DEPARTMENT OF ENVIRONMENTAL QUALITY
PERMITTING and COMPLIANCE DIVISION
MONTANA POLLUTANT DISCHARGE ELIMINATION SYSTEM (MPDES)

Statement of Basis

Permittee:	Montana Aviation Research Company
Permit No.:	MT0029980
Receiving Water:	East Fork Cherry Creek via Spring Coulee
Facility Information:	
Name	Montana Aviation Research Company Water Treatment Plant
Location	Glasgow Industrial Airport (St. Marie, MT) Valley County Latitude 48º23’43”N, Longitude 106º31’12”W
Facility Contact:	Darcel Wesen, Site Airfield Manager PO Box 831 Glasgow, MT 59230 (406) 524-3777
Fee Information:	
Number of Outfalls	1
Outfall – Type	001-Process Water

I. Permit Status

This is a renewal of the Montana Pollutant Discharge Elimination System (MPDES) permit issued to the Montana Aviation Research Company (MARCO) for its domestic potable water treatment plant (WTP). The MPDES permit was first issued in 1992. The current permit became effective October 1, 1999 and expired June 30, 2004. The permittee submitted fees on January 5, 2004 and a renewal application on January 20, 2004. After the Montana Department of Environmental Quality (Department) informed the permittee of several deficiencies during a site visit on September 22, 2005, the permittee resubmitted the updated renewal application on the same day. The application was deemed complete and the existing permit administratively extended by the Department on September 28, 2005.

II. Facility Information

A. Facility Description

The MARCO WTP is a conventional potable water treatment plant serving approximately 100 residents. The US Air Force built the plant in the mid-1950's to treat up to 2.5 million gallons per day (mgd) of Missouri River water. The facility is certified through the Department's Public Water Supply program under PWSID #MT0000416. The City of Glasgow and MARCO share the use of a surface water intake which is located on the northern edge of the Missouri River channel, approximately 14 miles southwest of the city. The two systems, Glasgow and MARCO, withdraw water during alternating time periods.

The latitude of the surface water intake location is 48.0697° N, and the longitude is 106.3956° W. The pump station, located just north of the Missouri River, houses four pumps. Missouri River water is pumped northwest through an 18-inch raw waterline to a T-connection where it is diverted to the MARCO WTP (Source Delineation and Assessment Report, Revised 4/23/04).

The MARCO WTP is a conventional plant with flash mix, three-stage flocculation, sedimentation, multimedia filtration, and gas chlorination. Following treatment, the finished water is sent to the distribution system and three elevated storage tanks with capacities of 300,000 gallons, 400,000 gallons, and 450,000 gallons (Source Delineation and Assessment Report, Revised 4/23/04).

The water treatment plant is operated for an average of six hours per week. Based on information supplied by Darcel Wesen during a phone conversation on November 5, 2008, MARCO currently treats raw water at an average of approximately 0.03 mgd (600 gallons per minute (gpm) x 60 min/hr x 6 hours/week divided by 7 days/week). MARCO is currently negotiating a buy/sell agreement to supply up to 0.2 mgd of treated water to the Dry Prairie Regional Water System.

MARCO backwashes the filters at 1000 gpm for one hour, which equates to the design flow rate of 0.06 mgd (= 1000 gpm x 60 min/hr x 1 hr/day). They currently backwash only one filter a month. The backwash wastewater is discharged into one of two unlined settling/ evaporation ponds, each of which discharges to a third settling/evaporation pond. The lagoons were rebuilt in 1992. The clarified effluent is permitted to discharge from the third

pond overflow to Spring Coulee through a 24" PVC pipe (Outfall 001), although MARCO has never discharged from the lagoons. A v-notch weir was added in 1999 to the outfall structure of the third lagoon.

B. Effluent Characteristics

The MARCO WTP has reported "no discharge" from Outfall 001 for the Period of Record (POR) of August 2003 to August 2008.

C. Compliance History

The Department conducted a compliance evaluation inspection of the MARCO WTP facility on September 22, 2005. No violations were noted during this inspection.

The Department has issued four (4) violation letters to MARCO for failure to submit Discharge Monitoring Reports (DMRs) on time (February 5, 2004; February 25, 2008; August 12, 2008; and October 20, 2008.)

III. Rationale for Proposed Technology-Based Effluent Limits

A. Scope and Authority

Technology-based effluent limits (TBELs) represent the minimum level of control that must be imposed by a permit issued under the MDPES program, as stated at 40 CFR 122.44(a) and adopted by reference in Administrative Rules of Montana (ARM) 17.30.1344(2)(b). The Department must consider technology available to treat wastewater, and limits that can be consistently achieved by that technology. TBELs are based on currently available treatment technologies and allow the permittee the discretion to choose applicable controls to meet those standards.

The Montana Board of Environmental Review (BER) has adopted performance standards for point source discharges to state waters under Title 17, Chapter 30, Subchapter 12 of the ARM. Under Subchapter 12, the BER adopted by reference 40 CFR Subpart N which is a series of federal agency rules that adopt TBELs for existing sources and performance standards for new sources [ARM 17.30.1207(1)]. In addition, ARM 17.30.635(3) states that industrial waste must receive, as a minimum, treatment equivalent to the best practicable control technology currently available (BPCTCA) as defined in Subchapter N. However, Effluent Limit Guidelines (ELG) have not been promulgated under Subchapter N for wastewater discharges at potable water treatment plants.

The BER has adopted general treatment requirements that establish the degree of wastewater treatment required to maintain and restore the quality of state surface waters. This rule states that in addition to federal ELGs, the degree of wastewater treatment is based on the surface water quality standards; the state's nondegradation policy; the quality and flow of the receiving water; the quantity and quality of sewage, industrial wastes and other wastes to be treated; and the presence or absence of other sources of pollution on the watershed [ARM 17.30.635(1)].

B. Proposed TBELs for Outfall 001

MARCO was previously permitted for Total Suspended Solids (TSS) TBELs of:
30 mg/L – monthly average
45 mg/L – daily maximum

This is consistent with the Environmental Protection Agency (EPA) Region VII policy issued in 1977; the Science Applications International Corporation (SAIC) draft "*Model Permit Package – Water Supply Industry*," dated January 30, 1987; and the majority of the WTP permits recently renewed by the Department.

Also, the Department recognizes that treatment in WTP settling ponds is similar to treatment in domestic wastewater lagoons. Settling basins can effectively reduce TSS and turbidity from waste water at a low cost. TSS concentrations in municipal lagoon discharges are limited to 30 mg/L monthly average and 45 mg/L daily maximum as National Secondary Standard effluent limits [40 CFR 133.102] and these limits have been demonstrated to be consistently achievable in the water treatment industry.

The MARCO WTP will be required to continue to meet TSS TBELs of 30 mg/L monthly average and 45 mg/L daily maximum.

C. Technology-based Effluent Limits – Mass-Based Calculations

ARM 17.30.1345(8) requires that all effluent limits be expressed in terms of mass, except when applicable standards and limitations are expressed in terms of other units of measurement. Calculation of any permit limits which is based on production must be based on a reasonable measure of actual production of the facility that corresponds to the appropriate time period [ARM 17.30.1345(2)(b)(i)]. Because the MARCO WTP is not subject to an ELG or other production- or mass-based limit, the development of mass-based effluent limits is not required.

D. Nondegradation Load Allocations

The provisions of ARM 17.30.701 - 718 (Nondegradation of Water Quality) apply to new or increased sources of pollution [ARM 17.30.702(18)]. Sources that are in compliance with the conditions of their permit and do not exceed the limits established in the permit or determined from a permit issued by the Department prior to April 29, 1993 are not considered new or increased sources. MARCO is in compliance with the conditions in the previous permit and has never exceeded a permit limit.

In addition, activities causing nonsignificant changes in existing water quality are not considered new or increased sources. The MARCO WTP has not increased wastewater design flow or undergone any modifications that would be considered a "new or increased source." Although the current maximum daily backwash flow to the lagoons is estimated at 0.06 mgd, there have been no operational or design changes to increase the discharge flow from the previous estimate of 0.05 mgd that was used in the nondegradation review for the previous permit. Therefore, the existing nondegradation load allocations that were derived in

the previous permit remain in effect. Since MARCO discharges to an ephemeral stream, which is not considered a high-quality water, water-quality-based effluent limits do not apply.

IV. Rationale for Proposed Water Quality-Based Effluent Limits (WQBEL)

A. Scope and Authority

Permits are required to include WQBEL when technology-based effluent limits are not adequate to protect state water quality standards (40 CFR 122.44 and ARM 17.30.1344). ARM 17.30.637(2) states that no wastes may be discharged that can reasonably be expected to violate any state water quality standards. Montana water quality standards (ARM 17.30.601-670) define both water use classifications for all state waters and numeric and narrative standards that protect those designated uses. New or increased sources, as defined in ARM 17.30.702(18), are subject to Montana Nondegradation Policy (75-5-303, MCA) and regulations (ARM 17.30.701-718).

B. Receiving Water

The receiving water, the Spring Coulee, is an ephemeral stream that ultimately discharges into the East Fork Cherry Creek approximately 10 miles downstream. After approximately 2 miles, the East Fork Cherry Creek discharges into Cherry Creek. Cherry Creek, which is listed as Montana steam segment MT40O002_010, discharges into the Milk River after 4 miles.

The facility drainage is located in the Lower Milk watershed. The U.S. Geological Survey (USGS) hydrologic unit code (HUC) for this watershed is 10050012.

East Fork Cherry Creek is the first high-quality surface water downstream from the plant, and is classified as B-3 according to Montana Water Use Classifications, ARM 17.30.610(1)(h). Waters classified B-3 are to be maintained suitable for drinking, culinary, and food processing purposes after conventional treatment; bathing, swimming, and recreation; growth and propagation of non-salmonid fishes and associated aquatic life, waterfowl, and furbearers; and agricultural and industrial water supply (ARM 17.30.625).

Neither Spring Coulee nor East Fork Cherry Creek are listed on the 1996 or 2006 303(d) lists of impaired streams. To date, a total maximum daily load (TMDL) has not been prepared for Spring Coulee or East Fork Cherry Creek.

C. Mixing Zone

A mixing zone is an area where the effluent mixes with the receiving water and certain water quality standards may be exceeded [ARM 17.30.502(6)]. A mixing zone must be of the smallest practicable size, have a minimum effect on water uses, and have definable boundaries [MCA 75-5-301(4)]. Acute standards for any parameter may not be exceeded in any portion of the mixing zone unless the Department specifically finds that allowing minimal initial dilution will not threaten or impair existing beneficial uses [ARM 17.30.507(1)(b)].

The Department must determine the applicability of a mixing zone [ARM 17.30.505(1)]. Any previously allowed mixing zone will remain designated in a renewed permit, unless there is evidence that the previously allowed mixing zone will impair existing or anticipated uses [ARM 17.30.505(1)(c)].

The previous permit determined that, since Spring Coulee is an ephemeral stream, the mixing zone is "nearly instantaneous" as defined in ARM 17.30.502(7). However, the Department has re-evaluated this determination in light of EPA Region VIII Guidance (Transmittal of Mixing Zones & Dilution Policy, December 29, 1994) stating that when no dilution is available, criteria must be met at end of pipe. The receiving water for the MARCO WTP is effluent dominated and the 7Q10 is zero; therefore, no in-stream dilution is available for mixing. A mixing zone is not applicable for the receiving water, and limits will apply at the end of pipe.

D. Applicable Water Quality Standards and Proposed WQBEL/Waste Load Allocation (WLA)

Discharges to ephemeral surface waters are not subject to any specific water quality standards of ARM 17.30.620 through 17.30.629, the Department Circular DEQ-7, or ARM 17.30 Subchapter 5 (Mixing Zones). However, these discharges are subject to the general provision of ARM 17.30.635 through 637 and Subchapter 7 (Nondegradation of Water Quality, March 2006).

Pollutants typically present at potable water treatment plants include conventional pollutants such as TSS and pH, non-conventional pollutants such as turbidity, and toxics such as chlorine and total dissolved aluminum. In order to be protective of ARM 17.30.637(1)(d), the limits from the previous permit are maintained or tightened, as follows:

1. Conventional Pollutants

The TSS TBEL identified in Part III is sufficient. No additional WQBEL will be required for TSS.

In the last permit, pH had an effluent limit of 6.0 – 9.0 s.u.. This limit will be maintained.

2. Non-conventional Pollutants

The previous permit did not require turbidity monitoring. Since the discharge is to an ephemeral stream, Water Quality Standards (WQSs) do not apply and there is no turbidity WQBEL. The TSS TBELs are assumed to be protective and to control turbidity levels in the wastewater.

3. Toxic Pollutants

Total Residual Chlorine (TRC) – The TRC concentration limit in the previous permit was 0.5 mg/L instantaneous maximum, based on the bureau policy in place in 1999. This included consideration that the receiving water body was ephemeral and did not support fish or aquatic organisms, as well as the fact that the residual chlorine is expected to dissipate before it reaches the first high quality surface waters approximately 10 miles downstream.

Since the receiving water is an ephemeral stream, WQS for TRC do not apply to the MARCO WTP discharges. However, the Department now recognizes the maximum TRC effluent concentration to a ephemeral stream to be 0.1 mg/L, in order to avoid creating a condition that is toxic or harmful to human, animal, plan, or aquatic life [ARM 17.30.637(1)(d)]. An instantaneous maximum TRC limit of 0.1 mg/L will be applied to discharges from the MARCO WTP.

Analytical methods in 40 CFR Part 136 requires chlorine samples to be analyzed immediately. On-site sampling for total residual chlorine with a chlorine meter using an approved method is required. The method must obtain a minimum detection level of 0.10 mg/L. Analytical results of less than 0.10 mg/L will be considered to be in compliance with the limits.

Dissolved Aluminum – Dissolved aluminum is a toxic metal that is present in WTP treatment chemicals and is typically discharged in WTP backwash.

The maximum dissolved aluminum concentration limit in the previous permit was 1.5 mg/L (instantaneous maximum), which was based on the Montana Circular WQB-7 that was in effect in 1999. However, the acute water quality standard for aluminum is now 0.75 mg/L [DEQ-7, February 2008]. Although the receiving water is an ephemeral stream and WQS for dissolved aluminum do not apply, the Department proposes to modify the acute discharge limit for the MARCO WTP to meet the standard of 0.75 mg/L, in order to avoid creating a condition that is toxic or harmful to human, animal, plant, or aquatic life [ARM 17.30.637(1)(d)].

The maximum 30-day average dissolved aluminum concentration limit in the previous permit was 1.0 mg/L. Since the WTP rarely (if ever) discharges to the receiving water, and the facility‘s receiving water is the Spring Coulee which does not typically flow, the Department does not expect a chronic condition to be caused from the MARCO WTP discharge. Therefore, the Department proposes to remove the average monthly limit to 0.75 mg/L.

V. Final Effluent Limits

All of the acute and chronic limits are applicable at the end of the pipe, prior to discharge to Spring Coulee.

Outfall 001: Proposed Effluent Limits(1)				
Parameter	Units	Sampling Location	Average Monthly Limit	Maximum Daily Limit
TSS	mg/L	Effluent	30	45
	lbs/day	Effluent	13(2)	--
TRC	mg/L	Effluent	--	0.1
Dissolved Aluminum(3)	mg/L	Effluent	--	0.75
pH	s.u.	Effluent	6.0 – 9.0	

Footnotes:
1. See Definition section at end of permit for explanation of terms.
2. TSS nondegradation load is 13 lb/day; this is not a mass-based limit.
3. Limit is applicable between 6.5 to 9.0 pH

VI. Monitoring Requirements

Monitoring of the effluent must be representative of the volume & nature of the discharge. The effluent sample and flow measurement must be obtained from the discharge pipe after the settling ponds, before the wastewater enters the Spring Coulee.

Outfall 001: Monitoring Requirements(1)				
Parameter	Units	Monitoring Location	Frequency of Analyses(2)	Sample Type
Flow	mgd	Effluent	1/Day	Instantaneous
Duration	days	Effluent	Reported	None
TSS	mg/L	Effluent	1/Week	Grab
Dissolved Aluminum	mg/L	Effluent	1/Week	Grab
pH	s.u.	Effluent	1/Week	Instantaneous
Total Residual Chlorine	mg/L	Effluent	1/Day	Grab

Footnote:
1. See Definition section at end of permit for explanation of terms.
2. Monitoring only required during discharge.

VII. Special Conditions/Compliance Schedules

None at this time.

VIII. Other Information

On September 21, 2000, a US District Judge issued an order stating that until all necessary total maximum daily loads (TMDLs) under Section 303(d) of the Clean Water Act are established for a particular water quality limited segment, the State is not to issue any new permits or increase permitted discharges under the MPDES program. The order was issued

under the lawsuit Friends of the Wild Swan vs. US EPA *et al*, CV 97-35-M-DWM, District of Montana, Missoula Division.

The renewal of this permit does not conflict with Judge Molloy's order because the permitted discharge does not represent a new or increased source of pollutants. The change from 0.05 mgd to 0.06 mgd design discharge rate is a refinement in the flow estimate, and does not reflect an actual change in conditions.

IX. Information Sources

Federal Water Pollution Control Act (Clean Water Act), 33 U.S.C. §§ 1251-1387, October 18, 1972, as amended 1973-1983, 1987, 1988, 1990-1992, 1994, 1995 and 1996.

US Code of Federal Regulations, 40 CFR Parts 122-125, 130-133, & 136.

Montana Code Annotated (MCA), Title 75-5-101, *et seq*., "Montana Water Quality Act," 2003.

Administrative Rules of Montana Title 17 Chapter 30 - Water Quality
- Subchapter 2 - Water Quality Permit and Application Fees, December 2006.
- Subchapter 5 - Mixing Zones in Surface and Ground Water, March, 2006.
- Subchapter 6 - Montana Surface Water Quality Standards and Procedures, March 2006.
- Subchapter 7- Nondegradation of Water Quality, March 2006.
- Subchapter 12 - MPDES Standards, March 2007.
- Subchapter 13 - MPDES Permits, March 2006.

Montana Department of Environmental Quality Circular DEQ-7, Montana Numeric Water Quality Standards, February 2008

MPDES Permit Number MT0029980:
- Administrative Record.
- Renewal Application EPA Form 2A, January 20, 2004.

Montana Aviation Research Company PWSID # MT0000416, Public Water System Source Water Delineation and Assessment Report revised May 23, 2004

2006 Integrated 303(d)/305(b) Water Quality Report for Montana December 2006

US EPA *Technical Support Document for Water Quality-Based Toxics Control*, EPA/505/2-30-001, March 1991.

US EPA NPDES Permit Writers' Manual, EPA 833-B-96-003, December 1996.

US EPA Region VIII *Transmittal of Mixing Zones and Dilution Policy*, December 29, 1994.

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Date: November 26, 2008
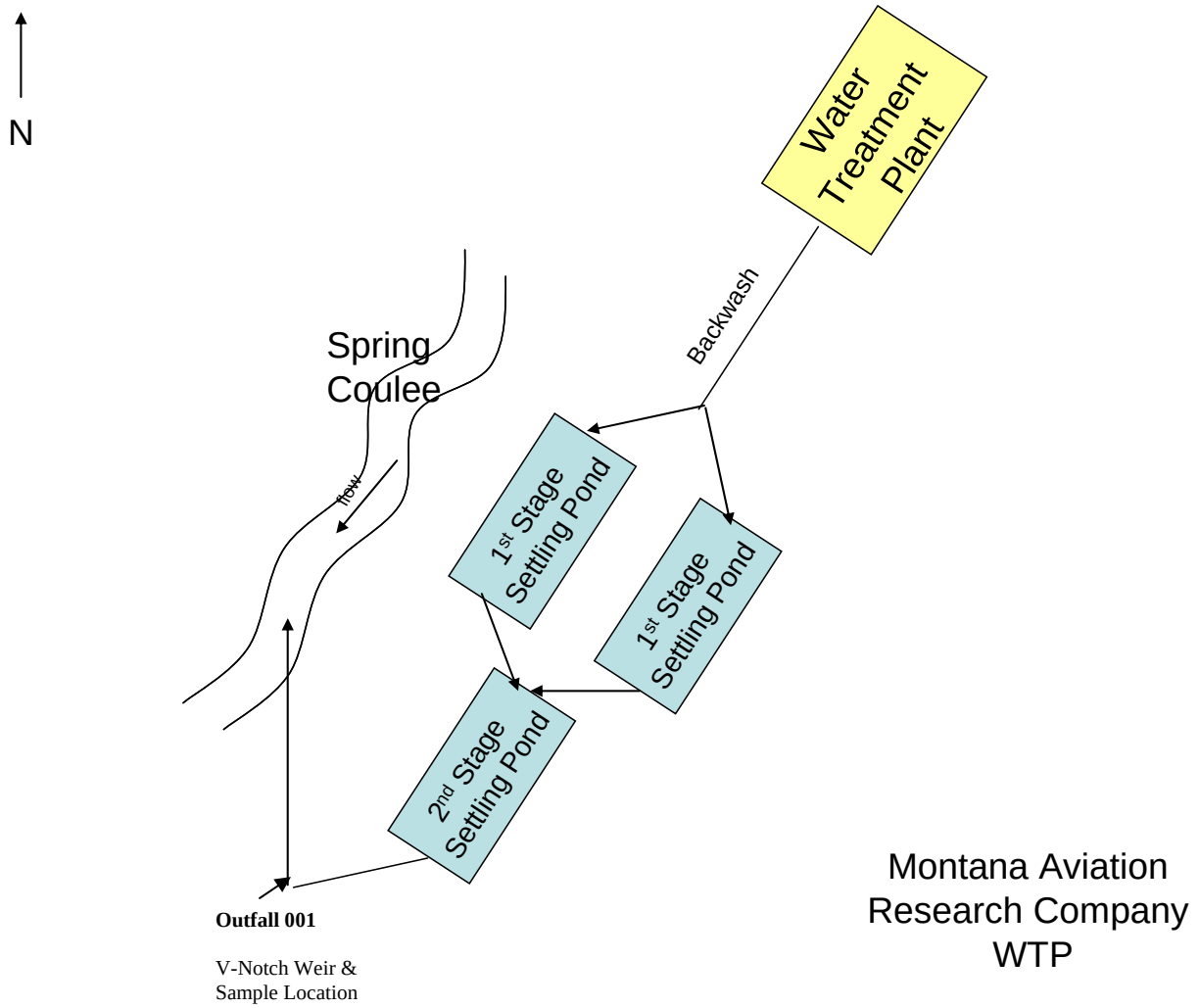
Figure 1: Flow diagram for water treatment plant.