature #032 – Land Application Site, Love/Weco Site, 890.8 acres
Legal description: Sec. 24, T26N, R16E, Mississippi County
UTM Coordinates: X= 832214, Y= 4088605
Receiving Stream: Tributary to Spillway Ditch
First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.: 08020201-0102

Permitted Feature #033 – Land Application Site, Mike Ray Fields1-3, 315.2 acres
Legal description: SW ¼, Sec. 6, T27N, R14E, Scott County
UTM Coordinates: X= 803007, Y= 4101460
Receiving Stream: St. Johns Ditch (P) (3707)
First Classified Stream and ID: St. Johns Ditch (P) (3707)
USGS Basin & Sub-watershed No.: 08020201-0301

Permitted Feature #034 – Land Application Site, Green Fields 1-4, 409.6 acres
Legal description: N ½, S ½, Sec. 1, T27N, R13E, Scott County
UTM Coordinates: X= 801978, Y= 4102775
Receiving Stream: Tributary to St. Johns Ditch
First Classified Stream and ID: 8-20-13 MUDD V1.0 (C) (3960)
USGS Basin & Sub-watershed No.: 08020201-0301

Permitted Feature #035 – Land Application Site, Green Fields 5, 72.2 acres
Legal description: NW ¼, SW ¼, Sec. 1, T27N, R13E, Scott County
UTM Coordinates: X= 801368, Y= 4102749
Receiving Stream: Tributary to St. Johns Ditch
First Classified Stream and ID: St. Johns Ditch (C) (3707)
USGS Basin & Sub-watershed No.: 08020201-0301

SM1 – Eliminated

Permitted Feature #SM2 – In-stream Monitoring, Upstream of the discharge point of Outfall #002 into the Diversion Channel
Legal description: Land Grant 3282, Cape Girardeau County
UTM Coordinates: X= 801234, Y= 4127512
Receiving Stream: Headwaters Diversion Channel (P)
First Classified Stream and ID: Headwater Diversion Channel (P)(2196)
USGS Basin & Sub-watershed No.: 07140107-0604

Permitted Feature #SM3 – In-stream Monitoring, Downstream of the discharge point of Outfall #002 into the Diversion Channel
Legal description: NE ¼, NE ¼, Sec. 27, T30N, R13E, Cape Girardeau County
UTM Coordinates: X= 801514, Y= 4127658
Receiving Stream: Headwaters Diversion Channel (P)
First Classified Stream and ID: Headwater Diversion Channel (P)(2196)
USGS Basin & Sub-watershed No.: 07140107-0604

Permitted Feature #MW1 – Monitoring Well - Headlight Farm Irrigation Well; BIO-1A
Legal description: SE ¼, NE ¼, Sec. 01, T27N, R14E, Scott County
UTM Coordinates: X= 812549, Y= 4103438
USGS Basin & Sub-watershed No.: 08020201-0303

Permitted Feature #MW2 – Monitoring Well - Headlight Farm Irrigation Well; BIO-2A
Legal description: NW ¼, Sec. 01, T27N, R14E, Scott County
UTM Coordinates: X= 811572 Y= 4102784
USGS Basin & Sub-watershed No.: 08020201-0303

FACILITY DESCRIPTION (continued)

Permitted Feature #MW3 – Monitoring Well - Headlight Farm Irrigation Well; BIO-3A
Legal description: NE ¼, Sec. 01, T27N, R14E, Scott County
UTM Coordinates: X= 812381, Y= 4102826
USGS Basin & Sub-watershed No.: 08020201-0303

Permitted Feature #MW4 – Monitoring Wells - Headlight Farm Irrigation Well; BIO-4A
Legal description: SE ¼, Sec. 01, T27N, R14E, Scott County
UTM Coordinates: X= 812418, Y= 4102016
USGS Basin & Sub-watershed No.: 08020201-0303

Permitted Feature #MW5 – Monitoring Well - Green Farm Irrigation Well; BIO-10A
Legal description: SE ¼, SE ¼, Sec. 12, T27N, R14E, Scott County
UTM Coordinates: X= 812727, Y= 4100059
USGS Basin & Sub-watershed No.: 08020201-0303

Permitted Feature #MW6 – Monitoring Well - Headquarters Farm Well; IW/ST-1A
Legal description: NW ¼, SW ¼, Sec. 12, T27N, R14E, Scott County
UTM Coordinates: X= 811382, Y= 4098938
USGS Basin & Sub-watershed No.: 08020201-0303

Permitted Feature #MW7 – Monitoring Well - Headquarters Farm Well; HW/ST-1A
Legal description: NE ¼, NE ¼, Sec. 14, T27N, R14E, Scott County
UTM Coordinates: X= 811140, Y= 4099747
USGS Basin & Sub-watershed No.: 08020201-0303

Permitted Feature #MW8 – Monitoring Well - Fox Meadow Farm Irrigation Well, N/ST-2A
Legal description: E ½, Sec. 18, T27N, R15E, Scott County
UTM Coordinates: X= 814065, Y= 4099205
USGS Basin & Sub-watershed No.: 08020201-0303

Permitted Feature #MW9 – Monitoring Well - Fox Meadow Farm Irrigation Well, S/ST-2A
Legal description: SE ¼, Sec. 19, T27N, R15E, Scott County
UTM Coordinates: X= 814166, Y= 4097203
USGS Basin & Sub-watershed No.: 08020201-0303

Permitted Feature #U01 – Total amounts of aerated water, sodium hypochlorite, and hydrochloric acid injected into underground injection wells 4 – 10. Well 009 will use the same locational data as Well 8:
Legal Description: S ½, Sec. 27, T30N, R13E, Cape Girardeau County
UTM Coordinates: X = 801835, Y = 4126284
Receiving Stream: Unnamed tributary to Ditch #1
First Classified Stream and ID: Ditch #1 (C) (3052)
USGS Basin & Sub-watershed No.: (08020204 -0102)

Wells 1, 2, 3 - These wells are no longer in used. The wells are operational for emergency use such as for firefighting.

Well 4
Legal Description: S ½, Sec. 27, T30N, R13E, Cape Girardeau County
UTM Coordinates: X = 801682, Y = 4126663

Well 5
Legal Description: S ½, Sec. 27, T30N, R13E, Cape Girardeau County
UTM Coordinates: X = 801521, Y = 4126219

Well 6
Legal Description: S ½, Sec. 27, T30N, R13E, Cape Girardeau County
UTM Coordinates: X = 802184, Y = 4126761

Well 7
Legal Description: S ½, Sec. 27, T30N, R13E, Cape Girardeau County
UTM Coordinates: X = 802034, Y = 4126523

Well 8
Legal Description: S ½, Sec. 27, T30N, R13E, Cape Girardeau County
UTM Coordinates: X = 801835, Y = 4126284

Well 9
Legal Description: S ½, Sec. 27, T30N, R13E, Cape Girardeau County
UTM Coordinates: X = 801703, Y = 4126421

Well 10
Legal Description: S ½, Sec. 27, T30N, R13E, Cape Girardeau County
UTM Coordinates: X = 801589, Y = 4126174

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

OUTFALL #001	TABLE A-1 FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					
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 **December 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 PARAMETERS	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
LIMIT SET: M1 Tier 1, Facility production 0-500 Tons/month β						
PHYSICAL						
Flow	MGD	*		*	daily	24 hr. total
Diffuser Pressure €	PSI	*		*	once/day	Gauge reading
CONVENTIONAL						
Biochemical Oxygen Demand$_5$ (BOD_5)	mg/L lbs./day	* 12,147		* 4647	once/week	24 hr. composite §
Chemical Oxygen Demand (COD)	mg/L lbs./day	* 39,318		* 21,551	once/week	24 hr. composite §
E. coli ¥	#/100 ml	1030		206	once/week	grab
pH £	SU	6.5 to 9.0			once/week	grab
Total Suspended Solids (TSS)	mg/L lbs./day	* 18,431		* 13,033	once/week	24 hr. composite §
NUTRIENTS						
Ammonia as N	mg/L lbs./day	* 14,143		* 9,631	once/week	grab
Total Kjeldahl Nitrogen	mg/L lbs./day	* *		* *	once/week	grab
Nitrate plus Nitrite	mg/L lbs./day	* *		* *	once/week	grab
Phosphorous, Total	mg/L lbs./day	* *		* *	once/week	grab

OUTFALL #001	**TABLE A-1 (CONTINUED)** **FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**					
LIMIT SET: M2 Tier 2, Facility production Over 500 Tons/month β						
PHYSICAL						
Flow	MGD	*		*	daily	24 hr. total
Diffuser Pressure €	PSI	*		*	once/day	Gauge reading
CONVENTIONAL						
BOD_5	mg/L lbs./day	* 18,107		* 11,686	once/week	24 hr. composite §
COD	mg/L lbs./day	* 37,647		* 36,026	once/week	24 hr. composite §
E. coli ¥	#/100 ml	1,030		206	once/week	grab
pH £	SU	6.5 to 9.0			once/week	grab
TSS	mg/L lbs./day	* 18,887		* 14,112	once/week	24 hr. composite §
NUTRIENTS						
Ammonia as N	mg/L lbs./day	* 15,748		* 14,965	once/week	grab
Total Kjeldahl Nitrogen	mg/L lbs./day	* *		* *	once/week	grab
Nitrate plus Nitrite	mg/L lbs./day	* *		* *	once/week	grab
Phosphorous, Total	mg/L lbs./day	* *		* *	once/week	grab
OTHER Tier 1 and Tier 2						
BOD Removal Efficiency ∞	%	*		70	once/week	calculated
COD Removal Efficiency ∞	%	*		50	once/week	calculated
TSS Removal Efficiency ∞	%	*		*	once/week	calculated
Ammonia as N Removal Efficiency ∞	%	*		*	once/week	calculated
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE JANUARY 28, 2020. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

OUTFALL #001	**TABLE A-2** **INFLUENT MONITORING REQUIREMENTS**

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 **December 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 PARAMETERS	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
LIMIT SET: IM						
BOD_5	mg/L	*		*	once/week	24 hr. composite §
	lbs./day	*		*		
COD	mg/L	*		*	once/week	24 hr. composite §
	lbs./day	*		*		
TSS	mg/L	*		*	once/week	24 hr. composite §
	lbs./day	*		*		
Ammonia as N	mg/L	*		*	once/week	24 hr. composite §
	lbs./day	*		*		
Total Kjeldahl Nitrogen	mg/L	*		*	once/week	24 hr. composite §
	lbs./day	*		*		
Nitrate plus Nitrite	mg/L	*		*	once/week	24 hr. composite §
	lbs./day	*		*		
Phosphorous, Total	mg/L	*		*	once/week	24 hr. composite §
	lbs./day	*		*		

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE JANUARY 28, 2020. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

OUTFALL #001 Tier 1 and 2	**TABLE A-3** **FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

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 **December 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:

OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	**FINAL EFFLUENT LIMITATIONS**			MONITORING EQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
LIMIT SET: WA						
Whole Effluent Toxicity (WET), Acute test	TUa	See Special Condition 22			Bi-annual ⌂	24 hr. composite §

MONITORING REPORTS SHALL BE SUBMITTED SEMI-ANNUAL; THE FIRST REPORT IS DUE JULY 28, 2020. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

OUTFALL #001	TABLE A-4 SLUDGE MONITORING REQUIREMENTS

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 **December 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 PARAMETERS	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
LIMIT SET: S						
NUTRIENTS						
pH	SU	*		*	once/month	grab
Total Kjeldahl Nitrogen as N (TKN)	mg/kg	*		*	once/month	grab
Ammonia Nitrogen as N	mg/kg	*		*	once/month	grab
Nitrate Nitrogen as N	mg/kg	*		*	once/month	grab
Phosphorous, Total	mg/kg	*		*	once/month	grab
METALS						
Arsenic	mg/kg	*		*	once/month	grab
Cadmium	mg/kg	*		*	once/month	grab
Copper	mg/kg	*		*	once/month	grab
Lead	mg/kg	*		*	once/month	grab
Mercury	mg/kg	*		*	once/month	grab
Molybdenum	mg/kg	*		*	once/month	grab
Nickel	mg/kg	*		*	once/month	grab
Selenium	mg/kg	*		*	once/month	grab
Zinc	mg/kg	*		*	once/month	grab
OTHER						
Percent Solids	%	*		*	once/month	grab

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE JANUARY 28, 2020. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

OUTFALL #002	TABLE A-5 FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS				
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 **December 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 PARAMETERS	UNITS	FINAL LIMITATIONS		MONITORING REQUIREMENTS	
		DAILY MAXIMUM	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
LIMIT SET: M					
PHYSICAL					
Flow	MGD	*	*	daily	24 hr. total
Temperature	°F	*	*	once/month	measured
CONVENTIONAL					
BOD_5	mg/L	*	*	once/month	grab
Chloride	mg/L lbs./day	* 26,568.41	*	once/month	grab
Chlorine, Total Residual (TRC) ≠	µg/L lbs./day	7.5 (130 ML) 0.54 (9.9 ML)	5.0 (130 ML)	once/month	grab
Oil & Grease	mg/L	15	10	once/month	grab
pH £	SU	6.5 to 9.0		once/month	grab
Sulfate SO_4	mg/L lbs./day	* 61400.73	*	once/month	grab
Total Suspended Solids	mg/L	*	*	once/month	grab
METALS					
Aluminum, Total Recoverable	µg/L lbs./day	* 46.37	*	once/month	grab
Barium, Total Recoverable	µg/L lbs./day	* 238.76	*	once/month	grab
Copper, Total Recoverable	µg/L lbs./day	26.0 2.18	16.4	once/month	grab
Iron, Total Recoverable	µg/L lbs./day	* 218.96	*	once/month	grab
Lead, Total Recoverable	µg/L lbs./day	* 0.78	*	once/month	grab
Selenium, Total Recoverable	µg/L lbs./day	* 0.59	*	once/month	grab

OUTFALL #002	TABLE A-5 (CONTINUED) FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS				
NUTRIENTS					
Ammonia as N (April 1 – Sept 30)	mg/L	13.9	2.9	once/month	grab
Ammonia as N (Oct 1 – March 31)	mg/L	14.1	2.9	once/month	grab
Nitrate	mg/L lbs./day	* 524.4	*	once/month	grab
Total Kjeldahl Nitrogen	mg/L lbs./day	* *	* *	once/month	grab
Nitrate plus Nitrite	mg/L lbs./day	* *	* *	once/month	grab
Phosphorous, Total	mg/L lbs./day	* *	* *	once/month	grab
OTHER					
Fluoride	mg/L lbs./day	* 232.2	*	once/month	grab
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE JANUARY 28, 2020. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.					

PERMITTED FEATURES #MW1 – #MW9	TABLE A-6 MONITORING WELL MONITORING REQUIREMENTS				
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 **December 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 PARAMETERS	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
LIMIT SET: MW						
Groundwater Depth⸸	feet	*			once/year±	measured
Nitrate/Nitrite as N	mg/L	10			once/year±	grab
Total Dissolved Solids	mg/L	*			once/year±	grab
MONITORING REPORTS SHALL BE SUBMITTED ANNUALLY; THE FIRST REPORT IS DUE JANUARY 28, 2021. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (CONTINUED)

PERMITTED FEATURES #005 - #035	**TABLE A-7.** LAND APPLICATION AND SOIL MONITORING REQUIREMENTS					
The permittee is authorized to conduct land application of sludge as specified in the application for this permit. The final limitations shall become effective upon issuance and remain in effect until expiration of the permit. The land application of sludge 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
LIMIT SET: LA						
Land Application Monitoring **Ω**						
Amount Applied	tons	*			daily	total
Application Area	acres	*			daily	total
Application Rate	tons/acre	*			daily	total
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE JANUARY 28, 2020. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
LIMIT SET: SO						
Soil Monitoring (See Special Condition 16.f.)						
pH – Units	SU	*			once/5 years	composite
Nitrate Nitrogen as N	mg/kg	*			once/5 years	composite
Available Phosphorus as P (Bray P-1)	mg/kg	*			once/5 years	composite
Cation Exchange Capacity (CEC)	mEq/100g	*			once/5 years	composite
MONITORING REPORTS SHALL BE SUBMITTED WITH THE ANNUAL REPORT; THE FIRST REPORT IS DUE JANUARY 28, 2024.						

PERMITTED FEATURES #SM2 & #SM3	**TABLE A-8 STREAM MONITORING REQUIREMENTS**					
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 **December 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 PARAMETERS	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
PERMITTED FEATURE #SM2, LIMIT SET: UM						
Upstream Temperature ⌗	°F	*		*	once/month	measured
PERMITTED FEATURE #SM3, LIMIT SET: DM						
Downstream Temperature ⌗	°F	*		*	once/month	measured
Net Temperature Difference ⌗	°F	*		*	once/month	calculated
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE JANUARY 28, 2020. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

PERMITTED FEATURE #U01 (combination of wells 4 – 10)	**TABLE A-9**. UNDERGROUND INJECTION MONITORING REQUIREMENTS

The permittee is authorized to conduct land application of sludge as specified in the application for this permit. The final limitations shall become effective upon issuance and remain in effect until expiration of the permit. The land application of sludge shall be controlled, limited and monitored by the permittee as specified below:

EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	MONTHLY TOTAL	ANNUAL TOTAL	MEASUREMENT FREQUENCY	SAMPLE TYPE
LIMIT SET: UI						
Aerated Water	gal		Ψ		monthly	calculated
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE JANUARY 28, 2020. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
Hydrochloric Acid	lbs./year			Ψ	annual	recorded
Sodium Hypochlorite	lbs./year			Ψ	annual	recorded
MONITORING REPORTS SHALL BE SUBMITTED ANNUALLY; THE FIRST REPORT IS DUE JANUARY 28, 2021. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

* Monitoring requirement only.

Ψ Monitoring requirement only. The data reported shall be the sums of wells 4 – 10. Total gallons per month.

⁜ Depth of water table below ground surface.

± Sample each well once per year during the month of May.

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

β Permittee shall report based on whether Tier 1 or 2 production conditions exist. Report "No Discharge" for the Tier production that is not effective.

€ Pressure readings for diffuser shall be recorded daily and reported with Discharge Monitoring Reports.

¥ 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.

£ The facility will report the minimum and maximum values. pH is not to be averaged.

∞ Efficiency shall be determined based on the total mass measured in the influent to the head works of the treatment plant in comparison with the total mass measured in the effluent. When the production is biased by plant shut down and removal efficiencies are not met, the permittee has the option of demonstrating as a defense that the plant was operated properly at the time the removal efficiency was not met.

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

(a) This effluent limit is below the minimum quantification level (ML) of the most sensitive 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.

Ω Report only sites that were used for land application during the reporting period. If no land application occurred at a site, no reporting is required.

⁜ Monitoring and reporting is only required when river stage level at the nearest gauging stations is below 9.0 feet.

⌂ See below for bi-annual sampling frequencies.

	MONTHS	**WET TEST**	**REPORT IS DUE**
First Half of Year	January, February, March, April, May, June	Sample at least once during any month of the half year	July 28th
Second Half of Year	July, August, September, October, November, December	Sample at least once during any month of the half year	January 28th

B. STANDARD CONDITIONS

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

C. SPECIAL CONDITIONS

1. Unauthorized Discharge.
   a. Unauthorized discharges, spills, or overflows for any reason shall constitute a permit violation and shall be reported in accordance with Standard Conditions Part 1 Section B.2. Unauthorized discharges are to be reported to the Southeast Regional Office during normal business hours or the Environmental Emergency Response spill-line at 573-634-2436 outside of normal business hours within 24 hours of becoming aware of the discharge.

   b. Monitoring. Any unauthorized discharge, spill, or overflow shall be monitored for the parameters in the table below at least once during the discharge event. Additional monitoring may be required by the Department on a case-by-case basis. The facility shall submit test results, along with the number of days the storage basin(s) has discharged during the month, via the Electronic Discharge Monitoring Report (eDMR) Submission System by the 28th day of the month after the discharge ceases. Permittee shall monitor for the following constituents:

Constituent	Units
Flow	MGD
Biochemical Oxygen Demand$_5$	mg/L
Total Suspended Solids	mg/l
Ammonia as N	mg/L
pH – Units	SU
Oil & Grease	mg/L
E. coli	#/100mL

2. The full implementation of this operating permit, which includes implementation of any applicable schedules of compliance, shall constitute compliance with all applicable federal and state statutes and regulations in accordance with §644.051.16, RSMo, and the CWA section 402(k); however, this permit may be reopened and modified, or alternatively revoked and reissued to comply with any applicable effluent standard or limitation issued or approved under Clean Water Act Sections 301(b)(2)(C) and (D), §304(b)(2), and §307(a) (2), if the effluent standard or limitation so issued or approved contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or controls any pollutant not limited in the permit. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, termination, notice of planned changes, or anticipated non-compliance does not stay any permit condition.

3. 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;
      (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).

4. All outfalls must be clearly marked in the field.

C. SPECIAL CONDITIONS (continued)

5. Electronic Discharge Monitoring Report (eDMR) Submission System
   (a) Discharge Monitoring Reporting Requirements. The permittee must electronically submit compliance monitoring data via the eDMR system. In regards to Standard Conditions Part I, Section B, #7, the eDMR system is currently the only Department approved reporting method for this permit.
   (b) Programmatic Reporting Requirements. The following reports (if required by this permit) must be electronically submitted as an attachment to the eDMR system until such a time when the current or a new system is available to allow direct input of the data:
      (1) Collection System Maintenance Annual Reports;
      (2) Wastewater Irrigation Annual Reports;
      (3) Sludge/Biosolids Annual Reports;
         i. In addition to the annual Sludge/Biosolids report submitted to the department, the permittee must submit Sludge/Biosolids Annual Reports electronically using EPA's NPDES Electronic Reporting Tool ("NeT") (https://cdx.epa.gov/).
      (4) Any additional report required by the permit excluding bypass reporting.
      After such a system has been made available by the department, required data shall be directly input into the system by the next report due date.
   (c) Other actions. The following shall be submitted electronically after such a system has been made available by the department:
      (1) General Permit Applications/Notices of Intent to discharge (NOIs);
      (2) Notices of Termination (NOTs);
      (3) No Exposure Certifications (NOEs);
      (4) Bypass reporting, See Standard Condition Part I, Section B, subsection 2.b.for 24-hr. bypass reporting requirements.
   (d) Electronic Submissions. To access the eDMR system, use the following link in your web browser: https://edmr.dnr.mo.gov/edmr/E2/Shared/Pages/Main/Login.aspx.
   (e) Waivers from Electronic Reporting. The permittee must electronically submit compliance monitoring data and reports unless a waiver is granted by the department in compliance with 40 CFR Part 127. The permittee may obtain an electronic reporting waiver by first submitting an eDMR Waiver Request Form: http://dnr.mo.gov/forms/780-2692-f.pdf. The department will either approve or deny this electronic reporting waiver request within 120 calendar days. Only permittees with an approved waiver request may submit monitoring data and reports on paper to the Department for the period that the approved electronic reporting waiver is effective.

6. Public access to storage areas and land application sites must be controlled by either positive barriers or remoteness of site.

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 report the "Non-Detect" result using the less than sign and the minimum detection limit (e.g. <10).
   d. See sufficiently sensitive method requirements in Standard Conditions Part I, Section A, #4 regarding proper detection limits used for sample analysis.
   e. When calculating monthly averages, one-half of the minimum detection limit (MDL) should be used instead of a zero. Where all data are below the MDL, the "<MDL" shall be reported as indicated in item (C).

8. 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.

9. It is a violation of the Missouri Clean Water Law to fail to pay fees associated with this permit (644.055 RSMo).

10. Hazardous waste regulated under the Missouri Hazardous Waste Law and regulations shall not be land applied under this permit.

11. The facility shall monitor the water level of Headwaters Diversion Channel at a nearby gauging station monthly to determine if in- stream monitoring in Table A-8 is required. Monitoring and reporting is only required when river stage level at the nearest gauging stations is below 9.0 feet.

C. SPECIAL CONDITIONS (continued)

12. The facility's SIC code(s) or description is found in 40 CFR 122.26(b)(14) and/or 10 CSR 20-6.200(2) hence shall implement a SWPPP which 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 every five (5) years or as site conditions change (see Part III: Antidegradation Analysis and SWPPP sections in the fact sheet). 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: *Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators*, (EPA 833-B-09-002) published by the EPA in February 2009 (www.epa.gov/npdes/pubs/industrial_swppp_guide.pdf). The SWPPP must include:
    a. A listing of specific contaminants and their control measures (or BMPs) and a narrative explaining how BMPs are implemented to control and minimize the amount of contaminants potentially entering stormwater.
    b. The SWPPP must include a schedule for once per month site inspections and brief written reports. The inspection report must include observations and evaluations of BMP effectiveness. Throughout coverage under this permit, the facility must perform ongoing SWPPP review and revision to incorporate any site condition changes.
        (1) Operational deficiencies must be corrected within seven (7) calendar days.
        (2) Minor structural deficiencies must be corrected within fourteen (14) calendar days.
        (3) Major structural deficiencies must be reported to the regional office within seven (7) days of discovery. The initial report shall consist of the deficiency noted, the proposed remedies, the interim or temporary remedies (including the general timing of the placement of the interim measures), and an estimate of the timeframe needed to wholly complete the repairs or construction. The permittee will work with the regional office to determine the best course of action, including but not limited to temporary structures to control stormwater runoff. The facility shall correct the major structural deficiency as soon as reasonably achievable.
        (4) All actions taken to correct the deficiencies shall be included with the written report, including photographs.
        (5) 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 and EPA 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.

13. Site-wide minimum Best Management Practices (BMPs). At a minimum, the permittee shall adhere to the following:
    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 stormwater 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 stormwater or provide other prescribed BMPs such as plastic lids and/or portable spill pans to prevent the commingling of stormwater with container contents. Commingled water may not be discharged under this permit. Provide spill prevention control, and/or management sufficient to prevent any spills of these pollutants from entering waters of the state. Any containment system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall also prevent the contamination of groundwater. Any spills should be noted in the SWPPP.
    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 to comply with general water quality criteria, effluent limits, or benchmarks. This could include the use of straw bales, silt fences, or sediment basins, if needed.
    f. Ensure adequate provisions are provided to protect storage basin embankments from erosion.

14. 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.

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. 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.

C. SPECIAL CONDITIONS (continued)

17. 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.
    b. Permitted Sites. This permit authorizes land application of sludge by the permittee or unpermitted contract haulers to those sites listed in the "Facility Description" of this permit. Land application sites where applications are conducted by permitted contract haulers 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.
    c. If land application sites listed in this permit are also included as land application sites in another permit, the wastewater or sludge applications from other sources shall be included in the application rates. Records of the amount and application rate from other sources must be kept.
    d. Storage basins shall be inspected monthly for structural integrity and leaks.
    e. Public Access Restrictions. This permit does not authorize application of sludge to public use areas.
    f. Soil Monitoring.
        (1) Composite soil samples shall be collected every five years from each field listed in this permit where land application has or will occur prior to the expiration date of this permit. No land application shall occur on fields listed in this permit if soil test results are more the five (5) years old.
        (2) Soil sampling shall be in accordance with University of Missouri (MU) Extension Guides G9215, Soil Sampling Pastures or G9217, Soil Sampling Hayfields and Row Crops or other methods approved by the department. The recommendation of one composite sample per 20 acres in G9215 and G9217 is not required by this permit, however, this is a useful method to identify soil fertility fluctuations in large fields due to past management practices, soil type, and variability of crop yields. There shall be at least one composite sample per 80 acres.
        (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.

18. Land Application Requirements.
    a. Sludge land applications shall not exceed agronomic rates to ensure agricultural use of nutrients and prevent contamination of surface and groundwater. The agronomic rate is the amount of wastewater and/or sludge applied to a field to meet the fertilizer recommendation.
    b. No land application shall occur when the soil is frozen, snow covered, or saturated. 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. Land application fields listed in the "Facility Description" shall be checked daily during land application 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. Sludge application slope limitations for application sites are as follows;
        (1) Slopes of 6 percent or less there are no limitations.
        (2) Slopes of 7 to 12 percent, biosolids when may be applied with no limitation when soil conservation practices are used to meet the allowable erosion levels.

C. SPECIAL CONDITIONS (continued)

(3) Slopes greater than 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

g. Grazing of animals and harvesting of forage crops deferments following wastewater irrigation or sludge application shall be as follows:
   (1) During the period May 1 to October 30 the minimum deferment shall be fourteen (14) days,
   (2) During the period November 1 to April 30, the minimum deferment shall be thirty (30) days,

h. Sludge should not be applied to fields used to grow food crops for human consumption to be eaten raw, such as leafed vegetables or root crops.

i. Land application equipment owned or operated by the facility 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. Land application equipment shall be calibrated at least once annually.

19. Nutrient Management Plant Available Nitrogen (PAN) Method
Land application to fields listed in the "Facility Description" in this permit shall use the following protocols to determine the amount of sludge to be applied.

a. The fertilizer recommendation shall be based on the following:
   (1) The nitrogen recommendation for each crop. Recommendations can be found in University of Missouri Extension Guide WQ430 Crop/Nutrient Considerations for Biosolids or from publications by other land grant universities in adjoining states,
   (2) Realistic yield goal for each crop. Yield goals should be based on actual crop yield records from multiple years for each field. Good judgment should be used to counteract unusually high or low yields. If a field's yield history is not available the USDA county wide average or other approved source may be used, and
   (3) The most recent soil test.

b. Sludge applications shall be conducted according to the following management practices.
   (1) The amount of sludge to be applied shall be adjusted annually based on the Plant Available Nitrogen (PAN) calculation using the current sludge nutrient analysis and the following:
      (a) For non-legume crops, the nitrogen fertilizer recommendation shall be adjusted to account for nitrogen credits from a preceding legume crop and residual nitrogen from the previous year's application. Nitrogen removal rates can be found in WQ430.
      (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 WQ430 and a realistic yield goal. The estimated nitrogen content of the crop must be adjusted using nitrogen credits for residual nitrogen fertilizer from the previous year's application.

      PAN = [Ammonia Nitrogen x volatilization factor*] + [Organic Nitrogen x 0.2] + [Nitrate Nitrogen]
      *Volatilization factor is 0.7 for surface application and 1 for subsurface application.

c. 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.

20. 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 land application field 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.

21. Annual Report on operation and land application 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:

a. 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.

b. The number of days the storage structure discharged during the year, the discharge flow, reason the discharge occurred and effluent analysis performed.

c. A summary for each field used for land application showing number of acres used number of days application occurred,

C. SPECIAL CONDITIONS (continued)

crop grown and yield, and total amount of sludge applied (gal. or tons/acre) .

d. Any soil tests taken during the reporting period.
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. Narrative summary of any problems or deficiencies identified, corrective action taken and improvements planned.

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

SUMMARY OF ACUTE WET TESTING FOR THIS PERMIT				
OUTFALL	AEC	FREQUENCY	SAMPLE TYPE	MONTH
001	0.05%	Twice/year	24 hr. composite**	Any

Dilution Series						
4X AEC	2X AEC	AEC	½ AEC	¼ AEC	(Control) 100% upstream, if available	(Control) 100% Lab Water, also called synthetic water
0.20% effluent	0.10% effluent	0.05% effluent	0.025% effluent	0.0125% effluent		

AEC = Design Flow of Outfall #001 / (ZID + D.F. OF 001) = 3.1 / 6,165.9 + 3.1 = 0.0005 = 0.05%

The zone of initial dilution (ZID) is based on the 2004 Diffuser Study which stated that 1989:1 dilution was achieved in the zone of initial dilution.

a. Freshwater Species and Test Methods: Species and short-term test methods for estimating the acute toxicity of NPDES effluents are found in the most recent edition of *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* (EPA/821/R-02/012; Table IA, 40 CFR Part 136). The permittee shall concurrently conduct 48-hour, static, non-renewal toxicity tests with the following species:
   (1) The fathead minnow, *Pimephales promelas* (Acute Toxicity EPA Test Method 2000.0).
   (2) The daphnid, *Ceriodaphnia dubia* (Acute Toxicity EPA Test Method 2002.0).
b. Chemical and physical analysis of the upstream control sample and effluent sample shall occur immediately upon being received by the laboratory, prior to any manipulation of the effluent sample beyond preservation methods consistent with federal guidelines for WET testing that are required to stabilize the sample during shipping. Where upstream receiving water is not available or known to be toxic, other approved control water may be used.
c. Test conditions must meet all test acceptability criteria required by the EPA Method used in the analysis.
d. The Allowable Effluent Concentration (AEC) for this facility is 0.05% with the dilution series being: 0.2%, 0.1%, 0.05%, 0.025%, and 0.0125%.
e. All chemical and physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% effluent concentration.
f. The facility must submit a full laboratory report for all toxicity testing. 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 effluent concentration that would cause death in 50 percent of the test organisms at a specific time.

D. UNDERGROUNG INJECTION CONTROL SPECIAL CONDITIONS

1. There shall be no release of polychlorinated biphenyl compounds (PCBs) to waters of the state at or above the level of quantification currently defined as 1 µg/L or 1 ppb.

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: contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or 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. Report as no-discharge when a discharge does not occur during the reporting period.

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FACT SHEET
FOR THE PURPOSE OF RENEWAL
OF
MO-0101729
BIOKYOWA

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 stormwater 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 for less.

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 or operating permit) listed below. A factsheet is not an enforceable part of an operating permit.

Part I. FACILITY INFORMATION

Facility Type: Major Industrial
Facility SIC Code(s): 0299
Application Date: 09/16/2016
Modification Date: 05/20/2013
Expiration Date: 03/19/2017
Last Inspection: 05/04/2016 in compliance

FACILITY DESCRIPTION:
Manufacturer of Amino Acids, SIC Codes #2099 and #2048. The crude grade amino acids are used by others as food additives and supplements, animal food, and as raw material by other chemical manufacturers.

The charter number for the continuing authority for this facility is 00245395; this number was verified by the permit writer to be associated with the facility and precisely matches the continuing authority reported by the facility.

OUTFALL AND PERMITTED FEATURES TABLE:

OUTFALLS AND PERMITTED FEATURES	AVERAGE FLOW MGD	DESIGN FLOW MGD	TREATMENT LEVEL	EFFLUENT TYPE
#001	1.37	2.0	Primary	Industrial wastewater
#002	4.4	9.135	None	Non-contact cooling water, RO reject water, stormwater
#005-#035	0	0	Land application	Industrial sludge

FACILITY PERFORMANCE HISTORY & COMMENTS:
The discharge monitoring reports were reviewed for the last five years and showed no exceedances. Underground Injection Control well were previously covered under Missouri State Operating Permit UI-0000017. It is being combined with this permit with this renewal.

Part II. OPERATOR CERTIFICATION REQUIREMENTS

As per [10 CSR 20-6.010(8) Terms and Conditions of a Permit], permittees shall operate and maintain facilities to comply with the Missouri Clean Water Law and applicable permit conditions and regulations. Operators or supervisors of operations at regulated wastewater treatment facilities shall be certified in accordance with [10 CSR 20-9.020(2)] and any other applicable state law or regulation. As per [10 CSR 20-9.010(2)(A)], requirements for operation by certified personnel shall apply to all wastewater treatment systems, if applicable, as listed below:

✓ This facility is not required to obtain the services of a certified operator.

Part III. RECEIVING STREAM INFORMATION

RECEIVING WATER BODY'S WATER QUALITY:
Currently, no stream survey has been conducted by the Department. When a stream survey is conducted, more information may be available about the receiving streams.

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

✓ Applicable; Headwater Division Channel is listed on the 2016 Missouri 303(d) list for Mercury and Stevenson Bayou is listed on the 2006 2016 Missouri 303(d) list for Dissolved Oxygen.

✓ This facility is not considered a source of the above listed pollutant(s) or considered to contribute to the impairment.

✓ Not applicable; The Mississippi River was listed on the 2002 Missouri 303(d) List for Chlordane and Polychlorinated Biphenyls (PCB). It was removed from the 303(d) List when a TMDL was approved. This facility is not considered a source of the above listed pollutant(s) or considered to contribute to the impairment.

TOTAL MAXIMUM DAILY LOAD (TMDL):
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; hence, the purpose of a TMDL is to determine the pollutant loading a specific waterbody can assimilate without exceeding water quality standards. If a water body is determined to be impaired as listed on the 303(d) list, then a watershed management plan or TMDL may be developed. The TMDL shall include the WLA calculation. http://dnr.mo.gov/env/wpp/tmdl/

✓ Applicable; Mississippi River is associated with the 2006 EPA approved TMDL for Chlordane and Polychlorinated Biphenyls (PCB).

✓ This facility is not considered to be a source of the above listed pollutant(s) or considered to contribute to the impairment.

UPSTREAM OR DOWNSTREAM IMPAIRMENTS:
The permit writer has reviewed upstream and downstream stream segments of this facility for impairments.
✓ The permit writer has noted upstream from the facility is impaired therefore WET testing requires the facility use an upstream and laboratory control to complete the WET test.

APPLICABLE DESIGNATIONS OF WATERS OF THE STATE:
✓ As per Missouri's Effluent Regulations [10 CSR 20-7.015(1)(B)], the waters of the state are divided into the following seven 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: ☒
Lake or Reservoir: ☐
Losing: ☐
Metropolitan No-Discharge: ☐
Special Stream: ☐
Subsurface Water: ☐
All Other Waters: ☒

RECEIVING STREAMS TABLE:

OUTFALL	WATERBODY NAME	CLASS	WBID	DESIGNATED USES*	12-DIGIT HUC
#001	Mississippi River	P	3701	AQL, DWS, IRR, LWW, SCR, WBCA, HHP	07140105-0503
#002	Headwater Division Channel	P	2196	AQL, DWS, IRR, LWW, SCR, WBCA, HHP	07140107-0604
#005- #006, #014-#016, #022	8-20-13 MUDD V1.0	C	3960	HHP, IRR, LWW, SCR, WBC-B, WWH (AQL)	08020201-0303
#020	Blue Ditch	C	3960	HHP, IRR, LWW, SCR, WBC-B, WWH (AQL)	
#025	North Cut Ditch	C	3143	HHP, IRR, LWW, SCR, WBC-B, WWH (AQL)	
#007	8-20-13 MUDD V1.0	C	3960	HHP, IRR, LWW, SCR, WBC-B, WWH (AQL)	
#019	Stevenson Bayou	C	3135	HHP, IRR, LWW, SCR, WBC-B, WWH (AQL)	
#008, #021, #031, #032	8-20-13 MUDD V1.0	C	3960	HHP, IRR, LWW, SCR, WBC-B, WWH (AQL)	08020201-0202
#009-#010	8-20-13 MUDD V1.0	C	7630	HHP, IRR, LWW, SCR, WBC-B, WWH (AQL)	08020201-0201
#011-#012	8-20-13 MUDD V1.0	C	3960	HHP, IRR, LWW, SCR, WBC-B, WWH (AQL)	08020201-0308
#013	Tributary to Wolf Hole Lateral	n/a		General Criteria	08020201-0103
	8-20-13 MUDD V1.0	C	3960	HHP, IRR, LWW, SCR, WBC-B, WWH (AQL)	
#017, #023, #024, #026	8-20-13 MUDD V1.0	C	3960	HHP, IRR, LWW, SCR, WBC-B, WWH (AQL)	
#018	Tributary to Spillway Ditch	n/a		General Criteria	
	Spillway Ditch	C	3809	HHP, IRR, LWW, SCR, WBC-B, WWH (AQL)	
#027- #029	Tributary to Wolf Hole Lateral	n/a		General Criteria	
	Wolf Hole Lateral	C	3166	HHP, IRR, LWW, SCR, WBC-B, WWH (AQL	
#030	8-20-13 MUDD V1.0	C	3960	HHP, IRR, LWW, SCR, WBC-B, WWH (AQL)	08020201-0104
#033	St. Johns Ditch	P	3707	AQL, DWS, IRR, LWW, SCR, WBCA, HHP	08020201-0301
#034-#035	Tributary to St. Johns Ditch	n/a		General Criteria	
	St. Johns Ditch	P	3707	AQL, DWS, IRR, LWW, SCR, WBCA, HHP	

n/a not applicable

WBID = Waterbody IDentification: Missouri Use Designation Dataset 8-20-13 MUDD V1.0 data can be found as an ArcGIS shapefile on MSDIS at ftp://msdis.missouri.edu/pub/Inland_Water_Resources/MO_2014_WQS_Stream_Classifications_and_Use_shp.zip

* As per 10 CSR 20-7.031 Missouri Water Quality Standards, the department defines the Clean Water Commission's 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 in the receiving stream table in accordance with [10 CSR 20-7.031(1)(C)].

Uses which may be found in the receiving streams table, above:

10 CSR 20-7.031(1)(C)1.:

AQL = Protection of aquatic life (Current narrative use(s) are defined to ensure the protection and propagation of fish shellfish and wildlife, which is further subcategorized as: WWH = Warm Water Habitat; CLH = Cool Water Habitat; CDH = Cold Water Habitat; EAH = Ephemeral Aquatic Habitat; MAH = Modified Aquatic Habitat; LAH = Limited Aquatic Habitat. This permit uses AQL effluent limitations in 10 CSR 20-7.031 Table A for all habitat designations unless otherwise specified.)

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

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

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

WBC-B = Whole body contact recreation supporting swimming;

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

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

HHP (formerly HHF) = Human Health Protection as it relates to the consumption of fish;
IRR = Irrigation for use on crops utilized for human or livestock consumption;
LWW = Livestock and wildlife watering (Current narrative use is defined as LWP = Livestock and Wildlife Protection);
DWS = Drinking Water Supply;
IND = Industrial water supply
10 CSR 20-7.031(1)(C)8-11.: Wetlands (10 CSR 20-7.031 Table A currently does not have corresponding habitat use criteria for these defined uses)
WSA = Storm- and flood-water storage and attenuation; WHP = Habitat for resident and migratory wildlife species;
WRC = Recreational, cultural, educational, scientific, and natural aesthetic values and uses; WHC = Hydrologic cycle maintenance.
10 CSR 20-7.031(6): GRW = Groundwater

RECEIVING STREAM LOW-FLOW VALUES:

RECEIVING STREAM (U, C, P)	LOW-FLOW VALUES (CFS)		
	1Q10	7Q10	30Q10
Mississippi River (P)	52,006	54,306	60,037
Headwaters Diversion Channel (P)	79.9	86.3	100.9

MIXING CONSIDERATIONS TABLE OUTFALL 001:

MIXING ZONE (CFS) [10 CSR 20-7.031(4)(A)4B(III)(a)]			ZONE OF INITIAL DILUTION (CFS) [10 CSR 20-7.031(4)(A)4B(III)(b)]	
1Q10	7Q10	30Q10	1Q10	7Q10
13,002	13577	12009	1300	1357

MIXING CONSIDERATIONS TABLE OUTFALL 002:

MIXING ZONE (CFS) [10 CSR 20-7.031(4)(A)4B(III)(a)]			ZONE OF INITIAL DILUTION (CFS) [10 CSR 20-7.031(4)(A)4B(III)(b)]	
1Q10	7Q10	30Q10	1Q10	7Q10
21.3	21.5	25.2	2.0	2.2

RECEIVING STREAM MONITORING REQUIREMENTS:
Monitoring for temperature is required for Headwaters Diversion Channel.

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

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

- Seven years of DMR data for upstream and downstream temperature data were available for the Headwaters Diversion Channel. A reasonable potential analysis (RPA) was conducted for the net difference in upstream and downstream temperature and showed a reasonable potential for the facility to cause an exceedance of change of temperature in accordance with 10 CSR 20 7.031(4)(D)1 only during periods of low stream flow. Therefore instream monitoring for temperature for Outfalls #SM2 and #SM3 will only be required when the river stage level is below 9.0 feet.

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

✓ Not applicable; the facility has not submitted information proposing expanded or altered process water discharge; no further degradation proposed therefore no further review necessary.

For stormwater discharges with new, altered, or expanding discharges, the stormwater BMP chosen for the facility, through the antidegradation analysis performed by the facility, must be implemented and maintained at the facility. Failure to implement and maintain the chosen BMP alternative is a permit violation; see SWPPP.

✓ Not applicable; the facility does not have stormwater discharges or the stormwater outfalls onsite have no industrial exposure.

BEST MANAGEMENT PRACTICES:

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

CHANGES IN DISCHARGES OF TOXIC POLLUTANT:

This special condition reiterates the federal rules found in 40 CFR 122.44(f) and 122.42(a)(1). In these rules, the facility is required to report changes in amounts of toxic substances discharged. Toxic substances are defined in 40 CFR 122.2 as "…any pollutant listed as toxic under section 307(a)(1) or, in the case of "sludge use or disposal practices," any pollutant identified in regulations implementing section 405(d) of the CWA." Section 307 of the clean water act then refers to those parameters found in 40 CFR 401.15. The permittee should also consider any other toxic pollutant in the discharge as reportable under this condition.

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.

DOMESTIC WASTEWATER, SLUDGE, AND BIOSOLIDS:

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

✓ Not applicable; this facility discharges domestic wastewater to an off-site permitted wastewater treatment facility (POTW).

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

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

✓ Not applicable; the facility does not manage domestic wastewater on-site.

EFFLUENT LIMITATIONS:

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

EFFLUENT LIMITATION GUIDELINE:

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

✓ The facility does not have an associated ELG.

ELECTRONIC DISCHARGE MONITORING REPORT (EDMR) SUBMISSION SYSTEM:

The U.S. Environmental Protection Agency (EPA) promulgated a final rule on October 22, 2015, to modernize Clean Water Act reporting for municipalities, industries, and other facilities by converting to an electronic data reporting system. The final rule requires regulated entities and state and federal regulators to use information technology to electronically report data required by the National

Pollutant Discharge Elimination System (NPDES) permit program instead of filing paper reports. To comply with the federal rule, the Department is requiring all permittees to begin submitting discharge monitoring data and reports online.

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

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

To assist the facility in entering data into the eDMR system, the permit describes limit sets in each table in Part A of the permit. The data entry personnel should use these identifiers to assure data entry is being completed appropriately.

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

GENERAL CRITERIA CONSIDERATIONS:

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

✓ Not applicable; this permit does not contain effluent limitations based on the narrative criteria.

GROUNDWATER MONITORING:

Groundwater is a water of the state according to 10 CSR 20-7.015(7) and 10 CSR 20-7.031(6) and must be protected accordingly.

✓ This facility is monitoring the groundwater at land application sites.

INDUSTRIAL SLUDGE:

Industrial sludge is solid, semi-solid, or liquid residue generated during the treatment of industrial process wastewater in a treatment works; including but not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment process; scum and solids filtered from water supplies and backwashed; and a material derived from industrial sludge.

✓ Applicable; permittee land applies industrial sludge in accordance with Standard Conditions III and a Department approved sludge management plan.

MAJOR WATER USER:

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

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

OIL/WATER SEPARATORS:

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

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

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 causing or have the reasonable potential to cause (or contribute to) an in-stream excursion above narrative or numeric water quality standards. If the permit writer determines 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 [40 CFR Part 122.44(d)(1)(iii)].

- ✓ Applicable; the permit writer conducted an RPD on applicable parameters within the permit. See Anti-Backsliding of this section.

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

SAMPLING TYPE JUSTIFICATION:
Sampling type was continued from the previous permit. The sampling types are representative of the discharges, and are protective of water quality. Discharges with altering effluent should have composite sampling; discharges with uniform effluent can have grab samples. Grab samples are usually appropriate for stormwater. Parameters which must have grab sampling are: pH, ammonia, *E. coli*, total residual chlorine, free available chlorine, hexavalent chromium, dissolved oxygen, total phosphorus, volatile organic compounds, and others.

SCHEDULE OF COMPLIANCE (SOC):
A schedule of remedial measures included in a permit, including an enforceable sequence of interim requirements (actions, effluent limits, operations, or milestone events) leading to compliance with the Missouri Clean Water Law, its implementing regulations, and/or the terms and conditions of an operating permit. SOCs are allowed under 40 CFR 122.47 providing certain conditions are met.
- ✓ Not applicable; this permit does not contain a SOC.

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

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

STANDARD CONDITIONS:
The standard conditions Part I attached to this permit incorporate all sections of 40 CFR 122.41(a) through (n) by reference as required by law. These conditions, in addition to the conditions enumerated within the standard conditions should be reviewed by the permittee to ascertain compliance with this permit, state regulations, state statues, federal regulations, and the Clean Water Act.

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

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

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

A standard mass-balance equation cannot be calculated for stormwater because stormwater flow and flow in the receiving stream cannot be determined for conditions on any given day or storm event. The amount of stormwater discharged from the facility will vary based on current and previous rainfall, soil saturation, humidity, detention time, BMPs, surface permeability, etc. Flow in the receiving stream will vary based on climatic conditions, size of watershed, area of surfaces with reduced permeability (houses, parking lots, and the like) in the watershed, hydrogeology, topography, etc. Decreased permeability may increase the stream flow dramatically over a short period of time (flash).

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

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

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

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

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

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

STORMWATER POLLUTION PREVENTION PLAN (SWPPP):

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

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

Areas which should be included in the SWPPP are identified in 40 CFR 122.26(b)(14). Once the potential sources of stormwater pollution have been identified, a plan should be formulated to best control the amount of pollutant being released and discharged by each activity or source. This should include, but is not limited to, minimizing exposure to stormwater, good housekeeping measures, proper facility and equipment maintenance, spill prevention and response, vehicle traffic control, and proper materials handling. Once a plan has been developed the facility will employ the control measures determined to be adequate to achieve the benchmark values discussed above. The facility will conduct monitoring and inspections of the BMPs to ensure they are working properly and re-evaluate any BMP not achieving compliance with permitting requirements. For example, if sample results from an outfall show values of TSS above the benchmark value, the BMP being employed is deficient in controlling stormwater pollution. Corrective action

should be taken to repair, improve, or replace the failing BMP. This internal evaluation is required at least once per month but should be continued more frequently if BMPs continue to fail. If failures do occur, continue this trial and error process until appropriate BMPs have been established.

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

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

If parameter-specific numeric benchmark exceedances continue to occur and the permittee feels there are no practicable or cost-effective BMPs which will sufficiently reduce a pollutant concentration in the discharge to the benchmark values established in the permit, the permittee can submit a request to re-evaluate the benchmark values. This request needs to include 1) a detailed explanation of why the facility is unable to comply with the permit conditions and unable to establish BMPs to achieve the benchmark values; 2) financial data of the company and documentation of cost associated with BMPs for review and 3) the SWPPP, which should contain adequate documentation of BMPs employed, failed BMPs, corrective actions, and all other required information. This will allow the Department to conduct a cost analysis on control measures and actions taken by the facility to determine cost-effectiveness of BMPs. The request shall be submitted in the form of an operating permit modification, which includes an appropriate fee; the application is found at: https://dnr.mo.gov/forms/#WaterPollution

✓ Applicable; a SWPPP shall be developed and implemented for this facility.

SUFFICIENTLY SENSITIVE ANALYTICAL METHODS:

Please review Standard Conditions Part 1, section A, number 4. The analytical and sampling methods used shall conform to the reference methods listed in 10 CSR 20-7.015 and/or 40 CFR 136 unless alternates are approved by the Department. The facility shall use sufficiently sensitive analytical methods for detecting, identifying, and measuring the concentrations of pollutants. The facility shall ensure the selected methods are able to quantify the presence of pollutants in a given discharge at concentrations low enough to determine compliance with Water Quality Standards in 10 CSR 20-7.031 or effluent limitations unless provisions in the permit allow for other alternatives. A method is "sufficiently sensitive" when; 1) the method quantifies the pollutant below the level of the applicable water quality criterion or; 2) the method minimum level is above the applicable water quality criterion, but the amount of pollutant in a facility's discharge is high enough the method detects and quantifies the level of pollutant in the discharge, or 3) the method has the lowest minimum level of the analytical methods approved under 10 CSR 20-7.015 and or 40 CFR 136. These methods are also required for parameters listed as monitoring only, as the data collected may be used to determine if numeric limitations need to be established. A permittee is responsible for working with their contractors to ensure the analysis performed is sufficiently sensitive. 40 CFR 136 lists the approved methods accepted by the Department. Tables A1-B3 at 10 CSR 20-7.031 shows water quality standards.

UNDERGROUND INJECTION CONTROL (UIC):

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

✓ Applicable; this facility has disclosed the use of Class V injection wells and is authorized by this permit.

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

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

VARIANCE:
Per the Missouri Clean Water Law §644.061.4, variances shall be granted for such period of time and under such terms and conditions as 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 permit is not drafted under premise of a petition for variance.

WASTELOAD ALLOCATIONS (WLA) FOR LIMITS:
As per [10 CSR 20-2.010(78)], the WLA is the amount of pollutant each discharger is allowed to discharge into the receiving stream without endangering water quality. Two general types of effluent limitations, technology-based effluent limits (TBELs) and water quality based effluent limits (WQBELs) are reviewed. If one limit does provide adequate protection for the receiving waters, then the other must be used.
✓ Not applicable; wasteload allocations were not calculated.

WLA MODELING:
Permittees may submit site specific studies to better determine the site specific wasteload allocations applied in permits.
✓ Not applicable; a WLA study was either not submitted or determined not applicable by department staff.

WATER QUALITY STANDARDS:
Per 10 CSR 20-7.031(4), 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.

Part V. EFFLUENT LIMITS DETERMINATION

Effluent limitations derived and established in the below effluent limitations table are based on current operations of the facility. Effluent means both process water and stormwater. Any flow through the outfall is considered a discharge and must be sampled and reported as provided below. 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.

OUTFALL #001 – MAIN FACILITY OUTFALL TIER 1 AND TIER 2

PARAMETERS TIER 1 0-500 TONS/MONTH	UNITS	DAILY MAXIMUM	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE	BASIS FOR LIMITS	PREVIOUS PERMIT LIMITS
PHYSICAL							
Flow	MGD	*	*	daily	24 hr. total	1	same
Diffuser Pressure	PSI	*	*	once/day	Gauge reading	6	same
CONVENTIONAL							
BOD_5	mg/L lbs./day	* 12,147	* 4647	once/week	24 hr. composite	1	same
COD	mg/L lbs./day	* 39,318	* 21,551	once/week	24 hr. composite	1	same
E. coli ‡	#/100 ml	1030	206	once/week	grab	1	same
pH ǂ	SU	6.5 to 9.0	6.5 to 9.0	once/week	grab	1	same
TSS	mg/L lbs./day	* 18,431	* 13,033	once/week	24 hr. composite	1	same
NUTRIENTS				once/week			
Ammonia as N (April 1 – Sept 30)	mg/L lbs./day	* 14,143	* 9,631	once/week	24 hr. composite	1	same
PARAMETERS TIER 1 OVER 500 TONS/MONTH	UNITS	DAILY MAXIMUM	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE	BASIS FOR LIMITS	PREVIOUS PERMIT LIMITS
Physical							
Flow	MGD	*	*	daily	24 hr. total	1	same
Diffuser Pressure	PSI	*	*	once/day	Gauge reading	6	same
Conventional							
BOD5	mg/L lbs./day	* 18,107	* 11,686	once/week	24 hr. composite	1	same
COD	mg/L lbs./day	* 37,647	* 36,026	once/week	24 hr. composite	1	same
E. coli ‡	#/100 ml	1,030	206	once/week	grab	1	same
pH ǂ	SU	6.5 to 9.0	6.5 to 9.0	once/week	grab	1	same
TSS	mg/L lbs./day	* 18,887	* 14,112	once/week	24 hr. composite	1	same
Nutrients							
Ammonia as N (April 1 – Sept 30)	mg/L lbs./day	* 15,748	* 14,965	once/week	grab	1	same
Total Kjeldahl Nitrogen	mg/L lbs./day	* *	* *	once/week	grab	1	new
Nitrate plus Nitrite	mg/L lbs./day	* *	* *	once/week	grab	1	new
Phosphorous, Total	mg/L lbs./day	* *	* *	once/week	grab	1	new
Other (Tier 1 & Tier 2)							
BOD Removal Efficiency	%	*	70	once/week	calculated		same
COD Removal Efficiency	%	*	50	once/week	calculated		same
TSS Removal Efficiency	%	*	*	once/week	calculated		same
Ammonia as N Removal Efficiency	%	*	*	once/week	calculated		same
WET Test	% Survival	Please see WET Test in the Derivation and Discussion Section below					

* Monitoring requirement only
ǂ The facility will report the minimum and maximum pH values; pH is not to be averaged.
‡ # of colonies/100mL; the Monthly Average for *E. coli* is a geometric mean.

Basis for Limitations Codes:

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

DERIVATION AND DISCUSSION OF LIMITS:

PHYSICAL:

Flow
In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to 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. The facility will report the total flow in millions of gallons per day (MGD).

CONVENTIONAL:

Biochemical Oxygen Demand (BOD_5)
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. Effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information.**

Chemical Oxygen Demand (COD)
Monitoring is included using the permit writer's best professional judgment. There is no water quality standard for COD; however, increased oxygen demand may impact instream water quality Effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information.**

Escherichia coli (E. coli)
A daily maximum of r 1030 bacteria per 100 mL and a monthly geometric mean of 206 bacteria per 100 mL during the recreational season (April 1 through October 31) only, to protect Whole Body Contact (A)) designated use of the receiving stream, as per 10 CSR 20-7.031(5)(C). An effluent limit for both monthly average and daily maximum is required by 40 CFR 122.45(d). The geometric mean is calculated by multiplying all of the data points and then taking the n^{th} root of this product, where n = # of samples collected. For example: Five *E. coli* samples were collected with results of 1, 4, 5, 6, and 10 (#/100 mL). Geometric mean = 5^{th} root of (1)(4)(5)(6)(10) = 5^{th} root of 1,200 = 4.1 #/100 mL.

pH
6.5 to 9.0 SU. The Water Quality Standard at 10 CSR 20-7.031(5)(E) states water contaminants shall not cause pH to be outside the range of 6.5 to 9.0 standard pH units.

Total Suspended Solids (TSS)
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. Effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information.**

NUTRIENTS:

Ammonia, Total as Nitrogen
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. Effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information.**

Total Kjeldahl Nitrogen
Monitoring requirement only. Monitoring for Total Kjeldahl Nitrogen is included to determine nutrient effluent limits. [10 CSR 20-7.015(9)(D)8.B.]

Nitrate plus Nitrite
Monitoring requirement only. Monitoring for Nitrate plus Nitrite is included to determine nutrient effluent limits. [10 CSR 20-7.015(9)(D)8.B.]

Phosphorous, Total
Monitoring requirement only. Monitoring for Phosphorous, Total is included to determine nutrient effluent limits. [10 CSR 20-7.015(9)(D)8.B.]

OTHER:
Biochemical Oxygen Demand (BOD_5) Removal Efficiency.

The removal efficiency determination requirement has been retained from the previous permit. This is to ensure that the treatment facility efficiency is maintained during periods when production is low and mass limits could be achieved even with little or no actual treatment by the treatment plant. They represent the removal efficiency that the plant should be able to meet 99% of the time. This limit/requirement is because the output of the plant is highly variable causing mass limits during extreme variation to be ineffective.

Chemical Oxygen Demand (COD) Removal Efficiency.
The removal efficiency determination requirement has been retained from the previous permit. This is to ensure that the treatment facility efficiency is maintained during periods when production is low and mass limits could be achieved even with little or no actual treatment by the treatment plant. They represent the removal efficiency that the plant should be able to meet 99% of the time. This limit/requirement is because the output of the plant is highly variable causing mass limits during extreme variation to be ineffective.

Total Suspended Solids (TSS) Removal Efficiency.
The removal efficiency monitoring requirement has been retained from the previous permit. This is to ensure that the treatment facility efficiency is maintained during periods when production is low and mass limits could be achieved even with little or no actual treatment by the treatment plant. This requirement is because the output of the plant is highly variable causing mass limits during extreme variation to be ineffective.

Ammonia as N Removal Efficiency.
The removal efficiency monitoring requirement has been retained from the previous permit. This is to ensure that the treatment facility efficiency is maintained during periods when production is low and mass limits could be achieved even with little or no actual treatment by the treatment plant. This requirement is because the output of the plant is highly variable causing mass limits during extreme variation to be ineffective.

Whole Effluent Toxicity (WET) Test, Acute
For classified permanent streams with other than default mixing considerations, the Allowable Effluent Concentration (AEC)% is determined as follows:

$$AEC = \frac{\text{Design Flow of Outfall \#001}}{\text{(ZID + D.F. OF 001)}} = \frac{3.1}{6{,}165.9 + 3.1} = 0.0005 = 0.05\%$$

The zone of initial dilution (ZID) is based on the 2004 Diffuser Study which stated that 1989:1 dilution was achieved in the zone of initial dilution.

OUTFALL #001 – INFLUENT MONITORING

PARAMETERS	UNITS	DAILY MAXIMUM	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE	BASIS FOR LIMITS	PREVIOUS PERMIT LIMITS
BOD_5	mg/L lbs./day	* *	* *	once/week	24 hr. composite	1	same
COD	mg/L lbs./day	* *	* *	once/week	24 hr. composite	1	same
TSS	mg/L lbs./day	* *	* *	once/week	24 hr. composite	1	same
Ammonia as N	mg/L lbs./day	* *	* *	once/week	24 hr. composite	1	same
Total Kjeldahl Nitrogen	mg/L lbs./day	* *	* *	once/week	24 hr. composite	1	new
Nitrate plus Nitrite	mg/L lbs./day	* *	* *	once/week	24 hr. composite	1	new
Phosphorous, Total	mg/L lbs./day	* *	* *	once/week	24 hr. composite	1	new

DERIVATION AND DISCUSSION OF LIMITS:

Biochemical Oxygen Demand (BOD_5).
Monitoring only for the calculation of removal efficiency.

Chemical Oxygen Demand (COD).
Monitoring only for the calculation of removal efficiency.

Total Suspended Solids (TSS).
Monitoring only for the calculation of removal efficiency.

Ammonia as N.
Monitoring only for the calculation of removal efficiency.

Total Kjeldahl Nitrogen
Monitoring requirement only. Monitoring for Total Kjeldahl Nitrogen is included to determine nutrient effluent limits. [10 CSR 20-7.015(9)(D)8.B.]

Nitrate plus Nitrite
Monitoring requirement only. Monitoring for Nitrate plus Nitrite is included to determine nutrient effluent limits. [10 CSR 20-7.015(9)(D)8.B.]

Phosphorous, Total
Monitoring requirement only. Monitoring for Phosphorous, Total is included to determine nutrient effluent limits. [10 CSR 20-7.015(9)(D)8.B.]

OUTFALL #001 – SLUDGE MONITORING

PARAMETERS	UNITS	DAILY MAXIMUM	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE	BASIS FOR LIMITS	PREVIOUS PERMIT LIMITS
NUTRIENTS							
pH	SU	*	*	once/month	grab	1	Same
TKN	mg/kg	*	*	once/month	grab	1	**
Ammonia Nitrogen as N	mg/kg	*	*	once/month	grab	1	Same
Nitrate Nitrogen as N	mg/kg	*	*	once/month	grab	1	Same
Phosphorous, Total	mg/kg	*	*	once/month	grab	1	Same
METALS							
Arsenic	mg/kg	*	*	once/month	grab	1	Same
Cadmium	mg/kg	*	*	once/month	grab	1	Same
Copper	mg/kg	*	*	once/month	grab	1	Same
Lead	mg/kg	*	*	once/month	grab	1	Same
Mercury	mg/kg	*	*	once/month	grab	1	Same
Molybdenum	mg/kg	*	*	once/month	grab	1	Same
Nickel	mg/kg	*	*	once/month	grab	1	Same
Selenium	mg/kg	*	*	once/month	grab	1	Same
Zinc	mg/kg	*	*	once/month	grab	1	Same
OTHER							
Percent Solids	%	*	*	once/month	grab	1	Same

* Monitoring requirement only
** Parameter not established in previous state operating permit.
ǂ The facility will report the minimum and maximum pH values; pH is not to be averaged.
‡ # of colonies/100mL; the Monthly Average for *E. coli* is a geometric mean.

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

pH.
Monitoring requirement only. Monitoring for pH is included to determine nutrient loading rates on the land application fields. [10 CSR 20-6.015(4)(A).]

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 20-6.015(4)(A).]

Ammonia Nitrogen as N. Monitoring requirement only.
Monitoring for Ammonia Nitrogen as N is included to determine nutrient loading rates on the land application fields. [10 CSR 20-6.015(4)(A).]

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 20-6.015(4)(A).]

Phosphorous Total.
Monitoring requirement only. Monitoring for Phosphorous is included to determine nutrient loading rates on the land application fields. [10 CSR 20-6.015(4)(A).]

Percent Solids.
Monitoring requirement only. Monitoring for Percent Solids is included to determine nutrient loading rates on the land application fields. [10 CSR 20-6.015(4)(A)]

Arsenic.
Monitoring requirement only. Monitoring for Arsenic is included to determine nutrient loading rates on the land application fields. [10 CSR 20-8.170(9)(C)]

Cadmium.
Monitoring requirement only. Monitoring for Cadmium is included to determine nutrient loading rates on the land application fields. [10 CSR 20-6.015(4)(A)]

Copper.
Monitoring requirement only. Monitoring for Copper is included to determine nutrient loading rates on the land application fields. [10 CSR 20-6.015(4)(A)]

Lead.
Monitoring requirement only. Monitoring for Lead is included to determine nutrient loading rates on the land application fields. [10 CSR 20-8.020(15)(F)7.]

Mercury.
Monitoring requirement only. Monitoring for Mercury is included to determine nutrient loading rates on the land application fields. [10 CSR 20-6.015(4)(A)]

Molybdenum.
Monitoring requirement only. Monitoring for Molybdenum is included to determine nutrient loading rates on the land application fields. [10 CSR 20-6.015(4)(A)]

Nickel.
Monitoring requirement only. Monitoring for Nickel is included to determine nutrient loading rates on the land application fields. [10 CSR 20-6.015(4)(A)]

Selenium.
Monitoring requirement only. Monitoring for Selenium is included to determine nutrient loading rates on the land application fields. [10 CSR 20-6.015(4)(A)]

Zinc.
Monitoring requirement only. Monitoring for Zinc is included to determine nutrient loading rates on the land application fields. [10 CSR 20-6.015(4)(A)]

OUTFALL #002 – NON-CONTACT COOLING WATER AND STORMWATER

PARAMETERS	UNITS	DAILY MAXIMUM	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE	BASIS FOR LIMITS	PREVIOUS PERMIT LIMITS
PHYSICAL							
Flow	MGD	*	*	daily	24 hr. total	1, 4	same
Temperature		*	*	once/month	measured	1, 4	same
CONVENTIONAL							
BOD_5	mg/L	*	*	once/month	grab	1, 4	same
Chloride	mg/L lbs./day	* 26,568.41	*	once/month	grab	1, 4	same
TRC	µg/L	7.5 (130 ML)	5.0 (130 ML)	once/month	grab	1, 4	same
TRC	lbs./day	0.54 (9.9) ML		once/month	grab	1, 4	same
Oil & Grease	mg/L	15	10	once/month	grab	1, 4	same
pH (Note 4)	SU	6.5 to 9.0	-	once/month	grab	1, 4	same
Sulfate SO_4	mg/L	*	*	once/month	grab	1, 4	same
Sulfate SO_4	lbs./day	61400.73		once/month	grab	1, 4	same
Total Suspended Solids	mg/L	*	*	once/month	grab	1, 4	same
METALS							
Aluminum, Total Recoverable	C	* 4,637	*	once/month	grab	1, 4	same
Barium, Total Recoverable	µg/L lbs./day	26.0 238.76	16.4	once/month	grab	1, 4	same
Copper, Total Recoverable	µg/L lbs./day	26.0 2.18	16.4	once/month	grab	1, 4	same
Iron, Total Recoverable	µg/L lbs./day	* 218.96	*	once/month	grab	1, 4	same
Lead, Total Recoverable	µg/L lbs./day	* 0.78	*	once/month	grab	1, 4	same
Selenium, Total Recoverable	µg/L lbs./day	*	*	once/month	grab	1, 4	same
Selenium, Total Recoverable	lbs./day	0.59	*	once/month	grab	1, 4	same
NUTRIENTS							
Ammonia as N (April 1 – Sept 30)	mg/L	13.9	2.9	once/month	grab	1, 4	same
Ammonia as N (Oct 1 – March 31)	mg/L	14.1	2.9	once/month	grab	1, 4	same
Nitrate	mg/L lbs./day	* 524.4	*	once/month	grab	1, 4	same
Total Kjeldahl Nitrogen	mg/L lbs./day	* *	* *	once/month	grab	1	new
Nitrate plus Nitrite	mg/L lbs./day	* *	* *	once/month	grab	1	new
Phosphorous, Total	mg/L lbs./day	* *	* *	once/month	grab	1	new
OTHER							
Fluoride	mg/L lbs./day	* 232.2	*	once/month	grab	1, 4	same

* Monitoring requirement only
ǂ The facility will report the minimum and maximum pH values; pH is not to be averaged.
‡ # of colonies/100mL; the Monthly Average for *E. coli* is a geometric mean.

Basis for Limitations Codes:

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

DERIVATION AND DISCUSSION OF LIMITS:

PHYSICAL:

Flow
In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to 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. The facility will report the total flow in millions of gallons per day (MGD).

Temperature
In accordance with 10 CSR 20-7.031(5)(D), water contaminant sources shall not cause or contribute to stream temperature in excess of ninety degrees Fahrenheit (90 °F) or thirty-two and two-ninths degrees Celsius (32 2/9 °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.

CONVENTIONAL:

Biochemical Oxygen Demand (BOD_5)
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. Effluent limitations have been retained from previous state operating permit, please see the **APPENDIX 1 WATER QUALITY AND ANTIDEGREDATION REVIEW.**

Chloride
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. Effluent limitations have been retained from previous state operating permit, please see the **APPENDIX 1 WATER QUALITY AND ANTIDEGREDATION REVIEW.**

Chlorine, Total Residual (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. Effluent limitations have been retained from previous state operating permit; please see the **APPENDIX 1 WATER QUALITY AND ANTIDEGREDATION REVIEW.** The calculation for the mass limit of 0.54 lbs./day is based on a concentration limit in µg/L that is below the 130 ML. This does not allow for an accurate calculation of the mass limit. The mass limit calculated from the 130 ML is 9.9 lbs./day Therefore, and 9.9 lbs./day ML has been added to the permit.

Oil & Grease
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. Effluent limitations have been retained from previous state operating permit, please see the **APPENDIX 1 WATER QUALITY AND ANTIDEGREDATION REVIEW.**

Sulfate
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. Effluent limitations have been retained from previous state operating permit, please see the **APPENDIX 1 WATER QUALITY AND ANTIDEGREDATION REVIEW.**

pH
6.5 to 9.0 SU. The Water Quality Standard at 10 CSR 20-7.031(5)(E) states water contaminants shall not cause pH to be outside the range of 6.5 to 9.0 standard pH units.

Total Suspended Solids (TSS)
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. Effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information.**

METALS:
Effluent limitations for total recoverable metals were developed using methods and procedures outlined in the *Technical Support Document For Water Quality-based Toxic Controls* (EPA/505/2-90-001) and *The Metals Translator: Guidance For Calculating a Total Recoverable Permit Limit From a Dissolved Criterion* (EPA 823-B-96-007). General warm-water habitat criteria apply (WWH) designated as AQL in 10 CSR 20-7.031 Table A. Additional use criterion (HHP, DWS, GRW, IRR, or LWW) may also be used as applicable to determine the most protective effluent limit for the stream class and uses.

When ambient site specific hardness data is not available, standard water hardness of 162 mg/L is used in the conversion below. This value represents the 25th percentile of all watershed's in-stream hardness values throughout Missouri. Additionally, when there are no site specific translator studies, partitioning between the dissolved and absorbed phases is assumed minimal (Section 5.7.3, EPA/505/2-90-001). Freshwater criteria conversion factors for dissolved metals were used as the metals translator as recommended in guidance (Section 1.3, 1.5.3, and Table 1, EPA 823-B-96-007). Conversion factors for Cd and Pb are hardness dependent. N/A means not applicable.

METAL	CONVERSION FACTORS USING HARDNESS OF 162 MG/L	
	ACUTE	CHRONIC
Aluminum	N/A	N/A
Antimony	N/A	N/A
Arsenic	1	1
Beryllium	N/A	N/A
Cadmium	0.924	0.889
Chromium III	0.316	0.860
Chromium VI	N/A	N/A
Copper	0.960	0.960
Iron	N/A	N/A
Lead	0.721	0.721
Mercury	0.85	N/A
Nickel	0.998	0.997
Selenium	N/A	N/A
Silver	0.850	N/A
Thallium	N/A	N/A
Zinc	0.978	0.986

The following calculations have been performed for your convenience for a facility with no mixing, no site specific hardness, no RPA performed. Remove unneeded metals. Default hardness values 162.

Aluminum, Total Recoverable
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. Effluent limitations have been retained from previous state operating permit; please see the **APPENDIX 1 WATER QUALITY AND ANTIDEGREDATION REVIEW.**

Copper, Total Recoverable
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. Effluent limitations have been retained from previous state operating permit; please see the **APPENDIX 1 WATER QUALITY AND ANTIDEGREDATION REVIEW.**

Iron, Total Recoverable
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. Effluent limitations have been retained from previous state operating permit; please see the **APPENDIX 1 WATER QUALITY AND ANTIDEGREDATION REVIEW.**

Lead, Total Recoverable
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. Effluent limitations have been retained from previous state operating permit; please see the **APPENDIX 1 WATER QUALITY AND ANTIDEGREDATION REVIEW.**

Selenium, Total Recoverable
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. Effluent limitations have been retained from previous state operating permit; please see the **APPENDIX 1 WATER QUALITY AND ANTIDEGREDATION REVIEW.**

Zinc, Total Recoverable
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. Effluent limitations have been retained from previous state operating permit; please see the **APPENDIX 1 WATER QUALITY AND ANTIDEGREDATION REVIEW.**

NUTRIENTS:

Ammonia, Total as Nitrogen
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. Effluent limitations have been retained from previous state operating permit; please see the **APPENDIX 1 WATER QUALITY AND ANTIDEGREDATION REVIEW.**

Total Kjeldahl Nitrogen
Monitoring requirement only. Monitoring for Total Kjeldahl Nitrogen is included to determine nutrient effluent limits. [10 CSR 20-7.015(9)(D)8.B.]

Nitrate plus Nitrite
Monitoring requirement only. Monitoring for Nitrate plus Nitrite is included to determine nutrient effluent limits. [10 CSR 20-7.015(9)(D)8.B.]

Phosphorous, Total
Monitoring requirement only. Monitoring for Phosphorous, Total is included to determine nutrient effluent limits. [10 CSR 20-7.015(9)(D)8.B.]

OTHER:

Fluoride
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. Effluent limitations have been retained from previous state operating permit; please see the **APPENDIX 1 WATER QUALITY AND ANTIDEGREDATION REVIEW.**

OUTFALL #005 - #035 – LAND APPLICATION AND SOIL MONITORING

PARAMETERS	UNITS	DAILY MAXIMUM	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE	BASIS FOR LIMITS	PREVIOUS PERMIT LIMITS
Land Application Monitoring							
Amount Applied	Tons	*	*	daily	total	1	same
Application Area	Acres	*		daily	total	1	same
Application Rate	Tons/acre	*	*	daily	total	1	same
SOIL MONITORING							
pH – Units	SU	*	*	once/5 years	composite	1	same
Nitrate Nitrogen as N	mg/kg	*	*	once/5 years	composite	1	same
Available Phosphorus as P (Bray P-1)	mg/kg	*	*	once/5 years	composite	1	same
Cation Exchange Capacity (CEC)	mg/kg	*	*	once/5 years	composite	1	same

* Monitoring requirement only

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

PERMITTED FEATURE #005 - #035 – DERIVATION AND DISCUSSION OF LIMITS:

Amount 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.

pH. Monitoring requirement only. Monitoring for pH is included to determine nutrient loading rates on the land application fields. [10 CSR 20-6.015(4)(A).]

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 20-6.015(4)(A).]

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 20-6.015(4)(A).]

Cation Exchange Capacity (CEC) Monitoring requirement only. Monitoring for CEC is included to determine nutrient loading rates on the land application fields. [10 CSR 20-6.015(4)(A).]

PERMITTED FEATURES #MW1 - #MW9 –MONITORING WELL MONITORING

PARAMETERS	UNITS	DAILY MAXIMUM	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE	BASIS FOR LIMITS	PREVIOUS PERMIT LIMITS
Groundwater Depth	feet	*	-	once/year	measured	1	same
Nitrate/Nitrite as N	mg/L	10	-	once/year	grab	1	same
Total Dissolved Solids	mg/L	*	-	once/year	grab	1	same

* Monitoring requirement only

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

PERMITTED FEATURES #MW1 - #MW9 – DERIVATION AND DISCUSSION OF LIMITS:

Groundwater Depth. 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. Effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information.**

Nitrate/Nitrite as N. 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. Effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information.**

Total Dissolved Solids. 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. Effluent limitations have been retained from previous state operating permit, please see the **APPLICABLE DESIGNATION OF WATERS OF THE STATE** sub-section of the **Receiving Stream Information.**

PERMITTED FEATURES #SM2- #SM3–IN-STREAM MONITORING

PARAMETERS	UNITS	DAILY MAXIMUM	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE	BASIS FOR LIMITS	PREVIOUS PERMIT LIMITS
PERMITTED FEATURE #SM2							
Upstream Temperature	°F	*	-	once/month	measured	1	same
PERMITTED FEATURE #SM3							
Downstream Temperature	°F	*	-	once/month	measured	1	same
Net Temperature Difference	°F	*	-	once/month	calculated	1	same

* Monitoring requirement only

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

PERMITTED FEATURES #SM2– DERIVATION AND DISCUSSION OF LIMITS:

Upstream Temperature. Based on a review of in-stream monitoring data, this facility has no reasonable potential for temperature exceedances during normal and elevated stream levels. In-stream monitoring frequency for temperature has been changed to only monitor during low flow conditions. The facility shall monitor the water level of Headwaters Diversion Channel at a nearby gauging station monthly to determine if in- stream monitoring in Table A-8 is required. Monitoring and reporting is only required when river stage level at the nearest gauging stations is below 9.0 feet. See **ANTI-BACKSLIDING section of Part IV-RATIONALE AND DERIVATION OF EFFLUENT LIMITATIONS & PERMIT CONDITIONS.**

Permitted Features - #SM3 – Derivation and Discussion of Limits:

Downstream Temperature. Based on a review of in-stream monitoring data, this facility has no reasonable potential for temperature exceedances during normal and elevated stream levels. In-stream monitoring frequency for temperature has been changed to only monitor during low flow conditions. The facility shall monitor the water level of Headwaters Diversion Channel at a nearby gauging station monthly to determine if in- stream monitoring in Table A-8 is required. Monitoring and reporting is only required when river stage level at the nearest gauging stations is below 9.0 feet. See **ANTI-BACKSLIDING section of Part IV-RATIONALE AND DERIVATION OF EFFLUENT LIMITATIONS & PERMIT CONDITIONS.**

Net Temperature Difference. Based on a review of in-stream monitoring data, this facility has no reasonable potential for temperature exceedances during normal and elevated stream levels. In-stream monitoring frequency for temperature has been changed to only monitor during low flow conditions. The facility shall monitor the water level of Headwaters Diversion Channel at a nearby gauging station monthly to determine if in- stream monitoring in Table A-8 is required. Monitoring and reporting is only required when river stage level at the nearest gauging stations is below 9.0 feet. See **ANTI-BACKSLIDING section of Part IV-RATIONALE AND DERIVATION OF EFFLUENT LIMITATIONS & PERMIT CONDITIONS.**

Whole Effluent Toxicity (WET) Test

Monitoring is required to determine if reasonable potential exists for the discharge to cause toxicity within the receiving stream. A WET test is a quantifiable method to determine discharges from the facility cause toxicity to aquatic life by itself, in combination with, or through synergistic responses, when mixed with receiving stream water.

Under the 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 the provisions in 10 CSR 20-6 and the Water Quality Standards in 10 CSR 20-7 are being met. Under 10 CSR 20-6.010(8)(A)4, the Department may require other terms and conditions it deems necessary to assure compliance with the CWA and related regulations of the Missouri Clean Water Commission. The following Missouri Clean Water Laws (MCWL) apply: §644.051.3. requires the Department to set permit conditions complying 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); and §644.051.5. is the basic authority to require testing conditions. WET tests are required by all facilities meeting the following criteria:

- ✓ Facility is a designated a Major

Annual testing is the minimum testing frequency; monitoring requirements promulgated in 40 CFR 122.44(i)(2) state "requirements to report monitoring results shall be established on a case-by-case basis with a frequency dependent on the nature and effect of the discharge, but in no case less than once per year."

WET, Acute

The permit writer has determined this facility has reasonable potential to cause toxicity in the receiving stream.

WQS: no toxics in toxic amounts [10 CSR 20-7.031(4)(J)2.B.] = 0.3 TUa

Acute WLA: $C_e = ((\#\# \text{ cfs}_{DF} + \#\# \text{ cfs}_{ZID7Q10})\ 0.3 \text{ TUa} - (\#\# \text{ cfs}_{ZID7Q10} * 0 \text{ TUa}_{Background})) \div \#\# \text{ cfs}_{DF}$

$C_e = 0.3$ TUa *(if no mixing)*

LTA_a: 0.3 TUa (0.321) = 0.0963 TUa [CV = 0.6, 99th Percentile]

MDL: 0.0963 TUa (3.11) = 0.3 TUa [CV = 0.6, 99th Percentile]

Where no mixing is allowed the acute criterion must be met at the end of the pipe. However, when using an LC_{50} as the test endpoint, the acute toxicity test has an upper sensitivity level of 100% effluent, or 1.0 TUa. If less than 50% of the test organisms die at 100% effluent, the true LC_{50} value for the effluent cannot be measured, effectively acting as a detection limit. Therefore, when the allowable effluent concentration is 100% a limit of **1.0 TUa** will apply.

For classified permanent streams with other than default mixing considerations, the Allowable Effluent Concentration (AEC)% is determined as follows: *EXAMPLE:* $AEC_a\% = [11.3 \text{ cfs}_{DF} \div (0.91 \text{ cfs}_{ZID7Q10} + 11.3 \text{ cfs}_{DF})] * 100\% = 93\%$ .10 CSR 20-7.015((9)(L)4.A. states the dilution series must be proportional. The dilution series is: 0.2%, 0.1%, 0.05%, 0.025%, and 0.0125%

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. http://dnr.mo.gov/env/wpp/cpp/docs/watershed-based-management.pdf. 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.

- ✓ This permit will maintain synchronization by expiring the end of the second quarter, 2024.

Public Notice:
The Department shall give public notice a draft permit has been prepared and its issuance is pending. http://dnr.mo.gov/env/wpp/permits/pn/index.html. Additionally, public notice will be issued if a public hearing is to be held because of a significant degree of interest in or with 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 was from September 20, 2019 to October 21, 2019. No responses were received.

Date of Fact Sheet: October 23, 2019

Completed By:

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Missouri Department of Natural Resources
Water Protection Program
Operating Permits Section - Industrial Unit
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Appendix 1 – Water Quality and Antidegredation Review

BioKyowa, Inc. WWTF
M0-0101729, Cape Girardeau County

STATE of Missouri
Jeremiah W (Jay) Nixon, Governor · Sara Parker Pauley, Director
DEPARTMENT OF NATURAL RESOURCES
www.dnr.mo.gov

JAN 0 8 2013

BioKyowa Inc.
Attn: David Jennings PO Box 1550
Cape Girardeau, MO 63702-1550

RE: Water Quality Review / Antidegradation Review Preliminary Determination on the *August* 7, *2012, Evaluation of Significant Degradation in Relation to BioKyowa 's Proposed New Well Water Treatment System,*

BioKyowa, Inc. Facility
M0-0101729, Cape Girardeau County

Dear Mr. Jennings:

Enclosed please find the finalized Water Quality and Antidegradation Review (WQAR) for the *BioKyowa,* Inc. Facility discharge in Cape Girardeau County. The WQAR contains pertinent antidegradation review information based on the use of existing water quality, effluent limitations and monitoring requirements for the facility discharge. It was developed in accordance with 10 CSR 20-7.031, the Clean Water Commission approved *Missouri Antidegradation Implementation Procedure* (AIP) dated May 2, 2012, U.S. Environmental Protection Agency (US EPA) guidance, the applicant-supplied antidegradation review documentation, and the State of Missouri's effluent regulations (10 CSR 20-7.015). Please refer to the *General Assumptions ofthe Water Quality and Antidegradation Review* section ofthe enclosed WQAR. The WQAR is preliminary and subject to change as new information becomes available during future permit application processing.

Based on the Missouri Department of Natural Resources, Water Protection Program (Department), initial review, preliminary determination is that the applicant-supplied antidegradation review documentation satisfies the requirements of the AIP. This WQAR/preliminary determination may be appealed within 30 days of this letter in accordance with the AIP Section II.F.4.

You may proceed with submittal of an application for an operating modification permit and antidegradation review public notice. These submittals must reflect the design flow, facility description, and general treatment components of this WQAR or this preliminary determination may have to be revisited. At the time of drafting of this review, no effluent limit guidelines applicable to the permittee have been developed. EPA requires an evaluation ofthe need for case-by-case TBELs or Best Professional Judgment (BPJ) limitations. BPJ limits have not been established and the need for limitations should be further evaluated during the permit modification.

Following the Department's public notice of draft Missouri State Operating Permit including the antidegradation review findings and preliminary determination, the Department will review any public notice comments received. If significant comments are made, the project may require another public notice and potentially another antidegradation review. If no comments are received or comments are resolved without another public notice, these findings and deter- minations will be considered final.

If you should have questions, please contact Todd Blanc by telephone at (314) 416-2064, bye- mail at todd.blanc@dnr.mo.gov or by mail at the Missouri Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, Missouri 65102-0176.

Sincerely,

WATER PROTECTION PROGRAM

Permits and Engineering Section

RM:tbn

Enclosure

c: William T. Hall, Associate, Hall & Associates
U.S. Environmental Protection Agency, Region VII
Chris Wieberg, Water Protection Program
File Copy

Missouri Department of Natural Resources Water Protection Program
Water Pollution Control Branch
NPDES Permits and Engineering Section

Water Quality and Antidegradation Review

For the Protection of Water Quality
and Determination of Effluent Limits for Discharge to Headwater Diversion Channel
by

BioKyowa, Inc

December 2012

Table of Contents

1. FACILITY INFORMATION

FACILITY NAME: Biokyowa Inc. NPDES #: Mo-0101729

FACILITY TYPE/DESCRIPTION: BioKyowa, Inc. is a manufacturer of amino acids. These amino acids are used for animal feed, health foods, and as a raw material by other chemical manufacturers that further refine it. BioKyowa operates two manufacturing facilities in Cape Girardeau. The facilities manufacture twelve (12) amino acids and may manufacture other products in the future.

The process for manufacturing all of the different amino acids is basically the same, as are the raw materials used. Wastewater is generated from tank cleaning and the extraction process. Process wastes consist primarily of chemical oxygen demand (COD)/biochemical oxygen demand (BOD), total suspended solids (TSS), and ammonia. The process wastewater also includes fecal coliform bacteria from the fermentation process. This process wastewater is sent to an activated sludge treatment facility prior to discharge to the Mississippi River via Outfall 001. BioKyowa's wastewater treatment facilities include a one (1) million gallon load and pH equalization basin, two activated sludge aeration basins, secondary clarifiers, dissolved air floatation for solids handling and a high rate outfall diffuser. These facilities routinely provide a high degree of treatment to the organic wastes generated by the manufacturing facility; however, the facilities do not remove ammonia.

BioKyowa, Inc. facility uses purified well water in its operations and needs to increase its production of purified well water to meet additional supply demands. BioKyowa wants to switch from an ion exchange system to iron filtration and a reverse osmosis (RO) system for the purification of water.

Outfall 002 discharges non-contact cooling water, barometric condenser water and storm water which is collected in a storm water basin. The expansion of Outfall 002 will include the addition of non-process wastewater from the reverse osmosis system and the iron filtration system. The wastewater will be composed of well water treatment backwash water from four iron filtration vessels (cat-ion exchange resin systems) and reject water from two reverse osmosis (RO) membrane units. BioKyowa uses three primary wells to provide blended well water to the well water treatment system (RO system and iron filtration system). Outfall 002 has a current design flow of8.7 MGD and an actual flow of 4.4 MGD. The schematic illustration presented on page 3 of the August 7, 2012, Antidegradation Review report shows 1.515 MGD ofraw well water withdrawn from wells and 0.435 MGD of waste water generated from the well water treatment system. The waste water generated from the well water treatment system will added to the 8.7 MGD flow for a new design flow of9.135 MGD.

COUNTY:	Cape Girardeau	UTM COORDINATES:	X= 801391/ Y=4127528- Outfall 002
12-DIGIT HUC:	071401050503	LEGAL DESCRIPTION:	Land Grant 3282 - Outfall 002
EDU•:	0zark/Upper St. Francis/Castor	ECO-REGION:	Ozark Border

* - Ecological Drainage Unit

2. WATER QUALITY INFORMATION

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(2)] and federal antidegradation policy at Title 40 Code of Federal Regulation (CFR) Section 131.12 (a), the Missouri Department of Natural Resources (MDNR) developed a statewide antidegradation policy and corresponding procedures to implement the policy. A proposed discharge to a water body will be required to undergo a level of Antidegradation Review which documents that the use of a water body's available assimilative capacity is justified. Effective August 30, 2008, a facility is required to use *Missouri's Antidegradation Implementation Procedure (AIP)* for new and expanded wastewater discharges.

2.1. WATER QUALITY HISTORY:

Headwater Diversion Channel is not 303 (d) listed as impaired. During permit renewal 2011, a reasonable potential analysis was conducted for ammonia from Outfall 002, and the facility has a reasonable potential to exceed water quality standards for ammonia.

OUTFALL	DESIGN FLOW	TREATMENT LEVEL	RECEIVING WATERBODY	DISTANCE TO CLASSIFIED SEGMENT (MI)
001	3.1	Secondary (Process Wastewater)	Headwater Diversion Channel	0.0
002	14.2	None (RO Reject, Noncontact Cooling and Storm Water)	Mississippi River	0.0
003	-	Land Application System	-	-
Numerous instream monitoring stations and groundwater monitoring wells				

3. RECEIVING WATERBODY INFORMATION

RECEIVING STREAM (U, C, P)	LOW-FLOW VALUES (CFS)			DESIGNATED USES**
	1Q10	7Q10	30Q10	
Mississippi River (P)	52,006	54,306	60,037	LWW, SCR, DWS, AQL, WBC(A)
Headwaters Diversion Channel (P)	79.9	86.3	100.9	LWW, SCR, DWS, AQL, WBC(LWW, SCR, DWS, AQL, WBC(B)

* Stream flow values for the Headwater Diversion Channel and Mississippi River were obtained from the BioKyowa NPDES permit dated March 20, 2012.

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

RECEIVING WATER BODY SEGMENT#1: BioKyowa Outfall in Headwater Diversion to Mouth of Headwater Diversion
Upper end segment* UTM coordinates: X= 801391/ Y=4127528 Outfall 002
Lower end segment* UTM coordinates: X= 809275/ Y=4128646 (Confluence with Mississippi River)

*Segment is the portion of the stream where discharge occurs. Segment is used to track changes in assimilative capacity and is bound at a minimum by existing sources and confluences with other significant water bodies.

4. GENERAL COMMENTS

Hall and Associates prepared, on behalf of Mr. David Jennings, BioKyowa, Inc, the *Evaluation of Significant Degradation in Relation to BioKyowa's Proposed New Well Water Treatment System,* BioKyowa, Inc. Waste Water Facility, Cape Girardeau County dated August 7, 2012, and revised September 21, 2012. Applicant elected to determine that all pollutants of concern (POC) are minimally degrading the receiving stream using existing water quality. This analysis was conducted to fulfill the requirements of the *Missouri's Antidegradation Implementation Procedure* (AIP). Information that was provided by the applicant in the submitted report and summary forms in Appendix C was used to develop this review document.

BioKyowa, Inc. facility uses purified well water in its operations and needs to increase its production of purified well water to meet additional supply demands. BioKyowa wants to switch from an ion exchange system to iron filtration and a reverse osmosis (RO) system for the purification of water. The new system would consist of four iron filtration vessels and two reverse osmosis membrane units. As a result, the generation of additional non-process waste water for disposal would increase. The company wants to discharge the non-process waste water from Outfall #002. The company stated that discharging the backwash from the iron and RO systems through Outfall #001 would washout the treatment facility.

Raw mixed well water is fed to the iron filter with the addition of a small about of sodium hypochlorite. The filter must be backwashed once per day, creating a backwash stream of approximately 75,000 gallons per day (gpd). The filtrate from the iron vessels are then fed to the RO system. Anti-sealant to prevent fouling and sodium meta-bisulfite to remove residual chlorine are added. The reject stream from the RO back wash is a concentrated flow of the well water constituents. The flow from the RO system will be approximately 360,000 gpd. The total flow from both the iron filtration vessel and the RO system is 435,000 gpd

BioKyowa uses three primary wells to provide blended well water to the well water treatment system (RO system and iron filtration system). The wastewater will be composed of well water treatment backwash water from four iron filtration vessels (cat-ion exchange resin systems) and reject water from two reverse osmosis (RO) membrane units. The reject water will be concentrated well water that is characterized in the antidegradation report from BioKyowa. Some of the sample results of the well testing were below quantitation level; however, the waste water reject water was characterized using the well testing results and a scale-up factor of 3.48. Table 2 below has the scaled-up reject water concentration before mixing with the Outfall 002 flows.

A Geohydrological Evaluation was not submitted with the request. The receiving stream is gaining for discharge purposes (Appendix A: Map). A Missouri Department of Conservation Natural Heritage Review was obtained by the applicant; and no records of endangered species were found near the discharge.

5. ANTIDEGRADATION REVIEW INFORMATION

The following is a review of the *Evaluation of Significant Degradation in Relation to BioKyowa's Proposed New Well Water Treatment System,* BioKyowa, Inc. Waste Water Facility dated August 7, 2012, and revised September 21, 2012.

5.1. TIER DETERMINATION

Below is a list of pollutants of concern reasonably expected to be in the discharge (see Appendix C: Tier Determination and Effluent Limit Summary). Pollutants of concern are defined as those pollutants "proposed for discharge that affects beneficial use(s) in waters of the state. POCs include pollutants that create conditions unfavorable to beneficial uses in the water body receiving the discharge or proposed to receive the discharge." (AIP, Page 7). The POCs will be present in the RO reject water that will be concentrated from well water. POCs that had water quality criteria were retained for assimilative capacity analysis and limit determination. Pollutants were determined to be Tier 2 for all POCs (see Appendix C).

Table 1. Pollutants of Concern and Tier Determination

POLLUTANTS OF CONCERN	TIER	DEGRADATION	COMMENT
Aluminum	2	Minimal	
Chloride	2	Minimal	
Fluoride	2	Minimal	
Iron	2	Minimal	
Selenium	2	Minimal	
Sulfate	2	Minimal	
Conner	2	Minimal	
Chlorine, Total Res.	2	Minimal	
Lead	2	Minimal	
Nitrate	2	Minimal	Designated drinking water use at Mississippi River
Barium	2	Minimal	Designated drinking water use at Mississippi River

The following Antidegradation Review Summary attachments in Appendix C were used by the applicant:

Tier Determination and Effluent Summary

For pollutants of concern, the attachments are:

Attachment B, Tier 2 with minimal degradation.

5.2. EXISTING WATER QUALITY

Existing water quality data for the Headwater Diversion Channel were based upon a review of analytical data obtained from 1) the water quality monitoring station on the Castor River at Greenbriar, Mo (USGS 07021020), 2) Missouri DNR sampling on the White River, 3) Missouri DNR sampling on Hubble Creek, and 4) Missouri DNR sampling at the mouth of the Headwater Diversion. Table 9 of the *Evaluation of Significant Degradation in Relation to BioKyowa's Proposed New Well Water Treatment System* summarizes the average water quality characteristics at low flow conditions. These data were obtained from the department's Water Quality Assessment online database and the USGS website.

For the Castor River dataset, each parameter sampling concentration was plotted against stream flow to obtain an appropriate low flow concentration. The 7Q10 for the Headwater Diversion Channel is 86.3 cfs. For the Caster River and other above mentioned sampling data, BioKyowa conducted a sampling event at the SM2 sampling location on May 30, 2012, for the purpose of provid ng insight on how to evaluate monitoring data obtained from the Headwater Diversion Channel drainage area.

Table 6 and 7 below have the existing water quality value for each parameter and references the source of the data.

5.3. ASSIMILATIVE CAPACITY CALCULATIONS

The calculated facility assimilative capacities for most POCs were much less than 9.6 %. *Missouri's Antidegradation Implementation Procedure* considers the use of less than I 0% of the facility's available assimilative capacity as insignificant degradation (Table 3). All POCs were insignificant. The procedures indicate that cumulative degradation as reflected in the segment assimilative capacity is measured from the time that existing water quality is first determined; therefore, the net increase in loading will only be those of BioKyowa's discharge (Table 4). Because this antidegradation review serves to establish the existing water quality, the proposed expansion of POCs in Outfall 002 amounts to the sum total of the degradation. All POCs were less than 10% of the segment's available assimilative capacity.

Effluent regulation 10 CSR 20-7.015(9)(B) discusses the use of dilution (with cooling water or other less contaminated water) before discharge to receiving stream to meet limitations. When attempting to meet water quality-based effluent limits, dilution (before discharge or mixing with receiving water body flow volume of a lake or classified stream with 7Q10 flow greater than O.1 cfs) is allowed. The regulation prohibits the use of dilution when developing technology-based effluent limits or attempting to meet effluent regulations of the state Clean Water Law or federal effluent limit guidelines.

Regarding the use of dilution before discharge to address the facility or segment assimilative capacity determination under the Antidegradation Implementation Procedure, dilution before discharge will be allowed. The assimilative capacity determination is based on a mass loading; therefore, to qualify for minimally degrading determination, there should be less than I0% increase loading in the stream on a pollutant-by-pollutant basis.

Table 2. Diluting RO reject water with current effluent flow in Outfall 002.

Cd2=((Cdro*Qro)+(Cd1*Qd1))/(Qro+Qd1)

Current flow= 13.5

RO flow= 0.7

Units: Metals, TRC = ug/L; Flouride, Chloride, nitrate, Sulfate= /L	Current Effluent Concentration Cd1	Reverse Osmosis Reject Water Concentration (Cdro)	Proposed Discharge Concentration (Cd2
Aluminum	100	348.3	*111.79*
Chloride	64	224	*71.60*
Fluoride	0.30	1.05	*0.34*
Iron	2550.00	8881.00	*2850.63*
Selenium	5.00	12.00	*5.33*
Sulfate	76.00	265.00	*84.97*
Co er	50.00	174.00	*55.89*
Chlorine, Total	0.01	10.00	*0.48*
Lead	6.00	6.00	*6.00*
Nitrate	0.10	0.35	*0.11*
Barium	2000.00	6966.00	*2235.81*

BioKyowa, Inc.

December 2012
Page 8

Table 3. Facility Assimilative Capacity (FAC) Calculations for the Headwater Diversion Channel Segment.

$$FAC = Cc * (Q_s + Q_{d2}) - C_d(Q_s + Q_{d1}) * CF$$

0Utfall#002
Classified P streams only
Facility Name BloKyowa Facility M0-
Permit Number 0101729

Cd1 = current effluent concentration
Cc= downstream concentration, the Water Quality Standard (WQS)
Qs" Stream 7Q10 flow (ft^3/s)
Qd1 " Current effluent design flow {ft^3/s)

CF" correction !actor-see below"
FACratio = facility assimilatl\e capacity ratio·

Dissolved components for all metals.

Stream name Headwater Division Qs 1Q10 = Not applicable Qd2 = Proposed effluent design flow (ft^3/s)

except Cd1. Cd2 are total metals for Fe, Al, Se, Pb.

Qd1= 13.5 Qs 30Q10 = Not applicable Cs " combined stream concentrations (see Footnote 1 below)

.9.d2= 14.2 Qli 7Q10 = 86.3 Cd2 = proposed effluent concentration

Units: Metals, TRC= ug/L; Flourlde, Chloride, nitrate, Sulfate = mo/L	*Aquatic* Life *Acum (CcJ*	*Aquatic* Life *Chronic (Cc)*	Chronic Drinking Water Standard or WBC	Current Effluent Concentration (Cd1)	Proposed Effluent Concentration (Cd2)	E><isting Water Quality	Receiving Stream Concentration (Cs)	FAC (Chronic)	FAG (Acute)	FAC (lbs/day)*	Net Increase (lbs/day)	FACratio or provided ratio
Aluminum[1]	750.0			100	111.8	10.20	*22.35*		*73107.24*	394.8	1.3	0.0032
Chloride[2]	684.0	423.0		64	71.6	7.60	*15.23*	*40970.47*	*67187.92*	221240.5	805.4	0.0036
Fluorlde[1]		4.0		0.30	0.33	0.05	*0.08*	*393.44*		2124.5	3.3	0.0016
Iron[1]		1000.0		2550.00	2851.00	48.30	*386.71*	*61856.71*		334.0	31.9	0.0957
Selenium[1]		5.0	50.0	5.00	5.33	0.10	*0.76*	426.12		2.3	0.043	0.0186
Sulfale[2]		1061.0		76.00	85.00	12.30	20.92	*104489.96*		564245.8	954.5	0.0017
Coooer2	25.0	15.7	1300.0	20.00	22.90	0.40	*3.05*	*1272.55*	*2206.73*	6.9	0.3	0.0425
Chlorine Total Res.	19.00	10.00		0.01	0.50	0.01	*0.01*	*1003.50*	*1907.55*	5.4	0.037	0.0069
Lead	131.0	5.1	15.0	6.00	6.00	0.10	*0.90*	*422.61*	*13069.26*	2.3	0.021	0.0092
Nltrate[2]			10.0	0.10	0.11	0.42	*0.38*	*966.90*		5221.3	1.3	0.0002
Barium			2000.0	2000.00	2236.00	0.10	270.63	*173891.37*		939.0	25.1	0.0267

Footnote 1: Upstream water quality was obtained from the USGS water quality sampling station - Castor River al Greenbriar, MO.
Cs represents a combination of existing water quality data and the current permitted discharge levels (Cd1) from BioKyowa's Antidegradation Review, Table 2.)
Footnote 2: Copper value from USGS sampling on L. Whitewater Row, near Millersville, Mo.
Nitrate from the MDNR sampling on the Whitewater River.
Chloride, sulfate -- from the MDNR sampling database Headwater Diversion Channel Mouth.
Upstream water quality for Barium, Lead and TRC were assumed. *Conversion factor to change FAG to pound per day were as follows: ug/L units -- 0.0054; mg/L units -- 5.4.

Discharge Concentrations:

Cd2 was obtain from BioKyowa's Antidegradation Review, Table 6 maximum concentration conditions. Cd2 is the result of diluting the water treatment reject water with Outfall 002 flow.
Cd1,2 values for TRC were assumed based on dechlorinating.
Cd1,2 values for Lead were assumed based on reject water from one pass RO membrane filter received from BioKyowa, Inc. during applicability review.

WQ Criteria:

Aquatic life chronic and acute standards were dissolved components
Hardness of 193 mg/L was used to calculate criteria for metals, including CL and 504, that are hardness dependent.
Chloride, sulfate -- calculated based upon values from BioKyowa's September 21 letter of CL 11.86 and S04 18.19 mb/L and hardness of 193 *mgtl*.
Hardness represents an estimated value provided by the BloKyowa In their September 21 letter for maximum discharge conditions.

Stream Flow and Mixing Zone Determination (does not apply for Minimally Degradation:

Stream flow *value for the Headwater Diversion Channel was obtained from the BioKyowa NPDES permit dated March 20, 2012.*

Table 4. Segment Assimilative Capacity (SAC) Calculations for the Headwater Diversion Channel Segment.

$$@Ac=Cc*(Qs+Q_2+Q_1)-sC(Q_s)*CF$$

Outfall#002

CF= correction factor-see below*

Classified P streams only
Facility Name BioKyowa Facility
Permit Number M0-0101729 Qd3 = 0.96

Cc= downstream concentration, the Water Quality Standard (WQS)
Qs Stream 7010 flow (113/s)
Qd1 = Current effluent design flow ($ft^3$1s)

FACratio = facility assimilative capacity ratio
Qd3 = Cumulative effluent design flow of other NPDES permits(ft^3/s)
Dissolved components fur anmetam.

Stream name Headwater Division
Qd1= 13.5
9_d2= 14.2

Qs 1Q10 = Not applicable Qd2 Proposed effluent design flow (ft^3/s)
Qs 30Q10 = Not applicable Cs combined stream concentrations (see Footnote 1 below)
Q 7Q10= 86.3 , Cd2 = proposed effluent concentration

except Cd1, Cd2 are total metals for Fe, Al, Se, Pb.

Units: Metals, TRC= ug/L; Fluoride, Chloride, nitrate, Sulfate = mall	*Aquatic* Life *Acute(Cc)*	*Aquatic* Life *Chronic (Cc)*	Chronic Drinking Water Standard or WBC	Current Effluent Concentration (Cd1)	Proposed Effluent Concentration (Cd2)	Existing Water Quality	Receiving Stream Concentration (Cs)	SAC (Chronic)	SAC (Acute)	SAC (lbs/dav)•	Net Increase (lbs/dav)	SAC ratio or provided ratio
Aluminum[1]	750.0			100	111.8	10.20	*23.31*		*73731.24*	398.1	1.3	0.0031
Chloride[2]	684.0	423.0		64	71.6	7.60	*15.84*	*41315.11*	*67783.12*	223101.6	805.4	0.0036
Fluoride[1]		4.0		0.30	0.33	0.05	*0.09*	*396.99*	*0.00*	2143.7	3.3	0.0016
Iron[1]		1000.0		2550.00	2851.00	48.30	*411.24*	*60368.71*	*0.00*	326.0	31.9	0.0980
Selenium[1]		5.0	50.0	5.00	5.33	0.10	*0.81*	*426.12*	*0.00*	2.3	0.0	0.0186
Sulfate[2]		1061.0		76.00	85.00	12.30	21.65	*105435.56*	*0.00*	569352.0	954.5	0.0017
Copper[2]	25.0	15.7	1300.0	20.00	22.90	0.40	*3.24*	*1268.42*	*2211.53*	6.8	0.3	0.0426
Chlorine TotalRes.	19.00	10.00		0.01	0.50	0.01	*0.01*	*1013.09*	*1925.78*	5.5	0.0	0.0069
Lead	131.0	5.1	15.0	6.00	6.00	0.10	*0.96*	*421.74*	*13189.26*	2.3	0.0	0.0092
Nitrate[2]			10.0	0.10	0.11	0.42	*0.38*	*976.41*	*0.00*	5272.6	1.3	0.0002
Barium			2000.0	2000.00	2236.00	0.10	*289.87*	*173891.37*	*0.00*	939.0	25.1	0.0267

Footnote 1: Upstream water quality was obtained from the USGS water quality sampling station - Castor River at Greenbriar, MO. Cs represents existing water quality data, current permitted discharge levels (Cd1) , and other permitted discharges from BioKyowa's Antidegradation Review Sept 21 letter, Table 2.)

Footnote 2: Copper value from USGS sampling on L. Whitewater River, near Millersville, Mo.
Nitrate from the MDNR sampling on the Whitewater River.
Chloride, sulfate -- from the MDNR sampling database Headwater Diversion Channel Mouth.

Upstream water quality for Barium, Lead and IRC were assumed. •conversion factor lo change FAC lo pound per day were as follows: ug/L units -- 0.0054; mg/L units -- 5.4.

Discharge concentrations:

Cd2 was obtain from BioKyowa's Antidegradation Review, Table 6 maximum concentration conditions. Cd2 is the result of diluting the water treatment reject water with Outfall 002 flow.

Cd1,2 values for TRC were assumed based on dechlorination.

Cd1,2 values for Lead were assumed based on reject water from one pass RO membrane filler received from BioKyowa, Inc. during applicability review.

WQ Criteria:

Aquatic life chronic and acute standards were dissolved components

Hardness of 193 mg/L was used to calculate criteria for metals, including CL and S04, that are hardness dependent.

Chloride, sulfate -- calculated based upon values from BioKyowa's September 21 letter of CL= 11.86 and S04 = 18.19 mg/L and hardness of 193 mg/L.

Hardness represents an estimated value provided by the BioKyowa in their September 21 letter for maximum discharge conditions.

Stream Fk>w and Mixing Zone Determination (does not apply fur Minimally Degradation):

Stream *flow value for the Headwater Diversion Channel was obtained from the BioKyowa NPDES permit dated March 20, 2012.*

5..4 DEMONSTRATION OF NECESSITY AND SOCIAL AND ECONOMIC IMPORTANCE

Missouri's antidegredation implementation procedures specify that if the proposed activity does not result in significant degradation then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are not required.

6. GENERAL ASSUMPTIONS OF THEWATER QUALITY AND ANTIDEGRADATION REVIEW

1. A Water Quality and Antidegradation Review (WQAR) assumes that [10 CSR 20-6.010(3) Continuing Authorities and 10 CSR 20-6.010(4) (D), consideration for no discharge] has been or will be addressed in a Missouri State Operating Permit or Construction Permit Application.
2. A WQAR does not indicate approval or disapproval of alternative analysis as per [10 CSR 20-7.015(4) Losing Streams], and/or any section of the effluent regulations.
3. Changes to Federal and State Regulations made after the drafting of this WQAR may alter Water Quality Based Effluent Limits (WQBEL).
4. Effluent limitations derived from Federal or Missouri State Regulations (FSR) may be WQBEL or Effluent Limit Guidelines (ELG).
5. WQBEL supersede ELG only when they are more stringent. Mass limits derived from technology based limits are still appropriate.
6. A WQAR does not allow discharges to waters of the state, and shall not be construed as a National Pollution Discharge Elimination System or Missouri State Operating Permit to discharge or a permitto construct, modify, or upgrade.
7. Limitations and other requirements in a WQAR may change as Water Quality Standards, Methodology, and Implementation procedures change.
8. Nothing in this WQAR removes any obligations tocomply with county or other local ordinances or restrictions.

7. MIXING CONSIDERATIONS

Mixing Zone (MZ): One-quarter (1/4) of the stream volume of flow; length one-quarter (1/4) mile. [10 CSR 20-7.031(4)(A)4.B.(III)(a)].

Zone of Initial Dilution (ZID): One-tenth (0.1) of the mixing zone volume of flow, not to exceed 10 times the effluent design flow. [10 CSR 20-7.031(4)(A)4.B.(III)(b)].

Stream flow values for the Headwater Diversion Channel were obtained from the BioKyowa NPDES permit dated March 20, 2012.

	Flow (cfs)	MZ (cfs)	ZID (cfs)
7Q10	86.0	21.5	2.2
lQlO	79.9	21.3	2.0
30Q10	100.9	25.2	-

8. PERMIT LIMITS AND MONITORING INFORMATION

WASTELOAD ALLOCATION STUDY CONDUCTED (Y OR N): N	USE ATTAINABILITY ANALYSIS CONDUCTED (Y OR N): N	WHOLE BODY CONTACT USE RETAINED (Y OR N): Y

OUTFALL #001 - Process wastewater - Treatment facilities consist of a flow equalization basin facilitating pH adjustment. two complete activated sludge processes operated in parallel.

No changes are proposed for this outfall; therefore, this outfall will not be addressed in the antidegradation review. Please reference to the factsheet of the permit for more information.

OUTFALL #002 - Non contact cooling water /storm water/reverse osmosis reject water

WET TEST (Y or N): Y FREQUENCY: ONCE/YEAR AEC: 86.6% METHOD: MULTIPLE

TABLE 5. EFFLUENT LIMITS FOR OUTFALL #002

PARAMETER	UNITS	DAILY Maximum	MONTHLY AVERAGE	UNITS	DAILY Maximum	BASIS FOR LIMIT (NOTE 1)	MONITORING FREQUENCY
FLOW	MGD	*	*	SEE CURRENT PERMIT. NOT ANEXPANDEDPOC IN THE REVIEW.		FSR	ONCE/MONTH
PH	SU	6.5-9.0	6.5-9.0			FSR	ONCE/MONTH
BOD5	MGIL	*	*			NA	ONCE/MONTH
TSS	MGIL	*	*			NA	ONCE/MONTH
AMMONIAASN (APRIL 1-SEPT 30)	MGIL	*	*			WQBEL	ONCE/MONTH
AMMONIAASN (OCT 1 - MARCH 31)	MGIL	*	*			WQBEL	ONCE/MONTH
OIL AND GREASE	MGIL	15	10			FSR	ONCE/MONTH
TEMPERATURE	of	*	*			NA	ONCE/MONTH
ALUMINUM	µG/L	*	*	LBS/DAY	46.37	MDEL	ONCE/MONTH
CHLORIDE	MGIL	*	*	LBS/DAY	26568.41	MDEL	ONCE/MONTH
FLUORIDE	MGIL	*	*	LBS/DAY	232.20	MDEL	ONCE/MONTH
IRON	µG/L	*	*	LBS/DAY	218.96	MDEL	ONCE/MONTH
SELENIUM	µG/L	*	*	LBS/DAY	0.59	MDEL	ONCE/MONTH
SULFATE	MGIL	*	*	LBS/DAY	61400.73	MDEL	ONCE/MONTH
COPPER	µGIL	26.0	16.4	LBS/DAY	2.18	WQBEL/MDEL	ONCE/MONTH
CHLORINE, TOTAL RES.	µGIL NOTE2	7.5 (130ML)	5.0 (130ML)	LBS/DAY	0.54	MDEL	ONCE/MONTH
LEAD	µGIL	*	*	LBS/DAY	0.78	MDEL	ONCE/MONTH
NITRATE	MGIL	*	*	LBS/DAY	524.20	MDEL	ONCE/MONTH
BARIUM	µGIL	*	*	LBS/DAY	238.76	MDEL	ONCE/MONTH
ADDITIONAL	BioKyowa submitted an MSDS for water treatment products likely to be used as part of the reverse osmosis water treatment. See Appendix B. Acute WET testing will be necessary due to the potential toxicity of the anti-sealant and potential for misapplication.						

NOTE 1- WATER QUALITY-BASED EFFLUENT LIMITATION --WQBEL; ORMINIMALLY DEGRADING EFFLUENTLIMIT--MDEL; OR PREFERRED ALTERNATIVE EFFLUENT LIMIT-PEL; TECHNOLOGY-BASED EFFLUENT LIMIT-TBEL; OR No DEGRADATION EFFLUENT LIMIT--NDEL; ORFSR--FEDERAL/STATEREGULATION; ORN/A--NOTAPPLICABLE. ALSO, PLEASESEETHE**GENERAL ASSUMPTIONS** OF THE WQAR #4 & #5.

NOTE 2 -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 µGIL 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 VALOES. MEASURED VALOES GREATER THAN OR EQUAL TO THE MINIMUM QUANTIFICATION LEVEL OF 130 µGIL WILL BE CONSIDERED VIOLATIONS OF THE PERMIT AND VALUES LESS THAN THE MINIMUM QUANTIFICATION LEVEL OF 130 µGIL WILL BE CONSIDERED TO BE IN COMPLIANCE WITH THE PERMIT LIMITATION.

* - MONITORING REQUIREMENTS ONLY.

OUTFALL #003 - Land Application System

No discharge system. Antidegradation review does not apply.

9. RECEIVING WATER MONITORING REQUIREMENTS

See permit factsheet for receiving water monitoring requirements.

10. DERIVATION AND DISCUSSION OF LIMITS

Wasteload allocations and limits were calculated using two methods:

1) Water quality-based (WQBEL)- Using water quality criteria or water quality model results and the dilution equation below:

$$C - \frac{(CsxQJ+(CexQJ}{-\quad (Qe+QJ} \qquad \text{(EPA/505/2-90-001, Section 4.5.5)}$$

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).

2) Assimilative capacity based - Using existing water quality (EWQ), water quality criteria, and the facility assimilative capacity ratio within the following equation:

Expanding Facility:

$$C_{d2} = ([C_c*(Q_s+Q_{d2})-C_s*(Q_s+Q_{d1})*CF]*FAC_{ratio}+(Q_{d1}*C_{d1}))/Q_{d2}$$

Where: Cc downstream concentration,the Water Quality Standard **(WQS)**
Qs Stream 7QIO flow (fl:3/s)
Qd1 Current effluent design flow (fl:^{3}/s) Qd2
Proposed effluent design flow (ft ^{3}/s))
Cs combined stream concentrations (calculated using EWQ, permitted discharges)
Cd1 = effluent concentration of the current facility
Cd2 effluent concentration of the proposed facility
FACratio facility assimilative capacity ratio (calculated or assumed)
Conversion factors for assimilative capacity calculations are: 0.0054 for ug/L, 5.4 for mg/L.

Chronic wasteload allocations (WLAc) were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and upstream stream flow without mixing considerations. Acute wasteload allocations are only used or determined in the absence of applicable chronic criteria.
For most toxic and conventional POCs, the minimally-degrading maximum daily limits are determined by applying the WLAc as the maximum daily (MDL) mass limitation. The WLA mass limitation must be applied as the maximum daily limit because the Antidegradation Implementation Procedure applies the FAC as pounds per day.

Note: Minimally-degrading effluent limits have been based on the authority included in Section III. Permit Consideration of the AIP.

10.1. OUTFALL #001 - DISCHARGE OF TREATED PROCESS WASTEWATER TO DIFFUSER IN MISSISSIPPI River

Outfall #001 is not part of the antidegradation review. Please refer to the permit for more information.

10.2. 0UTFALL #002- NON-CONTACT COOLING/STORM WATER/ REVERSE OSMOSIS REJECT WATER OUTFALL

10.3. LIMIT DERIVATION

The process for limit derivation for Table 1 POCs is as follows:

1) EPA has established national standards based on the performance of treatment and control technologies for wastewater discharges to surface waters for certain industrial categories. Effluent limitations guidelines represent the greatest pollutant reductions that are economically achievable for an industry, and are based on Best Practicable Control Technology (BPT), Best Conventional Pollutant Control Technology (BCT), and Best Available Technology Economically Achievable (BAT). (Sections 304(b)(l), 304(b)(4), and 304(b)(2) of the CWA respectively)

   At the time of drafting of this review, no effluent limit guidelines applicable to the permittee have been developed. EPA requires an evaluation of the need for case-by-case TBELs or Best Professional Judgment (BPJ) limitation. The regulation at§ I25.3(c)(2) specifically cites the Clean Water Act, stating that technology-based treatment requirements may be imposed in a permit "on a case-by-case basis under section 402(a)(l) of the Act, to the extent that EPA-promulgated effluent limitations are inapplicable."

   BPJ limits have not been established and the need for limitations should be further evaluated during the permit modification. According to the Hall and Associates in an email dated 10/25/12, there is no additional treatment to reduce the dissolved contaminants in the reject water from reverse osmosis water treatment system that does not result in more concentrated brine, also requiring disposal. Consequently, this waste is managed to minimize the impact of discharge on the receiving water by enhancing dilution. Adequate dilution is considered BPT in this case. In a letter dated 10/26/2012, Hall and Associates conducted a BPJ analysis and concluded that adequate dilution should be considered the best disposal method and therefore BPT. The permit writer will further evaluate the proposed BPJ management practices outlined in the 10/26/2012 letter.

2) Determine using limit derivation method #2 outlined above for all applicable POCs the minimally degrading wasteload allocation and effluent limit (MDEL) that retains the remaining assimilative

capacity and does not exceed 10% of the FAC. This MDEL value is first a concentration that is converted to a mass-based limitation and applied as a maximum daily limit.

3) The next step is to develop water quality-based effluent limits. The water quality-based maximum daily and average monthly limit will be compared to the MDEL maximum daily limit as a concentration value. If the MDEL concentration value is greater than the water quality-based maximum and average monthly limits, only the water quality limits will apply. If the MDEL concentration value is less than the water quality-based maximum and average monthly limits, the water quality-based limits and the MDEL maximum daily as a mass limit will apply.

4) Determine the need for permit limits of various POCs using reasonable potential analysis. While this process is applied to all applicable POCs, this process is particularly important for POCs having monitoring only requirements for an existing discharge. No POCs receiving water concentration will exceed water quality standards or the maximum daily limit (MDL) of the MDEL in pounds per day.

The Table 6 below contains the minimally-degrading maximum daily limit for the pollutants of concern. Discussion of the assumptions and basis for the limits can be found below the table. The area in yellow in the table is a confirmation that the maximum daily limit (MDL) is less than 10 % degradation. Both the maximum daily mass limit and the concentration value are provided. The maximum daily limit as a concentration value will be compared to the water quality-based maximum daily and average monthly limit found in Table 7.

Table 6. Calculations of the Minimally Degrading Effluent Limits for POCs discharging from Outfall 002.

Allowable discharge" Is equal to j Cd2=([Cc*(Qs+Qd2)-Cs*(Qs+Qd1)*CF]FACratio+Qd1*Cd1)/Qd2

Outfall #002
Classified P streams only
Facility Name BioKyowa Facility

Permit Number M0-0101729

Stream name Headwater Division Qs 1Q1O = Not applicable
Qd1= 13.6 Qs 30Q10 = Not applicable
Qd2= 14.2 Qs 7Q10 = B6 '

Cd1 = current effluent concentration
Cc= downstream concentration, the Water Quality Standard (WQS)
Qs = Stream flow (ft3/s) CF= Correction Factor see below'
Qd1 = Current effluent design tow (ft3/s)
Qd2 = Proposed effluent design flow (ft3/s)
Cs = combined stream concentrations (see Footnote 1 below)
Cd2 = affluent concentraiic1FACtatio = facility assimilative capacity ratio

All values are total recoverable,
except dissolved EWQ values for Al, Fe, Se, and Cu.
WLAa= Cd2 using the acute WQS
WLAc= Cd2 using the chronic WQS
MDL ug/L WLAa,c

Units: Metals, TRC= Ug/L; Fluoride, Chloride, nitrate, Sulfate= mall	*Aquatic Life Acute {Cc)*	*Aquatic Life Chronic (Cc)*	Chronic Drinking Water standard or WBC	Current Effluent Concentration (Cd1l	Proposed Effluent Concentration (Cd2)	Existing Water Quality	receiving Stream Concentration (Cs)	FAC (Chronic)	FAC (Acute)	FACratio or <10%	WLAc	WLAa	WLA (mg/L)	MDL (lbs.lday)	Net Increase (lbs/day)	Check of %FAC (MDL)
Aluminum1	750.0			100	111.8	10.20	22.35		*73107.24*	9.9%		*606.90*	606.9	*46.37*	39.1	9.9%
Chloride2	684.0	423.0		64	71,6	7.60	*15.23*	*40970.47*	*67187.92*	9.9%	347.71	*531.14*	347.7	*26588.41*	21902.B	9.9%
Fluoride1		4.0		0.30	0.33	0.05	*0.08*	*393.44*		9.9%	3.04		3.0	*232.20*	210.3	9.9%
Iron1		1000.0		2550.00	2851.00	48.30	*386.71*	*61856.71*		9.9%	2865.64		2865.6	*218.98*	33.1	9.9%
Selenium1		5.0	50.0	5.00	5.33	0.10	*0.78*	*428.12*		9.9%	7.75		7.8	*0.59*	0.2	9.9%
Sulfabe2		1061.0		76.00	85.00	12.30	*20.92*	*104489.96*		9.9%	803.57		803.6	*61400. 73*	55860.3	9.9%
Coor,er2	26.0	16.4	1300.0	20.00	22.90	0.40	*3.05*	*1342.86*	*2307.18*	9.9%	28.48	*35.22*	28.5	*2.18*	0.7	9.9%
Chlorine, Total Res	19.0	10.0		0.01	0.50	0.01	*0.01*	*1003.00*	*1907.55*	9.9%	7.03	*13.38*	7.0	*0.54*	0.5	9.9%
Lead	188.4	7.3	15.0	6.00	6.00	0.10	*0.90*	*643.60*	*18835.09*	9.9%	10.23	*137.00*	10,2	*0.78*	0.3	9.9%
Nitra1e2			10.0	0.10	0.11	0.42	*0.38*	966.90		9.9%	6.B6		6,9	*524.20*	516.0	9.9%
Barium			2000.0	2000.00	2236.00	0.10	*270.63*	*173891.37*		9.9%	3124.75		3124.8	*238.76*	93.0	9.9%

Footnote 1: Upstream water quality was obtained from the USGS water quality sampling station - Castor River at Greenbriar, MO.
Cs represents a combination of existing water quality data and the current permitted discharge levels (Cd1) from BioKyowa's Antidegradation Review Sept 21 Letter, Table 2.)
Footnote 2: Copper value from USGS sampling on L. Whitewater River, near Millersville, Mo.
Nitrate from the MDNR sampling on the Whitewater River. •conversion factors for assimilative capacity calculations are: 0.0054 for ug/L, 5.4 for mg/L.
Chloride, sulfate -- from the MDNR sampling database Headwater Diversion Char Net increase= (MDL*proposed design flow) - (Cd1•current design flow)
Upstream water quality for Barium, Lead and TRC were assumed.
Discharge Concentrations:
Cd2 was obtain from BioKyowa's Antidegradation Review, Table 2 Maximum concentration.
Cd1,2 values for TRC were assumed based on dechlorination.
Cd1,2 values for Lead were assumed based on reject water from one pass RO membrane filter received from BioKyowa, Inc. during applicability review.

Assumptions and Basis:
WI.A=MDL=pounds per day, maximum value
FACratio is a value that cannot be exceeded to retain minimal degradation.

wg Criteria:
Aquatic life chronic and acute standards were dissolved components
Hardness of 193 mg/L was used to calculate criteria for metals, including CL and S04, that are hardness dependent.
Chloride, sulfate -- calculated based upon values from BioKyowa's September 21 letter of CL= 11.86 and S04= 18.19 mg/Land hardness of 193 rng/L
Hardness represents an estimated value provided by the BioKyowa in their September 21 letter for maximum discharge conditions.

Stream Flow and Mixing Zone Determination (does not apply for Minimally Degradation):
Stream flow value for the Headwater Diversion Channel was *obtained from the BioKyowa NPDES permit dated March 20, 2012.*
Mixing Zone (MZ): One-quarter (1/4) of the stream volume of flow; length one-quarter (1/4) mile. (10 CSR 20-7.031(4l(A)4.B.(lll)(a)].
Zone of Initial Dilution (ZID): One-tenth (0.1) of the mixing zone volume of flow, not to exceed 1O times the effluent design flow. (1O CSR 20-7.031(4l(Al4.B.(lll)(b)].
Explanation of maximum dally limit:

Because the discharge has potential to impact Mississippi River which has drinking water designated uses nitrate and barium were retained.
The use of the LTAa or LTAc to determine MDL may create a percent of FAC greater than 10%, therefore the above assumption were used.
The Antidegradation Implementation Procedure describes the FAC as pounds per day; therefore, we apply a maximum daily limit.
The presence of zeros in the WI.A columns indicates that no water quality criteria are available.

- **Flow.** In accordance with [40 CFR Part 122.44(i)(l)(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 {BOD .** BOD_5 limits are monitoring only as indicated in the permit renewal. No antidegradation review is required for this pollutant.

- **Total Suspended Solids {TSS).** TSS limits are monitoring only as indicated in the permit renewal. No antidegradation review is required for this pollutant.

- **pH.** pH shall be maintained in the range from 6.5 to nine (6.5 -9.0) standard units [10 CSR 20-7.015 (8)(A)2.]. pH is not a pollutant of concern for this antidegradation review.

- **Temperature.** Monitoring requirement only. See permit for more information.

- **Total Ammonia Nitrogen.** Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(4)(B)7.C. & Table B3]. Background total ammonia nitrogen= 0.01 mg/L. We are applying the water quality-based limits below with ammonia decay in the classified stream. The wasteload allocation was increase slightly to account for decay that will take place in the unclassified stream.

  Ammonia is not a pollutant of concern in the antidegradation review; however, the hydraulic loading may result in changes to the final limitations. The current permit has monitoring only for 3 years from the issuance of the permit.

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

Summer: April 1 - September 30, Winter: October 1 - March 31.

$C_e = (((Q_e+Q_s)*C) - (Q_s*C_s))/Q_e$

Summer:
Chronic WLA: Ce= ((14.2 + 25.2)1.5 - (25.2 * 0.01))/14.2
Ce= 4.1 mg/L

AcuteWLA: Ce= ((14.2 +2.0)12.1-(2.0 * 0.01))/14.2
Ce= 13.8 mg/L

LTAc = 4.1 mg/L (0.535) = 2.2 mg/L [CV= 1.602, 99th Percentile, 30 day avg.] [CV=
LTAa = 13.8 mg/L (0.137) = **1.9 mg/L** 1.602, 99th Percentile]

Use most protective number ofLTAc or LTAa,

MDL= 1.9 mg/L (7.29) = 13.9 mg/L [CV= 1.602, 99th Percentile]
AML = 1.9 mg/L (1.54) = 2.9 mg/L [CV= 1.602, 95th Percentile, n =30]

Winter:

Chronic WLA: Ce= ((14.2 + 25.2)3.1 -(25.2 * 0.01))/14.2
Ce 8.6 mg/L

Acute WLA: Ce ((14.2 + 2.0)12.1-(2.0 * 0.01))/14.2
Ce 13.9 mg/L

LTAc = 8.6 mg/L (0.507) = 4.4 mg/L [CV 1.757, 99th Percentile, 30 day avg.]
LTAa = 13.9 mg/L (0.128) **1.8 mg/L** [CV 1.757, 99th Percentile]

Use most protective number of LTAc or LTAa.

. MDL= 1.8 mg/L (7.81) = 14.1 mg/L [CV 1.757, 99th Percentile]
AML = 1.8 mg/L (1.59) 2.9 mg/L [CV 1.757, 95th Percentile, n =30]

As a result of the increased hydraulic flow from the RO reject water, there is no change in the ammonia permit limitations.

Season	Maximum Daily Limit (mg/1)	Avera2e Monthly Limit (mg/I)
Summer	13.9	2.9
Winter	14.1	2.9

- **Oil & Grease.** Conventional pollutant, [10 CSR 20-7.031, Table A]. Oil and Grease is not a POC in the antidegradation review. As with the permit renewal, effluent limitation for protection of aquatic life; 10 mg/L monthly average, 15 mg/L daily maximum.

- **Total Residual Chlorine (TRC).** Warm-water Protection of Aquatic Life CCC= 10 µg/L, CMC 19 µg/L [10 CSR 20-7.031, Table A]. Derived limitations in Table 6 and 7 were compared; MDEL is lower than the WQBEL; therefore, the both the mass-based MDEL and WQBELs apply. This effluent limit is below the minimum quantification level (ML) of the most common and practical EPA approved CLTRC methods. See Note 2 below Table 5. The ML value lends to uncertainty in the actual discharge concentration, therefore, limits apply.

- **Chloride.** Protection of Aquatic Life Chronic and Acute Criteria (µg/L) are listed in Table 3, 4, and 7. Hardness was 193 mg/Land sulfate, 18.19 mg/L. Derived limitations in Table 6 and 7 were compared; MDEL is lower than the WQBEL; therefore, the both the mass-based MDEL and WQBELs apply. Monitoring only will be applied until a RPTE is determined.

- **Sulfate.** Protection of Aquatic Life Chronic Criteria (µg/L) is listed in Table 3, 4, and 7. Hardness was 193 mg/L and chloride, 11.86 mg/L. Derived limitations in Table 6 and 7 were compared; MDEL is lower than the WQBEL; therefore, the both the mass-based MDEL and WQBELs apply. Monitoring only will be applied until a RPTE is determined.

- **Fluoride, Total Recoverable.** Protection of Aquatic Life Chronic Criteria (mg/L) is listed in Table 3, 4, and 7. Derived limitations in Table 6 and 7 were compared; MDEL is lower than the WQBEL; therefore, the both the mass-based MDEL and WQBELs apply. Monitoring only will be applied until a RPTE is determined.

- **Nitrate.** Drinking water criteria is listed in Table 3, 4, and 7. Derived limitations in Table 6 and 7 were compared; MOEL is lower than the WQBEL; therefore, the both the mass-based MOEL and WQBELs apply. Monitoring only will be applied until a RPTE is determined.

Metals

Non-hardness Dependent Metals:

Note: Minimally degrading effluent limits were determined for these metals. Limits were determined using the method described in the beginning of the Derivation and Discussion of Limits section and below Table 6 and 7 of this section. These Maximum Daily Limits will be compared to the reasonable potential analysis upon renewal, i.e., these limits will be compared to the calculated receiving water concentration (from future discharge monitoring data). No monitoring is available for the current discharge concentrations. No RPA was conducted.

- **Selenium, Total Recoverable.** Protection of Aquatic Life Chronic (µg/L) is listed in Table 3, 4, and 7. Derived limitations in Table 6 and 7 were compared; MOEL is lower than the WQBEL; therefore, the both the mass-based MOEL and WQBELs apply. Monitoring only will be applied until a RPTE is determined.

- **Aluminum, Total Recoverable.** Protection of Aquatic Life Acute Criteria (µg/L) is listed in Table 3, 4, and 7. Derived limitations in Table 6 and 7 were compared; MOEL is lower than the WQBEL; therefore, the both the mass-based MOEL and WQBELs apply. Monitoring only will be applied until a RPTE is determined.

Iron, Total Recoverable. Protection of Aquatic Life Chronic Criteria (µg/L) is listed in Table 3, 4, and 7. Derived limitations in Table 6 and 7 were compared; MOEL is lower than the WQBEL; therefore, the both the mass-based MOEL and WQBELs apply. The FAC ratio is close to the threshold; Monitoring only will be applied until a RPTE is determined. Staff believes limits should be imposed if the mass limitation is exceeded.

- **Barium, Total Recoverable.** Drinking water criteria (µg/L) is in Table 3, 4, and 7. Derived limitations in Table 6 and 7 were compared; MOEL is lower than the WQBEL; therefore, the both the mass-based MOEL and WQBELs apply. Monitoring only will be applied until a RPTE is determined.

Hardness Dependent Metals:

Effluent limitations for total recoverable metals were developed using methods and procedures outlined in EPA/505/2-90-001 and "The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion" (EPA 823-B-96-007). General warm-water fishery criteria apply and water hardness = 193 mg/L. Hardness was determined from data submitted with the September 21, 2012, revision of the *Antidegradation Report.*

Due to the absence of contemporaneous effluent and instream data for total recoverable metals, dissolved metals, hardness, and total suspended solids with which to calculate metals translators, partitioning between the dissolved and adsorbed phases was assumed to be minimal (Section 5.7.3, EPA/505/2-90-001). Freshwater criteria conversion factors for dissolved metals were used as the metals translator as recommended in guidance (Section 1.3, 1.5.3, and Table 1, EPA 823-B-96-007). If concurrent site-specific data for total recoverable metals, dissolved metals, hardness, and total

suspended solids are provided to the department, partitioning evaluations may be considered and site-specific translators developed.

METAL	CONVERSION FACTORS	
	ACUTE	CHRONIC
Copper	0.960	0.960
Lead	0.695	0.695

Conversion factor for Pb is hardness dependent. Values calculated using equation found in Section 1.3 of EPA 823-B-96-007 and hardness= 193 mg/L.

- **Copper, Total Recoverable.** Protection of Aquatic Life Chronic and Acute Criteria (µg/L) are listed in Table 3, 4 and 7. Derived limitations in Table 6 and 7 were compared; MDEL is lower than the WQBEL; therefore, the both the mass-based MDEL and WQBELs apply. The discharge has a potential to exceed water quality criteria with the proposed discharge concentration values used in the MDEL calculations, therefore limits are applied.

- **Lead, Total Recoverable.** Protection of Aquatic Life Chronic and Acute Criteria (µg/L) are listed in Table 3, 4 and 7; 14.5 mg/L average monthly limit and 9.7 mg/L maximum daily limit. Derived limitations in Table 6 and 7 were compared; MDEL is lower than the WQBEL; therefore, the both the mass-based MDEL and WQBELs apply. Monitoring only will be applied until a RPTE is determined.

The next step in the limit determination process is the comparison of the water quality-based effluent limit (WQBEL) and the minimally degrading maximum daily limit as a concentration value. Table 7 shows the WQBEL for the POCs. By comparison, all minimally degrading effluent limits in Table 6 are less than the WQBELs. Therefore mass-based maximum daily value will apply.

Upon renewal, a reasonable potential analysis will be conducted to determine the need for limits. The RPA should be conducted such that the receiving water concentration will not exceed water quality standard and the MDEL mass-based maximum daily limit. No RPA was conducted during this review due to the lack of effluent monitoring data.

Table 7. Water Quality-based Effluent Limits for POCs discharge from Outfall 002.

Outfall #002
Classified P streams only
Facility Name BioKyowa Facility

Permit Number M0-0101729
Stream name Headwater Division

_Qd2= 14.2

Qs 1Q10 = Not applicable
Qs 30Q10 = Not applicable
Qs 7Q10_= 86.3

Allowable discharge is equal to Ce=((Qe+Qs)Cc-(Qs'Cs))/Qe
Cc=downstream concentration, the Water Quality Standard
Qs=Stream 7010 flow (ft^3/s), or 1010. or 30010
Qe=proposed effluent design flow (lt^3/s)
Cs=combined stream concentrations (see Footnote 1)
Ca=effluent concentration
''' Qs decreased by 0.26 for mixing zone and 0.026 for zone of lnl11al dilution considerations

WLAa= Ce using the chronic WQS
WLAc= Ce using the acute WQS
LTAe = WLA acute • LTAa multiplier
LTAc = WLA chronic • LTAc multiplier
MDL ug/L = the more protective LTA (LTAa or LTAc) • AML multiplier
AML ug/L the more protective LTA (LTAa or LTAc) • MDL multiplier

Units: Metals *TRC = uaA_ · Fluoride Chloride nitrate Sulfate = mnn*	*Aquatic* Life *Acute(CcJ*	*Aquatic* Life *Chronic (CcJ*	Chronic Drinking Water S1andard or WBC	Existing Water Qualitv	WLAa	WIAc	LTAa	LTAc	MDL	AML
Aluminum[1]	750.0			*10.20*	*862.40*	*0.00*	276.9	0.0	862.4	429.9
Chloride[2]	684.0	423.0		*7.60*	*786.77*	*1054.14*	252.6	556.0	786.8	392.2
Fluoride'		4.0		*0.05*	*0.00*	*10.00*	0.0	7.8	24.3	9.3
I on[1]		1000.0		*48.30*	*0.00*	*2445.98*	0.0	1290.1	4017.9	2002.8
Selenium'		5.0	50.0	*0.10*	*0.00*	*12.44*	0.0	6.6	20.4	10.2
Sulfate[2]		1061.0		*12.30*	*0.00*	*2654.36*	0.0	1400.0	4360.2	2173.4
Coooer2	26.0	16.4	1300.0	*0.40*	*29.89*	*40.71*	9.6	21.5	29.9	14.9
Chlorine Total Res	19.0	10.0		*0.01*	*21.89*	*25.18*	7.0	13.3	21.9	10.9
Lead	188.4	7.3	15.0	*0.10*	*217.01*	*18.24*	69.7	9.6	30.0	14.9
Nitrate[2]			10.0	*0.42*	*0.00*	*24.56*	NA	NA	49.3	24.6
Barium			2000.0	*0.10*	*0.00*	*5038.58*	NA	NA	10108.3	5038.6

Footnote 1: Upstream water quality was obtained from the USGS water quality sampling station - Castor River at Greenbriar, MO.
Footnote 2: Copper value from USGS sampling on L. Whitewater River, near Millersville, Mo.
Nitrate from the MDNR sampling on the Whitewater River.
Chloride, sulfate -- from the MDNR sampling database Headwater Diversion Channel Mouth.
Upstream water quality for Barium, Lead and 1RC were conservatively assumed.

Assumptions and Basis:
CV = 0.6
For LTA, MDL the 99th Percentile was used.
For AML, the 95th Percentile was used.
Metals Multiplier:
LTAa = 0.321
LTAc = 0.527
MDL= 3.11
AML =1.55 n=4

Nitrate and Barium:
AML=WIA
MDL=AML *2.01

WQ Criteria:
Aquatic life chronic and acute s1andards were dissolved components
Hardness of 193 mg/L was used to calculate criteria for metals, including CL and S04, that are hardness dependent.
Chloride, sulfate-- calculated based upon values from BioKyowa's September 21 letter of CL=11.86 and S04=18.19 mg/L and hardness of 193 mg/L
Hardness provided by the BioKyowa in their September 21 letter for maximum discharge conditions.

Mixing Zone Determination;

Mixing Zone (MZ): One-quarter (1/4) of the stream volume of flow; length one-quarter (1/4) mile. (10 CSR 20-7.031(4)(A)4.B.(lll)(a)].
zone of Initial Dilution {ZID): One-tenth (0.1) of the mixing zone volume of flow, not to e>1eeed 10 times the effluent design flow. [10 CSR 20-7.031(4)(A)4.B.(lll)(b)].

Explanation of Limjts:

Because the discharge has potential to impact Mississippi Riwr which has drinking water designated uses nitrate and barium were retained.
The lesser of the LTAa or LTAc was used to determine MDL and AML (shown in bold letters above on 1able).
The presence of zeros in the WlA and LTA columns indicates that no water quality criteria available.
Nitrate and Barium follow EPA TSD Section 5.4.4 WQBEL procedure.

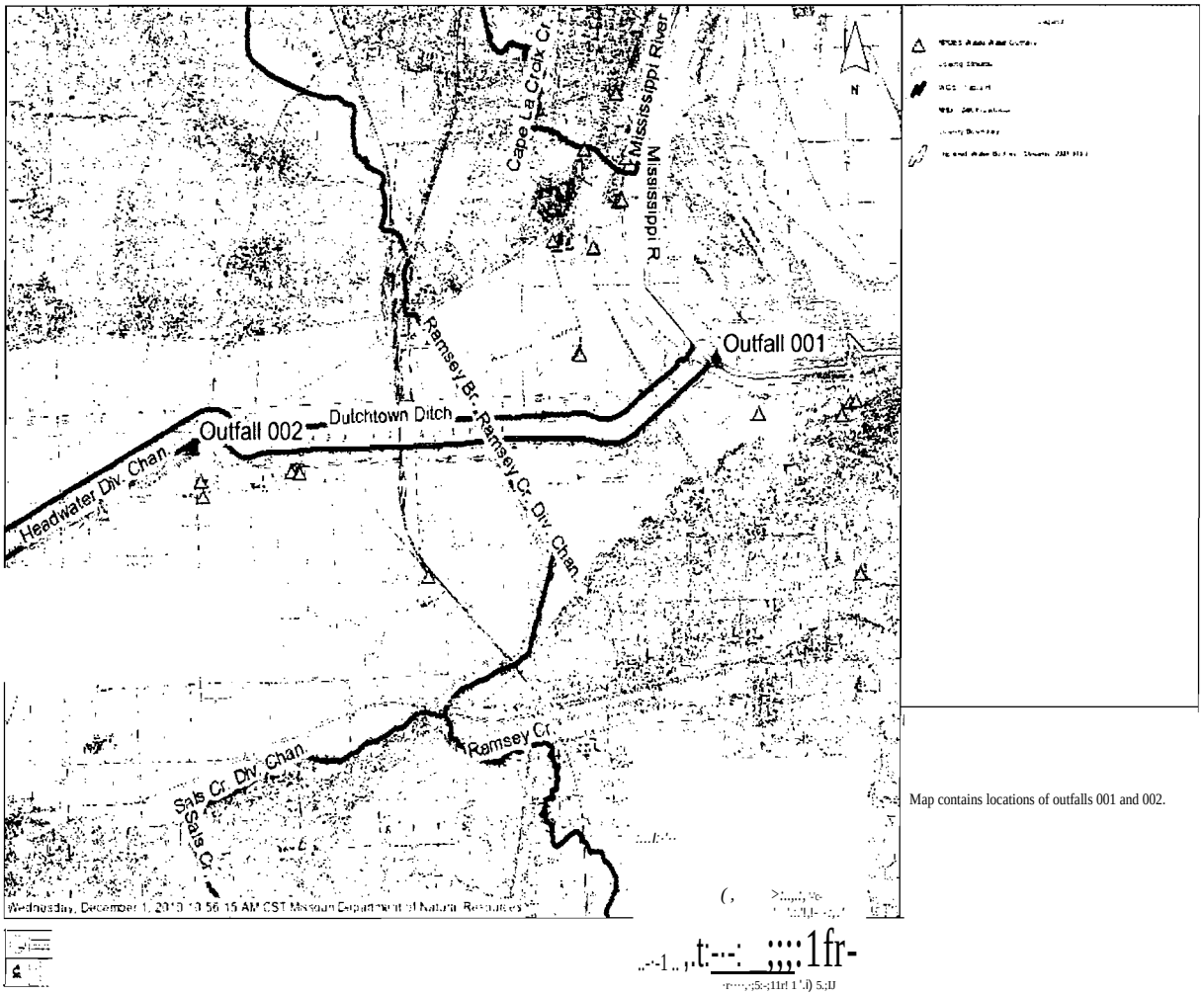
11. ANTIDEGRADATION REVIEW PRELIMINARY DETERMINATION

BioKyowa's proposed discharge from Outfall #002, 9.135 MGD or 14.2 cfs, will result in minimal degradation of the segment identified in the antidegradation review. Per the requirements of the AIP, the effluent limits in this review were developed to be protective of beneficial uses and to retain the remaining assimilative capacity. The permit writer will further evaluate the proposed BPJ management practices outlined in the 10/26/2012 letter. MDNR has determined that the submitted review is sufficient to meet the requirements of the AIP.

Reviewer: Todd J. Blanc
Date: December 20, 2012
Unit Chief: John Rustige, P.E.

Appendix A: Map of Discharge Location

BioKyowa Inc. MO-0101729 Outfall Map



Map contains locations of outfalls 001 and 002.

Missouri Department of Natural Resources

Disclaimer: Although this map has been compiled by the Missouri Department of Natural Resources no warranty, expressed or implied is made by the department as to the accuracy of the data and related materials. The act of distribution shall not constitute any such warranty and no responsibility is assumed ty the department in the re use of these data or related materials.

Appendix B: Material Safety Data Sheet (MSDS) Product Safety

BioKyowa submitted an MSDS for water treatment products likely to be used as part of the reverse osmosis water treatment. The table below provides the list of the products and the hazardous substances.

Product Name	Manufacturer	Hazardous Substance
Formula 6035	Garratt-Callahan Company	Proprietary- anti-sealant for the reverse osmosis water treatment system

Appendix C: Antidegradation Review Summary Attachments

The attachments that follow contain summary information provided by the applicant, BioKyowa, Inc. MDNR staff determined that changes must be made to the information contained within these attachments. The following were modified and can be found within the MDNR WQAR:

1) Tier Determination and Effluent Limit Summary Sheet: The applicant checked "yes" for the non-degrading box on page 24 below. The degradation is insignificant, therefore the answer should have been "no." Effluent limits on page 26 that were provided by the applicant were developed by a different method; therefore, they were not used.

2) Attachment B: No changes needed.

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
ANTIDEGRADATION REVIEW SUMMARY
TIER DETERMINATION AND EFFLUENT LIMIT SUMMARY

; **1 FACILITY**

NAME		TELEPIIONE NUMBER WITH AREA CODE
BioKyowa, Inc.		573 335-4849 x127
ADDRESS (PHYSICAL)	CITY	STATE / ZIPCODI:
5469 Nash Road	Cape Girardeau	MO 63702-1550

1 **2. RECEIVING WATER BODY SEGMENT #1**

NAME

Headwater Diversion Channel

2.1 UPPER END OF SEGMENT (Location discharge)
UTM __ OR Lat 37.2 , Long 89.6

2.2 I OWER END OF SEGMENT
UTM OR Lat . Long 89.5

Per the Mi ssouri Antidegradation Rule and Implementation Procedure. or AIP. the definition of a segment's 'a segment is a section of water that Is bound, at a Minimum by significant existing **sources** and confluences with other significant water bodies.·

3. **WATER BODY SEGMENT #2** {IF **APPLICABLE)**

: NAME

UPPER ENO OF SEGMENT
UTM OR Lat_____, Long

3.2 LOWER END OF SEGMENT
UTM OR Lat Long

4. WATER BODY SEGMENT #3 (IF APPUCABLEI

NAME

4.1 UPPER END OF SEGMENT
UTM OR Lat____, Long

4.2 LOWER END OF SEGMENT
UTM OR Lat , Long

5. PROJECT INFORMATION

: **Is the receiving water body an Outstanding National Resource Water, an Outstanding State Resource Water, or drainage thereto?**

Yes X No

In Tables D and E of 10 CSR 20-7 031 Outstanding National Resource Waters and Outstanding State Resource Water are listed Per the Antidegradation Implementation Procedure Section 1.B.3., "any degradation of water quality is prohibited in these waters unless the discharge only results in temporary degradation.• Therefore, if degradation is significant or minimal, the Antidegradation Review will be denied.

Will the proposed discharge of all pollutants of concern, or POCs, result in no net increase in the ambient water quality concentration of the receiving water after mixing?

Yes X No

If yes, submit a summary table showing the levels of each pollutant of concern before and after the proposed discharge in the receiving water and then complete Attachment B for the first downstream classified water body segment.

' **Will the discharge result in temporary degradation?**

Yes No

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SEP 2 1 2012

If es, complete Attachment C.
Has **the project been determined as non-degrading?**

Yes X No

If yes, complete No Degradation Evaluation - Conclusion of Antidegradation Review form.
Submit with the apl)ropriate Construction Permit A lication as no antid radation review is re

I If **yes to one of the above questions, skip to Section 8 • Wet Weather.**

;NATER PROTECTI ON PROGRAM

6. EXISTING WATER QUALITY DATA OR MODEL SUMMARY

Ob1aining Existing Water Quality is possible by three methods according to the Antidegradation Implementation Procedure Section ILA.1.; (1) using previously collected data with an appropriate Quality Assurance Project Plan. or OAPP (2} collecting water quality data by approved the Missouri Department of Natural Resources methodology or (3) using an appropriate water quality model. OAPPs must be submitted to the depar1ment for approval well in advance (six months) of the proposed activity. Provide all the **appropriate corresponding date and reports which were approved by the department Water Quality Monitoring and Assessment Section** Section.

Date existing water quality data was provided by the Water Quality Monitoring and Assessment Section;

Approval date of the QAPP by the Water Quality Monitoring and Assessment Section:

Approval date of the project **sampling plan by the Water Quality Monitoring and Assessment Section:**

Approval date of the data collected for all appropriate pollutants of concern by the Water Quality Monitoring and Assessment Section:

Comments/Discussion:

7. POLLUTANTS OF CONCERN AND TIER DETERMINATION(SJ

Pollutants of Concern to be considered include those pollutants reasonably expected to be present In the discharge per the Antidegradatlon implementation Procedure Section 11.S. The tier protection levels are specified and defined in rule at 10 CSR 20-7.031 (2).

Water Body Segment One
Pollutants of Concern and Tier Determination(s)

Tier 1	Tier 2 with Minima! Degradation	Tier 2 with Significant Degradation
	Aluminum, Barium	
	Total Residual Chlorine, Copper	
	Iron, Lead, Selenium	
	Chloride, Fluoride	
	Nitrate, Sulfate	

Note: Add an asterisk to items that you only assume are Tier 2 with significant degradation.

Water Body Segment Two
Pollutants of Concern and Tier Determination(s)

Tier 1	Tier 2 with Minimal Degradation--	Tier 2 with Significant Degradation

- For pollutants of concern that are Tier 2 with significant degradation, complete Attachment A
- For pollutants of concern that are Tier 2 with minimal degradation. complete Attachment B.
- For pollutants of concern that are Tier 1, complete Attachment D. Additionally, a Tier 2 review must be conducted for each pollutant of concern on the appropriate water body seament.

WET WEATHER ANTICIPATIONS

If an applicant anticipates excessive inflow or infiltration and pursues approval from the department to bypass secondary treatment. a feasibility analysis is required. The feasibility analysis must comply with the criteria of all applicable state and federal regulations Including 40 CFR 122.41(m)(4). Attach the feasibility analysis to this report.

What Is the Wet Weather Flow Peaking Factor In relation to design flow?

Not Applicable

Wet Weather Design Summary:

Not Applicable

9. SUMMARY OF THE PROPOSED ANTIDEGRADATION REVIEW EFFLUENT LIMITS

What are the proposed pollutants of concern and their respective effluent limits that the selected treatment option comply with.

Pollutant of Concern	Units	Wasteload Allocation	Average Monthly limit	Daily Maximum Limit
BOD5				
TSS				
Dissolved Oxygen				
Ammonia		--		-
Bacteria (E Coli)		(lbs/d)	>-----	
Aluminum/Barium	ugll	23.3/187.3	305/2,455	612/4,926
TRC/Copper	u	0.54/0.96	7.1/12.6	**14.3125.4**
Iron/Lead	ua/l	152.5/0.60	1,999/7.86	4,011/15.8
Selenium	ugll	0.59	7.78	15.6
Chloride/Fluoride	mo/I.	24,802/233.8	325/3.06	652/6.15
Nitrate/Sulfate	mall	523/62,602	6.85/820	13.8/1,646

These proposed limits must not violate water quality standards, be protective of beneficial uses and achieve *the* highest statutory and regulatory requirements.

Attach the Antidegradation Review report and all supporting documentation.

CONSULTANT: I have prepared or reviewed this form and all attached reports and documentation. The conclusion proposed is consistent with the Antidegradation Implementation Procedure and current state and federal regulation.

S!G'NATURf (J:.00.._ .r.t{.if) DATE 09/17/2012

OWNER: I have read and reviewed the prepared documents and agree with this submittal.

SIGNATURE DATE

NAME AND OFFICIAL TITLES
William T. Hall

COMPANY NAME
Hall & Associates / BIOKYOWA INC. DAVE JENNINGS

ADDRESS	CITY	STATE	ZIPCODE
1620 I Street, **NW**	Washington	DC	20006

TELEPHONE NUMBER with AREACODE: 202 463-1166
E-MAIL ADDRESS: bhall@hall-associates.com

SrGNATUlll:

CONTINUING AUTHORITY: Continuing Authority is the permanent organization that will be responsible for the operation, maintenance and modernization of the facility. The regulatory requirement regarding continuing authority is found in 10 CSR 20-6.010(3) available at www.sos.mo.gov/adrules/csr/current/10csr/10c20-6a.pdf.

I have read and reviewed the prepared documents and agree with this submittal.

SIGNATURE DATE 9/17/12

NAME AND OFFICIAL TITLE: BIOKYOWA INC. DAVE JENNINGS - SITE ENGINEER

ADDRESS	CITY	STATE	ZIP CODE
5469 AVIASH ROAD	CAPE GIRARDEAU	MO	63701

TELEPHONE NUMBER WITH AREA CODE: 573-335-4849 x-127
E-MAIL ADDRESS: dave.jennings@biokyowa.com

MO 780-2025 (05-09)

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM. WATER POLLUTION CONTROL BRANCH

ANTIOEGRADATION REVIEW SUMMARY
ATTACHMENT B: TIER 2-MINIMAL DEGRADATION

1.FACILITY

NAME		TELEPHONE WITH AREA CODE
B10Kyowa. Inc.		(573) 335-4849
ADORES$ (PHYSICAL)	CITY	S1ATE ZIP COO€.
5469 Nash Road	Cape Girardeau	MO 63702

2. RECEIVING WATER BODY SEGMENT#1

NA!oo!E

Headwater Diversion Channel

3. WATER BOQY. SEGMENT #2 (IF APPLICABLE)

NAME

NIA

4. ASSIMILATIVE CAPACITY TABLE

Determining the facility assimilative capacity. or FAC, and the segment assimilative capacity, or SAC for each pollutant of concern is explained In detail in the Antidegradation implementation Procedure Section 11.A.3 and Appendix 3. POCs to be considered include those pollutants reasonably expected to be present In the discharge per the Antidegradation Implementation Procedure Section II.A Provide all calculations In the Antidegradation Review retmrt.

Pollutant of Concern	Facility Assimilative Capacity (lbs/day)	New Load lbs/day)	Percent of Facility Assimilative Capacity (%)
Aluminum (dissolved)	395	<1.27	<0.32
Chloride	208,197	815.4	0.39
Fluoride	2,124	3.74	0.18
Iron (dissolved)	352.7	29.1	8.25
Selenium (dissolved)	1.88	<0.063	<3.36
Sulfate	332.040	960	0.29

Pollutant of Concern	Water Body Segment 111 SAC	Cumulative Net Increase in Load	Cumulative % of Water Body Segment#1 SAC	Water Body Segment#% SAC	Cumulative Net Increase In Load	Cumulative % of Water Body Segment#% SAC
Aluminum (dissolved)	400	<:1.27	<0.32			
Chloride	210,892	815.4	0.39			
Fluoride	2.154	3.74	0.17			
Iron (dissolved)	342.2	29.1	8.51			
Selenium (dissolved)	1.88	<:0.063	<3.36			
Sulfate	336,521	960	029			

Assimilative Capacity Summary

See attached repcrt.

Is degradation considered minimal for all Pollutants of Concern? X Yes No

Degradation is considered minimal if the new or proposed loading is less than 10 percent of the FAC and the cumulative degradation is less than 20 percent of the SAC according to the Antidegradation implementation Procedure Section 11 A3. If yes. an alternatives analysis and a social and economic importance analysis are not required

Comments/Discussion

See attached report

MINIMAL DEGRADATION CALCULATIONS

See attached report

5. OIL **AND GREASE** ·

Is this a publicly owned treatment works, or POTW, restaurant, school or other domestic wastewater treatment facility with oil and grease as a Pollutant of Concern? Yes X No

In accordance with 10 CSR 20-7.031(3)(8). waters shall be free from oil. scum and floating debris in sufficient amounts lo be unsightly or prevent full maintenance of beneficial uses In accordance with 10 CSR 20-7.031 Table A. oil and grease has a Chronic toxicity of 10 mg/L for protection of aquatic life. This facility will meet the effluent limits (MDL and AML of 15 mg/land 10 mg/l, respectively)

6.-DECHLO-RiNAT:IOfif: . .

If ChlorInation and Dechlorination Is the existing or proposed method of disinfection treatment. will the effluent discharged be equal to or **less than the Water Quality Standards for Total Residual Chlorine stated In Table A of 10 CSR 20-7.031?**

X Yes **No**

Based on the **disinfection** treatment system being designed for total removal of Total Residual Chlorine, minimal degradation for Total Residual Chlorine is assumed and the facility will be required to meet the water quality based effluent limits These compliance limits for Total Residual Chlorine are much less than the method detection limit of 0.13 mg/L.

7. PROPOSED PROJECT SUMMARY

See attached report

Attach the Antidegradation Review report and all supporting documentation.

CONSULTANT: I have prepared or reviewed this from and all attached reports and documentation. The conclusion proposed in consistent with the AIP and current state and federal regulations.

SIGNATURE

DATE
08/01/2012

PRINT NAME
William T. Hall

TELEPHONE NUMBER WITH AREA CODE
(202) 463-1166

E-MAIL ADDRESS
bhall@hall-associates.com

OWNER: I have read and reviewed the prepared documents and agree with this submittal.

SIGNATURE

DATE

CONTINUING AUTHORITY: I have read and reviewed the prepared documents and agree with this submittal

SIGNATURE

DATE

YO 760-2{)22 (01/09)

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.

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.

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.
   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 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

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.

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.

31482

RECEIVED
JAN 02 2019
Water Protection Program

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

FOR AGENCY USE ONLY	
CHECK NUMBER	
DATE RECEIVED 1-2-19	FEE SUBMITTED 88

Note ► PLEASE READ THE ACCOMPANYING INSTRUCTIONS BEFORE COMPLETING THIS FORM.

1. This application is for:
   - ☐ An operating permit for a new or unpermitted facility:
     Please indicate the original Construction Permit # _____
   - ☑ An operating permit renewal:
     Please indicate the permit # MO- 0101729 Expiration Date June 30, 2019
   - ☐ An operating permit modification:
     Please indicate the permit # MO-_____ Modification Reason: _____

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

2. FACILITY

NAME		TELEPHONE NUMBER WITH AREA CODE
BIOKYOWA, INC		(573) 335-4849
		FAX (573) 335-1466
ADDRESS (PHYSICAL) 5469 Nash Rd.	CITY CAPE GIRARDEAU	STATE MO / ZIP CODE 63702

3. OWNER

NAME	EMAIL ADDRESS	TELEPHONE NUMBER WITH AREA CODE
KYOWA HAKKO BIO		(573) 335-4849
		FAX (573) 335-1466
ADDRESS (MAILING) P.O. BOX 1550	CITY CAPE GIRARDEAU	STATE MO / ZIP CODE 63703

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

4. CONTINUING AUTHORITY

NAME	EMAIL ADDRESS	TELEPHONE NUMBER WITH AREA CODE
SAME AS ABOVE		FAX
ADDRESS (MAILING)	CITY	STATE / ZIP CODE

5. OPERATOR

NAME	CERTIFICATE NUMBER	TELEPHONE NUMBER WITH AREA CODE
SAME AS ABOVE		FAX
ADDRESS (MAILING)	CITY	STATE / ZIP CODE

6. FACILITY CONTACT

NAME	TITLE	TELEPHONE NUMBER WITH AREA CODE
DAVE JENNINGS	Supt. of Environmental Affairs	(573) 335-4849
	E-MAIL ADDRESS dave.jennings@biokyowa.com	FAX (573) 335-1466

7. ADDITIONAL FACILITY INFORMATION

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

001 NW ¼ SE ¼ Sec 20 T 30N R 14E CAPE County
UTM Coordinates Easting (X):_____ Northing (Y): _____
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

002 NE ¼ NE ¼ Sec 28 T 30N R 13E CAPE County
UTM Coordinates Easting (X): _____ Northing (Y): _____

003 ____ ¼ ____ ¼ Sec ____ T ____ R ____ ____ County
UTM Coordinates Easting (X):_____ Northing (Y): _____

004 ____ ¼ ____ ¼ 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 2099 and NAICS 311999 002 – SIC 2048 and NAICS 311119
003 – SIC _____ and NAICS _____ 004 – SIC _____ and NAICS _____

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 or 2F. (2F is the U.S. EPA's Application for Storm Water Discharges Associate with Industrial Activity.)	YES ☑	NO ☐
B.	Is application for storm water discharges only? If yes, complete Form C or 2F.	YES ☐	NO ☑
C.	Is your facility considered a "Primary Industry" under EPA guidelines: If yes, complete Forms C or 2F and D.	YES ☐	NO ☑
D.	Is wastewater land applied? If yes, complete Form I.	YES ☐	NO ☑
E.	Is sludge, biosolids, ash or residuals generated, treated, stored or land applied? If yes, complete Form R.	YES ☑	NO ☐

F. If you are a Class IA CAFO, please disregard part D and E of this section. However, please attach any revision to your Nutrient Management Plan.

F. Attach a map showing all outfalls and the receiving stream at 1" = 2,000' scale.

9. DOWNSTREAM LANDOWNER(S) Attach additional sheets as necessary. See Instructions.
(PLEASE SHOW LOCATION ON MAP. SEE 8.D ABOVE).

NAME			
LITTLE RIVER DRAINAGE DISTRICT			
ADDRESS	**CITY**	**STATE**	**ZIP CODE**
1440 KURRE LANE	CAPE GIRARDEAU	MO	63701

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 NUMBER WITH AREA CODE
Akinori Yasuhara; President	(573) 335-4849
SIGNATURE Akinori Yasuhara	**DATE SIGNED** 12-26-2018

MO 780-1479 (07-14)

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 or 2F, if applicable?
- ☐ Form D, if applicable?
- ☐ Form I (Irrigation), if applicable?
- ☑ Form R (Sludge), if applicable?
- ☐ Revised Nutrient Management Plan, if applicable?

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH

FORM C – APPLICATION FOR DISCHARGE PERMIT – MANUFACTURING, COMMERCIAL, MINING, SILVICULTURE OPERATIONS, PROCESS AND STORMWATER

FOR AGENCY USE ONLY	
CHECK NO.	
DATE RECEIVED	FEE SUBMITTED

NOTE: DO NOT ATTEMPT TO COMPLETE THIS FORM BEFORE READING THE ACCOMPANYING INSTRUCTIONS

1.00 NAME OF FACILITY

BIOKYOWA, INC.

1.10 THIS FACILITY IS NOW IN OPERATION UNDER MISSOURI OPERATING PERMIT NUMBER

MO-0101729

1.20 THIS IS A NEW FACILITY AND WAS CONSTRUCTED UNDER MISSOURI CONSTRUCTION PERMIT NUMBER (COMPLETE ONLY IF THIS FACILITY DOES NOT HAVE AN OPERATING PERMIT).

N/A

2.00 LIST THE STANDARD INDUSTRIAL CLASSIFICATION (SIC) CODES APPLICABLE TO YOUR FACILITY (FOUR DIGIT CODE)

A. FIRST 2099 (Food Preparations, Not Elsewhere Cl.) B. SECOND 2048 (Animal Feed)

C. THIRD _____ D. FOURTH _____

2.10 FOR EACH OUTFALL GIVE THE LEGAL DESCRIPTION.

OUTFALL NUMBER (LIST) NW 1/4 SE 1/4 SEC 20 T 30N R 14E CAPE GIRARDEAU COUNTY

2.20 FOR EACH OUTFALL LIST THE NAME OF THE RECEIVING WATER

OUTFALL NUMBER (LIST)	RECEIVING WATER
001	MISSISSIPPI RIVER

2.30 BRIEFLY DESCRIBE THE NATURE OF YOUR BUSINESS

BioKyowa manufactures amino acids in two manufacturing facilities at this site. Each of these facilities use a similar manufacturing process. The "crude grade" amino acids produced at each facility are used by others as food additives and food supplements, animal food, and as a raw material by other chemical manufacturers.

The manufacturing process is based on the fermentation of sugars using pure microbial producing strains such as, E. coli cultures, selected to produce specific amino acids. A sterilized broth, consisting of purified well water, sugar, and nutrients is inoculated with the pure microbial culture in fermentation tanks. After completion of fermentation, the amino acid product is extracted from the broth using various processes. The amino acid is then purified and converted from a liquid solution to a dried crystal. The dried crystal is then packaged for distribution and sale.

Process wastewater is generated from the fermentation, the extraction process, tank cleaning, utility operations and other miscellaneous sources. This wastewater consists of carbonaceous materials (sugar, bacterial cultures), suspended solids, nutrients (nitrogen), and ammonia. The process wastewater is sent to an activated sludge treatment facility consisting of flow equalization and pH adjustment, primary settling, aeration tanks, secondary settling, and filtration. The treated process wastewater is then pumped to the Mississippi River and discharged through a submerged, high-rate diffuser (Outfall 001). Waste solids from the manufacturing process are shipped off-site for land application as a fertilizer, as part of a bio-solids management plan. Waste solids from wastewater treatment thickened by centrifuge for disposal in a landfill. BioKyowa is investigating other uses for the waste solids.

BioKyowa uses well water from on-site wells in the manufacturing process. Raw well water is purified using de-ionization and/or reverse osmosis. Reject water from the de-ionization process is discharged through Outfall 001. Reject water from reverse osmosis is discharged to Outfall 002. A portion of the purified water is used in the manufacturing process. The remainder is used in the boilers and cooling water system. Non-contact cooling water (NCCW) is discharged through Outfall 002 to the Headwater Diversion Channel. A portion of the NCCW may be diverted to the stormwater holding pond to reduce temperature before discharge. Stormwater runoff, along with any diverted NCCW, is also discharged through Outfall 002.

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 by 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.	2. OPERATION(S) CONTRIBUTING FLOW		3. TREATMENT	
(LIST)	A. OPERATION (LIST)	B. AVERAGE FLOW (INCLUDE UNITS) (MAXIMUM FLOW)	A. DESCRIPTION	B. LIST CODES FROM TABLE A
001	MANUFACTURING		EQUALIZATION	1-O
	BOILER BLOWDOWN		PRI. SETTLING	1-U
	AIR SCRUBBER		AERATION	3-A
	DE-IONIZED BACKWASH		SEC. SETTLING	1-U
	STORMWATER		AERATION	3-A
			MEMBRANE FILT.	5-U
		876 GPM (1,870 GPM)	DIFFUSER	4-A
		357 TONS/MO (770 T/MO)	THICKENING	5-D

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 *(list)*	2. OPERATION(S) CONTRIBUTING FLOW *(list)*	3. FREQUENCY		4. FLOW				C. DURATION *(in days)*
				A. FLOW RATE *(in mgd)*		B. TOTAL VOLUME (specify with units)		
		A. DAYS PER WEEK *(specify average)*	B. MONTHS PER YEAR *(specify average)*	1. 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 GUIDELINES EXPRESSED IN TERMS OF PRODUCTION (OF 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 *(list outfall numbers)*
A. QUANTITY PER DAY	B. UNITS OF MEASURE	C. OPERATION, PRODUCT, MATERIAL, ETC. *(specify)*	

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.

3.10 BIOLOGICAL TOXICITY TESTING DATA

DO YOU HAVE ANY KNOWLEDGE OR REASON TO BELIEVE THAT ANY BIOLOGICAL TEST FOR ACUTE OR CHRONIC TOXICITY HAS BEEN MADE ON ANY OF YOUR DISCHARGES OR ON RECEIVING WATER IN RELATION TO YOUR DISCHARGE WITHIN THE LAST THREE YEARS?

☑ YES (IDENTIFY THE TEST(S) AND DESCRIBE THEIR PURPOSES BELOW.) ☐ NO (GO TO 3.20)

WE PERFORM WET TEST ON OUTFALL 001 AS PER PERMIT CONDITIONS.

3.20 CONTRACT ANALYSIS INFORMATION

WERE ANY OF THE ANALYSES REPORTED PERFORMED BY A CONTRACT LABORATORY OR CONSULTING FIRM?

☑ YES (*LIST THE NAME, ADDRESS AND TELEPHONE NUMBER OF AND POLLUTANTS ANALYZED BY EACH SUCH LABORATORY OR FIRM BELOW.*) ☐ NO *(GO TO 3.30)*

A. NAME	B. ADDRESS	C. TELEPHONE *(area code and number)*	D. POLLUTANTS ANALYZED *(list)*
ENVIRONMENTAL ANALYSIS SOUTH	4000 E. JACKSON BLVD. JACKSON, MO 63755	573-204-8817	Per Standard

3.30 CERTIFICATION

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED IN THIS APPLICATION AND ALL ATTACHMENTS AND THAT, BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THAT THE INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.

NAME AND OFFICIAL TITLE (TYPE OR PRINT)	TELEPHONE NUMBER WITH AREA CODE
Akinori Yasuhara, President	(573) 335-4849
SIGNATURE (SEE INSTRUCTIONS) Akinori Yasuhara	DATE SIGNED 12-26-2018

PLEASE PRINT OR TYPE. You may report some or all of this information on separate sheet *(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

OUTFALL NO. 001

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.

1. POLLUTANT	2. EFFLUENT							3. UNITS *(specify if blank)*		4. INTAKE *(optional)*		
	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE *(if available)*		C. LONG TERM AVRG. VALUE *(if available)*		D. NO. OF ANALYSES	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
A. Biochemical Oxygen Demand (BOD)	1390	15002	1017	10619	279	2959	273	mg/L	lbs			
B. Chemical Oxygen Demand (COD)	3400	35028	2265	22973	1024	10918	272	mg/L	lbs			
C. Total organic Carbon (TOC)												
D. Total Suspended Solids (TSS)	1600	18493	903	9628	373	3925	272	mg/L	lbs			
E. Ammonia *(as N)*	1470	16251	1098	12452	562	6044	275	mg/L	lbs			
F. Flow	VALUE 2.69		VALUE 1.47		VALUE 1.26			mgd		VALUE		
G. Temperature *(winter)*	VALUE		VALUE		VALUE			°C		VALUE		
H. Temperature *(summer)*	VALUE		VALUE		VALUE			°C		VALUE		
I. pH	MINIMUM 6.6	MAXIMUM 8.96	MINIMUM 7.1	MAXIMUM 8.3			272	STANDARD UNITS				

PART B – Mark "X" in column 2A for each pollutant you know or have reason to believe is present. Mark "X" in column 2B for each pollutant you believe to be absent. If you mark column 2A for any pollutant, you must provide the results for at least one analysis for 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. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE *(if available)*		C. LONG TERM AVRG. VALUE *(if available)*		D. NO. OF ANALYSES	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
CONVENTIONAL AND NONCONVENTIONAL POLLUTANTS														
A. Bromide (24959-67-9)		X												
B. Chlorine, Total Residual		X												
C. Color		X												
D. Fecal Coliform		X												
E. Fluoride (16984-48-8)		X												
F. Nitrate - Nitrate *(as N)*	X		94.2	668			7.96	84.7	201	mg/L	lbs			

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE *(if available)*		C. LONG TERM AVRG. VALUE *(if available)*		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
G. Nitrogen, Total Organic *(as N)*		X												
H. Oil and Grease		X												
I. Phosphorus *(as P)*, Total (7723-14-0)		X												
J. Sulfate *(as SO^4)* (14808-79-8)		X												
K. Sulfide *(as S)*		X												
L. Sulfite (as SO^3) (14265-45-3)		X												
M. Surfactants		X												
N. Aluminum, Total (7429-90-5)		X												
O. Barium, Total (7440-39-3)		X												
P. Boron, Total (7440-42-8)		X												
Q. Cobalt, Total (7440-48-4)		X												
R. Iron, Total (7439-89-6)		X												
S. Magnesium, Total (7439-95-4)		X												
T. Molybdenum, Total (7439-98-7)		X												
U. Manganese, Total (7439-96-5)		X												
V. Tin, Total (7440-31-5)		X												
W. Titanium, Total (7440-32-6)		X												

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, AND TOTAL PHENOLS														
1M. Antimony, Total (7440-36-0)		X												
2M. Arsenic, Total (7440-38-2)		X												
3M. Beryllium, Total (7440-41-7)		X												
4M. Cadmium, Total (7440-43-9)		X												
5M. Chromium III (16065-83-1)		X												
6M. Chromium VI (18540-29-9)		X												
7M. Copper, Total (7440-50-8)		X												
8M. Lead, Total (7439-92-1)		X												
9M. Mercury, Total (7439-97-6)		X												
10M. Nickel, Total (7440-02-0)		X												
11M. Selenium, Total (7782-49-2)		X												
12M. Silver, Total (7440-22-4)		X												
13M. Thallium, Total (7440-28-0)		X												
14M. Zinc, Total (7440-66-6)		X												
15M. Cyanide, Amenable to Chlorination		X												
16M. Phenols, Total		X												
RADIOACTIVITY														
(1) Alpha Total		X												
(2) Beta Total		X												
(3) Radium Total		X												
(4) Radium 226 Total		X												

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION BRANCH

FORM C – APPLICATION FOR DISCHARGE PERMIT – MANUFACTURING, COMMERCIAL, MINING, SILVICULTURE OPERATIONS, PROCESS AND STORMWATER

FOR AGENCY USE ONLY	
CHECK NO.	
DATE RECEIVED	FEE SUBMITTED

NOTE: DO NOT ATTEMPT TO COMPLETE THIS FORM BEFORE READING THE ACCOMPANYING INSTRUCTIONS

1.00 NAME OF FACILITY

BIOKYOWA, INC.

1.10 THIS FACILITY IS NOW IN OPERATION UNDER MISSOURI OPERATING PERMIT NUMBER

MO-0101729

1.20 THIS IS A NEW FACILITY AND WAS CONSTRUCTED UNDER MISSOURI CONSTRUCTION PERMIT NUMBER (COMPLETE ONLY IF THIS FACILITY DOES NOT HAVE AN OPERATING PERMIT).

N/A

2.00 LIST THE STANDARD INDUSTRIAL CLASSIFICATION (SIC) CODES APPLICABLE TO YOUR FACILITY (FOUR DIGIT CODE)

A. FIRST 2099 (Food Preparations, Not Elsewhere Cl.) B. SECOND 2048 (Animal Feed)

C. THIRD _____ D. FOURTH _____

2.10 FOR EACH OUTFALL GIVE THE LEGAL DESCRIPTION.

OUTFALL NUMBER (LIST) NE 1/4 SE 1/4 SEC 28 T 30N R 14E CAPE GIRARDEAU COUNTY

2.20 FOR EACH OUTFALL LIST THE NAME OF THE RECEIVING WATER

OUTFALL NUMBER (LIST)	RECEIVING WATER
002	HEADWATERS DIVERSION CHANNEL

2.30 BRIEFLY DESCRIBE THE NATURE OF YOUR BUSINESS

BioKyowa manufactures amino acids in two manufacturing facilities at this site. Each of these facilities use a similar manufacturing process. The "crude grade" amino acids produced at each facility are used by others as food additives and food supplements, animal food, and as a raw material by other chemical manufacturers.

The manufacturing process is based on the fermentation of sugars using pure microbial producing strains such as, E. coli cultures, selected to produce specific amino acids. A sterilized broth, consisting of purified well water, sugar, and nutrients is inoculated with the pure microbial producing culture in fermentation tanks. After completion of fermentation, the amino acid product is extracted from the broth using various processes. The amino acid is then purified and converted from a liquid solution to a dried crystal. The dried crystal is then packaged for distribution and sale.

Process wastewater is generated from the fermentation, the extraction process, tank cleaning, utility operations and other miscellaneous sources. This wastewater consists of carbonaceous materials (sugar, bacterial cultures), suspended solids, nutrients (nitrogen), and ammonia. The process wastewater is sent to an activated sludge treatment facility consisting of flow equalization and pH adjustment, primary settling, aeration tanks, secondary settling, and filtration. The treated process wastewater is then pumped to the Mississippi River and discharged through a submerged, high-rate diffuser (Outfall 001). Waste solids from the manufacturing process are shipped off-site for land application as a fertilizer, as part of a bio-solids management plan. Waste solids from wastewater treatment thickened by centrifuge for disposal in a landfill. BioKyowa is investigating other uses for the waste solids.

BioKyowa uses well water from on-site wells in the manufacturing process. Raw well water is purified using de-ionization and/or reverse osmosis. Reject water from the de-ionization process is discharged through Outfall 001. Reject water from reverse osmosis is discharged to Outfall 002. A portion of the purified water is used in the manufacturing process. The remainder is used in the boilers and cooling water system. Non-contact cooling water (NCCW) is discharged through Outfall 002 to the Headwater Diversion Channel. A portion of the NCCW may be diverted to the stormwater holding pond to reduce temperature before discharge. Stormwater runoff, along with any diverted NCCW, is also discharged through Outfall 002.

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 by 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.	2. OPERATION(S) CONTRIBUTING FLOW		3. TREATMENT	
(LIST)	A. OPERATION (LIST)	B. AVERAGE FLOW (INCLUDE UNITS) (MAXIMUM FLOW)	A. DESCRIPTION	B. LIST CODES FROM TABLE A
002	REVERSE OSMOSIS			
	NCCW			
	BAROMETRIC COND.			
	STORMWATER			
		3,326 GPM (10,026 GPM)	STORM POND	1-F
			OUTFALL	4-A

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 *(list)*	2. OPERATION(S) CONTRIBUTING FLOW *(list)*	3. FREQUENCY		4. FLOW				C. DURATION *(in days)*
				A. FLOW RATE *(in mgd)*		B. TOTAL VOLUME (specify with units)		
		A. DAYS PER WEEK *(specify average)*	B. MONTHS PER YEAR *(specify average)*	1. 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 GUIDELINES EXPRESSED IN TERMS OF PRODUCTION (OF 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 *(list outfall numbers)*
A. QUANTITY PER DAY	B. UNITS OF MEASURE	C. OPERATION, PRODUCT, MATERIAL, ETC. *(specify)*	

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.

3.00 INTAKE AND EFFLUENT CHARACTERISTICS

A. & B. SEE INSTRUCTIONS BEFORE PROCEEDING – COMPLETE ONE TABLE FOR EACH OUTFALL – ANNOTATE THE OUTFALL NUMBER IN THE SPACE PROVIDED.
NOTE: TABLE 1 IS INCLUDED ON SEPARATE SHEETS NUMBERED FROM PAGE 6 TO PAGE 7.

C. USE THE SPACE BELOW TO LIST ANY OF THE POLLUTANTS LISTED IN PART B OF THE INSTRUCTIONS, WHICH YOU KNOW OR HAVE REASON TO BELIEVE IS DISCHARGED OR MAY BE DISCHARGED FROM ANY OUTFALL. FOR EVERY POLLUTANT YOU LIST, BRIEFLY DESCRIBE THE REASONS YOU BELIEVE IT TO BE PRESENT AND REPORT ANY ANALYTICAL DATA IN YOUR POSSESSION.

1. POLLUTANT	2. SOURCE	1. POLLUTANT	2. SOURCE

3.10 BIOLOGICAL TOXICITY TESTING DATA

DO YOU HAVE ANY KNOWLEDGE OR REASON TO BELIEVE THAT ANY BIOLOGICAL TEST FOR ACUTE OR CHRONIC TOXICITY HAS BEEN MADE ON ANY OF YOUR DISCHARGES OR ON RECEIVING WATER IN RELATION TO YOUR DISCHARGE WITHIN THE LAST THREE YEARS?

☑ YES (IDENTIFY THE TEST(S) AND DESCRIBE THEIR PURPOSES BELOW.) ☐ NO (GO TO 3.20)

WE PERFORM WET TEST ON OUTFALL 001 AS PER PERMIT CONDITIONS.

3.20 CONTRACT ANALYSIS INFORMATION

WERE ANY OF THE ANALYSES REPORTED PERFORMED BY A CONTRACT LABORATORY OR CONSULTING FIRM?

☑ YES (*LIST THE NAME, ADDRESS AND TELEPHONE NUMBER OF AND POLLUTANTS ANALYZED BY EACH SUCH LABORATORY OR FIRM BELOW.*) ☐ NO *(GO TO 3.30)*

A. NAME	B. ADDRESS	C. TELEPHONE *(area code and number)*	D. POLLUTANTS ANALYZED *(list)*
ENVIRONMENTAL ANALYSIS SOUTH	4000 E. JACKSON BLVD. JACKSON, MO 63755	573-204-8817	

3.30 CERTIFICATION

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED IN THIS APPLICATION AND ALL ATTACHMENTS AND THAT, BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THAT THE INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.

NAME AND OFFICIAL TITLE (TYPE OR PRINT)	TELEPHONE NUMBER WITH AREA CODE
Akinori Yasuhara, President	(573) 335-4849
SIGNATURE (SEE INSTRUCTIONS) akinori Yasuhara	DATE SIGNED 12-26-2018

PLEASE PRINT OR TYPE. You may report some or all of this information on separate sheet *(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

OUTFALL NO. 002

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.

1. POLLUTANT	2. EFFLUENT							3. UNITS *(specify if blank)*		4. INTAKE *(optional)*		
	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE *(if available)*		C. LONG TERM AVRG. VALUE *(if available)*		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
A. Biochemical Oxygen Demand (BOD)	28.1	1237	28.1	1237	5.20	213	44	mg/L	lbs/day			
B. Chemical Oxygen Demand (COD)												
C. Total organic Carbon (TOC)												
D. Total Suspended Solids (TSS)	18.0	583	18.0	583	3.18	130	45	mg/L	lbs/day			
E. Ammonia *(as N)*	2.5	137	2.5	137	0.179	7.42	57	mg/L	lbs/day			
F. Flow	VALUE 14.44		VALUE 6.29		VALUE 4.82		1809	mgd		VALUE		
G. Temperature *(winter)*	VALUE 17.2		VALUE		VALUE 9.2		30	°C		VALUE		
H. Temperature *(summer)*	VALUE 33.9		VALUE		VALUE 24.3		26	°C		VALUE		
I. pH	MINIMUM 6.6	MAXIMUM 7.9	MINIMUM 6.6	MAXIMUM 7.9			60	STANDARD UNITS				

PART B – Mark "X" in column 2A for each pollutant you know or have reason to believe is present. Mark "X" in column 2B for each pollutant you believe to be absent. If you mark column 2A for any pollutant, you must provide the results for at least one analysis for 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. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE *(if available)*		C. LONG TERM AVRG. VALUE *(if available)*		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
CONVENTIONAL AND NONCONVENTIONAL POLLUTANTS														
A. Bromide (24959-67-9)		X												
B. Chlorine, Total Residual	X		100	4.83			<43.2	<1.78	31	ug/L	lbs/day			
C. Color		X												
D. Fecal Coliform		X												
E. Fluoride (16984-48-8)	X		0.50	95.0			<0.26	<16.5	14	mg/L	lbs/day			
F. Nitrate - Nitrate *(as N)*	X		0.50	16.91			<0.17	<6.89	31	mg/L	lbs/day			

1. POLLUTANT AND CAS NUMBER *(if available)*	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE *(optional)*		
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE *(if available)*		C. LONG TERM AVRG. VALUE *(if available)*		D. NO. OF ANALYSES	A. CONCEN-TRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
G. Nitrogen, Total Organic *(as N)*		X												
H. Oil and Grease	X		< 5.00				< 5.00		12	mg/L				
I. Phosphorus *(as P)*, Total (7723-14-0)		X												
J. Sulfate *(as SO^4)* (14808-79-8)	X		67.3	2860			31.8	1297	31	mg/L	lbs/day			
K. Sulfide *(as S)*		X												
L. Sulfite (as SO^3) (14265-45-3)		X												
M. Surfactants		X												
N. Aluminum, Total (7429-90-5)	X		94.0	3.57			<31.0	<1.22	14	ug/L	lbs/day			
O. Barium, Total (7440-39-3)	X		880	46.8			728	30.4	31	ug/L	lbs/day			
P. Boron, Total (7440-42-8)		X												
Q. Cobalt, Total (7440-48-4)		X												
R. Iron, Total (7439-89-6)	X		2300	117			781	35.6	14	ug/L	lbs/day			
S. Magnesium, Total (7439-95-4)		X												
T. Molybdenum, Total (7439-98-7)		X												
U. Manganese, Total (7439-96-5)		X												
V. Tin, Total (7440-31-5)		X												
W. Titanium, Total (7440-32-6)		X												

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	A. BELIEVED PRESENT	B. BELIEVED ABSENT	A. MAXIMUM DAILY VALUE		B. MAXIMUM 30 DAY VALUE (if available)		C. LONG TERM AVRG. VALUE (if available)		D. NO. OF ANALYSES	A. CONCENTRATION	B. MASS	A. LONG TERM AVRG. VALUE		B. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, AND TOTAL PHENOLS														
1M. Antimony, Total (7440-36-0)		X												
2M. Arsenic, Total (7440-38-2)		X												
3M. Beryllium, Total (7440-41-7)		X												
4M. Cadmium, Total (7440-43-9)		X												
5M. Chromium III (16065-83-1)		X												
6M. Chromium VI (18540-29-9)		X												
7M. Copper, Total (7440-50-8)	X		10	0.43			<3.59	<0.15	31	ug/L	lbs/day			
8M. Lead, Total (7439-92-1)	X		10	0.59			<5.97	<0.23	31	ug/L	lbs/day			
9M. Mercury, Total (7439-97-6)		X												
10M. Nickel, Total (7440-02-0)		X												
11M. Selenium, Total (7782-49-2)	X		12	0.59			<6.10	<0.25	31	ug/L	lbs/day			
12M. Silver, Total (7440-22-4)		X												
13M. Thallium, Total (7440-28-0)		X												
14M. Zinc, Total (7440-66-6)		X												
15M. Cyanide, Amenable to Chlorination		X												
16M. Phenols, Total		X												
RADIOACTIVITY														
(1) Alpha Total		X												
(2) Beta Total		X												
(3) Radium Total		X												
(4) Radium 226 Total		X												

Summary of outfall 001 for first 10 months applicable to current permit	
	Year 2018 (February through November)
Average Daily Flow	1.23 MGD
Maximum Daily Flow	1.68 MGD
Average Daily BOD Concentration	61.1 mg/l
Maximum Daily BOD Concentration	206 mg/l
Average Daily BOD MASS	611 pounds
Maximum Daily BOD MASS	1949 pounds
Average Daily COD Concentration	338 mg/l
Maximum Daily COD Concentration	1225 mg/l
Average Daily COD MASS	3331 pounds
Maximum Daily COD MASS	10,206 pounds
Average Daily NH3-N Concentration	344 mg/l
Maximum Daily NH3-N Concentration	972 mg/l
Average Daily NH3-N MASS	3426 ponds
Maximum Daily NH3-N MASS	10,867 pounds
Average Daily TSS Concentration	57 mg/l
Maximum Daily TSS Concentration	680 mg/l
Average Daily TSS MASS	586 pounds
Maximum Daily TSS MASS	7622 pounds
Average Daily Nitrates Concentration	51 mg/l
Maximum Daily Nitrates Concentration	146 mg/l
Average Daily Nitrates MASS	443 pounds
Maximum Daily Nitrates MASS	1352 pounds

Summary of outfall 002 for first 10 months applicable to current permit				
Average Flow for period	4.514 MGD			
Maximum Flow for period	8.279 MGD			
	Average Concentration	Maximum Concentration	Average Mass (pounds)	Maximum Mass (pounds)
BOD	<2.68 mg/l	5.98 mg/l	<117.4234	199.09
TSS	<2 mg/l	14 mg/l	<174.8648	790.82
pH	7.8	7.9	7.76	7.90
Oil & Grease	<2	5.1		
Ammonia Nitrogen	<0.02 mg/l	0.156 mg/l	<2.395042	7.12
Aluminum	<10 µg/l	10 µg/l	<1.547455	4.67
Chlorides	<16.6 mg/l	26 mg/l	<495.8961	1212.14
Flouride	<0.58 mg/l	1 mg/l	<21.52542	37.85
Iron	<640 µg/l	1000 µg/l	<30.00782	53.10
Selenium	<2.6 µg/l	5 µg/l	<0.107502	0.23
Sulfates	<44 mg/l	44 mg/l	<1338.889	1977.04
Copper	<3 µg/l	7.1 µg/l	<0.155123	0.33
Total Residual Chlorine	<40 µg/l	<40 µg/l	<1.490488	<2.259473
Lead	<1 µg/l	5 µg/l	<0.091205	0.23
Nitrates	<0.213 mg/l	0.213 mg/l	<4.166711	11.13
Barium	730 µg/l	770 µg/l	25.03	37.28

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.

(Note: Form D can be found in Attachment 4.31.)

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

1.00 FACILITY INFORMATION

1.10 Facility Name
Kyowa Hakko Bio - BioKyowa, Inc.

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. 003 ___ ___ ___ ___ ___

2.00 STORAGE BASINS *See Attachment 2.00*

2.10 Number of storage basins: 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 _____ Width _____ Depth _____ Freeboard _____ Berm Width _____ % Slope _____
Basin #2: Length _____ Width _____ Depth _____ 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:	Permanent Volume +	Storage =	Total volume (gallons) Basin
#2:	Gallons:	Permanent Volume +	Storage =	Total volume (gallons)

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

2.40 Storage Basin design storage capacity: (storage between minimum and maximum operating levels for 1-in10 year storm water flows.)
Basin #1: ___days Basin #2: ___days Basin #3: ___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. *N/A*

2.70 Attach a closure plan for lagoons, storage basins and treatment units. *N/A*

3.00 LAND APPLICATION SYSTEM

3.10 Number of application sites 31 Total Available Acres 8,573.2 Minimum & Maximum % field slopes 0-10
Location: ___¼ ___¼ ___¼ ___Sec. ___T ___R _____County ___Acres
Location: ___¼ ___¼ ___¼ ___Sec. ___T ___R _____County ___Acres
Attach extra sheets as necessary. *See Attachment 3.10*

3.12 Type of vegetation: ☑ Grass hay ☐ Pasture ☐ Timber ☑ Row crops ☐ Other (describe) _____
Specific Crops and Yields/acre: Goal: _____ Actual for last five years: _____ *See Attachment 3.12*

3.20 Annual sludge production (gallons per year): 1,883,445 Actual (*based on 5-yr. average*) 5,785,550 Design
(dry tons per year): 564.7 Actual (*based on 5-yr. average*) 2,467 Design
Human Population Equivalent: _____ Actual _____ Design

3.21 Land Application rate per acre: ***See Attachment 3.21***
Design: 1-2 dry ton/year 1-2 dry ton/application 1 No. applications/year
Actual: 1.55 dry ton/year 1.55 dry ton/application 1 No. applications/year
Total amount land applied each year (total all sites) Design 2,467 dry ton/year Actual 564.7 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: ***See Attachment 3.22***
☐ Nutrient Management Plan (N&P) ☑ PAN ☐ Conservative
☐ Hydraulic Loading ☐ Limiting Pollutant (Specify) _____
☐ Other (describe)

3.30 Equipment type: ***See Attachment 3.30*** ☐ ☐ ☐
☐ Tank wagon Tank truck Subsurface injection Slinger spreader Dry spreader Other (describe) ___
Equipment Capacity: Gallons (cubic feet) per hour 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: ***See Attachment 3.50***
100 Permanent flowing stream 300 Losing Stream 50 Intermittent (wet weather) stream 100 Lake or pond
50 Property boundary 50 Dwellings 300 Water supply well 100 Other (describe) Wetlands

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 _____ Depth of bedrock ____Feet Depth to water table ____Feet ***See soils info on maps in Attachment 3.50***
Soil Infiltration rate in inches/hour (in/hr) for most restrictive layer within the following soil depth ranges:
_____In/hr for 0-12 inch soil depth _____In/hr for 12-24 inch soil depth _____In/hr for 24-60 inch soil depth
Also see Attachment 3.60 (Soil Survey Maps)

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. ***See Attachment 3.70***

3.80 Geologic Investigation: 4/25/2000 Date of most recent Geologic Report by Department's Division of Geology and Land Survey. ***See Attachment 3.80***

3.81 Ground Water Monitoring Wells: (Attach Groundwater Monitoring Plan when required by department) ***See Attachment 3.81***
☐ NONE ☑ EXISTING ☐ PLANNED NUMBER: 9 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:
See Attachment 3.90 for BioKyowa's Interim Biosolids Management Plan.

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

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

4.00 INDUSTRIAL PROCESS INFORMATION ***See Attachment 4.00***

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)
_____

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

See Attachment 4.00

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. *See Attachment 4.31 (Form D)*

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 Bulleting 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. ***See Attachment 5.00. Also see Volume 2 for Maps and Soil Test Results***

Total area sampled is 8,573.2 acres. Each composite sample covers 1-20 acres. Each composite consists of 12-15 subsamples.

Sample depth: ☑ 0-6 inches ☐ 0-12 inches ☐ Other (describe) ____ See Attachment 5.00 For Soil Summary for Fields

Pollutant	Concentration (mg/kg or ppm)			Pounds/ Acre	No. Composite Samples	Sample Period
	Minimum	Maximum	Average			
Organic Nitrogen as N						
Ammonia Nitrogen as N						
Nitrate Nitrogen as N						
Phosphorus as P (Bray 1P)						
Exchangeable Sodium %						
Organic Matter (percent)						
Cation Exchange Capacity						
pH (standard units)						
Other pollutants present in the material to be land applied: (Attach extra sheets as necessary)						

6.00 LAND LIMITING CONSTITUENTS FOR LAND APPLICATION

6.10 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. *See Attachment 6.10*

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

6.20 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. *See Attachment 6.20*

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

6.30 Other Limiting Pollutants for Land Application Rates. Specify any other pollutants that are most limiting for determining land application rates. Include any additional significant pollutants from Section 4 that is not already listed in Section 6.00. Attach extra sheets as necessary. ***See Attachment 6.30***

Pollutant	Concentration (mg/kg dry weight)			Design LBS/ Acre/Year	Type of Samples	Number Samples	Sample Location	Sample Period
	Minimum	Maximum	Average					

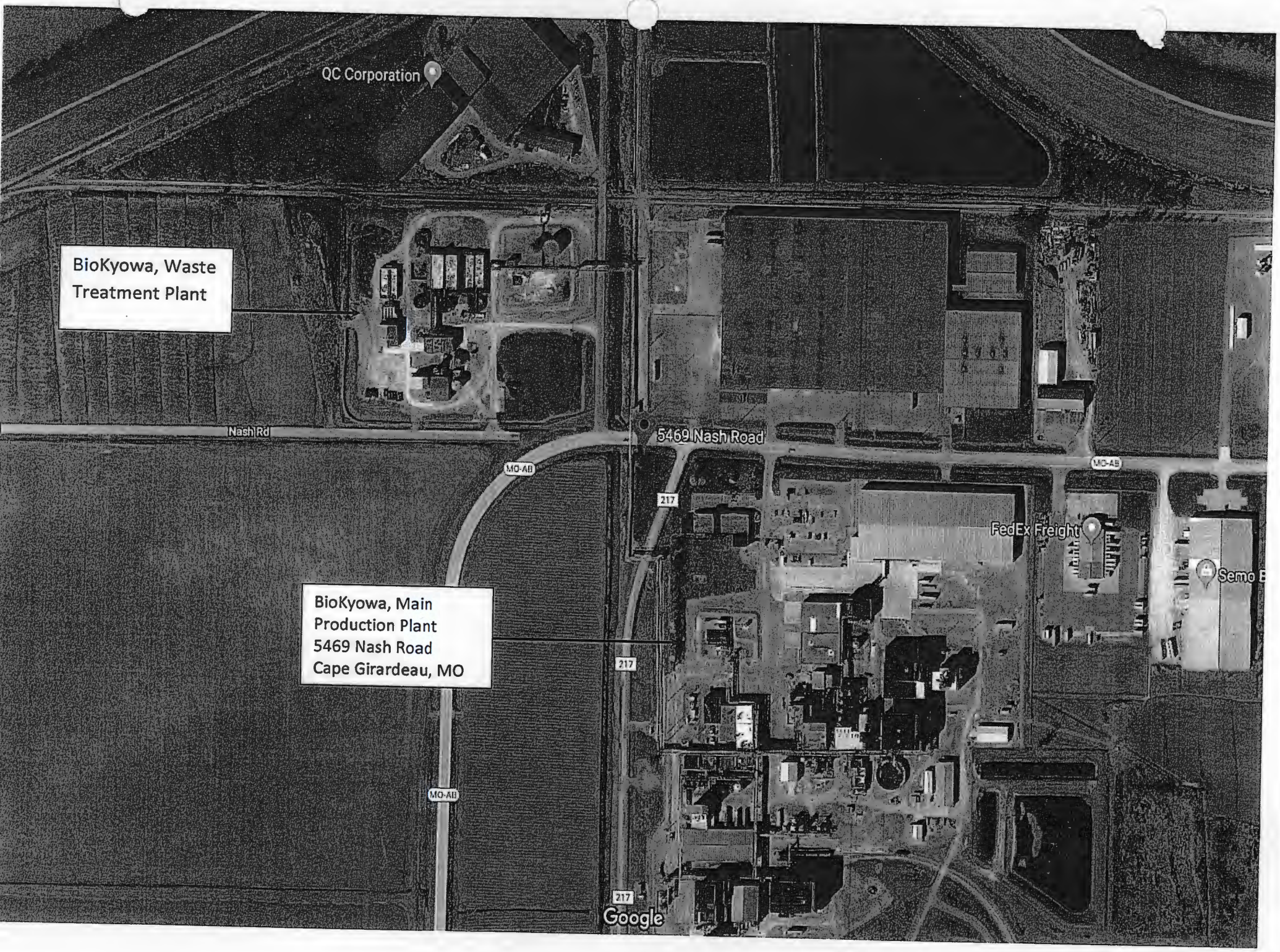
6.40 Requirements for Public Use Sites. Complete this if land application onto public use or public access sites or if material will be distributed for general public use. Fecal Coliform, Salmonella and Enteric Virus must be tested if the biosolids include waste material from humans, animals, vegetables or organic matter. ***N/A – No public use site; agricultural only.***

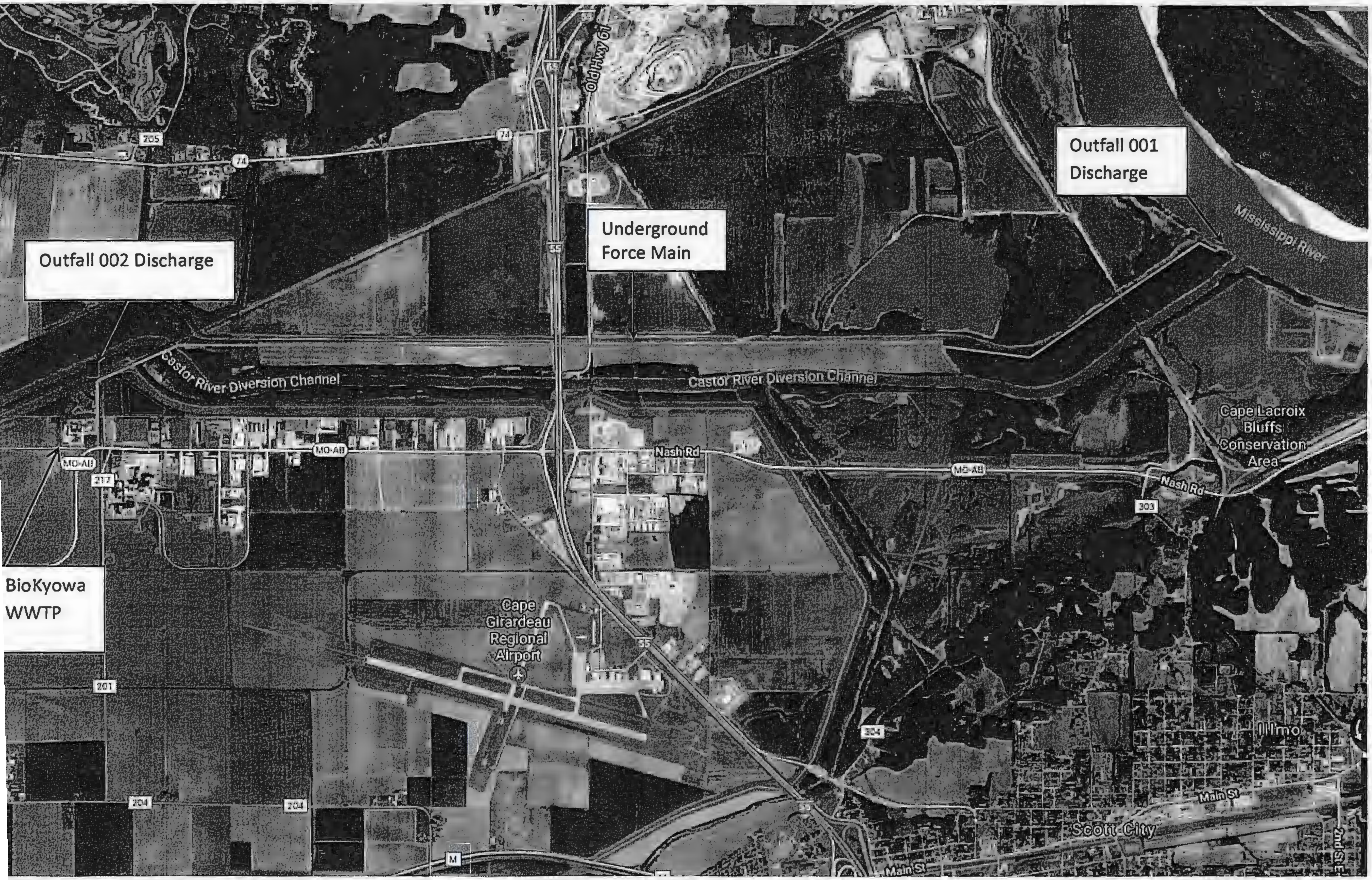
Pollutant		Concentration (mg/kg dry weight)			Type of Samples	Number Samples	Sample Location	Sample Period
		Minimum	Maximum	Average				
Total Dioxin TEQ*								
* Required Only for public access sites. TEQ = Toxicity Equivalents for CDD and CDF isomers per EPA Publication EPA/625/3-89/016 and EPA method 1613. Detection limits must be less than 1.0 ppt.								
Fecal Coliform								
Salmonella								
Enteric Virus								
Other (specify)	***Fertilizer Exemptions (See Attachment FE)***							

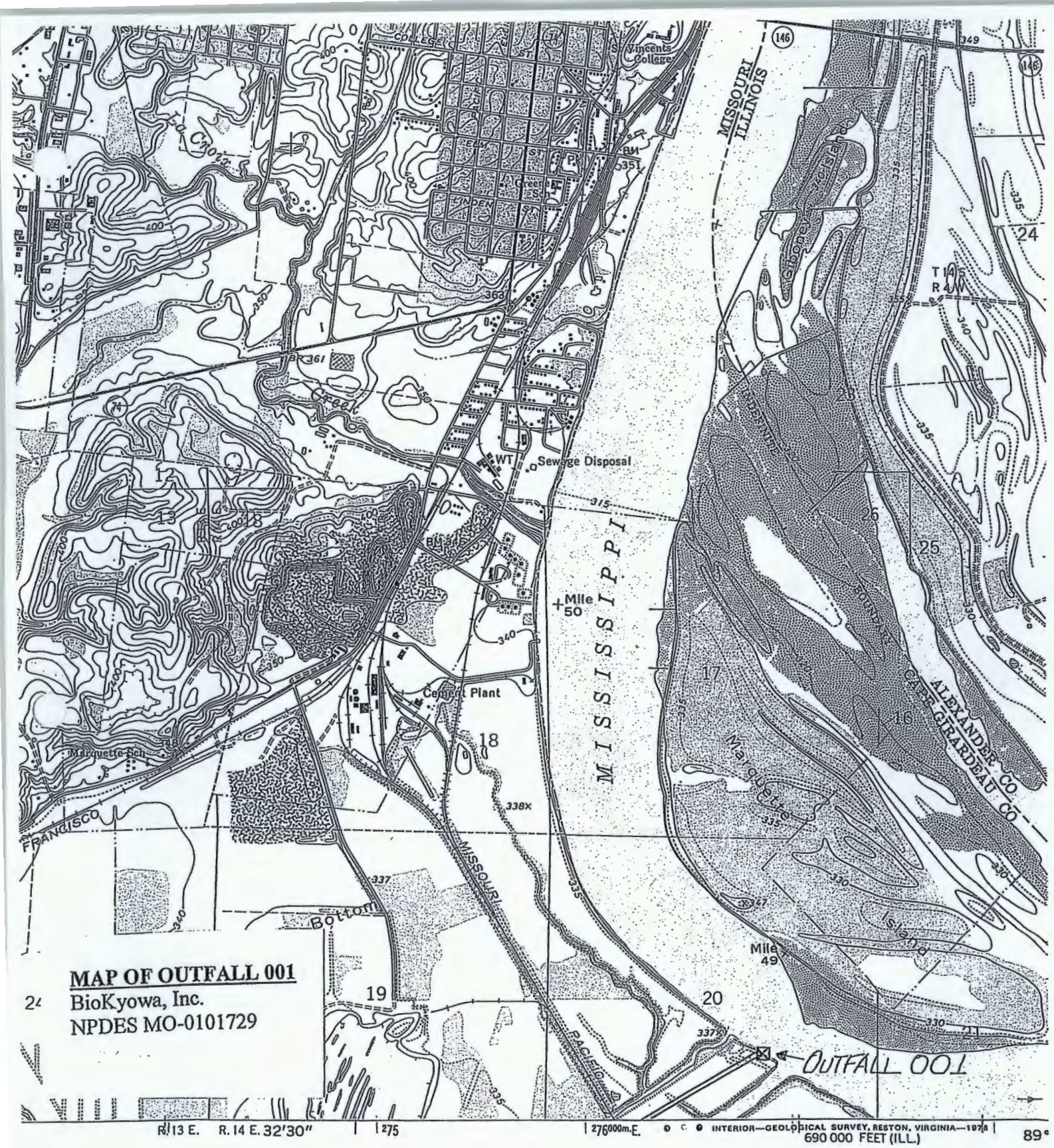
7.00 CERTIFICATION

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED IN THIS APPLICATION AND ALL ATTACHMENTS AND THAT BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THIS INFORMATION, I BELIEVE THAT THE INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE OR IMPRISSONMENT.

CONSULTING ENGINEER – Name, Official Title and Engineering Firm (TYPE OR PRINT)	TELEPHONE NUMBER (area code and number)
Anthony G. Boone, Boone Consulting	217-656-3668
SIGNATURE Anthony G. Boone	DATE SIGNED 9-8-16
OWNER OR AUTHORIZED REPRESENTATIVE – Name and Official Title (TYPE OR PRINT)	TELEPHONE NUMBER (area code and number)
David C. Jennings, Environmental Coordinator	573-335-4849
SIGNATURE David C. Jennings	DATE SIGNED 9-8-16


QC Corporation
BioKyowa, Waste Treatment Plant
Nash Rd
5469 Nash Road
MO-AB
217
FedEx Freight
Semo
BioKyowa, Main Production Plant
5469 Nash Road
Cape Girardeau, MO
MO-AB
217
MO-AB
217
Google


Outfall 001 Discharge
Underground Force Main
Outfall 002 Discharge
BioKyowa WWTP
Castor River Diversion Channel
Castor River Diversion Channel
Mississippi River
Old Hwy 61
Nash Rd
MO-AB
Cape Lacroix Bluffs Conservation Area
Cape Girardeau Regional Airport
Illmo
Scott City
Main St
Main St
2nd St E



1 MILE

6000 7000 FEET

1 KILOMETER

OURS
1929

Y STANDARDS
1225, OR RESTON, VIRGINIA 22092
SOURI 65401
LINOIS 61801

MISSOURI

QUADRANGLE LOCATION

ROAD CLASSIFICATION

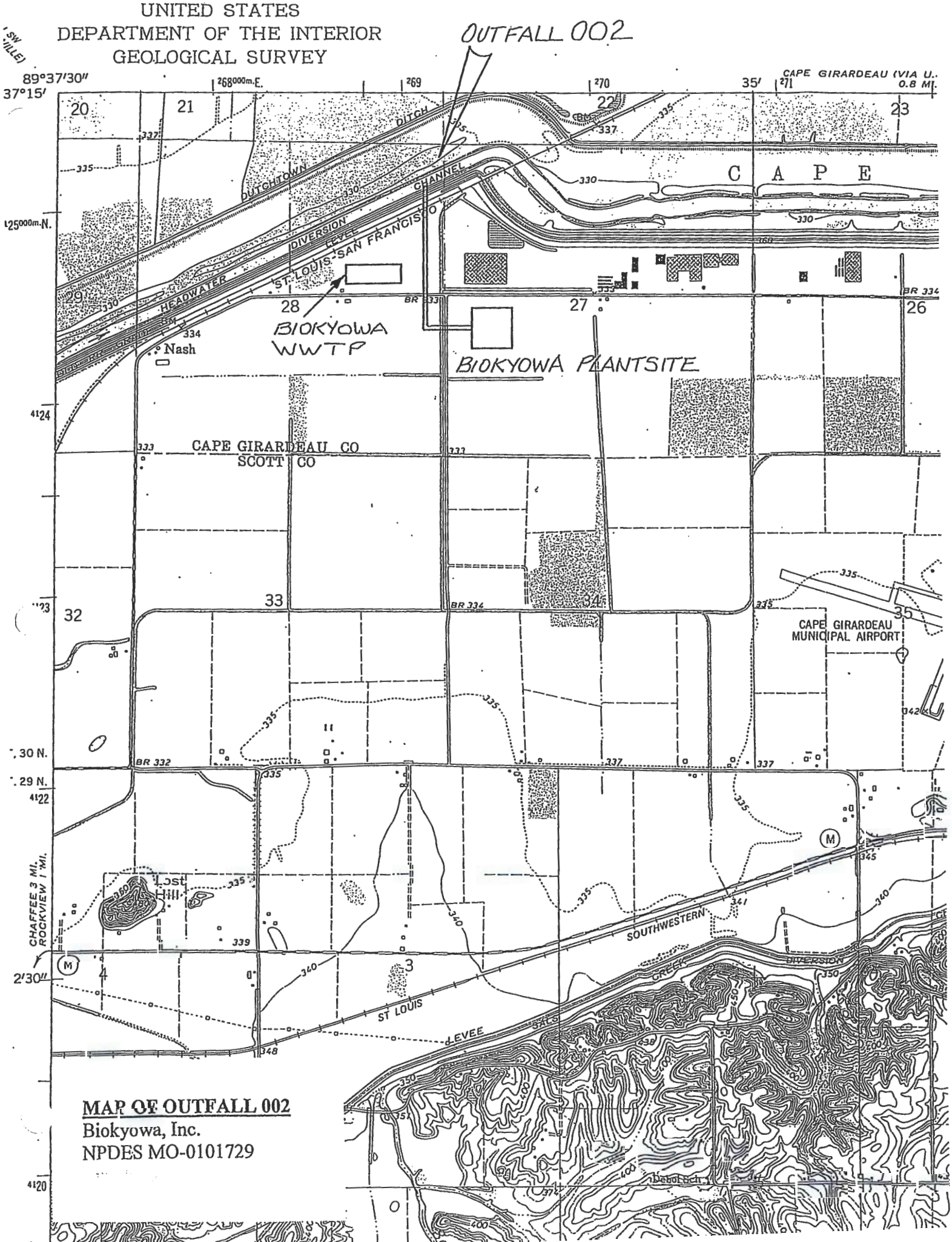
Heavy-duty ——— Light-duty ———

Medium-duty ——— Unimproved dirt - - - - -

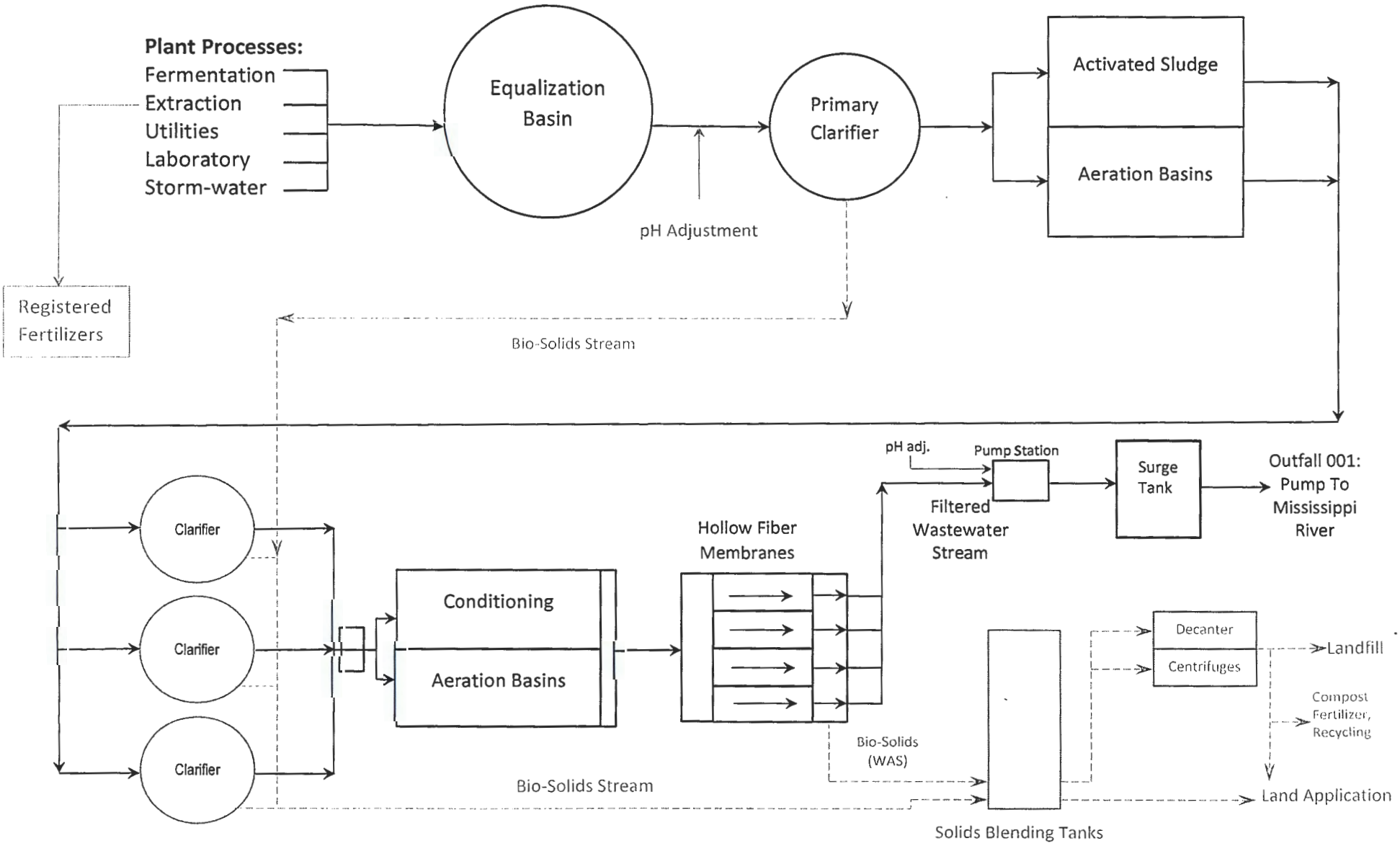
Interstate Route U.S. Route State Route

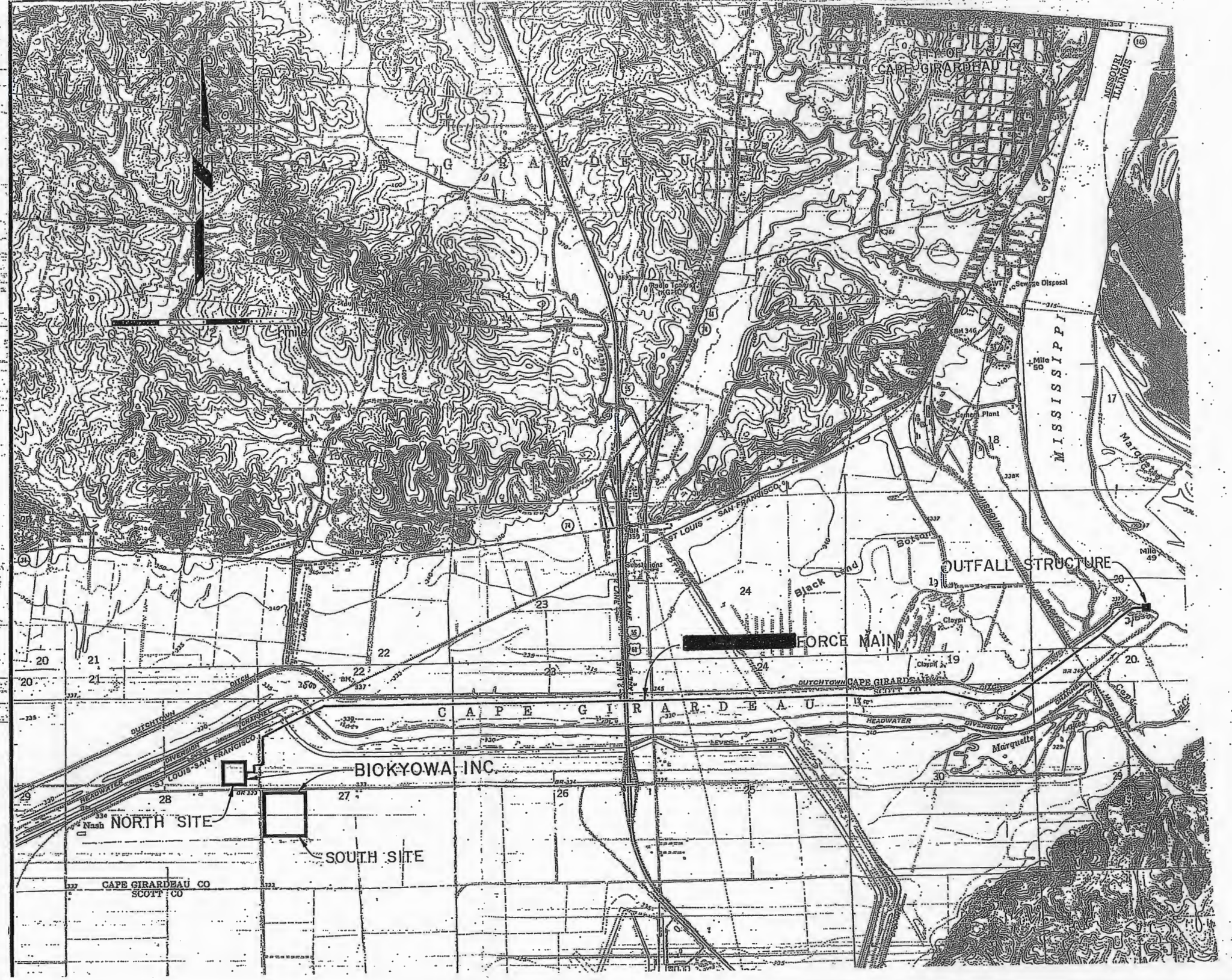
CAPE GIRARDEAU, MO.–ILL.

N3715–W8930/7.5


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
OUTFALL 002
89°37'30"
37°15'
CAPE GIRARDEAU (VIA U.
0.8 MI.
DUTCHTOWN DITCH
DUTCHTOWN DIVERSION CHANNEL
HEADWATER DITCH
ST. LOUIS-SAN FRANCISCO RY
DIVERSION LEVEE
BIOKYOWA WWTP
BIOKYOWA PLANTSITE
Nash
CAPE GIRARDEAU CO
SCOTT CO
CAPE GIRARDEAU MUNICIPAL AIRPORT
Lost Hill
SOUTHWESTERN
CREEK DIVERSION
ST LOUIS LEVEE
CHAFFEE 3 MI.
ROCKVIEW 1 MI.
MAP OF OUTFALL 002
Biokyowa, Inc.
NPDES MO-0101729

BioKyowa, Inc. – Cape Girardeau, MO
Wastewater Treatment (Outfall 001) and Bio-solids Management





MAP OF OUTFALL 001
BioKyowa, Inc
PDES MO-0101729