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-0138959
Owner:	ZF Active Safety and Electronics US LLC
Address:	11202 East Germann Road, Mesa, AZ 85212
Continuing Authority:	Same as above
Address:	Same as above
Facility Name:	Former TRW Automotive U.S. LLC- Ramsey Facility Groundwater Treatment System
Facility Address:	300 Ramsey Drive, Sullivan, MO 63080
Legal Description:	Sec. 17, T40N, R02W, Franklin County
UTM Coordinates:	X = 660340, Y = 4230166
Receiving Stream:	8-20-13MUDD V1.0 (3960) Tributary to Winsel Creek
First Classified Stream and ID:	Winsel Creek (C) (3960) (losing)
USGS Basin & Sub-watershed No.:	(07140103-0402)

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

FACILITY DESCRIPTION

Facility type: Former manufacturing of automotive piston rings and chrome plating; SIC # 9512 NAICS # 924120
Facility description: Contaminated groundwater is extracted by three wells (RW-1, RW-2, and RW-4) pump flows up to 0.15 MGD to an air stripper. Following the air stripper further treatment for hexavalent chromium (Cr VI) by an ion exchange system. The treated groundwater will be discharged to outfall #001

Design Flow: 0.15 MGD

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

April 1, 2019 — Effective Date
October 1, 2019 — Modification Date

Edward B. Galbraith, Director, Division of Environmental Quality

March 31, 2024 — Expiration Date

Chris Wieberg, Director, Water Protection Program

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

OUTFALL #001 *main outfall*	**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 **April 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
PHYSICAL						
Flow	MGD	*		*	once/month	24 hr. total
CONVENTIONAL						
pH	SU	6.5-9.0		6.5-9.0	once/month	grab
METALS						
Iron, Total Recoverable	µg/L	492		245	once/month	grab
Chromium (III), Total Recoverable	µg/L	100		95	once/month	grab
Chromium (VI), Dissolved	µg/L	15		7.5	once/month	grab
OTHER						
Trichloroethylene (TCE)	µg/L	5.0		3.5	once/month	grab

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE MAY 28, 2019.
THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

Facility Influent Monitoring	**TABLE A-2** **FINAL 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 **April 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:

INFLUENT MONITORING PARAMETERS	UNITS	FINAL INFLUENT MONITORING			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
METALS						
Iron, Total Recoverable	µg/L	*		*	once/month	grab
Chromium (III), Total Recoverable	µg/L	*		*	once/month	grab
Chromium (VI), Dissolved	µg/L	*		*	once/month	grab
OTHER						
Trichloroethylene (TCE)	µg/L	*		*	once/month	grab

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE MAY 28, 2019.
THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

* Monitoring and reporting requirement only.

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. 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.
   The permittee shall submit an eDMR Permit Holder and Certifier Registration form within **30days** of the effective date of this permit. Per 40 CFR Part 127 National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule, reporting of effluent limits and monitoring shall be submitted by the permittee via an electronic system to ensure a timely, complete, accurate, and nationally-consistent set of data. Visit http://dnr.mo.gov/pubs/pub2474.pdf to access the Facility Participation Package which contains the eDMR Permit Holder and Certifier Registration form.
   Once the permittee is activated in the eDMR system:
   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:
      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.
   (b) Electronic Submission: access the eDMR system, via: https://edmr.dnr.mo.gov/edmr/E2/Shared/Pages/Main/Login.aspx.
   (c) 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 the approved electronic reporting waiver is effective.

2. Permittee shall adhere to the following minimum Best Management Practices (BMPs):
   (a) Prevent the spillage or loss of fluids, oil, grease, fuel, etc. from vehicle maintenance, equipment cleaning, warehouse activities, and other areas 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) Provide good housekeeping practices on the site to keep trash from entry into waters of the state.
   (d) Provide sediment and erosion control sufficient to prevent or control sediment loss off of the property

3. 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 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.

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

5. Changes in Discharges of Toxic Pollutant
   In addition to the reporting requirements under §122.41(1), all existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Director as soon as they know or have reason to believe:
   (a) That an activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following notification levels:
      (1) One hundred micrograms per liter (100 µg/L);
      (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile;
      (3) Five hundred micrograms per liter (500 µg/L) for 2,4-dinitrophenol and for 2-methyl-4, 6-dinitrophenol;
      (4) One milligram per liter (1 mg/L) for antimony;
      (5) Five (5) times the maximum concentration value reported for the pollutant in the permit application in accordance with 40 CFR 122.21(g)(7); or
      (6) The notification level established by the Department in accordance with 40 CFR 122.44(f).

(b) That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
   (1) Five hundred micrograms per liter (500 µg/l);
   (2) One milligram per liter (1 mg/l) for antimony;
   (3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with §122.21(g)(7).
   (4) The level established by the Director in accordance with §122.44(f).

6. Report as no-discharge when a discharge does not occur during the report period. It is a violation of this permit to report no-discharge when a discharge has occurred.

7. Reporting of Non-Detects
   (a) An analysis conducted by the permittee or their contracted laboratory shall be conducted in such a way 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 or the reporting limit of the laboratory. Reporting as "non-detect" without also including the detection/reporting 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 "<" symbol and the laboratory's detection/reporting limit (e.g. <6).
   (d) Where the permit contains a Minimum Level (ML) and the permittee is granted authority in the permit to report zero in lieu of the < ML for a specified parameter, then zero (0) is reported for the parameter.
   (e) See Standard Conditions Part I, Section A, #4 regarding proper detection limits used for sample analysis.
   (f) 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. Failure to pay fees associated with this permit is a violation of the Missouri Clean Water Law (644.055 RSMo).

9. Operation of Ion Exchange System

Operation of the Ion Exchange treatment system may be suspended under the following circumstances:

(a) If, after the three months of operation, monthly influent monitoring for Cr VI reveal influent concentrations are below 50% of the WQBEL in this permit.

(b) If, after six months of operation, monthly influent monitoring for Cr VI reveal influent concentrations are below the WQBEL in this permit.

*** Suspended operation of the Ion Exchange does not alter requirements for monitoring or compliance with final effluent limits.**

MISSOURI DEPARTMENT OF NATURAL RESOURCES
STATEMENT OF BASIS
MO-0138959
FORMER TRW AUTOMOTIVE U.S. LLC

This Statement of Basis (Statement) gives pertinent information regarding minor modification to the above listed operating permit without the need for a public comment process. A Statement is not an enforceable part of a Missouri State Operating Permit.

Part I – Facility Information

Facility Type: Former manufacturing of automotive piston rings and chrome plating
Facility SIC Code(s): #9512
Facility Description: Contaminated groundwater is extracted by three wells (RW-1, RW-2, and RW-4) pump flows up to 0.15 MGD to an air stripper. Following the air stripper further treatment for hexavalent chromium (Cr VI) by an ion exchange system. The treated groundwater will be discharged to outfall #001

Part II – Modification Rationale

This operating permit is hereby modified to reflect a change in ownership.

No other changes were made at this time.

Part III – Administrative Requirements

On the basis of preliminary staff review and the application of applicable standards and regulations, the Department, as administrative agent for the Missouri Clean Water Commission, proposes to issue a permit(s) subject to certain effluent limitations, schedules, and special conditions contained herein and within the operating permit.
DATE OF FACT SHEET: 9/7/19

COMPLETED BY:

GORDEN WRAY, ENVIRONMENTAL SPECIALIST III
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
OPERATING PERMITS SECTION – INDUSTRIAL WASTEWATER UNIT
(573) 751-1398
Gorden.wray@dnr.mo.gov

MISSOURI DEPARTMENT OF NATURAL RESOURCES
FACT SHEET
FOR NEW OPERATING PERMIT
MO-0138959
FORMER TRW AUTOMOTIVE U.S. LLC- RAMSEY FACILITY GROUNDWATER TREATMENT SYSTEM

The Federal Water Pollution Control Act ("Clean Water Act" Section 402 Public Law 92-500 as amended) established the National Pollutant Discharge Elimination System (NPDES) permit program. This program regulates the discharge of pollutants from point sources into the waters of the United States, and the release of wastewater 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)(A)2.] a factsheet shall be prepared to give pertinent information regarding the applicable regulations, rationale for the development of effluent limitations and conditions, and the public participation process for the Missouri State Operating Permit (MSOP or operating permit) listed below. A factsheet is not an enforceable part of an operating permit.

PART I. FACILITY INFORMATION

Facility Type: Industrial
SIC Code(s): 9512
NAICS Code(s): 924120
Application Date: 04/10/2018

FACILITY DESCRIPTION:
The purpose of the discharge is to remediate contaminated groundwater from a former automotive manufacturing and plating facility. The facility consists of two extraction wells, RW-1 and RW-2, that pump groundwater from up to 150 ft. below ground surface at a rate of up to 2 gpm and a third extraction well, RW-4, that extracts groundwater between 310 and 360 feet below ground surface at a rate between 50 and 100 gpm.

The charter number for the continuing authority for this facility is FL001425792; this number was verified by the permit writer to be associated with the facility and precisely matches the continuing authority reported by the facility on the secretary of state webpage.

PERMITTED FEATURES TABLE:

OUTFALL	AVERAGE FLOW	DESIGN FLOW	EFFLUENT TYPE
#001	## MGD	0.15 MGD	Industrial

FACILITY PERFORMANCE HISTORY & COMMENTS:
This is a new facility; therefore, no performance history exists for the treatment system; however, sampling of the contaminated groundwater was performed as a result of Abatement Order on Consent (AOC#17-HW-P001). The applicant used the sampling data of the groundwater to identify the appropriate pollutants of concern (POC) as proposed in the antidegradation report (Appendix A). The EPA ID# is MOD094390416 and additional information on the facility can be found at https://dnr.mo.gov/env/hwp/permits/mod094390416/information.htm .

FACILITY MAP:

PART II. RECEIVING WATERBODY INFORMATION

RECEIVING WATERBODY'S WATER QUALITY:
The receiving waterbody has no concurrent water quality data available.

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

✓ Not applicable; this facility does not discharge to an impaired segment of a 303(d) listed stream.

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

✓ Not applicable; this facility does not discharge to a waterbody/watershed with a TMDL.

APPLICABLE DESIGNATIONS OF WATERS OF THE STATE:
Per Missouri's Effluent Regulations [10 CSR 20-7.015(1)(B)], waters of the state are divided into seven categories. Each category lists effluent limitations for specific parameters, which are presented in each outfall's effluent limitation table and further discussed in Part IV: Effluents Limits Determinations

✓ Losing
✓ All Other Waters

RECEIVING WATERBODY TABLE:

OUTFALL	WATERBODY NAME	CLASS	WBID	DESIGNATED USES	DISTANCE TO SEGMENT (MI)	12-DIGIT HUC
#001	Tributary to Winsel Creek	C	3960	AQL, HHP, LWW, SCR, WBC(B)	0.0	07140103-0402
	Winsel Creek (Losing)	C	3960	AQL, HHP, LWW, IRR, LWW, SCR, WBC(B)	0.7	

n/a not applicable

Classes are hydrologic classes as defined in 10 CSR 20-7.031(1)(F). L1: Lakes with drinking water supply - wastewater discharges are not permitted to occur to L1 watersheds per 10 CSR 20-7.015(3)(C); L2: major reservoirs; L3: all other public and private lakes; P: permanent streams; C: streams which may cease flow in dry periods but maintain pools supporting aquatic life; E: streams which do not maintain surface flow; and W: wetland. Losing streams are defined in 10 CSR 20-7.031(1)(O) and are designated on the Losing Stream dataset or determined by the Department to lose 30% or more of flow to the subsurface.

WBID = Waterbody Identification: Missouri Use Designation Dataset per 10 CSR 20-7.031(1)(Q) and (S) as 8-20-13 MUDD V1.0 or newer; 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; New C streams described on the dataset per 10 CSR 20-7.031(2)(A)3. as 100K Extent Remaining Streams.

Per 10 CSR 20-7.031, 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 are to be maintained in the receiving streams 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.: **ALP** = Aquatic Life Protection (formerly AQL; current uses are defined to ensure the protection and propagation of fish shellfish and wildlife, further subcategorized as: WWH = Warm Water Habitat; CLH = Cool Water Habitat; CDH = Cold Water Habitat; EAH = Ephemeral Aquatic Habitat; MAH = Modified Aquatic Habitat; LAH = Limited Aquatic Habitat. This permit uses ALP effluent limitations in 10 CSR 20-7.031 Table A1-A2 for all habitat designations unless otherwise specified.
10 CSR 20-7.031(1)(C)2.: Recreation in and on the water
WBC = Whole Body Contact recreation where the entire body is capable of being submerged;
WBC-A = whole body contact recreation supporting swimming uses and has public access;
WBC-B = whole body contact recreation not supported in WBC-A;
SCR = Secondary Contact Recreation (like fishing, wading, and boating)
10 CSR 20-7.031(1)(C)3. to 7.:
HHP (formerly HHF) = Human Health Protection as it relates to the consumption of fish and drinking of water;
IRR = irrigation for use on crops utilized for human or livestock consumption
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 Tables A1-B3 currently does not have corresponding habitat use criteria for these defined uses): WSA = storm- and flood-water storage and attenuation; WHP = habitat for resident and migratory wildlife species; WRC = recreational, cultural, educational, scientific, and natural aesthetic values and uses; WHC = hydrologic cycle maintenance.
10 CSR 20-7.031(6): **GRW** = Groundwater

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

RECEIVING WATERBODY MONITORING REQUIREMENTS:
No receiving water monitoring requirements are recommended at this time.

PART III. RATIONALE AND DERIVATION OF EFFLUENT LIMITATIONS & PERMIT CONDITIONS

ALTERNATIVE EVALUATIONS FOR NEW FACILITIES:
As per [10 CSR 20-7.015(4)(A)], discharges to losing streams shall be permitted only after other alternatives including land application, discharges to a gaining stream and connection to a regional wastewater treatment facility have been evaluated and determined to be unacceptable for environmental and/or economic reasons.
✓ Applicable; the facility discharges to a tributary to Winsel Creek which is classified as losing at the point of confluence and continuing downstream. Alternate discharge locations and non-discharging potential were addressed in the antidegradation report and determined not to be practical.

ANTIBACKSLIDING:
Federal Regulations [CWA §303(d)(4); CWA §402(c); 40 CFR Part 122.44(l)] require a reissued permit to be as stringent as the previous permit with some exceptions. Backsliding (a less stringent permit limitation) is only allowed under certain conditions.
✓ New facility, backsliding does not apply.

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

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.

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.
✓ Applicable; the facility is subject to Abatement Order of Consent (AOC) No. 17-HW-P001 for historical groundwater contamination; the facility is not under WWP enforcement.

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.

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 State water quality standard, including State narrative criteria for water quality. The rule further states pollutants which have been determined to cause, have the reasonable potential to cause, or contribute to an excursion above a narrative criterion within an applicable State water quality standard, the permit shall contain a numeric effluent limitation to protect the specified narrative criterion. In order to comply with this regulation, the permit writer has completed a reasonable potential determination on whether the discharge has reasonable potential to cause, or contribute to an excursion of the general criteria listed in 10 CSR 20-7.031(4). These specific requirements are listed below followed by derivation and discussion (the lettering matches the rule itself, under 10 CSR 20-7.031(4)). In instances where reasonable potential exists, the permit includes numeric limitations to address the reasonable potential. In instances where reasonable potential does not exist, the permit may include monitoring to later determine the discharges potential to impact the receiving stream's narrative criteria. It should also be noted Section 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 permit any discharge of water contaminants from any water contaminant or point source located in Missouri is 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.

(A) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses.
- For all outfalls, there is no RP for putrescent bottom deposits preventing full maintenance of beneficial uses because nothing disclosed by the permittee indicates putrescent wastewater would be discharged from the facility.
- For all outfalls, there is RP for unsightly or harmful bottom deposits preventing full maintenance of beneficial uses because this facility is expected to discharge iron; therefore, possibly causing bottom deposits.

(B) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses.
- For all outfalls, there is no RP for oil in sufficient amounts to be unsightly preventing full maintenance of beneficial uses because nothing disclosed by the permittee indicates oil will be present in sufficient amounts to impair beneficial uses.

- For all outfalls, there is no RP for scum and floating debris in sufficient amounts to be unsightly preventing full maintenance of beneficial uses because nothing disclosed by the permittee indicates scum and floating debris will be present in sufficient amounts to impair beneficial uses.

(C) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.
- For all outfalls, there is RP for unsightly color or turbidity in sufficient amounts preventing full maintenance of beneficial uses because permittee indicates iron will be present in the discharge and could be present in sufficient amount to impact color or turbidity in the receiving stream.
- For all outfalls, there is no RP for offensive odor in sufficient amounts preventing full maintenance of beneficial uses because nothing disclosed by the permittee indicates offensive odor will be present in sufficient amounts to impair beneficial uses.

(D) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life.
- The permit writer considered specific toxic pollutants when writing this permit. Numeric effluent limitations are included for those pollutants that could be discharged in toxic amounts. These effluent limitations are protective of human health, animals, and aquatic life.

(E) There shall be no significant human health hazard from incidental contact with the water.
- This criterion is very similar to (D) above. See Part IV, Effluent Limits Derivation below.

(F) There shall be no acute toxicity to livestock or wildlife watering.
- This criterion is very similar to (D) above. See Part IV, Effluent Limits Derivation below.

(G) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community.
- For all outfalls, there is no RP for physical changes that would impair the natural biological community because nothing disclosed by the permittee indicates physical changes that would impair the natural biological community.
- Any chemical changes are covered by the specific numeric effluent limitations established in the permit.
- For all outfalls, there is no RP for hydrologic changes that would impair the natural biological community because nothing disclosed by the permittee indicates physical changes would impair the natural biological community.

(H) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247.
- There are no solid waste disposal activities or any operation which has reasonable potential to cause or contribute to the materials listed above being discharged through any outfall.

GROUNDWATER MONITORING:
Groundwater is a water of the state according to 10 CSR 20-2.010(82), and is subject to regulations at 10 CSR 20-7.015(7) and 10 CSR 20-7.031(6) and must be protected accordingly.
✓ This facility is monitoring the groundwater at the site to determine the effectiveness of the air stripper and the necessity of operation for the ion exchange to treat for hexavalent chromium.

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/pub2337.htm
✓ Applicable; this facility falls under the definition of major water user but is not yet registered with the Department. The facility must register with the Department. Registration can be completed at this website: https://dnr.mo.gov/MWU/

NO-DISCHARGE LAND APPLICATION:
Land application of wastewater or sludge shall comply with the all applicable no-discharge requirements listed in 10 CSR 20-6.015 and all facility operations and maintenance requirements listed in 10 CSR 20-8.020(15). These requirements ensure appropriate operation of the no-discharge land application systems and prevent unauthorized and illicit discharges to waters of the state. Land applications by a contract hauler on fields the permittee has a spreading agreement on are not required to be in this permit. A spreading agreement does not constitute the field being rented or leased by the permittee as they do not have any control over management of the field.
✓ Not applicable; this permit does not authorize operation of a no-discharge land application system to treat wastewater or sludge.

REASONABLE POTENTIAL (RP):
Federal regulation [40 CFR Part 122.44(d)(1)(i)] requires effluent limitations for all pollutants which are (or may be) discharged at a level causing or have the reasonable potential to cause (or contribute to) an in-stream excursion above narrative or numeric water quality standards. Per 10 CSR 20-7.031(4), general criteria shall be applicable to all waters of the state at all times; however, acute toxicity criteria may be exceeded by permit in zones of initial dilution, and chronic toxicity criteria may be exceeded by permit in mixing zones. If the permit writer determines any given pollutant has the reasonable potential to cause or contribute to an in-stream excursion above the WQS, the permit must contain effluent limits for the pollutant per 40 CFR Part 122.44(d)(1)(iii) and the most stringent limits per 10 CSR 20-7.031(9)(A).

✓ Not applicable; a mathematical RPA was not conducted for this facility as it is a new discharge.

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. A SOC is not allowed:

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

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

✓ Not applicable; this permit does not contain a SOC.

SPILL REPORTING:
Per 10 CSR 24-3.010, any emergency involving a hazardous substance must be reported to the Department's 24 hour Environmental Emergency Response hotline at (573) 634-2436 at the earliest practicable moment after discovery. The Department may require the submittal of a written report detailing measures taken to clean up a spill. These reporting requirements apply whether or not the spill results in chemicals or materials leaving the permitted property or reaching waters of the state. This requirement is in addition to the noncompliance reporting requirement found in Standard Conditions Part I. http://dnr.mo.gov/env/esp/spillbill.htm

SLUDGE – DOMESTIC BIOSOLIDS:
Biosolids are solid materials resulting from domestic wastewater treatment meeting federal and state criteria for beneficial use (i.e. fertilizer). 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. Additional information: http://extension.missouri.edu/main/DisplayCategory.aspx?C=74 (WQ422 through WQ449).

✓ Not applicable; this condition is not applicable to the permittee for this facility.

SLUDGE – INDUSTRIAL:
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.

✓ Not applicable; sludge is not generated at this facility.

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.

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

VARIANCE:
Per the Missouri Clean Water Law §644.061.4, variances shall be granted for such period of time and under such terms and conditions as 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 not provide adequate protection for the receiving water, then the other must be used per 10 CSR 20-7.015(9)(A).
✓ Applicable; wasteload allocations were calculated where relevant using water quality criteria or water quality model results and by applying the dilution equation below:

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

- Acute wasteload allocations designated as daily maximum limits (MDL) were determined using applicable water quality criteria (CMC: criteria maximum concentration) and stream volume of flow at the edge of the zone of initial dilution (ZID).
- Chronic wasteload allocations designated as monthly average limits (AML) were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and stream volume of flow at the edge of the mixing zone (MZ).
- Water quality based MDL and AML effluent limitations were calculated using methods and procedures outlined in USEPA's *Technical Support Document For Water Quality-based Toxics Control* or TSD EPA/505/2-90-001; 3/1991.
- Number of Samples "n": In accordance with the TSD for water quality-based permitting, effluent quality is determined by the underlying distribution of daily values, which is determined by the Long Term Average (LTA) associated with a particular Wasteload Allocation (WLA) and by the Coefficient of Variation (CV) of the effluent concentrations. Increasing or decreasing the monitoring frequency does not affect this underlying distribution or treatment performance which should be, at a minimum, targeted to comply with the values dictated by the WLA. Therefore, it is recommended the actual planned frequency of monitoring normally be used to determine the value of "n" for calculating the AML. However, in situations where monitoring frequency is once per month or less, a higher value for "n" must be assumed for AML derivation purposes. Thus, the statistical procedure being employed using an assumed number of samples is "n = 4" at a minimum. For total ammonia as nitrogen, "n = 30" is used.

WLA MODELING:
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.

PART IV. EFFLUENT LIMITS DETERMINATIONS

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 below. 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).

OUTFALL #001 – MAIN FACILITY OUTFALL

EFFLUENT LIMITATIONS TABLE:

PARAMETERS	UNIT	DAILY MAX	MONTHLY AVG	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQUENCY	SAMPLE TYPE
PHYSICAL						
FLOW	MGD	*	*	ONCE/MONTH	ONCE/MONTH	24 HR. TOT
CONVENTIONAL						
pH Ω	SU	6.5-9.0	6.5-9.0	ONCE/MONTH	ONCE/MONTH	GRAB
METALS						
CHROMIUM (III), TR	µg/L	100	95	ONCE/MONTH	ONCE/MONTH	GRAB
CHROMIUM (VI), DISSOLVED	µg/L	15.0	7.5	ONCE/MONTH	ONCE/MONTH	GRAB
IRON, TR	µg/L	492	245	ONCE/MONTH	ONCE/MONTH	GRAB
VOLATILE ORGANIC COMPOUNDS						
TRICHLOROETHYLENE	µg/L	5.0	3.5	ONCE/MONTH	ONCE/MONTH	GRAB

* Monitoring and reporting requirement only
Ω Report the minimum and maximum pH values; pH is not to be averaged
TR Total Recoverable

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:

pH
6.5 to 9.0 SU – instantaneous grab sample. Water quality limits [10 CSR 20-7.031(5)(E)] are applicable to this outfall.

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). Propagation of fish, shellfish, and wildlife apply designated as "Aquatic Life Protection" in 10 CSR 20-7.031 Tables A1 and A2. Additional use criterion (HHP, DWS, GRW, IRR, or LWW) may also be used as applicable to determine the most protective effluent limit for the waterbody class and uses. The hardness value used for hardness-dependent metals was assumed to be 162.

Chromium III, Total Recoverable
$C_e = (((Q_e+Q_s)*C) - (Q_s*C_s))/Q_e$

Conversion factors are used to calculate a Total Recoverable limit from a dissolved Water Quality Standard. A default hardness of 162 is assumed.

$C = \frac{\text{WQS chronic}}{\text{Conversion factor for hardness}} = \frac{100}{0.860} = 116.3$

Chronic WLA: $C_e = ((0.23 + 0.0)116.3 – (0.0 * 0.01))/0.23$
$C_e = 116.3$ µg/L

$LTA_c = 116.3$ ug/L (0.527) = 61.3 µg/L [CV = 0.6, 99th Percentile, 30 day avg.]

MDL = 61.3 ug/L (3.11) = **191 µg/L** [CV = 0.6, 99th Percentile]
AML = 61.3 ug/L (1.55) = **95 µg/L** [CV = 0.6, 95th Percentile, n = 4]

Chromium VI, Dissolved

Acute AQL WQS: 15 µg/L
Chronic AQL WQS: 10 µg/L

Acute WLA: $C_e = ((0.23 + 0.0)15 – (0.0 * 0.0))/0.23 = 15$ µg/L
Chronic WLA: $C_e = ((0.23 + 0.0)10 – (0.0 * 0.0))/0.23 = 10$ µg/L

$LTA_a = 15$ (0.321) = 4.8 [CV = 0.6, 99th Percentile]
$LTA_c = 10$ (0.527) = 5.27 [CV = 0.6, 99th Percentile]

MDL = 5.27 (3.11) = **15.0 µg/L** [CV = 0.6, 99th Percentile]
AML = 5.27 (1.55) = **7.5 µg/L** [CV = 0.6, 95th Percentile, n = 4]

INFLUENT

INFLUENT MONITORING TABLE:

PARAMETERS	UNIT	DAILY MAX	MONTHLY AVG	MINIMUM SAMPLING FREQUENCY	MINIMUM REPORTING FREQUENCY	SAMPLE TYPE
METALS						
CHROMIUM (III), TR	µg/L	*	*	ONCE/MONTH	ONCE/MONTH	GRAB
CHROMIUM (VI), DISSOLVED	µg/L	*	*	ONCE/MONTH	ONCE/MONTH	GRAB
IRON, TR	µg/L	*	*	ONCE/MONTH	ONCE/MONTH	GRAB
VOLATILE ORGANIC COMPOUNDS						
TRICHLOROETHYLENE	µg/L	*	*	ONCE/MONTH	ONCE/MONTH	GRAB

* Monitoring and reporting requirement only
TR Total Recoverable

DERIVATION AND DISCUSSION OF REQUIREMENTS:

METALS:

Chromium III, Total Recoverable
Monitoring required to determine the baseline iron concentrations in the influent.

Chromium VI, Dissolved
Monitoring required to determine the baseline iron concentrations in the influent.

Iron, Total Recoverable
Monitoring required to determine the baseline iron concentrations in the influent.

VOLATILE ORGANICS

Trichloroethylene (TCE)
Monitoring required to determine effectiveness of the treatment system.

PART V. SAMPLING AND REPORTING REQUIREMENTS

Refer to each outfall's derivation and discussion of limits section to review individual sampling and reporting frequencies and sampling type. Additionally, see Standard Conditions Part I attached at the end of this permit and fully incorporated within.

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.

- ✓ The facility is not currently using the eDMR data reporting system. The permittee has submitted an eDMR Permit Holder and Certifier Registration form.

SAMPLING FREQUENCY JUSTIFICATION:
This facility is a new facility monthly sampling is required to determine if the facility will be in compliance with the operating permit in accordance with Appendix U of Missouri's Water Pollution Control Permit Manual.

SAMPLING TYPE JUSTIFICATION:
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 wastewater. Parameters which must have grab sampling are: pH, hexavalent chromium, volatile organic compounds, and others.

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 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 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.

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 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 two years old, such data may be re-submitted to meet the requirements of the renewal application.

- ✓ If the Department issues the permit at this time, the effective period of the permit would be less than one year in length. To ensure efficient use of Department staff time, reduce the Department's permitting back log, and to provide better service to the permittee by avoiding another renewal application to be submitted in such a short time period, this operating permit will be issued for the maximum timeframe of five years and synced with other permits in the watershed at a later date.

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 12/07/2018 to 1/07/2019. One comment was received during the public notice regarding possible need for copper limits, however; after review the Department concluded no changes to the permit as a result of the comment were necessary. Limits for Chromium VI were changed because of a typo in table A-1 to reflect WQBEL established in the Water Quality and Antidegradation Review. A change was made in Part IV of the fact sheet under Chromium VI discussion implementing the approved chronic and acute water quality criteria for the pollutant in the effluent limit calculation. The criteria implemented in the public noticed draft permit were reflective of amended criteria proposed by the Department to the EPA. The proposed criteria for Chromium VI were not adopted by the EPA in December 2018 resulting in the criteria and calculation for Chromium VI being changed to reflect the currently approved criteria.

DATE OF FACT SHEET: (10/24/2018)
COMPLETED BY:
AARON SAWYER, ENVIRONMENTAL ENGINEER
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
ENGINEERING SECTION - ANTIDEGRADATION UNIT
573-526-4589
aaron.sawyer@dnr.mo.gov

Appendix A: Water Quality and Antidegradation Review

Water Quality and Antidegradation Review

For the Protection of Water Quality
and Determination of Effluent Limits for Discharge to
Tributary to Winsel Creek
by
TRW Automotive U.S. LLC-Ramsey Groundwater Treatment Facility

October, 2018

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1. FACILITY INFORMATION

FACILITY NAME: TRW Automotive U.S LLC – Ramsey Facility Groundwater Treatment Facility
NPDES #: MO0138959

FACILITY TYPE: INDUSTRIAL – Non-POTW – SIC #9512
FACILITY DESCRIPTION: Two onsite recovery wells RW-1 and RW-2 extract water at a depth of up to 150 ft below ground surface. The extracted water is then treated by an air stripper located at the facility. An abatement order of consent No. 17-HW-P001 was implemented on July 24, 2017 directing the owner to extract groundwater from the intermediate zone at a depth of approximately 325 ft below ground surface and upgrade the existing treatment facility to address the increased flow of contaminated groundwater. As a result of the submitted alternative analysis, the applicant's preferred alternative is to upgrade the existing system with a new air stripper to remove VOCs and metals from the contaminated groundwater. RW-4 was drilled and screened from 310-360 ft. bellow ground surface. Ion exchange will be operated as needed. The design flow will be 0.15 MGD.

COUNTY:	Franklin	UTM COORDINATES:	X=660340 / Y=4230166
12- DIGIT HUC:	07140103-0402	LEGAL DESCRIPTION:	NW ¼ , NW ¼, Section 17, T 40N, R 02W
EDU*:	Meramec/Ozark	ECOREGION:	Ozarks

* - Ecological Drainage Unit

2. WATER QUALITY INFORMATION

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(3)] and federal antidegradation policy at Title 40 Code of Federal Regulation (CFR) Section 131.12 (a), the Missouri Department of Natural Resources (Department) 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, and revised July 13, 2016, a facility is required to use *Missouri's Antidegradation Implementation Procedure (AIP)* for new and expanded wastewater discharges.

2.1. WATER QUALITY HISTORY:

OUTFALL	DESIGN FLOW (CFS)	RECEIVING WATERBODY	DISTANCE TO CLASSIFIED SEGMENT (MI)
001	0.23	Tributary to Winsel Creek	0.0
		Winsel Creek	0.7

3. RECEIVING WATERBODY INFORMATION

WATERBODY NAME	CLASS	WBID	LOW-FLOW VALUES (CFS)			DESIGNATED USES**
			1Q10	7Q10	30Q10	
Tributary to Winsel Creek (8-20-13MUDD V1.0)	C	3960	-	-	-	AQL, HHP, IRR, LWW, SCR, WBC(B)
Winsel Creek (losing)	C	3960	-	-	-	AQL, HHP, LWW, IRR, LWW, SCR, WBC(B)

** Irrigation (IRR), Livestock & Wildlife Protection (LWP), Protection of Warm Water Aquatic Life (AQL), Human Health Protection (HHP), Cool Water Fishery (CLF), Cold Water Fishery (CDF), Whole Body Contact Recreation – Category A (WBC-A), Whole Body Contact Recreation – Category B (WBC-B), Secondary Contact Recreation (SCR), Drinking Water Supply (DWS), Industrial (IND), Groundwater (GRW).

RECEIVING WATER BODY SEGMENT #1: Tributary to Winsel Creek
Upper end segment* UTM coordinates: X = 660262 Y= 4230154 (Outfall)
Lower end segment* UTM coordinates: X= 659743 Y= 4231047 (Winsel Creek)

* 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

Arcadis U.S., Inc. prepared, on behalf of TRW Automotive U.S. LLC, the *Antidegradation Review Report for TRW Ramsey Site Facility* received 06/05/2018. The applicant elected to assume that all pollutants of concern (POC) are significantly degrading the receiving stream in the absence of existing water quality. An alternative analysis was conducted to fulfill the requirements of the AIP.

Geohydrological Evaluation was submitted with the request and the receiving stream is gaining for discharge purposes (Appendix A: Map).

A Missouri Department of Conservation Natural Heritage Review was obtained by the applicant; no records of endangered species were found for the project area.

5. ANTIDEGRADATION REVIEW INFORMATION

The following is a review of the *Antidegradation* dated May, 2018.

5.1. TIER DETERMINATION

Below is a list of pollutants of concern reasonably expected to be in the discharge (see Appendix B), 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). Tier 2 was assumed for all POCs (see Appendix B).

Table 1. Pollutants of Concern and Tier Determination

POLLUTANTS OF CONCERN	TIER*	DEGRADATION	COMMENT
Trichloroethylene (TCE)	2	Significant	
Iron (Fe)	2	Significant	
Chromium, III (CR3)	2	Significant	
Chromium, VI (CR6)	2	Significant	

* Tier assumed. Tier determination not possible: ** No in-stream standards for these parameters. *** Standards for these parameters are ranges

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

For pollutants of concern, the attachments are:
☒ Attachment A, Tier 2 with significant degradation.

5.2. EXISTING WATER QUALITY

All POCs were considered to be Tier 2 and significantly degraded in the absence of existing water quality.

5.3. NO DISCHARGE EVALUATION

According to 10 CSR 20-6.010 (4)(D), reports for the purpose of constructing a wastewater treatment facility shall consider the feasibility of constructing and operating a no discharge facility. Because Missouri's antidegradation implementation procedures specify that if the proposed activity results in significant degradation then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are required. The facility has entered into a Corrective Action Order on Consent with the US EPA. The Order directs the applicant to pursue extraction and treatment of the contaminated groundwater. The costs associated with extraction/treatment on top of purchase of land for application would be cost prohibitive. Part of that analysis as shown below is the non-degrading or no discharge evaluation. See Section 5.4.1 discussion for the regionalization alternative.

5.4. DEMONSTRATION OF NECESSITY AND SOCIAL AND ECONOMIC IMPORTANCE

Missouri's antidegradation implementation procedures specify that if the proposed activity does result in significant degradation then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are required. Four alternatives from non-degrading to less degrading to degrading alternatives were evaluated. All discharging alternatives that were evaluated have been presented in Table 2. Initially hexavalent chromium was not included as a POC for the site by the applicant but was added to Table 1 as a POC after discussions between the applicant and the Department.

Table 2: Alternatives Analysis Comparison

Proposed average monthly effluent values	Air Stripper	Air Stripper with Granular Activated Carbon (GAC)	Air Stripper with Reduction/Precipitation	**Air Stripper With Ion exchange**
Trichloroethylene (TCE) (µg/L)	3.5	3.5	3.5	**3.5**
Iron (Fe) (µg/L)	1,000	1,000	245	**245**
Chromium, III (µg/L)	***	***	95	**95**
Chromium, VI (µg/L)	***	***	5	**8**
Practical	Y	Y	Y	**Y**
Economical	Y	N	N	**N**
Life Cycle Cost*	928,000	1,492,000	2,143,000	**1,542,600**
Ratio	1 : 1	1 : 1.61	1 : 2.31	**1 : 1.66**

* Life cycle cost at 10 year design life and 5% interest
** Unable to treat for Chromium, therefore determined to be impractical
*** No treatment expected but must meet Water Quality based effluent limits

The applicant identified an Air Stripper as a preferred alternative as it is economically efficient and practicable and serves as the Base Case Technology for TCE. An Air Stripper does not treat for Chromium III or VI; therefore, Water Quality Based Effluent Limits is Base Case for Cr III and VI and must be met. There is uncertainty of the concentration of Cr VI in the groundwater; therefore the applicant evaluated the addition of Ion Exchange and Reduction/Precipitation to provide treatment for Cr VI. Ion Exchange was selected as alternative treatment technology for Cr VI in the event Cr III and VI concentration are higher than WQBEL. Continuous operation of the Ion Exchange was demonstrated to be economically inefficient over the life-cycle of the facility in the event that Cr VI does not exceed the WQBEL. Influent sampling to determine the concentration of Cr VI will need to be taken prior to treatment by the Ion Exchange unit to determine if continued operation is necessary. The Ion exchange will be in operation the first three months of the facility discharging. If, after three months of sampling the influent, Cr VI concentrations do not exceed 50% of the WQBEL operation of the Ion Exchange can be discontinued. Sampling will be continuous for Cr VI throughout the life of the permit. Following discontinuation of operating the Ion Exchange treatment for Cr VI will be reactivated as-needed to maintain compliance with the final effluent limits established in Table 3.

5.4.1. Regionalization Alterative

Within Section II B 1. of the AIP, discussion of the potential for discharge to a regional wastewater collection system is mentioned. The applicant provided discussion of this alternative. On July 24, 2017 TRW Automotive, LLC entered into an abatement order of consent (AOC) with the Department to treat polluted ground water. Currently the groundwater is being treated before discharging to the City POTW The owner is obligated to conduct its own treatment of the groundwater plume as the regional wastewater system cannot accept the increased flow from RW-4.

Needs a Waiver to prevent conflict with area wide management plan approved under Section 208 of the Clean Water Act and/or under 10 CSR 20-6.010(3) (B) 1 or 2 Continuing Authorities? (Y or N) N

5.3.2 Losing Stream Alterative Discharge Location

Under 10 CSR 20-7.015(4) (A), *discharges to losing stream shall be permitted only after other alternatives including land application, discharge to gaining stream and connection to a regional facility have been evaluated and determined to be unacceptable for environmental and/or economic reasons*.
The Discharge will be within 2 miles of a losing stream segment of Winsel Creek. Land application was eliminated as an alternative in section 5.3. No Discharge Evaluation. The nearest gaining stream that could be considered for discharge is greater than half mile away. The applicant would need to obtain easements. Much of the surrounding property are domestic residential subdivisions in nature. It is likely the costs associated with piping the wastewater to another stream would be prohibitive.

5.3.3 Social and Economic Importance Evaluation

The applicant first identified the community that will be affected by the proposed degradation of water quality as the citizens of the city of Sullivan, particularly those who use the city public drinking supply. Construction of the Air Stripper will minimize the potential off site migration of the VOCs in the groundwater to the city's water supply well COS-2. Appendix B, Attachment A: Tier 2 with Significant Degradation form contains a summary of this information.

6. General Assumptions of the Water 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 permit to 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 to comply with county or other local ordinances or restrictions.

7. Mixing Considerations

Mixing Zone (MZ): Not Allowed [10 CSR 20-7.031(5)(A)4.B.(I)(a)].

Zone of Initial Dilution (ZID): Not Allowed [10 CSR 20-7.031(5)(A)4.B.(I)(b)].

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

TABLE 3. EFFLUENT LIMITS OUTFALL #001

PARAMETER	UNITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	BASIS FOR LIMIT (NOTE 1)	MONITORING FREQUENCY
FLOW	MGD	*		*	FSR	ONCE/MONTH
PH	SU	6.5– 9.0		6.5 – 9.0	FSR	ONCE/MONTH
TRICHLOROETHYLENE (TCE)	µG/L	5.0		3.5	PEL	ONCE/MONTH
IRON (FE)	µG/L	492		245	FSR	ONCE/MONTH
CHROMIUM III, TOTAL RECOVERABLE	µG/L	100		95	FSR	ONCE/MONTH
CHROMIUM VI, DISSOLVED	µG/L	16		8	FSR	ONCE/MONTH

NOTE 1– WATER QUALITY-BASED EFFLUENT LIMITATION – WQBEL; OR MINIMALLY DEGRADING EFFLUENT LIMIT –MDEL; OR PREFERRED ALTERNATIVE EFFLUENT LIMIT – PEL; OR TECHNOLOGY-BASED EFFLUENT LIMIT – TBEL; OR NO DEGRADATION EFFLUENT LIMIT – NDEL; OR FEDERAL/STATE REGULATION – FSR; OR NOT APPLICABLE – N/A. ALSO, PLEASE SEE THE **GENERAL ASSUMPTIONS OF THE WQAR #4 & #5.**

* Monitoring requirements only.

9. RECEIVING WATER MONITORING REQUIREMENTS

No receiving water monitoring requirements recommended at this time.

10. DERIVATION AND DISCUSSION OF LIMITS

Wasteload allocations and limits were calculated using two methods:

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

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

Where C = downstream concentration
C_s = upstream concentration
Q_s = upstream flow
C_e = effluent concentration
Q_e = effluent flow

Chronic wasteload allocations were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration). Acute wasteload allocations were determined using applicable water quality criteria (CMC: criteria maximum concentration).

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) Alternative Analysis-based – Using the preferred alternative's treatment capacity for conventional pollutants such as BOD_5 and TSS that are provided by the consultant as the WLA, the significantly-degrading effluent average monthly and average weekly limits are determined by applying the WLA as the average monthly (AML) and multiplying the AML by 1.5 to derive the average weekly limit (AWL). For toxic and nonconventional pollutant such as ammonia, the treatment capacity is applied as the significantly-degrading effluent monthly average (AML). A maximum daily can be derived by dividing the AML by 1.19 to determine the long-term average (LTA). The LTA is then multiplied by 3.11 to obtain the maximum daily limitation. This is an accepted procedure that is defined in USEPA's "Technical Support Document For Water Quality-based Toxics Control" (EPA/505/2-90-001).

Note: Significantly-degrading effluent limits have been based on the authority included in Section III. Permit Consideration of the AIP. Also under 40 CFR 133.105, permitting authorities shall require more stringent limitations than equivalent to secondary treatment limitations for 1) existing facilities if the permitting authority determines that the 30-day average and 7-day average BOD_5 and TSS effluent values could be achievable through proper operation and maintenance of the treatment works, and 2) new facilities if the permitting authority determines that the 30-day average and 7-day average BOD_5 and TSS effluent values could be achievable through proper operation and maintenance of the treatment works, considering the design capability of the treatment process.

10.1. OUTFALL #001 **– MAIN FACILITY OUTFALL**

10.2. LIMIT DERIVATION

- **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.

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

- **Trichloroethylene.**

  GRW CCC = 5 µg/L
  AML = WLA = **5 µg/L**
  MDL = AML * 2.01 [multiplier per TSD EPA/505/2-90-001 Section 5; Table 5-3; CV=0.6, n=4]
  MDL = 5*2.01 = **10 µg/L**

  The proposed discharge location is less than 1 mile from a losing steam segment of Winsel Creek. 10 CSR 20-7.015(1)(B)3. and 10 CSR 20-7.015(7)(A) address losing streams and discharges to subsurface waters. GRW use designation is applied for this discharge location.

  The applicant proposed the technology could achieve effluent limits of 3.5 µg/L average monthly and 5.0 µg/L daily maximum. These limits are less degrading compared to the water quality based limits calculated above and are therefore are applied in Table 3.

- **Iron, Total Recoverable.**

  The proposed discharge location is less than 1 mile from a losing steam segment of Winsel Creek. 10 CSR 20-7.015(1)(B)3. and 10 CSR 20-7.015(7)(A) address losing streams and discharges to subsurface waters. GRW use designation is applied for this discharge location.

  Acute GRW WQS: none
  Chronic GRW WQS: 300 µg/L

  Chronic WLA: $C_e = ((0.23 + 0.0)300 – (0.0 * 0.0))/0.23 = 300$ µg/L

  LTA_a: none [CV = 0.6, 99th Percentile]
  LTA_c: 300 (0.527) = 158.1 µg/L [CV = 0.6, 99th Percentile]

  MDL: 158.1 (3.11) = 1642.7 = **492 µg/L** [CV = 0.6, 99th Percentile]
  AML: 527.43 (1.55) = 818.8 = **245 µg/L** [CV = 0.6, 95th Percentile, n = 4]

- **Chromium III, Total Recoverable**.

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

  Conversion factors are used to calculate a Total Recoverable limit from a dissolved Water Quality Standard. A default hardness of 162 is assumed.

  $C = \frac{\text{WQS chronic}}{\text{Conversion factor for hardness}} = \frac{100}{0.860} = 116.3$

  Chronic WLA: $C_e = ((0.23 + 0.0)116.3 – (0.0 * 0.01))/0.23$

  $C_e = 116.3$ µg/L

  LTA_c = 116.3 ug/L (0.527) = 61.3 µg/L [CV = 0.6, 99th Percentile, 30 day avg.]
  MDL = 61.3 ug/L (3.11) = **191 µg/L** [CV = 0.6, 99th Percentile]
  AML = 61.3 ug/L (1.55) = **95 µg/L** [CV = 0.6, 95th Percentile, n = 4]

The applicant proposed 100 µg/L daily maximum and monthly average limits. The water quality based limits developed above show that 100 µg/L is protective of water quality for the maximum daily limit; however, the water quality standard for the average monthly limit is calculated to be 95 µg/L. The applicant proposed maximum daily value of 100 µg/L is applied in table 3 while the average monthly limit of 95 µg/L is based on water quality standards and also applied in Table 3.

- **Chromium VI, Dissolved.**

  Acute AQL WQS: 16 µg/L
  Chronic AQL WQS: 11 µg/L

  Acute WLA: $C_e = ((0.23 + 0.0)16 – (0.0 * 0.0))/0.23 = 16$ µg/L
  Chronic WLA: $C_e = ((0.23 + 0.0)11 – (0.0 * 0.0))/0.23 = 11$ µg/L

  LTA_a: 16 (0.321) = 5.136 [CV = 0.6, 99th Percentile]
  LTA_c: 11 (0.527) = 5.797 [CV = 0.6, 99th Percentile]

  MDL: 5.136 (3.11) = **16 µg/L** [CV = 0.6, 99th Percentile]
  AML: 5.136 (1.55) = **8 µg/L** [CV = 0.6, 95th Percentile, n = 4]

Hexavalent chromium will be treated by Ion Exchange. Life cycle costs of operating the Ion Exchange treatment continuously would be cost prohibitive as an alternative. Ion Exchange will continue operation until influent concentrations are below 50% of the WQBEL established in Table 3 for three consecutive months. Once this threshold is achieved the Ion Exchange treatment will discontinue operation until and be reactivated on an as-needed basis to ensure compliance with final effluent limits. Sampling will continue for the pollutant when the treatment unit is offline. After two years of sampling data has been collected and reported the Department will entertain a request from the applicant to modify the NPDES permit to adjust the discharge monitoring frequency from monthly to quarterly.

11. ANTIDEGRADATION REVIEW PRELIMINARY DETERMINATION

The proposed new facility discharge, TRW Automotive U.S. LLC- Ramsey WWTF, 0.15 MGD will result in significant degradation of the segment identified in the tributary to Winsel Creek. An air stripper with ion exchange was determined to be the base case technology (lowest cost alternative that meets technology and water quality based effluent limitations. The cost effectiveness of the other technologies were evaluated, and the air stripper with ion exchange was found to be cost effective and was determined to be the preferred alternative. Ongoing continuous operation of the ion exchange unit is not cost effective, but its operation in the short-term is necessary to address hexavalent chrome concerns (See section 10, Chromium VI, Dissolved).

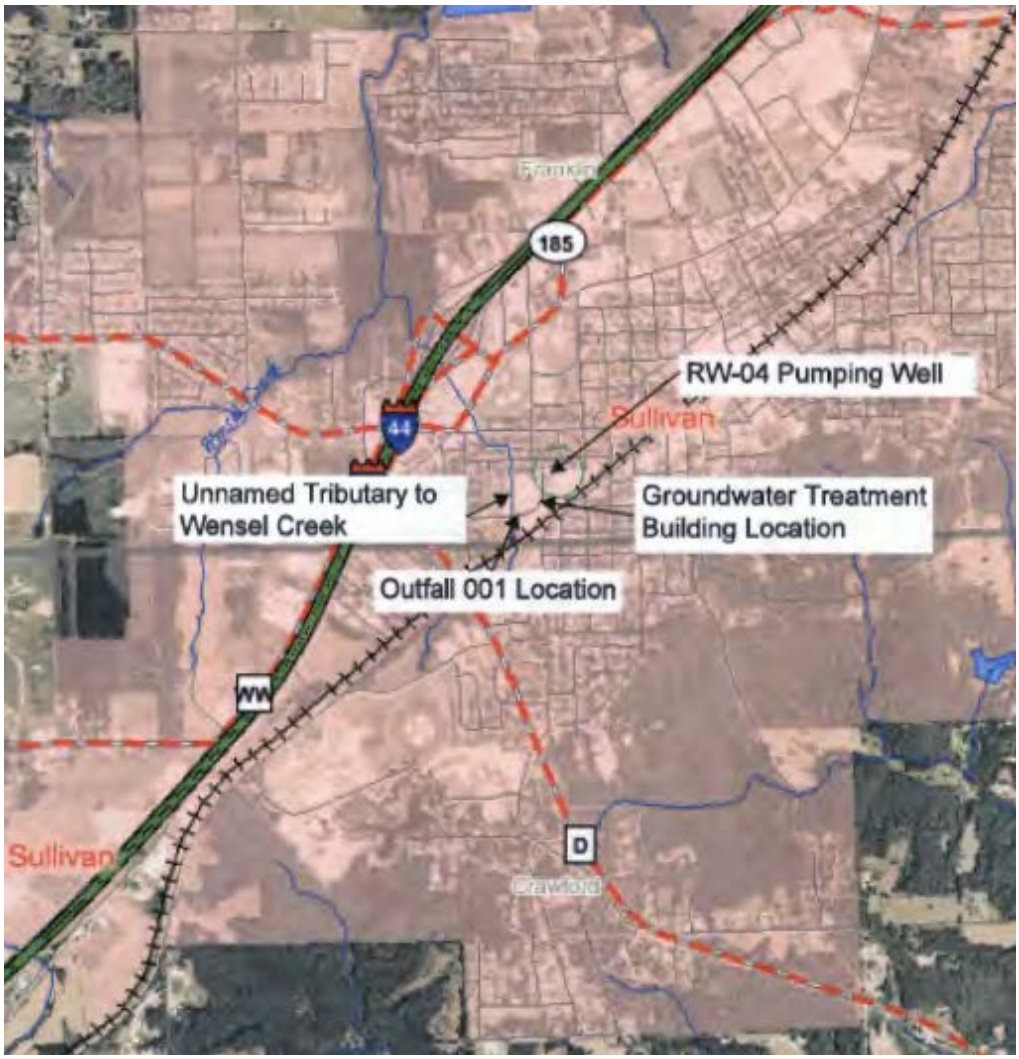
It has also been determined that the other treatment option presented (air stripper with GAC) may also be considered reasonable alternatives provided they are designed to be capable of meeting the effluent limitations developed based on the preferred alternative. If the other option is selected, you may proceed with construction without the need to modify this Antidegradation review document.

Per the requirements of the AIP, the effluent limits in this review were developed to be protective of beneficial uses and to attain the highest statutory and regulatory requirements. The Department has determined that the submitted review is sufficient and meets the requirements of the AIP. No further analysis is needed for this discharge.

Reviewer: Aaron Sawyer
Date: 10/17/2018
Unit Chief: John Rustige, P.E. JR

Appendix A: Map of Discharge Location

(*A USGS topographic map can be obtained on the web at http://www.dnr.mo.gov/internetmapviewer/.*)



Appendix B: Antidegradation Review Summary Attachments

The attachments that follow contain summary information provided by the applicant, Former TRW Automotive.

1) Attachment A:

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
WATER QUALITY REVIEW ASSISTANCE/ ANTIDEGRADATION REVIEW REQUEST
PRE-CONSTRUCTION REVIEW FOR PROTECTION OF BENEFICIAL USES AND DEVELOPING EFFLUENT LIMITS

For Office Use Only	
CHECK NUMBER	
DATE RECEIVED	FEE SUBMITTED

TYPE OF PROJECT ☐ Grant ☐ SRF Loan ☑ All Other Projects

REQUESTER	TELEPHONE NUMBER WITH AREA CODE
TRW AUTOMOTIVE U.S. LLC	(248) 994-2288
PERMITTEE / FACILITY NAME: FORMER TRW AUTOMOTIVE U.S. LLC - RAMSEY FACILITY GROUNDWATER TREATMENT	MSOP NUMBER (IF APPLICABLE)
COUNTY: FRANKLIN	SIC / NAICS CODE: 9512/924120

REASON FOR REQUEST

☑ New Discharge (See Instruction #9) ☐ Upgrade (No expansion) (See AIP) ☐ Expansion ☐ QAPP or Study Review

DESCRIPTION OF PROPOSED ACTIVITY
Install and operate groundwater treatment system to comply with Corrective Action Abatement Order on Consent with MDNR, Order No. 17-HW-P001. Recovered groundwater will be treated to remove volatile organic compounds using an air stripper and hexavalent chrome (Cr+6) using ion exchange prior to discharging to surface water via drainage ditch to unnamed tributary to Wensel Creek.

FACILITY INFORMATION

METHOD OF BACTERIA COMPLIANCE
☐ Chlorine Disinfection ☐ Ultraviolet Disinfection ☐ Ozone ☑ Not Applicable

WATER QUALITY ISSUES*
Chlorinated VOCs are present in groundwater at concentrations exceeding MCL. Groundwater remediation required per Order of Consent with MDNR

*Water quality issues include: effluent limit compliance issues, notices of violation, water body beneficial uses not attained or supported, etc.

OUTFALL	LOCATION (UTM OR LAT/LONG OR LEGAL DESCRIPTION)	MAPPED[1] (CHECK)	RECEIVING WATER BODY[2]
001	NW1/4, NW1/4, Sec 1, T 40N, R2W	☑	Wensel Creek
		☐	
		☐	

[1] Please attach topographic map (See: www.dnr.mo.gov/internetmapviewer/) with outfall locations clearly marked. For additional outfalls, attach a separate form.
[2] Please see general instructions for discharges to streams.

OUTFALL	NEW DESIGN FLOW ** (MGD)	TREATMENT TYPE	EFFLUENT TYPES*
001	.15	air stripping to remove VOCs, ion exchange to re	Groundwater Remediation

* Describe predominating character of effluent. Example: Domestic Wastewater, Municipal Wastewater, Industrial Wastewater, Storm water, Mining Leachate, etc.
** If expansion, indicate new design flow.

See General Instructions. Additional information may be needed to complete your request. Your request may be returned if items are missing. The water quality review assistance is a process to determine effluent limits for new facilities or existing facilities seeking to increase loading into the receiving stream.

SIGNATURE	DATE
PRINT NAME	EMAIL ADDRESS
	TELEPHONE NUMBER WITH AREA CODE

Applicant supplied (check all that apply):
☐ Fee. See Instructions
☑ Attachment A – Significant Degradation
☐ Attachment B – Minimal Degradation
☐ Attachment C – Temporary degradation
☐ Attachment D – Tier 1 Review
☐ No Degradation Evaluation
☐ Heritage Review Determination. See Instruction #8.
☐ Geohydrologic Evaluation. See Instruction #9.
☐ Tier Analysis for minimal degradation (see Page 3, Tier 2 Reviews).
☐ Quality Assurance Project Plan.
☐ Time of travel study (see Instruction #3) or model (see Instruction #2).

Submit request to:
Missouri Department of Natural Resources,
Water Protection Program,
ATTN: WPCB Engineering Section
P.O. Box 176
Jefferson City, MO 65102-0176
Telephone: 573-751-1300
Fax: 573-522-9920

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GENERAL INSTRUCTIONS

Fees. This form must be submitted with the appropriate application fee: For an anti-degradation review for a new wastewater treatment plant if the design flow is less than 100,000 gallons per day the fee is $500; for an anti-degradation review for a new wastewater treatment plant if the design flow is equal to or more than 100,000 gallons per day the fee is $1000; for an anti-degradation review for which the existing wastewater treatment train is being retained as part of an upgrade or for a water quality review analysis the fee is $250.

1. Please attach maps clearly showing the location of each outfall. A U.S. Geological Survey topographic map is available at www.dnr.mo.gov/internetmapviewer/. Additional water quality information is available at www.dnr.mo.gov/env/wpp/wpp-map-gallery.htm.
2. **Discharges to all gaining streams**: Applicant must submit dissolved oxygen analysis (using Missouri Department of Natural Resources approved models such as Streeter Phelps (www.ecy.wa.gov/programs/eap/pwspread/pwspread.html, use PWSPREAD.XLS and the dosag2 sheet only) or Qual2K/Qual2E (Q2K/Q2E) stream water quality study (www.epa.gov/athens/wwqtsc/index.html) indicating the proposed BOD_5 effluent limitations are protective of Missouri's water quality standard for dissolved oxygen. DO modeling and BOD effluent limit development guidance can be found at www.dnr.mo.gov/env/wpp/permits/DO_Modeling_Administrative_Guidance_Dec_09.pdf. The department may provide more specific procedures upon request. **Note:** If Q2K/Q2E is used, wasteload allocation for ammonia must be assumed. All Q2K/Q2E studies must have department-approved Quality Assurance Project Plans
3. **Discharges to unclassified gaining stream**: Applicant may provide the time of travel to the confluence with the classified stream segment for modeling pollutant decay (See *Total Ammonia Nitrogen Criteria Implementation Guidance Policy* at www.dnr.mo.gov/env/wpp/permits/antideg-implementation.htm). Otherwise, the applicant may determine limits based on no decay of discharge pollutants. The department uses a Manning's N method for time of travel determination (see *Technical Addendum* #3 at www.dnr.mo.gov/env/wpp/permits/antideg-guidance.htm). Please include items requested in the Technical Addendum and a map, schematic or description of flow segments with your calculations. A worksheet with instructions is available at the above web link.
4. For all discharges, the chronic water quality criteria point of compliance is the classified stream or the confluence with the classified stream. No mixing is allowed for streams with seven-day Q10 low flow less than 0.1 cfs (10 CSR 20-7.031(A)4.B.(I)), while mixing is allowed for streams with seven-day Q10 low flow greater than 0.1 cfs (10 CSR 20-7.031(A) 4.B.(II)) and (III).
5. For industrial facilities, a list of all chemicals, compounds, elements, etc. found in the discharge must be submitted with the request. Proprietary names of chemicals are not sufficient, as these chemicals may contain several pollutants for which the department must evaluate separate effluent limits. A pre-construction review meeting is highly recommended.
6. Do not submit water quality review assistance requests for renewals. All water quality based effluent limits will be determined during the renewal process.
7. 10 CSR 20-7.015(8)(A)3 allows alternative limitations (i.e., lagoon or trickling filters) if a water quality impact study is conducted. This impact study should indicate that equivalents to secondary treatment for lagoons or trickling filters are protective of Missouri Water Quality standards for dissolved oxygen and ammonia.
8. Applicant must check for rare and endangered aquatic species that may be affected by the discharge at http://mdcgis.mdc.mo.gov/heritage/newheritage/heritage.htm. Send information to provided address or select the Heritage Review Link. Register and supply requested information.
9. Additional requirements for new facilities:
   - A. Division of Geology and Land Survey Geohydrologic Evaluations must be submitted with the request.
   - B. Coordinates of outfalls in UTMs and in the public land survey system must be provided.
   - C. Please submit a letter with project timeframe.

Note: Lack of response for additional informational within a reasonable timeframe will result in return of request.

ANTIDEGRADATION INSTRUCTIONS:

For more detailed instructions, the applicant should refer to *Missouri's Antidegradation Rule and Implementation Procedure* (AIP), which is available at www.dnr.mo.gov/env/wpp/permits/antideg-implementation.htm. All **waters of the state** (except groundwater) are subject to the AIP. All applicants must submit a determination of assigned tiers of protection to water quality for all **waters of the state** on a pollutant-by-pollutant basis. The applicant should consult AIP, Section 1.B. for the process of assigning tier protection levels. Both Tier 1 and 2 reviews are conducted on a pollutant-by-pollutant basis. Outstanding national and state water resources listed on Table D and E in the Water Quality Standards at 10 CSR 20-7.031 automatically are assigned Tier 3 reviews that are conducted on a water body-by-water body basis.

As an overview, AIP requires the new or expanded discharge either:

1. Demonstrate that the loading is below the allowed facility assimilative capacity and segment assimilative capacity.
2. Demonstrate that loading will be maintained or decreased.
3. Demonstrate degradation or assume degradation with alternative analysis and Social and Economic Importance (SEI) evaluation.

For minimally degrading activities as defined in AIP, no alternative analysis or socio-economic importance demonstration is required. If the activity is degrading or assumed to be degrading, then in order to complete the Administrative Record of Decision the applicant must submit both:

1. An alternative analysis that demonstrates non-degrading and minimally degrading discharging options are either impracticable, non-cost efficient, or unaffordable.
2. An evaluation of SEI of the proposed degrading discharging activity for social and economic development of the community. Applicants must summarize the review using the attached summary sheets (See below).

Tier 1 Reviews: Pollutants of concern (POC) that qualify for Tier 1 reviews may be discharged in accordance with Water Quality Standards without performing the alternative analysis or SEI demonstration. However, for a POC with Tier 1 designation, the applicant must provide existing receiving water quality data[1], or an appropriate water quality model[1], or department Section 303(d) listings (facilities with water bodies having 305(b) listed POCs should contact the department). Appendix 2 of the AIP demonstrates the statistical process (90 percentile value is significantly more than 95 percent of the Water Quality Standards for the POC) that applicants must use to designate POC as Tier 1 (below, at or near Water Quality Standard), if POC is not department Section 303(d) listed for that water body. Finally, for Tier 1 POCs, the total maximum daily load process must be followed to maintain or improve water quality. The applicant must demonstrate the discharge will not violate the water quality criterion for that pollutant (see Attachment D). For a list of activities that are considered not to result in significant degradation, see AIP, Section II.A.

Tier 2 Reviews: By default, and in the absence of existing water quality data, all **waters of the state** must have a Tier 2 review before an application for a permit to discharge is filed. If an applicant is assuming some or all POCs cause degradation, alternative analysis and SEI demonstration is required. Worksheets for evaluating alternative to discharge (see AIP, Section II.B) and SEI to the community (See AIP, Section II.E), as provided in 10 CSR 20-7.031, must be provided for review (see Attachment A). For POCs with Tier 2 designation, applicant must provide the basis for determination by providing existing water quality[1] or an appropriate water quality model[1]. The applicant must consider the current existing water quality value in the administrative record from previous sampling events (see AIP, Water Quality Assessment Procedures). If degradation is minimal or temporary, no alternative analysis and socio-economic demonstration is required (Tier 2 review is not required) but applicant must provide basis for minimal determination. Degradation is considered minimal if the proposed new or expanded loading is less than 10 percent of the facility assimilative capacity and the cumulative degradation is less than 10 percent of the segment assimilative capacity as a result of all discharges combined. Minimal degradation as defined by AIP must be supported by summary worksheet in Attachment B for facility assimilative capacity or segment assimilative capacity demonstrating assimilative capacity of POC. A tier analysis must be provided with the review to ensure all pollutants have the Tier 2 designation.

Tier 3 Reviews: Tier 3 water bodies shall receive no degradation of water quality. If hydrologic connection to Tier 3 water bodies has been or is demonstrated, then the applicant must demonstrate that water quality in the Tier 3 segment will not be lowered. Applicants in watersheds with significant losing segments should contact the department's Division of Geology and Land Survey for a geohydrological evaluation and available dye tracings information. Temporary degradation of water receiving with Tier 3 protection may be allowed by the department on a case-by-case basis as explained in Section II.A of AIP document. Applicant must provide information stated below for evaluation of temporary degradation (see Attachment C).

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[1] Quality Assurance Project Plan, or QAPP, must be provided to the department's Water Protection Program for review in advance (i.e., at least six months) of the proposed data collection activity and before submittal of the Antidegradation Review. A pre-applicant conference is highly recommended. **Important:** Applicant must follow the U.S. Environmental Protection Agency's requirements for Quality Assurance Project Plan document, available at www.epa.gov/QUALITY/qs-docs/r5-final.pdf. **Additional information needed with the EWQ data includes**: 1) Date existing water quality data was provided by the Watershed Protection Section, 2) Approval date by the Watershed Protection Section of the QAPP, project sampling plan, and data collected by all appropriate POCs.

ANTIDEGRADATION INSTRUCTIONS: (CONTINUED)

Applicants choosing to use new wastewater technology that is considered, "unproven technology" in their Tier 2 Reviews with alternative analysis must comply with the requirements set forth in the *New Technology Definitions and Requirements fact sheet* found at: www.dnr.mo.gov/pubs/pub2453.htm.

Temporary degradation is defined in the Antidegradation Implementation Procedure on pages 8 and 23. If degradation is temporary, describe the nature of the temporary impact by providing:

1. Length of time during which water quality will be lowered (time frame is typically less than a year).
2. Percent change in ambient conditions.
3. Parameters affected.
4. Likelihood for long-term water quality benefits to the segment.
5 Degree to which achieving the applicable water quality standards during the proposed activity may be at risk.
6. Potential for any residual long-term influences on existing uses.

Summary Documentation for Public Notice: Please attach the entire antidegradation review report. In addition, the department requests antidegradation review summaries for public notice of the major findings for each analysis. Please do not use the phrase "See Report" to complete these forms. Attached to this request form are outlines of the requested information:

Attachment A – Form used for pollutants of concern that are Tier 2 with significant degradation. Significant degradation requires an alternative analysis, preferred alternative outline, social and economic importance of discharge, and if necessary, facility and segment assimilative capacity.

Attachment B – Form used for pollutants of concern that are Tier 2 with minimal degradation or maintenance or reduction of loading demonstrations. For reduction or maintenance of loading demonstrations, 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. Minimal degradation requires a summary of facility and segment assimilative capacity. ***Tier determination analysis must be submitted with this review.***

Attachment C – Submit this form if the discharge will result in temporary degradation. Temporary degradation requires description of the nature of the impact and Tier 1 Review.

Attachment D – Form used for pollutants of concern that are Tier 1. Tier 1 Review requires determination of Tier 1 and may require facility assimilative capacity and segment assimilative capacity for discharge water body or downstream water body segment.

No Degradation Evaluation – Conclusion of Antidegradation Review – Submit this form with the appropriate Construction Permit Application if the project is determined to be non-degrading. Do not submit water quality review assistance request to the central office as no antidegradation review is required. Note: During consultation with Water Protection Staff under the "Other" option of no degradation, a Water Quality Review Assistance Request may be required.

Outstanding National Resource Waters – Outstanding National Resource Waters and Outstanding State Resource Water are listed in Tables D and E of 10 CSR 20-7.031. If the discharge's proposed receiving water body is an Outstanding National Resource Water, an Outstanding State Resource Water, or drainage thereto, per Section I.B.3 of the AIP, "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.

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

ANTIDEGRADATION REVIEW SUMMARY FOR PUBLIC NOTICE
ATTACHMENT A: TIER 2 – SIGNIFICANT DEGRADATION

1. FACILITY

NAME		TELEPHONE NUMBER WITH AREA CODE	
FORMER TRW AUTOMOTIVE U.S. LLC-RAMSEY FACILITY		(248) 994-2288	
ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE
300 RAMSEY DRIVE	SULLIVAN	MO	63080

2. OWNER

NAME AND OFFICIAL TITLES			
TRW AUTOMOTIVE U.S. LLC			
ADDRESS	CITY	STATE	ZIP CODE
11202 EAST GERMANN ROAD	MESA	AZ	85212
TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS		
(480) 722-4866	ROBERT.BLEAZARD@ZF.COM		

3. CONTINUING AUTHORITY 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.

NAME AND OFFICIAL TITLES			
TRW AUTOMOTIVE U.S. LLC			
ADDRESS	CITY	STATE	ZIP CODE
11202 EAST GERMANN ROAD	MESA	AZ	85212
TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS		
(480) 722-4866	ROBERT.BLEAZARD@ZF.COM		

4. RECEIVING WATER BODY SEGMENT #1

NAME
DRAINAGE DITCH TO UNNAMED TRIB OF WENSEL CREEK - UTM Coordinates Easting (X) 660340.36, Northing (Y) 4230166.59

4.1 UPPER END OF SEGMENT (Location of discharge)
UTM X_____ OR Lat _____, Long _____
4.2 LOWER END OF SEGMENT
UTM _____ OR Lat _____, Long _____

Per the Missouri Antidegradation Implementation Procedure, or AIP, the definition of a segment, "a segment is a section of water that is bound, at a minimum, by significant existing sources and confluences with other significant water bodies."

5. WATER BODY SEGMENT #2 (IF APPLICABLE, Use another form if a third segment is needed)

NAME

5.1 UPPER END OF SEGMENT
UTM _____ OR Lat _____, Long _____
5.2 LOWER END OF SEGMENT
UTM _____ OR Lat _____, Long _____

6. 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 the antidegradation review report.

What is the Wet Weather Flow Peaking Factor in relation to design flow?

Wet Weather Design Summary:
No information required

7. EXISTING WATER QUALITY DATA OR MODEL SUMMARY

Obtaining Existing Water Quality is possible by three methods according to the Antidegradation Implementation Procedure Section II.A.1.: (1) using previously collected data with an appropriate Quality Assurance Project Plan, or QAPP (2) collecting water quality data approved by the Missouri Department of Natural Resources methodology or (3) using an appropriate water quality model. QAPPs must be submitted to the department for approval well in advance (six months) of the proposed activity. Provide all the appropriate corresponding data and reports which were approved by the department Watershed Protection Section. **Additional information needed with the EWQ data includes**: 1) Date existing water quality data was provided by the Watershed Protection Section, 2) Approval date by the Watershed Protection Section of the QAPP, project sampling plan, and data collected for all appropriate POCs.

Comments/Discussion: No information required

8. SUMMARY OF THE POLLUTANTS OF CONCERN AND THE PROPOSED EFFLUENT LIMITS

Pollutants of Concern to be considered include those pollutants reasonably expected to be present in the discharge per the Antidegradation Implementation Procedure Section II.A. and assumed or demonstrated to cause significant degradation. The tier protection levels are specified and defined in rule at 10 CSR 20-7.031 (2).

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

Pollutants of Concern*	Units	Wasteload Allocation	Average Monthly Limit	Daily Maximum Limit
BOD5	MG/L		NA	NA
TSS	MG/L		NA	NA
DISSOLVED OXYGEN	MG/L		NA	NA
AMMONIA	MG/L		NA	NA
BACTERIA (E. COLI)	CFUS		NA	NA
Trichloroethylene (TCE)	MG/L		0.0035	0.005
Iron (Fe)	MG/L		1	1
Total Chromium	MG/L		0.1	0.1
Hexavalent Chromium (Cr+6)	MG/L		0.008	0.016

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

*Assumed Tier 2.

9. IDENTIFYING ALTERNATIVES

Supply a summary of the alternatives considered and the level of treatment attainable with regards to the alternative. "For Discharges likely to cause significant degradation, an analysis of non-degrading and less-degrading alternatives must be provided," as stated in the Antidegradation Implementation Procedure Section II.B.1. Per 10 CSR 20-6.010(4)(D)1., the feasibility of a no-discharge system must be considered. Attach all supportive documentation in the Antidegradation Review report.

Applicants choosing to use a new wastewater technology that are considered an "unproven technology" in Missouri in their Tier 2 Reviews with alternative analysis must comply with the requirements set forth in the *New Technology Definitions and Requirements Factsheet* that can be found at: http://dnr.mo.gov/pubs/pub2453.pdf.

Non-degrading alternatives: See Report

Alternatives ranging from less-degrading to degrading including Preferred Alternative
(All treatment levels for POCs must at a minimum meet water quality standards):

Alternatives	Level of Treatment Attainable for each Pollutant of Concern					
	BOD5	TSS	AMMONIA AS N	TCE	Total Cr	Cr+6
	(MG/L)	MG/L	MG/L	MG/L	MG/L	MG/L
Air Stripper	NA	NA	NA	< 0.001	NA	NA
Air Stripper w/ GAC Polishing	NA	NA	NA	< 0.001	NA	NA
Air Stripper w/ Ion Exchange				< 0.001	< 0.001	< 0.001
Air Stripper w/ Precipitation				< 0.001	< 0.005	< 0.005

10. DETERMINATION OF THE REASONABLE ALTERNATIVE

Per the Antidegradation Implementation Procedure Section II.B.2, "a reasonable alternative is one that is practicable, economically efficient and affordable." Provide basis and supporting documentation in the Antidegradation Review report. **Please do not write "See Report" for any box below.**

Practicability Summary:

"The practicability of an alternative is considered by evaluating the effectiveness, reliability, and potential environmental impacts," according to the Antidegradation Implementation Procedure Section II.B.2.a. Examples of factors to consider, including secondary environmental impacts, are given in the Antidegradation Implementation Procedure Section II.B.2.a.

Air stripping is a common method for removal of VOCs in water, effective and reliable where inorganic groundwater quality is high and where VOCs are readily stripped as at this site. The air stripper manufacturer model indicates complete removal of VOCs under design conditions. The initial conc. of VOCs in groundwater are approx. 1,000 ug/L total VOCs, predominantly trichloroethyene (TCE). While VOCs stripped from the groundwater will be discharged directly to the atmosphere, the rate of discharge is low, approximately 2 ppmV at a rate of 0.05 lbs/hr (1.2 lbs/day, 438 lbs/yr). Concentrations and mass discharge are expected to decrease over the period of operation. Ion exchange is a cost effective and flexible method for removing Cr+6 where general water quality is high.

Economic Efficiency Summary:

Alternatives that are deemed practicable must undergo a direct cost comparison in order to determine economic efficiency. Means to determine economic efficiency are provided in the Antidegradation Implementation Procedure Section II.B.2.b.

Costs for the treatment system utilizing an air stripper are estimated to be $350,000 to install and $46,000 to operate for the first year. The cost to install and operate over 10 yrs is estimated to be $928,000.

Costs were evaluated to provide carbon polishing as supplemental groundwater treatment in addition to air stripping. Costs for a treatment system incorporating both the air stripper and carbon polishing are estimated to be $453,000 to install and $83,000 to operate for the first year. The cost to install and operate over 10 yrs is estimated to be $1,492,000.

Affordability Summary:

Alternatives identified as most practicable and economically efficient are considered affordable if the applicant does not supply an affordability analysis. An affordability analysis per the Antidegradation Implementation Procedure Section II.B.2.c, "may be used to determine if the alternative is too expensive to reasonably implement."

While treatment of Cr+6 is incorporated into the treatment system, operating costs of the ion exchange system require periodic changeout of the vessels irregardless of the influent Cr+6 concentration. Due to these high operating costs (doubling of yearly O&M costs from approximately $46,000 to over $90,000), treatment for Cr+6 will be discontinued once influent concentration of Cr+6 consistently falls below NPDES limit.

Preferred Chosen Alternative:

The preferred alternative is utilization of an air stripper without carbon polishing followed by treatment of Cr+6 utilizing ion exchange. The design would incorporate treatment of the primary groundwater supply from RW-4 (at up to 100 gpm) combined with 1 to 2 gpm from existing shallow recovery wells RW-1 and RW-2 which are currently discharging to the City of Sullivan POTW. Incidental water produced at low volumes (up to 500 gallons per day) during periodic groundwater sampling events will also be treated and discharged through the treatment system.

A carbonate inhibitor may be be used at low concentrations (up to 10 ppm) to reduce scaling and improve system reliability if warranted.

Reasons for Rejecting the other Evaluated Alternatives:

There is no benefit to GAC polishing given the robust design of the air stripper and the favorable quality of site groundwater. Operation of nearby City of Sullivan well COS-2 demonstrates that the quality of the groundwater that will be produced from RW-4 will result in slow fouling, minimizing the potential for a rapid reduction in treatment efficiency.

The addition of GAC polishing would significantly increase costs of the treatment system and also increase the complexity of the system operation and monitoring, likely reducing the overall run time of the system.

Treatment of Cr+6 utilizing reduction and precipitation is no more effective, significantly more expensive, and would result in a higher level of chemical exposure to maintenance workers.

Comments/Discussion:

Air stripping to remove VOCs from groundwater where inorganic groundwater quality is high results in effective and reliable treatment as well as producing high quality, aerated effluent. Additional polishing using GAC would result in additional costs and system complexity with no benefit to system effectiveness.

Treatment of Cr+6 via ion exchange is effective, reliable, and flexible in implementation.

11. SOCIAL AND ECONOMIC IMPORTANCE OF THE PREFERRED ALTERNATIVE

If the preferred alternative will result in significant degradation, then it must be demonstrated that it will allow important economic and social development in accordance to the Antidegradation Implementation Procedure Section II.E. Social and Economic Importance is defined as the social and economic benefits to the community that will occur from any activity involving a new or expanding discharge.

Identify the affected community:

The affected community is defined in 10 CSR 20-7.031(2)(B) as the community "in the geographical area in which the waters are located.: Per the Antidegradation Implementation Procedure Section II.E.1, "the affected community should include those living near the site of the proposed project as well as those in the community that are expected to directly or indirectly benefit from the project."

Groundwater from the site has migrated downgradient and is captured by the City of Sullivan well (COS-2) that supplies potable water for the city. Operation of the on-site system will have little impact on the surrounding neighborhood as the treatment system is located within an industrial area, approximately 500 ft from the nearest home. In addition, the treatment system will be similar to an existing system currently treating small amounts of groundwater (1-2 gpm) prior to discharge to the POTW.

Identify relevant factors that characterize the social and economic conditions of the affected community:

Examples of social and economic factors are provided in the Antidegradation Implementation Procedure Section II.E.1., but specific community examples are encouraged.

The installation and operation of the groundwater recovery and treatment system is being installed and operated to comply with an MDNR Corrective Action Abatement Order on Consent (Order No. 17-HW-P001) to implement an approved final remedy for groundwater contamination at the Ramsey facility. This remedy has been approved following public review and comment.

Describe the important social and economic development associated with the project:

Determining benefits for the community and the environment should be site specific and in accordance with the Antidegradation Implementation Procedure Section II.E.1.

The results of constructing a successful treatment system will be to reduce off-site migration of VOCs to the City of Sullivan water supply well COS-2.

PROPOSED PROJECT SUMMARY:

VOC impacted groundwater will be recovered at a rate at up to 100 gpm from RW-4, screened between 310 ft and 360 ft bgs and at 1-2 gpm from two shallow recovery wells, RW-1 and RW-2, completed at depths of approximately 150 ft bgs. Recovered groundwater will be transported via force main to the treatment system where VOCs will be removed via air stripping and Cr+6 will be removed via ion exchange. Treated groundwater will be discharged via force main to a drainage ditch that discharges to an unnamed tributary of Wensel Creek. Due to the method of treatment, treated groundwater will have elevated dissolved oxygen,

Attach the Antidegradation Review report and all supporting documentation. This is a technical document, which must be signed, sealed and dated by a registered professional engineer of Missouri.

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 regulations.

SIGNATURE	DATE

NAME AND OFFICIAL TITLES / LICENSE #	COMPANY NAME		
Royce Face, Principal Engineer - MO-P.E. #2006029699	Arcadis U.S., Inc.		
ADDRESS	**CITY**	**STATE**	**ZIP CODE**
8725 Rosehill, Suite 350	Lenexa	KS	66215
TELEPHONE NUMBER WITH AREA CODE	**E-MAIL ADDRESS**		
(913)998-6915	royce.face@arcadis.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

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TRW – Ramsey Site

Antidegradation Review

On July 24, 2017, TRW Automotive LLC voluntarily entered into a Corrective Action Abatement Order on Consent with the MDNR, Order No. 17-HW-P001, to implement the approved final remedy for groundwater contamination at the former TRW Ramsey facility. TRW-Ramsey has been conducting corrective action investigations and remediation activities at the site under a 3008(h) Corrective Action Order on Consent with U.S. Environmental Protection Agency (EPA).

A component of the Order on Consent is the installation and operation of a groundwater recovery and treatment system designed to minimize off site migration of volatile organic compound (VOC) impacted groundwater. Currently, groundwater recovery is ongoing at two locations.

- Onsite, two groundwater recovery wells (RW-1 and RW-2 completed at depths of approximately 150 ft below ground surface) extract shallow groundwater at a combined rate of 1-2 gallons per minute (gpm). The extracted groundwater had a dissolved TCE concentration of 6,800 micrograms per liter (ug/L) during the most recent sampling period. The extracted groundwater is treated using an air stripper to remove VOCs and discharged to the City of Sullivan POTW.
- VOCs have migrated vertically into deeper portions of the aquifer where dissolved VOCs migrate downgradient of the site and are captured at City of Sullivan water supply well COS-2. Groundwater produced from COS-2 at approximately 300 gpm is impacted with TCE at a concentration of approximately 35 micrograms per liter (ug/L) prior to treatment. Groundwater is treated using an air stripper to remove VOCs prior to being introduced into the City of Sullivan potable water distribution system. Treated groundwater is sampled monthly for VOCs.

In order to comply with the Order on Consent, TRW has installed RW-4 into the deeper aquifer near the downgradient site boundary. RW-4 is screened from 310 ft to 360 feet (ft) below ground surface (bgs) and contained 860 ug/L of TCE during the initial sampling event. Sampling of inorganic parameters indicated low hardness (170 mg/L). Groundwater produced during the installation and development of RW-4 was discharged to the City of Sullivan POTW. To comply with discharge requirements, groundwater from RW-4 was sampled for a parameter list provided by the city. Hexavalent chromium (Cr+6) was present at 23 ug/L, exceeding the 10 ug/L discharge limit requiring the water to be treated prior to discharge.

Groundwater from RW-4 will be produced at rates of up to 100 gpm and transported via dual wall force main to a groundwater treatment system where VOCs will be removed via air stripping and Cr+6 via ion exchange before discharging to a drainage ditch on the west side of the property that drains to an unnamed tributary of Wensel Creek.

EPA ID# MOD094390416

MDNR Contact: **Bruce Stuart**, 573-751-3553 or 800-361-4827 [bruce.stuart@dnr.mo.gov]
EPA Contact: **Robert Aston, Jr.**, 913-551-7392 or 800-223-0425
Facility Contact: **Robert Bleszard**, 480-722-4866

- Former Company Name: Ramsey Corp. Inc., TRW Inc., TRW Automotive Products Inc.
- Location of hard copies of hazardous waste permit application, Part I and Part II Permits, modification requests, reports, etc. and supporting documents:
  - Missouri Department of Natural Resources, Elm Street Conference Center, 1730 E. Elm St., Jefferson City, Missouri.
  - U.S. Environmental Protection Agency, Information Resource Center, 11201 Renner Blvd., Lenexa, Kansas (ph: 913-551-7241).

Facility Location and Description

The Site is located on about 7 acres at 300 Ramsey Drive in Sullivan, Missouri. From 1960 through 1984, the Ramsey Corp. Inc., a wholly owned subsidiary of TRW Inc., manufactured automobile piston rings and operated a chrome plating system. A variety of hazardous wastes were produced as part of the facility operations, including trichloroethylene (TCE) and chrome-contaminated sludge. The Ramsey site operated three wastewater treatment lagoons and one lagoon to store sludge produced during wastewater treatment operations. Waste TCE solvent and used oil were temporarily stored in drums before being shipped off-site for disposal.

Sullivan Warehousing Inc. and Sister Property Inc. acquired the property from TRW in July 1987. Through an agreement with Sullivan Warehousing and Sister Property, Rockwell Industries have been conducting manufacturing operations at the facility.

Corrective Action Status

TRW Ramsey closed the hazardous waste management units in the late 1980s. According to applicable state and federal hazardous waste laws and regulations, all hazardous waste treatment, storage and disposal facilities are required to investigate and clean up releases of hazardous waste and hazardous constituents to the environment at their facility resulting from present and past hazardous waste handling practices. Investigations performed by TRW after the closure showed groundwater was contaminated with volatile organic compounds (VOCs), chromium and lead. VOC contaminated groundwater from the former TRW Ramsey facility was linked to impacts at the City of Sullivan's municipal water supply well COS-2. The movement of the impacted groundwater is controlled by continued pumping of well COS-2. Water treatment equipment was also installed on this well to allow for continued use of the water.

On April 1, 1993, TRW Inc., Sullivan Warehousing Inc., Sister Property Inc., Rockwell Industries and the EPA voluntarily entered into a 3008(h) Administrative Order on Consent, to conduct corrective action investigations and remediation activities at the former TRW Ramsey facility. The MDNR, in coordination with the EPA, previously approved a final remedy for the facility following public review and comment. The approved final remedy includes property activity and use limitations, which are contained in an Environmental Covenant that was filed with the Franklin County Recorder of Deeds.

On July 24, 2017, TRW Automotive US LLC voluntarily entered into a Corrective Action Abatement Order on Consent with the Department, Order No. 17-HW-P001, to implement remaining elements of the approved final remedy for groundwater contamination at the former TRW Ramsey facility. This

Order addresses ongoing operation of the treatment equipment at COS-2 and monitoring of the treatment effectiveness. The Order also contains provisions that can be implemented to address any facility-related impacts to other municipal water supply wells. The Constituents of Concern (COCs) identified in the Order are summarized in the table below.

Constituents of Concern

Constituent	MCL (µg/L)
1,1-Dichloroethylene	7
1,2-Dichloroethane	5
Cis-1,2-Dichloroethylene	70
Trans-1,2-Dichloroethylene	100
Trichloroethylene	5
Vinyl Chloride	2
Chromium	100
Lead	15

Notes:
MCL - Maximum Concentration Limit
Limits obtained from both state and federal public drinking water regulations

Determination of the Reasonable Alternative

Practicability Summary

"The practicability of an alternative is considered by evaluating the effectiveness, reliability, and potential environmental impacts," according to the Antidegradation Implementation Procedure Section II.B.2.a. Examples of factors to consider, including secondary environmental impacts, are given in the Antidegradation Implementation Procedure Section II.B.2.a.

Groundwater extraction at RW-4 is required by the Order on Consent to recover VOCs and prevent migration towards the city water production wells. Reinjection of the treated groundwater is not feasible as that would interfere with the hydraulic capture of the groundwater plume. No discharge approach was evaluated during the feasibility study and found impractical. Groundwater production and the resulting NPDES discharge rates will be minimized to the extent feasible while still providing hydraulic capture of the VOC plume.

Two primary treatment alternatives were evaluated to remove the VOCs from the groundwater prior to discharge, air stripping and air stripping with granular activated carbon (GAC) polishing. Both are highly effective and reliable when properly maintained. Air stripping was selected due to its cost effectiveness over what is likely to be an extended operational period (> 10 yrs).

The primary criteria that led to the selection of air stripping are 1) the generally high water quality with regards to its inorganic geochemistry which allows for low maintenance operation of the air stripper, and 2) the lower life cycle costs of the air stripper as continuous carbon replacement is not required. Use of GAC requires periodic carbon exchanges that generate solid waste requiring treatment or regeneration.

As demonstrated by the attached model output, the technical feasibility of removing the COCs from the groundwater using an air stripper is high. While in practice, the efficiency of the air stripper declines over time as scaling (carbonate deposits that occur within the stripper trays) reduces the contact between the air and water, the model demonstrates a high degree of conservatism in the design. As demonstrated, complete removal occurs in a four-tray stripper when the stripper is clean, prior to any reduction in efficiency due to scaling. The stripper utilized will have six trays, significantly increasing the treatment capacity and thus long-term performance reliability. While groundwater from RW-4 has low hardness and low iron, scaling inevitably occurs, resulting in periodic detections of VOCs in the effluent, typically at concentrations less than 5 ug/L. The rate of scaling under the site conditions is likely to be low and can be effectively monitored through system operating data and periodic effluent monitoring, ensuring that maintenance (i.e., cleaning of the air stripper) can occur before a major reduction in treatment efficiency occurs. Despite the relatively low scaling potential, a conservative approach to sizing the air stripper will be utilized to provide a less degrading alternative. While a 100 gpm stripper can effectively treat the groundwater to the VOC discharge limits, a 240 gpm stripper will be utilized. This larger stripper will provide additional treatment capacity that will reduce the rate of impact of scaling, lengthening the period required between stripper cleanings and reducing the rate at which scaling reduces treatment efficiency.

Finally, chemical sequestrants will be utilized as necessary to reduce scaling, further minimizing the rate and effect. The City of Sullivan currently operates a similar air stripper on one of the city wells. The stripper operates continuously at rates over 250 gpm. Without sequestrants, the air stripper can operate for more than 5 years between cleanings.

As currently planned, the system will operate continuously, with interruptions for only maintenance and repairs. The pumping rate will vary depending on site requirements, at rates up to a maximum of 100 gpm. In practice, the system will operate between 90% and 100% of the time, only inoperative due to maintenance or repairs.

The treated groundwater will discharge into a drainage ditch that flows into Wensel Creek approximately 1,000 ft north of the site. The drainage ditch receiving the treated groundwater typically flows only during periods of precipitation, receiving runoff from streets and parking lots in the vicinity. The ditch flows north through the Meramec Manufacturing property before joining Wensel Creek.

In addition to removing VOCs from the groundwater, treatment using the air stripper will aerate the extracted groundwater, adding dissolved oxygen prior to discharge to surface water. Given the generally high groundwater quality, biological oxygen demand (BOD) of the treated water will be insignificant.

While the VOCs are transferred from the groundwater to air, both the mass of VOCs discharged and the concentrations in discharged air are very low. The attached treatment model results indicate a maximum concentration of 2 ug/m3 in air. The yearly rate of VOC discharged to the atmosphere will be less than 500 lbs.

In addition to the VOCs whose removal is the primary goal of the proposed remediation activities, treatment for Cr+6 will be conducted to meet the proposed NPDES discharge limits. Total chrome (Cr+3) was identified as a COC at the site and has been part of the long-term sampling program.

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While concentrations in shallow groundwater are elevated, concentrations within the production zone for the groundwater recovery well are well below MCLs. While Cr+6 was not identified as a COC at the site, sampling done to obtain permission to discharge well development water to POTW identified Cr+6 at a concentration of 23 ug/L in RW-4. A review of the groundwater data indicated that while elevated concentrations of total chrome are present in the shallow zone (where a small portion of the extracted groundwater will be produced), total chrome within the deep unit is relatively low (up to 40 ug/L) and only present immediately below the site. It is possible that even the small concentrations of Cr+6 currently present at RW-4 will decline under sustained production as clean water is drawn towards RW-4. However, it is not feasible to accurately predict the rate and extent of decline in concentration.

Given the uncertainty in the long-term influent concentration, temporary treatment utilizing ion exchange will be conducted at startup. As currently evaluated, a lead/lag pair of vessels containing ion exchange resin will be utilized to treat groundwater discharged from the air stripper and prior to discharge to the outfall.

Treatment for Cr+6 will continue until monitoring confirms the reduction in influent concentrations to below NPDES permit levels is sustained. Monthly sampling will be conducted for both influent and effluent Cr+6 concentrations. Treatment for Cr+6 will continue until monitoring confirms the reduction in influent concentrations is sustained. The basis for discontinuing treatment will be when CR+6 is below the NPDES limit for 6 consecutive months or when concentrations are less than 50% of the NPDES limit for 3 consecutive months.

Economic Efficiency

"Alternatives that are deemed practicable must undergo a direct cost comparison in order to determine economic efficiency. Means to determine economic efficiency are provided in the Antidegradation Implementation Procedure Section II.B.2.b."

As discussed with John Rustiga with the MDNR, an alternative including GAC polishing was evaluated to provide secondary treatment.

Attached in Tables 1 and 2 are a comparative evaluation for capital and operating costs for the two alternatives. These are summarized below:

	Air Stripper	Air Stripper with GAC
Capital	350,000	$453,000
O&M (1 yr)	$46,313	$63,323
O&M (10 yrs)	$578,000	$1,039,000
Capital + 10 yrs O&M	**$928,000**	**$1,492,000**

In addition to evaluating the VOC treatment cost, the incremental costs for treatment of Cr+6 are included to the air stripper costs in Tables 3 and 4. The alternative evaluated for Cr+6 treatment are for ion exchange as well as Cr+6 reduction and precipitation. These costs are summarized below:

	Air Stripper w/o Cr+6 Treatment	Air Stripper w/Ion Exchange Cr+6 Treatment	Air Stripper w/ Reduction/Precipitation Cr+6 Treatment
Capital	350,000	469,000	$717,000
O&M (year 1)	$46,313	$93,600	$124,000
O&M (years 2-10)	$578,000	$980,000	$1,302,000
Capital + 10 yrs O&M	**$928,000**	**$1,642,800**	**$2,143,000**

As noted in the costs above, the ion exchange is the most cost-effective technology for treating Cr+6 to NPDES discharge limits. It should also be noted that while the addition of ion exchange treatment to the system increases capital costs by about 50%, it results in a doubling of the O&M costs.

Utilization of Cr+6 reduction and precipitation would add significantly to both the capital and to the operation and maintenance costs. Due to the larger footprint of the reduction/precipitation option, the process would not fit in the existing building, requiring a secondary structure be added.

Affordability Summary

Alternatives identified as most practicable and economically efficient are considered affordable if the applicant does not supply affordability analysis. An affordability analysis per the Antidegradation Implementation Procedure Section II.B.2.c, "may be used to determine if the alternative is too expensive to reasonably implement."

An evaluation of the effectiveness and reliability of an air stripper alone indicates 1) a high confidence in treatment efficiency in meeting discharge limits, and 2) a high degree of reliability in system operation and maintaining treatment efficiencies.

An evaluation of the effectiveness and reliability of ion exchange for Cr+6 removal indicates 1) a high confidence in treatment efficiency in meeting discharge limits and 2) a high degree of reliability in system operation and maintaining treatment efficiencies. Reduction and precipitation provide no significant benefit in treatment efficiency and would be a much more maintenance intensive process that would result in reduced overall reliability.

Preferred Chosen Alternative

The air stripping without GAC polishing is the chosen alternative due to its high level of treatment efficiency for the targeted COCs, high level of reliability given the site groundwater quality, and the significantly lower life cycle costs.

Ion exchange is the chosen alternative due to its high level of treatment efficiency, its high reliability (using a lead and lag treatment vessel to ensure treatment), the lower life cycle costs, and the flexibility it provides to long-term operation and changing conditions at the site.

ARCADIS

Reasons for Rejecting the other Evaluated Alternatives:

There is minimal benefit to GAC polishing given the robust design of the air stripper and the favorable conditions of site groundwater. Operation of City of Sullivan well COS#2 demonstrates that the quality of the groundwater that will be produced from RW-4 will result in slow fouling, minimizing the potential for a rapid reduction in treatment efficiency. The addition of GAC polishing would also increase the complexity of the system operation and monitoring, likely reducing the overall run time of the system.

Given the significant increase in capital and operating costs and the minimal effect on the system reliability (slight increase in likely treatment reliability offset by a small decrease in run time reliability), the implementation of GAC polishing was rejected.

There is no benefit to reduction/precipitation for Cr+6 treatment given the favorable conditions at the site for ion exchange. Reduction/precipitation is not well suited for continuous operation of an unmanned treatment process at relatively low design flow rates. In addition, waste management of the precipitate will increase potential exposure to maintenance staff. The ion exchange resin is provided to the site in rental vessels, minimizing the potential exposure of maintenance staff to site chemicals.

Given the large increase in both capital and O&M costs along with the elevated health and safety concerns, the implementation of reduction/precipitation was rejected.

Comments/Discussion:

Air stripping to remove VOCs from groundwater followed by ion exchange to remove Cr+6 where inorganic groundwater quality is high results in effective and reliable treatment as well as producing high quality, aerated effluent. Additional polishing using GAC would result in additional costs and system complexity for no benefit.

Social and Economic Importance of the Preferred Alternative

Identify the Affected Community

"The affected community is defined in 10 CSR 20-7.031(2)(B) as the community "in the geographical area in which the waters are located." Per the Antidegradation Implementation Procedure Section II.E.1, "the affected community should include those living near the site of the proposed project as well as those in the community that are expected to directly or indirectly benefit from the project."

As discussed above, the groundwater recovery and treatment system is being installed to comply with an Order on Consent with the MDNR. The goal of the recovery and treatment system is to recover impacted groundwater near the source to minimize the travel of VOCs in groundwater that are currently being captured and treated at City of Sullivan water supply well COS-2. Extended operation of the recovery well is anticipated to minimize off site migration of the COCs, reducing impacts to the City of Sullivan wellfield.

ARCADIS

Identify relevant factors that characterize the social and economic conditions of the affected community:

"Examples of social and economic factors are provided in the Antidegradation Implementation Procedure Section II.E.1., but specific community examples are encouraged."

The groundwater treatment method selected is a counter flow air stripper, designed to efficiently transfer dissolved VOCs into air, discharging them to the atmosphere. Air stripping is a commonly used technology for cost effectively treating VOCs.

Ion exchange, in addition to being an effective treatment method is both widely used and is inherently flexible (number and size of vessels can be changed to reflect changing site conditions).

Describe the important social and economic development associated with the project:

"Determine the benefits for the community and the environment should be site specific and in accordance with the Antidegradation Implementation Procedure Section II.E.1."

The results of successful construction of the treatment system will be to reduce off-site migration of VOCs that are captured and treated at the City of Sullivan water supply well COS-2.

Proposed Project Summary

VOC impacted groundwater will be recovered at a rate at up to 100 gpm from RW-4, screened between 310 ft and 360 ft bgs and at 1-2 gpm from two shallow recovery wells, RW-1 and RW-2, completed at depths of approximately 150 ft bgs.

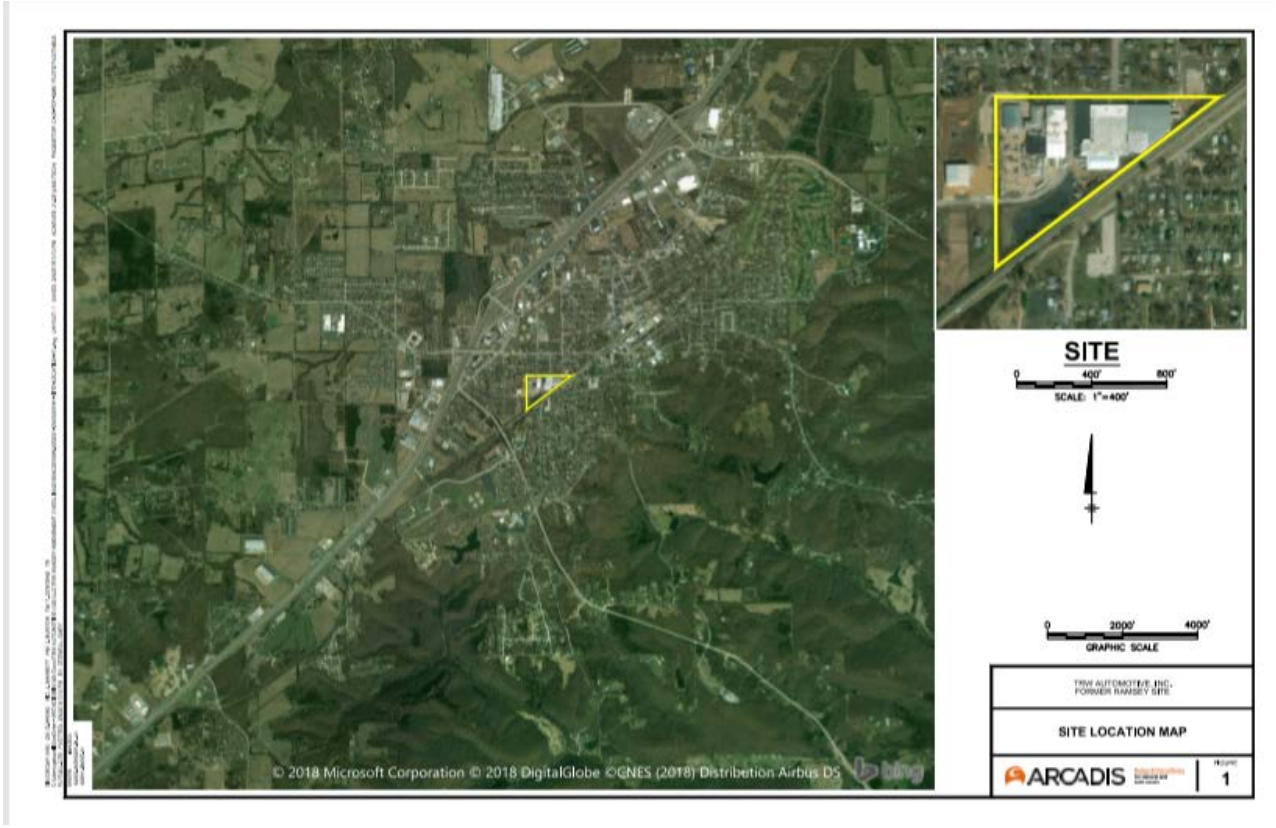
Produced groundwater will be transported via force main to the treatment system where VOCs will be removed via air stripping and discharged to the atmosphere. The treated groundwater will be pumped through a lead and lag ion exchange vessel to remove Cr+6 and discharged via force main to a drainage ditch that discharges to an unnamed tributary of Wensel Creek.

Treatment of Cr+6 will continue until influent concentrations are below NPDES limits for six consecutive months or until concentrations are less than 50% of NPDES limits for three consecutive months.

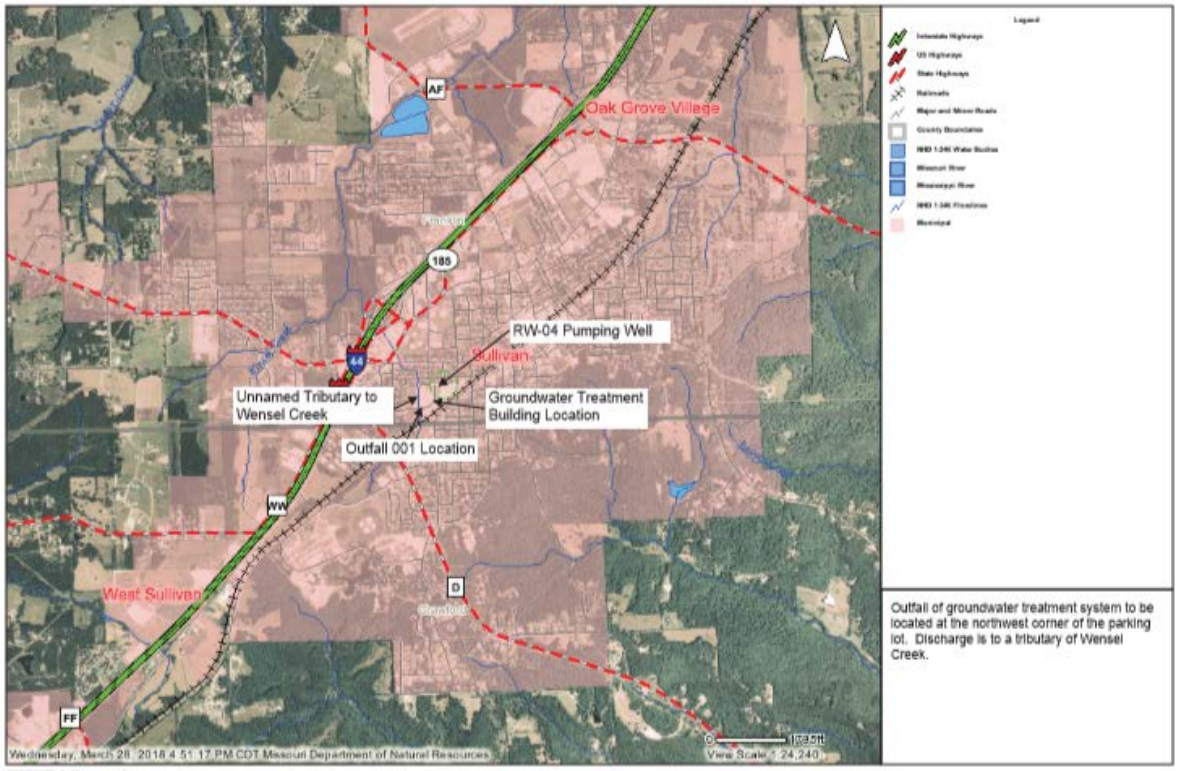
NPDES discharge monitoring will initially be conducted on a monthly basis. Upon meeting NPDES discharge limits for 24 consecutive months, discharge monitoring will be conducted on a quarterly basis.

Due to the nature of the groundwater and method of treatment, water discharged via the NPDES permit will be of high quality with elevated dissolved oxygen.

Successful implementation of the groundwater recovery and treatment system will provide significant benefit to the Sullivan community by reducing the presence of dissolved VOCs within the city wellfield.



TRW Automotive NPDES Outfall Location



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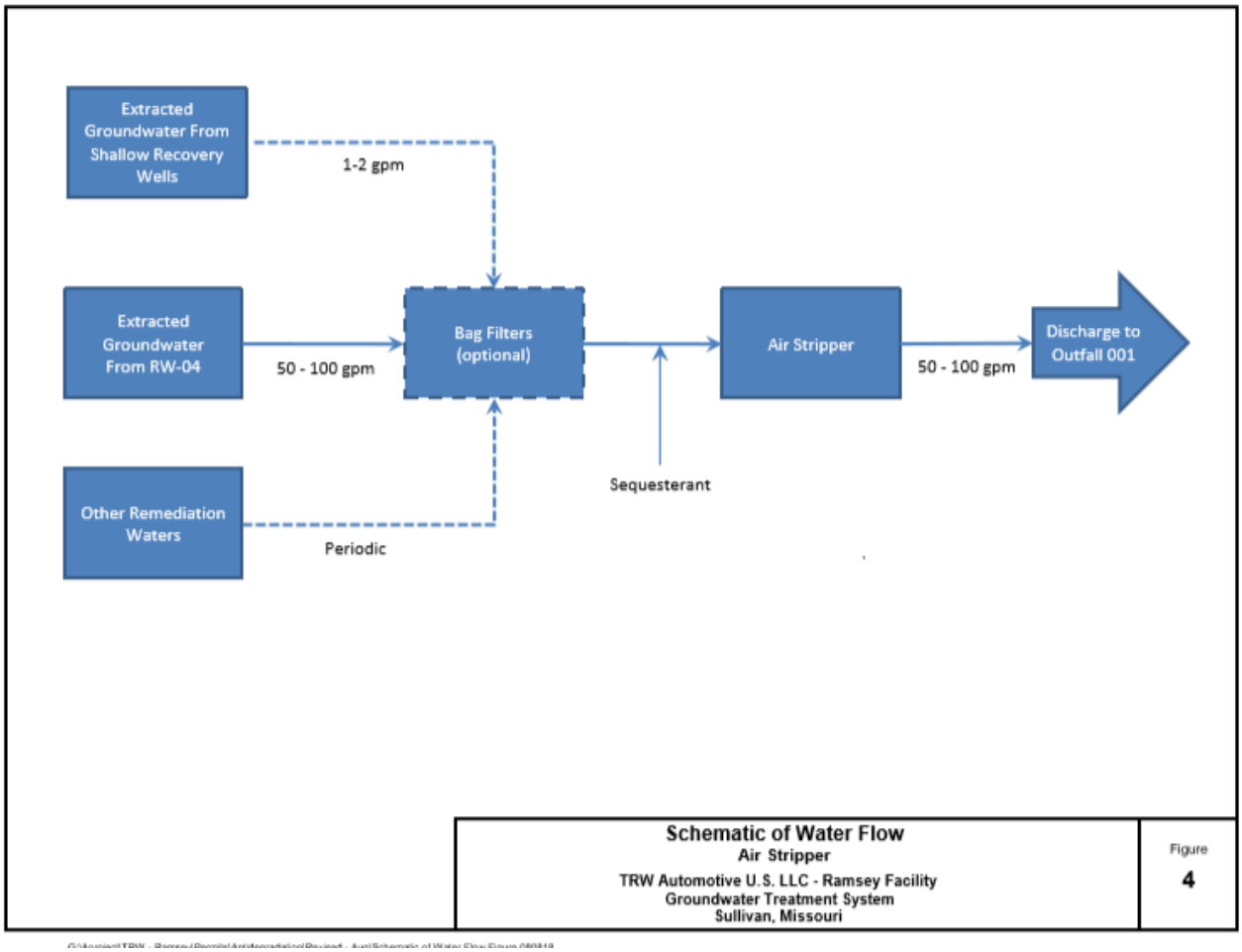
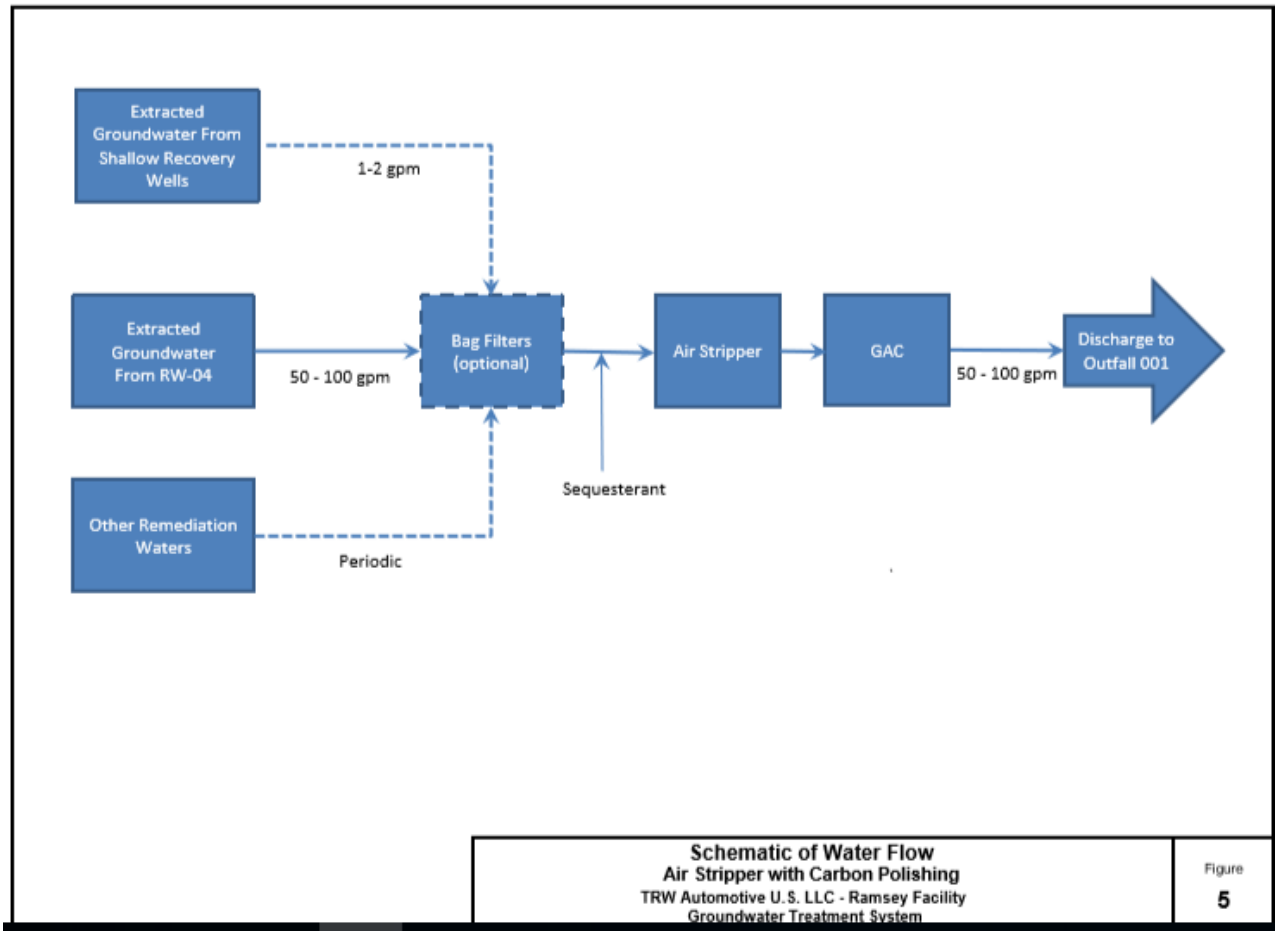
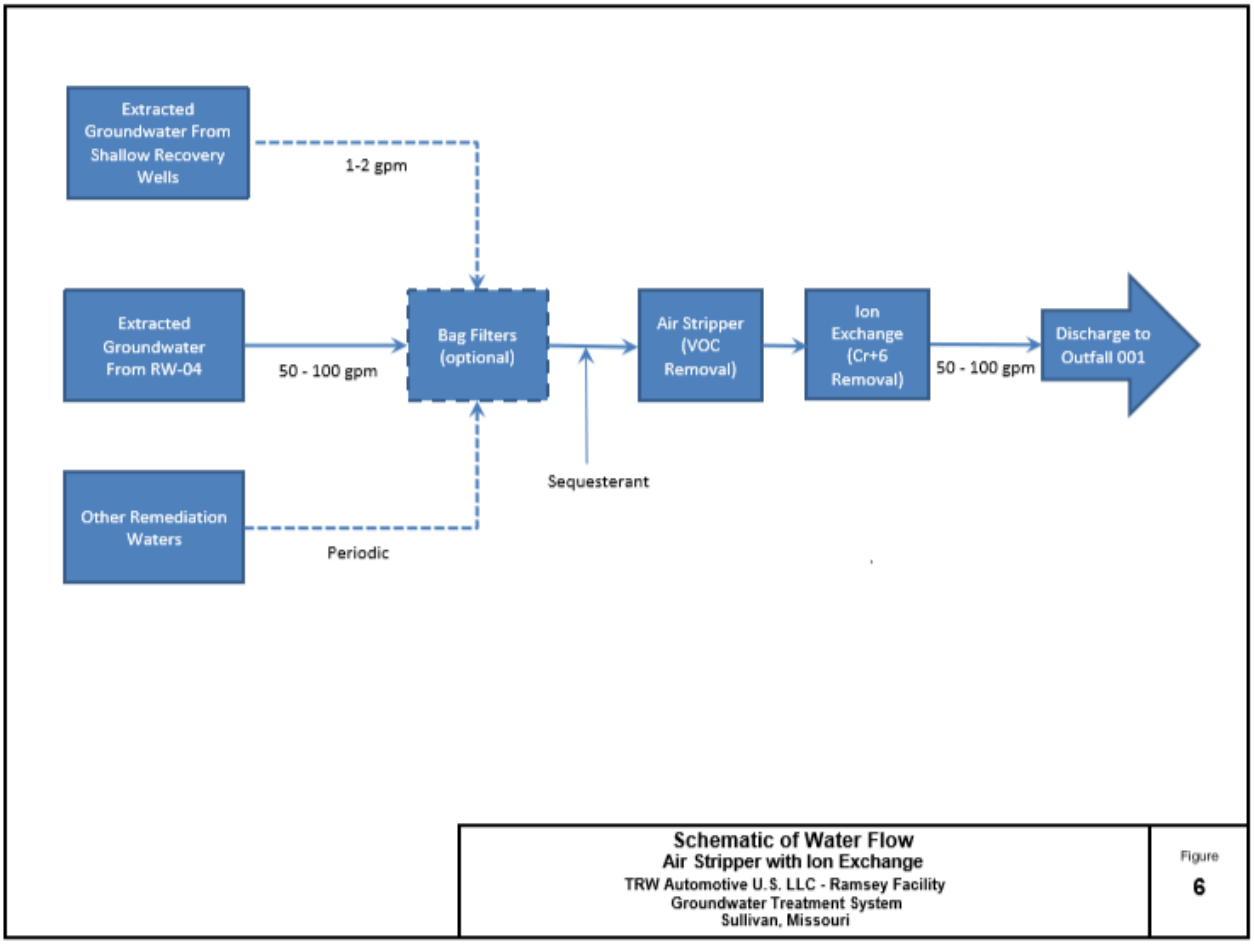

Extracted Groundwater From Shallow Recovery Wells
1-2 gpm
Extracted Groundwater From RW-04
50 - 100 gpm
Bag Filters (optional)
Air Stripper
50 - 100 gpm
Discharge to Outfall 001
Sequesterant
Other Remediation Waters
Periodic
Schematic of Water Flow
Air Stripper
TRW Automotive U.S. LLC - Ramsey Facility
Groundwater Treatment System
Sullivan, Missouri
Figure
4


Extracted Groundwater From Shallow Recovery Wells
1-2 gpm
Extracted Groundwater From RW-04
50 - 100 gpm
Bag Filters (optional)
Air Stripper
GAC
50 - 100 gpm
Discharge to Outfall 001
Sequesterant
Other Remediation Waters
Periodic
Schematic of Water Flow
Air Stripper with Carbon Polishing
TRW Automotive U.S. LLC - Ramsey Facility
Groundwater Treatment System
Figure
5



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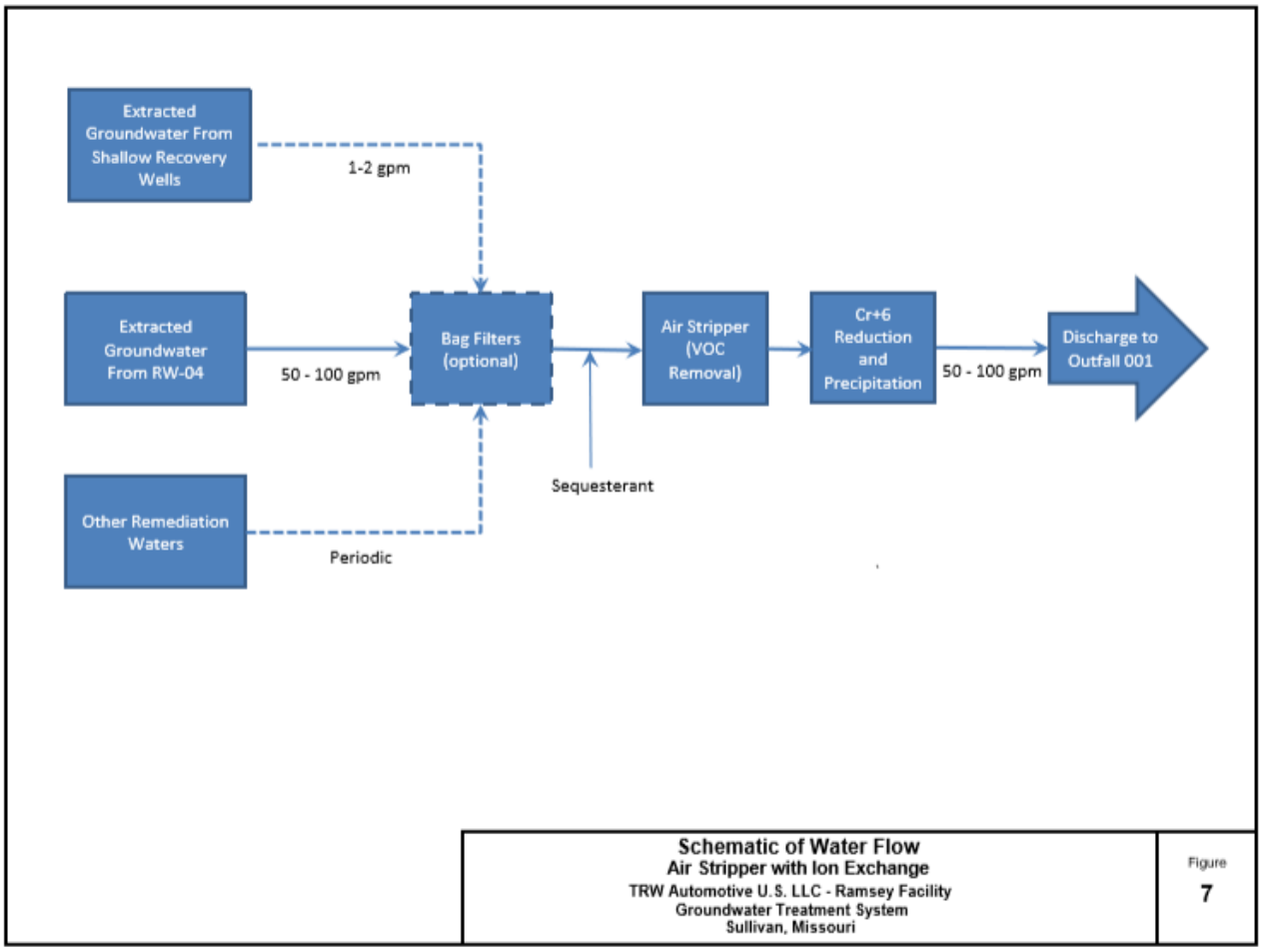

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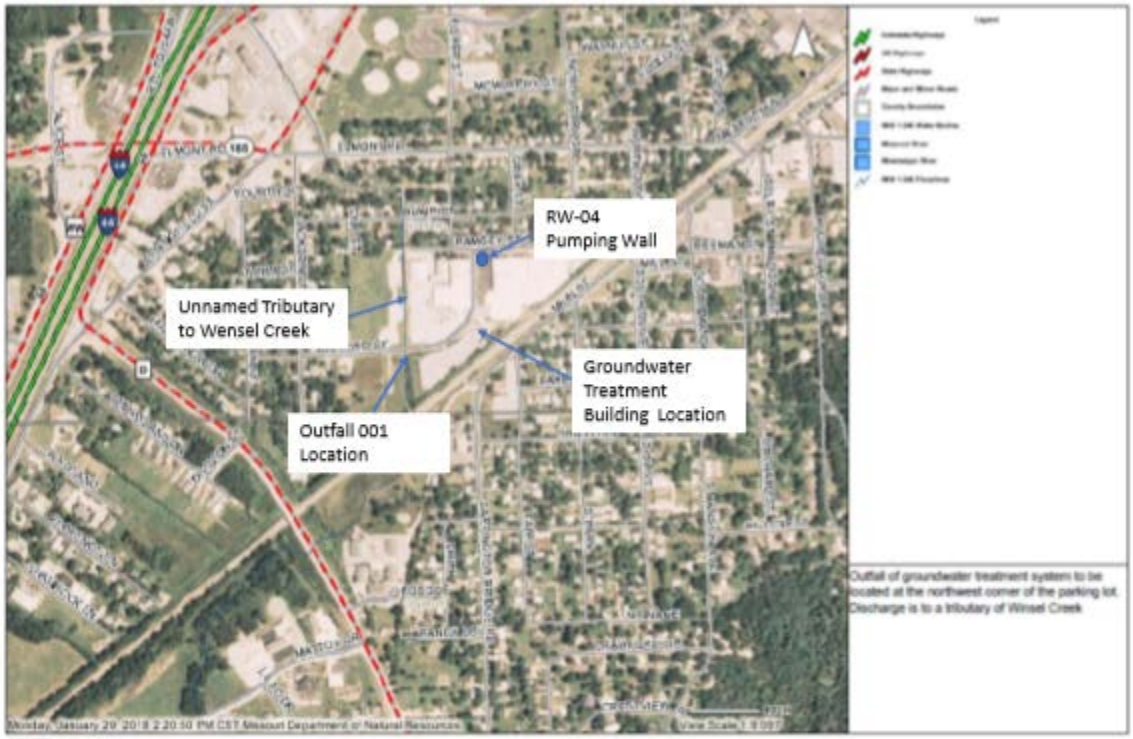
TRW Automotive NPDES Outfall Location



Missouri Department of Natural Resources

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QED Air Stripper Model ver. 3.0 4/25/2018

Site Data

Name: Arcadis
e-mail: royce.face@arcadis.com
Project: Ramsey Groundwater Treatment
Units: English
Altitude: 1000 ft
Air Temp: 95 F
Flow: 100 gpm
Water Temp: 55 F
Stripper: EZ-Tray 24.x - Click for details
Stripper Air Flow: 1300 cfm
Stripper Max Flow: 250 gpm
Ease of Stripping: Max High Med Low Min

Water Results

Ease	Contaminant	Influent (ppb)	Target (ppb)	4-Tray Results (ppb)	4-Tray % Removal	6-Tray Results (ppb)	6-Tray % Removal
MAX	trichloroethylene (TCE)	1000	0	< 1	100.000	< 1	100.000

Air Results

Contaminant	4-Tray (ppmV)	4-Tray (lb/hr)	6-Tray (ppmV)	6-Tray (lb/hr)
trichloroethylene (TCE)	1.9783	0.05006	1.9789	0.05007

Notes

Copyright -- QED Treatment Equipment, PO Box 3726, Ann Arbor, MI 48106.

PH-> 1-800-624-2026 or 1-734-995-2547, FX-> 1-734-995-1170.
E-mail->info@qedenv.com. WEB->www.qedenv.com.

The QED modeler estimates unit performance for the listed contaminants. Results assume -

1. *Contaminants are in the dissolved-phase, within a water matrix*
2. *Stripper Influent air is contaminant-free*
3. *Influent liquid does not have surfactants, oil, grease, other immiscible phase(s) or other Henry's constant altering additions present, such as dissolved phase polar organic contaminants*
4. *The air stripper is operated within the given parameters listed above and as instructed in the E-Z Tray O&M manual*

Stripper performance shall meet or exceed either the required effluent concentration(s) or effluent estimates, whichever is greater, for the conditions supplied and assumes the influent concentrations of each contaminant are less than 25% solubility in water. QED makes no claim of the model's accuracy beyond the 25% solubility in water limit.

Save Data

Use the following URL to reconstruct your data form for future remodeling with changes. This URL can be saved in any text file for record keeping and later retrieval. This run's URL:

Groundwater Treatment - Air Stripper
TRW - Ramsey

CAPITAL COST

Purchased Equipment Costs	QTY	Unit	Unit Cost	Extension
System Equipment				
Air Stripper Package System (includes AS, pumps, manifold, clean-in-place tank and manifold, metering pump, flow meters, etc.)	1	each	$85,000	$85,000
Electrical Control Panels and Instrumentation and Controls	1	each	$35,000	$35,000
			Equipment Subtotal (EQ):	*$120,000*
Taxes (5% of EQ)	1	LS	$9,600	$9,600
Freight (5% of EQ)	1	LS	$6,000	$6,000
Mark-up (5% of EQ)	1	LS	$6,000	$6,000
			Total Purchased Equipment Cost (PEC):	*$142,000*

Direct Installation Costs	QTY	Unit	Unit Cost	Extension
Trenching				
Mobilization/Demobilization	1	LS	$3,000	$3,000
Trenching - Discharge Line	200	LF	$30	$6,000
Piping	200	LF	$7	$1,400
Asphalt Cutting, Removal, Disposal and Restoration	600	SF	$10	$6,000
System Installation				
System Installation	1	each	$58,000	$58,000
Eletrical Installation	1	each	$25,000	$25,000
Miscellaneous				
Survey	1	day	$1,800	$1,800
IDW Disposal	1	LS	$10,000	$10,000
			Total Direct Installation Cost (DI):	*$109,000*
			TOTAL DIRECT COST (DC) [PEC + DI]:	$251,000

Indirect Costs	QTY	Unit	Unit Cost	Extension
Engineering (50% of EQ)	1	LS	$60,000	$60,000
Administration (3% of EQ)	1	LS	$3,600	$3,600
Construction Oversight (15% of DI)	1	LS	$16,400	$16,400
Contractor Profit (8% of PEC)	1	LS	$11,400	$11,400
Contingency (5% of PEC)	1	LS	$7,100	$7,100
			Total Indirect Cost (IC):	*$99,000*
			TOTAL CAPITAL INVESTMENT (TCI) [DC + IC]:	$350,000

O&M COST

Operating Cost - System O&M

Direct Operating Cost	QTY	Unit	Unit Cost	Extension
Yearly Expenses (Year 1)				
Electrical	182,929	kW/hrs	$0.10	$18,293
Labor	192	hrs	$80	$15,360
Repairs and Maintenance (3% of EQ)	1	lump sum	$3,600	$3,600
Samples	24	ea	$150	$3,600
Reporting and Permitting	60	hrs	$80	$4,800
Year 1 (total)			$42,000	$42,000
Subsequent Years (assumes 3% increase per year)				
Year 2	1	LS	$43,260	$43,260
Year 3	1	LS	$44,558	$44,558
Year 4	1	LS	$45,895	$45,895
Year 5	1	LS	$47,271	$47,271
Year 6	1	LS	$48,690	$48,690
Year 7	1	LS	$50,150	$50,150
Year 8	1	LS	$51,655	$51,655
Year 9	1	LS	$53,204	$53,204
Year 10	1	LS	$54,800	$54,800
			Subtotal:	*$482,000*
			Total Direct Operating Cost (DOC):	*$482,000*
			TOTAL COSTS (TCI + DOC) OVER 10 YRS:	$832,000

Groundwater Treatment - Air Stripper with GAC Polishing
TRW - Ramsey

CAPITAL COST

Purchased Equipment Costs	QTY	Unit	Unit Cost	Extension
System Equipment				
Two GAC Units with Manifold (8,000 lbs total)	1	each	$35,000	$35,000
Air Stripper Package System (includes AS, pumps, manifold, clean-in-place tank and manifold, metering pump, flow meters, etc.)	1	each	$85,000	$85,000
Electrical Control Panels and Instrumentation and Controls	1	each	$40,000	$40,000
			Equipment Subtotal (EQ):	***$160,000***
Taxes (8% of EQ)	1	LS	$12,800	$12,800
Freight (5% of EQ)	1	LS	$8,000	$8,000
Mark-up (5% of EQ)	1	LS	$8,000	$8,000
			Total Purchased Equipment Cost (PEC):	***$180,000***

Direct Installation Costs	QTY	Unit	Unit Cost	Extension
Trenching				
Mobilization/Demobilization	1	LS	$3,000	$3,000
Trenching - Discharge Line	200	LF	$30	$6,000
Piping	200	LF	$7	$1,400
Asphalt Cutting, Removal, Disposal and Restoration	600	SF	$10	$6,000
System Installation				
System Installation	1	each	$76,000	$76,000
Elctrical Installation	1	each	$30,000	$30,000
Miscellaneous				
Survey	1	day	$1,800	$1,800
IDW Disposal	1	LS	$10,000	$10,000
			Total Direct Installation Cost (DI):	***$134,000***
			TOTAL DIRECT COST (DC) (PEC + DI):	**$323,000**

Indirect Costs	QTY	Unit	Unit Cost	Extension
Engineering (50% of EQ)	1	LS	$80,000	$80,000
Administration (3% of EQ)	1	LS	$4,800	$4,800
Construction Oversight (15% of DI)	1	LS	$20,100	$20,100
Contractor Profit (8% of PEC)	1	LS	$15,100	$15,100
Contingency (5% of PEC)	1	LS	$9,500	$9,500
			Total Indirect Cost (IC):	***$130,000***
			TOTAL CAPITAL INVESTMENT (TCI) (DC + IC):	**$453,000**

O&M COST

Operating Cost - System O&M

Direct Operating Cost	QTY	Unit	Unit Cost	Extension
Yearly Expenses (Year 1)				
Electrical	182,929	kW/hrs	$0.10	$18,293
Labor	192	hrs	$80	$15,360
Repairs and Maintenance (3% of EQ)	1	lump sum	$5,670	$5,670
Samples	48	ea	$150	$7,200
Reporting and Permitting	60	hrs	$80	$4,800
GAC Replacement (2 times/yr)	16,000	lb	$2	$32,000
Year 1 (total)				$83,323
Subsequent Years (assumes 3% increase per year)				
Year 2	1	LS	$85,823	$85,823
Year 3	1	LS	$88,397	$88,397
Year 4	1	LS	$91,049	$91,049
Year 5	1	LS	$93,781	$93,781
Year 6	1	LS	$96,594	$96,594
Year 7	1	LS	$99,492	$99,492
Year 8	1	LS	$102,477	$102,477
Year 9	1	LS	$105,551	$105,551
Year 10	1	LS	$108,718	$108,718
			Subtotal:	***$1,039,000***
			Total Direct Operating Cost (DOC):	***$1,039,000***
			TOTAL COSTS (TCI + DOC) OVER 10 YRS:	**$1,492,000**

Groundwater Treatment - Air Stripper with Ion Exchange Cr+6 Treatment
TRW - Ramsey

CAPITAL COST

Purchased Equipment Costs	QTY	Unit	Unit Cost	Extension
System Equipment				
Waste Water Ion Exchange Resin System	1	each	$38,400	$38,400
Vessels (limited delivery of rental vessels)				
Filter Housing				
Hoses				
Air Stripper Package System (includes AS, pumps, manifold, clean-in-place tank and manifold, metering pump, flow meters, etc.)	1	each	$85,000	$85,000
Electrical Control Panels and Instrumentation and Controls	1	each	$45,000	$45,000
			Equipment Subtotal (EQ):	***$168,400***
Taxes (8% of EQ)	1	LS	$13,500	$13,500
Freight (5% of EQ)	1	LS	$8,400	$8,400
Mark-up (5% of EQ)	1	LS	$8,400	$8,400
			Total Purchased Equipment Cost (PEC):	***$199,000***

Direct Installation Costs	QTY	Unit	Unit Cost	Extension
Trenching				
Mobilization/Demobilization	1	LS	$3,000	$3,000
Trenching - Discharge Line	200	LF	$30	$6,000
Piping	200	LF	$7	$1,400
Asphalt Cutting, Removal, Disposal and Restoration	600	SF	$10	$6,000
System Installation				
System Installation	1	each	$76,000	$76,000
Electrical Installation	1	each	$30,000	$30,000
Miscellaneous				
Survey	1	day	$1,800	$1,800
IDW Disposal	1	LS	$10,000	$10,000
			Total Direct Installation Cost (DI):	***$134,000***
			TOTAL DIRECT COST (DC) [PEC + DI]:	**$333,000**

Indirect Costs	QTY	Unit	Unit Cost	Extension
Engineering (50% of EQ)	1	LS	$84,200	$84,200
Administration (3% of EQ)	1	LS	$5,100	$5,100
Construction Oversight (15% of DI)	1	LS	$20,100	$20,100
Contractor Profit (8% of PEC)	1	LS	$15,900	$15,900
Contingency (5% of PEC)	1	LS	$10,000	$10,000
			Total Indirect Cost (IC):	***$136,000***
			TOTAL CAPITAL INVESTMENT (TCI) [DC + IC]:	**$469,000**

O&M COST

Operating Cost - System O&M

Direct Operating Cost	QTY	Unit	Unit Cost	Extension
Yearly Expenses (Year 1)				
Electrical	182,929	kW-hrs	$0.10	$18,293
Labor	192	hrs	$80	$15,360
Repairs and Maintenance (3% of EQ)	1	lump sum	$5,970	$5,970
Samples	48	ea	$150	$7,200
Reporting and Permitting	60	hrs	$80	$4,800
IX Vessel Rental	24	months (2 vessels)	$600	$14,400
months)	2	ea	$13,800	$27,600
Year 1 (total)				$93,623
Subsequent Years (assumes 3% increase per year)				
Year 2 (Exchanges of 1 IX vessel every 6 months)	1	LS	$96,432	$96,432
Year 3	1	LS	$99,325	$99,325
Year 4	1	LS	$102,304	$102,304
Year 5	1	LS	$105,373	$105,373
Year 6	1	LS	$108,535	$108,535
Year 7	1	LS	$111,791	$111,791
Year 8	1	LS	$115,144	$115,144
Year 9	1	LS	$118,599	$118,599
Year 10	1	LS	$122,157	$122,157
			Subtotal:	***$980,000***
			Total Direct Operating Cost (DOC):	***$1,073,623***
			TOTAL COSTS (TCI + DOC) OVER 10 YRS:	**$1,542,623**

Groundwater Treatment - Air Stripper with Cr+6 Reduction and Precipitation
TRW - Ramsey

CAPITAL COST

Purchased Equipment Costs	QTY	Unit	Unit Cost	Extension
System Equipment				
Package Reduction and Precipitation System	1	each	$160,000	$160,000
Vessels, Tanks, Instrumentation, Piping, Valves, and Appurtenances				
Air Stripper Package System (includes AS, pumps, manifold, clean-in-place tank and manifold, metering pump, flow meters, etc.)	1	each	$85,000	$85,000
Electrical Control Panels and Instrumentation and Controls	1	each	$45,000	$45,000
			Equipment Subtotal (EQ):	*$290,000*
Taxes (6% of EQ)	1	LS	$23,200	$23,200
Freight (5% of EQ)	1	LS	$14,500	$14,500
Mark-up (5% of EQ)	1	LS	$14,500	$14,500
			Total Purchased Equipment Cost (PEC):	*$342,000*

Direct Installation Costs	QTY	Unit	Unit Cost	Extension
Trenching				
Mobilization/Demobilization	1	LS	$3,000	$3,000
Trenching - Discharge Line	200	LF	$30	$6,000
Piping	200	LF	$7	$1,400
Asphalt Cutting, Removal, Disposal and Restoration	600	SF	$10	$6,000
System Installation				
System Installation	1	each	$66,000	$66,000
Electrical Installation	1	each	$30,000	$30,000
Miscellaneous				
Survey	1	day	$1,800	$1,800
IDW Disposal	1	LS	$10,000	$10,000
			Total Direct Installation Cost (DI):	*$153,000*
			TOTAL DIRECT COST (DC) [PEC + DI]:	$495,000

Indirect Costs	QTY	Unit	Unit Cost	Extension
Engineering (50% of EQ)	1	LS	$145,000	$145,000
Administration (3% of EQ)	1	LS	$8,700	$8,700
Construction Oversight (15% of DI)	1	LS	$23,000	$23,000
Contractor Profit (8% of PEC)	1	LS	$27,400	$27,400
Contingency (5% of PEC)	1	LS	$17,100	$17,100
			Total Indirect Cost (IC):	*$222,000*
			TOTAL CAPITAL INVESTMENT (TCI) [DC + IC]:	$717,000

O&M COST

Operating Cost - System O&M

Direct Operating Cost	QTY	Unit	Unit Cost	Extension
Yearly Expenses (Year 1)				
Electrical	182,929	kW/Yrs	$0.10	$18,293
Labor	480	hrs	$80	$38,400
Repairs and Maintenance (4% of EQ)	1	lump sum	$13,680	$13,680
Samples	48	ea	$150	$7,200
Reporting and Permitting	60	hrs	$80	$4,800
Chemical Costs	12	mo	$2,000	$24,000
Sludge Disposal	6	ea	$3,000	$18,000
Year 1 (total)				$124,373
Subsequent Years (assumes 3% increase per year)				
Year 2	1	LS	$128,104	$128,104
Year 3	1	LS	$131,947	$131,947
Year 4	1	LS	$135,906	$135,906
Year 5	1	LS	$139,983	$139,983
Year 6	1	LS	$144,182	$144,182
Year 7	1	LS	$148,508	$148,508
Year 8	1	LS	$152,963	$152,963
Year 9	1	LS	$157,552	$157,552
Year 10	1	LS	$162,278	$162,278
			Subtotal:	*$1,302,000*
			Total Direct Operating Cost (DOC):	*$1,426,373*
			TOTAL COSTS (TCI + DOC) OVER 10 YRS:	$2,143,373

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.

AP 33214 RECEIVED

JUL 23 2019

Water Protection Program

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM

APPLICATION FOR CHANGE OF NAME OR ADDRESS FOR YOUR MISSOURI STATE OPERATING PERMIT

FOR AGENCY USE ONLY	
APPLICATION ID NUMBER	DATE RECEIVED 7-16-19
CHECK NUMBER / JETPAY CONFIRMATION NUMBER 710990	

READ THE ACCOMPANYING INSTRUCTIONS BEFORE COMPLETING THIS FORM

1. THIS APPLICATION IS FOR:

☑ Owner change of name or address

☑ Continuing Authority change of name or address

☐ Facility change of name or address

1.1 Is the appropriate fee included with the application? ☑ Yes ☐ No

Permit fees may be payed online by credit card or eCheck through a system called JetPay. Use the URL provided to access JetPay and make an online payment. https://magic.collectorsolutions.com/magic-ui/payments/mo-natural-resources/596/

2. PERMIT

PERMIT NUMBER	COUNTY
#MO- 0138959	Franklin

3. ADDITIONAL INFORMATION

ANTICIPATED DATE OF NAME OR ADDRESS CHANGE
06/04/2019

4. INFORMATION TO CHANGE

PREVIOUS INFORMATION FOR OWNER			REVISED INFORMATION FOR OWNER		
OWNER NAME TRW Automotive U.S. LLC			OWNER NAME ZF Active Safety and Electronics US LLC		
ADDRESS (MAILING) 11202 East Germann Road			ADDRESS (MAILING) 11202 East Germann Road		
CITY Mesa	STATE AZ	ZIP CODE 85212	CITY Mesa	STATE AZ	ZIP CODE 85212
TELEPHONE NUMBER WITH AREA CODE 480.987.4000			TELEPHONE NUMBER WITH AREA CODE 480.987.4000		

PREVIOUS INFORMATION FOR CONTINUING AUTHORITY			REVISED INFORMATION FOR CONTINUING AUTHORITY		
CONTINUING AUTHORITY NAME TRW Automotive U.S. LLC			CONTINUING AUTHORITY NAME ZF Active Safety and Electronics US LLC		
ADDRESS (MAILING) 11202 East Germann Road			ADDRESS (MAILING) 11202 East Germann Road		
CITY Mesa	STATE AZ	ZIP CODE 85212	CITY Mesa	STATE AZ	ZIP CODE 85212
TELEPHONE NUMBER WITH AREA CODE 480.987.4000			TELEPHONE NUMBER WITH AREA CODE 480.987.4000		

PREVIOUS INFORMATION FOR FACILITY			REVISED INFORMATION FOR FACILITY		
FACILITY NAME No Change			FACILITY NAME No Change		
ADDRESS (PHYSICAL LOCATION)			ADDRESS (PHYSICAL LOCATION)		
CITY	STATE	ZIP CODE	CITY	STATE	ZIP CODE
TELEPHONE NUMBER WITH AREA CODE			TELEPHONE NUMBER WITH AREA CODE		

5. FACILITY CONTACT

NAME	TITLE		
Robert Bleazard	Sr. Regional HS&E Manager		
EMAIL Robert.Bleazard@zf.com	TELEPHONE NUMBER WITH AREA CODE 480.987.4000		
ADDRESS 11202 East Germann Road	CITY Mesa	STATE AZ	ZIP CODE 85212

6. CERTIFICATION

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

NAME (TYPE OR PRINT)	OFFICIAL TITLE	TELEPHONE NUMBER WITH AREA CODE
Robert Bleazard	Sr. Regional HS&E Manager	480.987.4000
SIGNATURE Robert A Bleazard		DATE SIGNED July 17, 2019