UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

August 28, 2006

In Reply Refer To: WTR-7

John Stevens, Plant Manager
Bruce Industries
101 Evans Avenue
Dayton, Nevada 89403-1700

Re: July 20, 2006 Clean Water Act Inspection

Dear Mr. Stevens:

Enclosed is the August 28, 2006 report for our July 20 inspection of Bruce Industries. Please submit a short response to the findings in Sections 2 through 5 of this report, to EPA, Lyon County, and the Nevada Department of Environmental Protection, by **October 30, 2006**.

The main findings are summarized below:

1 Bruce Industries qualifies as a new source metal finisher subject to the Federal metal finishing standards. The NDEP permit did not correctly apply the Federal standards and Lyon County has not yet issued its own permit.

2 It is unlikely that a metal finisher like Bruce Industries can comply with the Federal standards without also increasing the capability and capacity of treatment. The treatment is not equivalent in design to the models used in setting the standards and only a small fraction of the wastewaters undergo treatment to remove metals and cyanide.

3 Past sample results are not usable to determine compliance because of dilution from continuously overflowing rinses and the intermittent discharge of batch treated spents.

As we discussed at the inspection, EPA intends to follow-up this report with an Administrative Order that establishes the interim requirements in effect until Lyon County can issue its own permit. I certainly appreciate your helpfulness extended to me during this inspection. I remain available to Lyon County and to you to assist in any way. Please do not hesitate to call me at (415) 972-3504 or e-mail at arthur.greg@epa.gov.

Sincerely,

Greg V. Arthur
CWA Compliance Office

Enclosure

cc: Joe Maez, NDEP
Skeet Sellers, Lyon County

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION 9

CLEAN WATER ACT COMPLIANCE OFFICE

NPDES COMPLIANCE EVALUATION INSPECTION REPORT

Industrial User:	Bruce Industries 101 Evans Avenue, Dayton, Nevada 89403-1700 40 CFR 433 – New Source Metal Finishing
Treatment Works:	Lyon County Utilities Department South Dayton Valley Wastewater Treatment Plant (No NPDES Permit - Nevada Permit NEV10017)
Date of Inspection:	July 20, 2006

Inspection Participants:

US EPA:	Greg V. Arthur, Region 9, CWA Compliance Office, (415) 972-3504
State of Nevada:	Joe Maez, NDEP, Bureau of Water Pollution Control, (775) 687-9431 Steve McGoff, NDEP, Bureau of Water Poll Control
Lyon County:	Skeet Sellers, Utilities, Wastewater Supervisor, (775) 246-6220
Bruce Industries	John Stevens, Plant Manager, (775) 246-0101 Jack Powell, Safety Officer, (775) 246-0101

Report Prepared By:	Greg V. Arthur, Environmental Engineer
	August 28, 2006

1.0 Scope and Purpose

On July 20, 2006 EPA, the Nevada Department of Environmental Protection ("NDEP"), and Lyon County conducted a compliance evaluation inspection of Bruce Industries in Dayton, Nevada. The purpose was to ensure compliance with the Federal, State and local regulations covering the discharge of non-domestic wastewaters into the sewers under the Clean Water Act and the Nevada Revised Statutes. In particular, it was to ensure:

- Classification in the proper Federal categories;
- Application of the correct Federal, State and local standards at correct sampling points;
- Consistent compliance with the standards; and
- Fulfillment of Federal self-monitoring requirements.

Bruce Industries qualifies under the Clean Water Act as a significant industrial user ("SIU") within the Lyon County Utilities sewer service area. Lyon County operates the South Dayton Valley wastewater treatment plant under a State of Nevada ground water permit. It does not operate under an NPDES permit because the wastewater treatment plant discharges to ground waters and to a golf course for reclaim. Lyon County Utilities does qualify under the Clean Water Act as a publicly-owned treatment works ("POTW") subject to the Federal regulations for pretreatment and sludge in 40 CFR 403 and 503. The inspection participants are listed on the title page. Arthur conducted the inspection of Bruce Industries on July 20.

1.1 Process Description

Bruce Industries manufactures indoor aircraft lighting fixtures from aluminum/stainless steel/ steel/brass sheet and bar stock, polycarbonate plastic, and pre-manufactured parts such as lights, bulbs, fasteners, electrical components, wire, and printed circuits boards. The operations involve metals sawing, bead blasting, punch pressing, shearing, water-soluble oil cooled machining, non-contact cooled welding, vacuum forming of plastic, silk screening, vibratory deburring, chem-film chromium conversion coating of aluminum, dry-booth painting, and assembly. . ***See*** Appendix 1.

Bruce Industries owns the assemblies that undergo metal finishing on-site. Operations began in 1987. Bruce Industries discharges non-domestic wastewaters to the Lyon County domestic sewers through a single sewer connection designated in this report as IWD-BR1. Domestic sewage discharges through separate connections downstream of the industrial wastewater connection.

Silk Screening - Silk screening is used to apply writing on polycarbonate plastic lighting signs. The steps involve the application of a photo resist and photo resist stripping. The process does not involve photo developing because all art work is prepared off-site. The silk screenings and equipment are washed-off in a work sink. ***See*** the photo on the next page.

Chemical Storage – Hazardous wastes such as chem-film wastes, spent oils, and paint wastes are stored in a sealed underground vault. The vault floor drain is now sealed.

Painting – Operations are dry-booth. Military-specified chrome-based priming is performed off-site by suppliers. Painting and equipment clean-up is performed in a general use work sink located outside of the chem-film room.

Vibratory Deburring – Deburring wash water circulates through a cartridge filter to a holding tank for reuse as make-up. Excess wash waters are drained to a portable tank.

Photo: Vibratory Deburring
Taken By: Greg V. Arthur
Date: 07/20/06

Photo: Silk Screening Work Sink
Taken By: Greg V. Arthur
Date: 07/20/06

Chem-Film Line – Bruce Industries performs chromium conversion coating in a line consisting of nine 1,200 gallon and four smaller <100 gallon tanks, installed over bermed secondary containment. The steps include alkaline cleaning, alkaline soap cleaning, nitric-acid deoxidation, dichromate conversion coating, clear dichromate coating, and nitric-acid passivation.

Tank #	Volume	Tank Description and Contents	Disposal Method
Tank 1	1200 gals	alkaline cleaning	drained ~1/yr to pH adjust
Tank 2	1200 gals	1° low-overflow rinse for Tank 1	overflows to sewer *
Tank 3	1200 gals	alkaline soap cleaning	drained ~1/yr to pH adjust
Tank 4	1200 gals	1° low-overflow rinse for Tank 3	overflows to sewer *
Tank 5	1200 gals	nitric-acid deoxidation	drained ~1/yr to pH adjust
Tank 6	1200 gals	1° low-overflow rinse for Tank 5	overflows to sewer *
Tank 7	1200 gals	dichromate conversion coating	drained ~1/yr to metals treat
Tank 8	1200 gals	1° static rinse for Tank 7	drained ~1/mo to metals treat
Tank 9	1200 gals	2° static rinse for Tank 8	drained ~1/mo to metals treat
Tank 10	55 gals	clear chromate conversion coating	drained ~1/yr to metals treat
Tank 11	100 gals	1° static rinse for Tank 10	drained ~1/mo to metals treat
Tank 12	20 gals	nitric-acid passivation	drained ~1/yr to pH adjust
Tank 13	20 gals	1° static rinse for Tank 12	drained ~1/mo to pH adjust
* Overflowing rinses are also drained ~1/mo to pH adjust			

Photo: Chem-Film Line
Taken By: Greg V. Arthur
Date: 07/20/06

See Tank List, on the previous page, for the contents, volumes, and disposal methods.

1.2 Facility SIC Code

Bruce Industries is assigned the SIC code for aircraft lighting (SIC 3467).

1.3 Facility Wastewater Sources

Bruce Industries generates wastewaters primarily from the chem-film line but also from vibratory deburring, machine shop water-soluble coolants, and various work sinks used for the cleaning of equipment and work pieces. ***See*** Appendix 1.

Spent Chem-Film Solutions – The imparted contamination from the chem-film processing of parts and the progressive drop in solution strength results in the generation of spent solutions. Bruce Industries batch treats all spents on-site through a batch treatment unit. The spent solutions comprise the tank contents for alkaline cleaning, alkaline soap cleaning, acidic deoxidation, chromium conversion coating, and acidic passivation. Each tank has a valved drain for the hard-plumbed delivery of the spent solutions to the batch treatment unit.

Chem-Film Rinses – Bruce Industries employs continuous overflowing rinses following the chem-film preparation steps of alkaline cleaning, alkaline soap cleaning, and deoxidation, and static rinses following chromium conversion coating and passivation. The continuous overflow rinses drain through a common pipe directly to the sewer connection sump. Each static rinse tank has a valved drain for the hard-plumbed deliver of the spent static rinses to the batch treatment unit.

Work Sinks - There are three work sinks that generate process-related wastewaters. A work sink in the chem-film room generates miscellaneous wash waters related to chem-film. A work sink located just outside of the chem-film room is used for general clean-up of painting equipment. A work sink located in the silk screen room is used to wash-off photo resist and photo resist strip, as well as clean silk screening equipment. Wash water drainage from these work sinks discharge directly to the sewer connection sump.

Vibratory Deburring - Wash water from vibratory deburring collects through cartridge filters to a holding tank to be reused as make-up. Excess deburring wash water is drained to a carboy on a cart for delivery and discharge directly to the sewer connection sump.

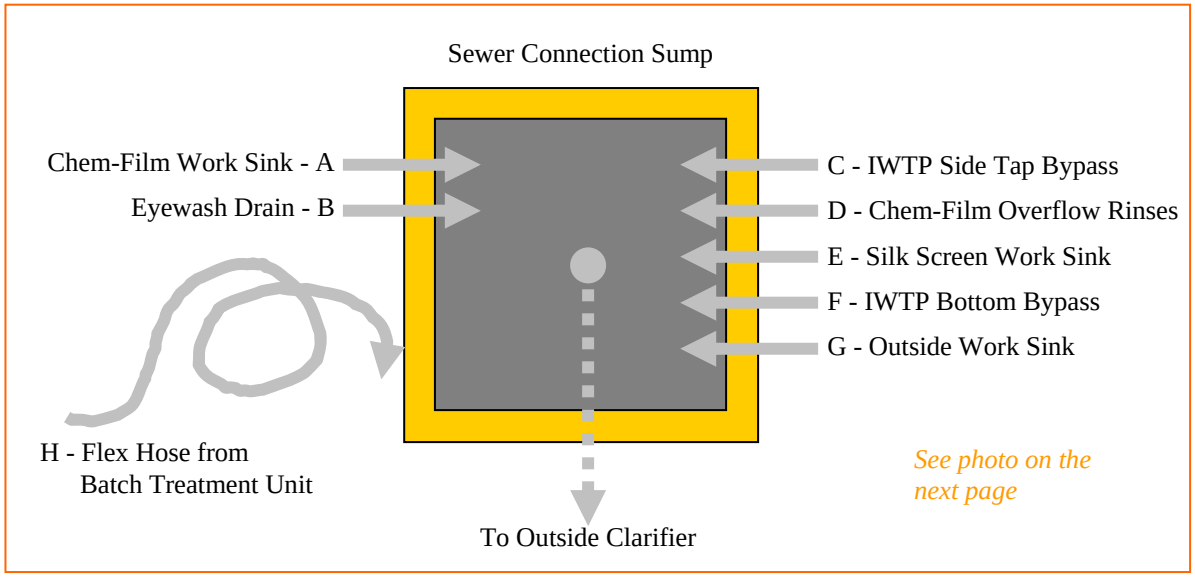
Residuals - Bruce Industries generates spent machine shop coolants, paint and thinner wastes, broken fluorescent bulbs, and filter press cake from the batch treatment unit. All residual wastes except broken fluorescent bulbs are collected to hazardous waste storage in the chemical storage vault. Broken fluorescent bulbs are collected in a separate area of the work floor. All of these residual wastes are then hauled off-site as hazardous to Romic.

1.4 Facility Process Wastewater Composition

The process wastewaters listed in section 1.3 above would be expected to contain chromium, copper, lead, nickel, silver, zinc, cyanide, and acidity, as well as oil & grease, salts, iron, surfactants, aluminum, free oils, suspended solids, and other pollutants cleaned off of parts.

1.5 Facility Process Wastewater Treatment

Bruce Industries provides on-site batch treatment for spent chem-film solutions and static rinses. All other wastewaters discharge to the sewers without treatment. All process-related wastewaters discharge to the sewers through a single sewer connection sump. This sump discharges through a five-chambered clarifier located outside of the building in the parking lot. It is not apparent that there are no other wastewater contributions since the piping is concealed under the floors inside and pavement outside. In the absence of any other wastewater contributions to the clarifier, the exit chamber of the clarifier is the final discharge point to the sewers, designated for the purposes of this report as IWD-BR1. The 2004-2006 sampling data indicates that Bruce Industries now discharges an average of ~2,500 gallons per day ("gpd") to the sewers. ***See*** Appendix 1. Also ***see*** photos on the next page.



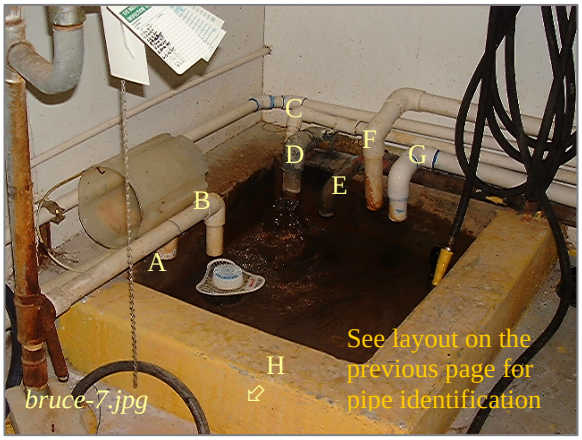


Photo: Sewer Connection Sump
Taken By: Greg V. Arthur
Date: 07/20/06

Photo: Location of Outside Clarifier
Taken By: Greg V. Arthur
Date: 07/20/06

Delivery – Spent chem-film solutions and static rinses are drained as needed individually from their tanks through valving to a common sewer line that feeds into the batch treatment tank. A flexible hose from the batch treatment unit is moved by hand during operations to outlet into the sewer connection sump. All other wastewaters are delivered either through hard-piping or by cart directly to the sewer connection sump.

Batch Treatment – The batch treatment consists of a conical-shaped 1,200-gallon chemical treatment tank followed by a filter press, a small 50-gallon holding tank, and final canister polishing filters. The current maintenance manual and the NDEP permit also indicate the use of a pre-discharge holding tank following the canister polishing filter. However, the pre-discharge tank was found during this inspection to have been removed.

Photo: Batch Treatment Unit
Taken By: Greg V. Arthur
Date: 07/20/06

A - Chemical Reaction Tank
B - Side-Taps Bypass Valves
C - Bottom Tap Bypass Valve
D - Bottom Inlet/Outlet Stub-out
E - Filter Press
F - Small Holding Tank
G - Cartridge Filters
H - Sewer Connection Sump

Bruce Industries batch treats each spent chem-film wastewater separately using specific procedures outlined in its maintenance manual. The maintenance manual sets the change-out schedule, discharge rate, pH metering set-points for treatment, and procedures for each type of wastewater. The solution tanks are changed-out once per year at a rate of 200 gallons per

day. The static and running rinses are changed-out once per month at the same 200 gallons per day rate. The batch treatment steps are listed below.

Tanks 1-6, 12,13 *non-chromium spents and change-outs*	Tanks 7-11 *chromium-bearing spents and change-outs*
(1) adjusted to a pH between 6.5-8.5 (2) discharged to the sewer connection sump without further treatment to remove metals	(1) adjusted to a pH below 2.0 (2) chrome reduction through addition of sodium metabisulfite (3) re-adjusted to a pH between 7.0-9.0 (4) flocculation (5) solids removal through the filter press (6) holding + cartridge filtration (7) discharged to the sewer connection sump

Residuals Handling – Filter press cake is hauled off-site for disposal as hazardous to Romic Chemical. Filtrate does not return for re-treatment but rather discharges to the sewers through the final cartridge filters into to the sewer connection sump.

Operational Controls – The treatment on-site employs two design operational controls that improve the performance. Foremost, batch operations allow analytical testing for pH and chromium to determine whether the treatment steps have reached their end-points. Batch operations also allow separate segregated treatment for each type of chem-film wastewater. These controls reduce the operational variability inherent in the treatment, as well as imparted into treatment from the sources, thereby improving the system performance. On the other hand, the batch treatment tank is little used to remove metals. Most wastewaters discharge without treatment for any pollutants, and of those that are treated, around half are adjusted just for pH. Only a fraction of the wastewaters actually are treated through batch treatment to remove metals (~45,000 gallons per year). The batch treatment unit is also outfitted with side and bottom taps that can be operated to allow bypassing around the filter press and cartridge filters directly to the sewer connection sump. Finally, the treatment does not involve ORP metering to provide positive indication of the chemical reaction end-points.

Sewer Discharge – The outside clarifier discharge to the sewer is designated as the permitted compliance sampling point, IWD-BR1. According to Bruce Industries, all process-related wastewaters, and nothing else including domestic sewage, discharge through the outside clarifier. However, this is unverifiable at this time. There is no sample box designated for compliance self-monitoring. A sample box at the sewer connection sump would remove doubt regarding the contents of the discharge through the outside clarifier.

1.6 POTW Wastewater Treatment

State and Federal Legal Authorities – Lyon County operates the South Dayton Valley wastewater treatment plant under the authority of NDEP permit NEV10017 for the discharge of treated wastewater for reclaim and to the ground water. Lyon County does not possess a Federal NPDES permit issued under the Clean Water Act because the treated wastewaters do

not discharge to surface waters. Nevertheless, Lyon County does qualify as a publicly-owned treatment works ("POTW") under the Federal definition in 40 CFR 403.3(o) because the wastewater treatment plant treats mixed domestic and non-domestic wastewaters and its sludges are regulated under the Clean Water Act by the Federal regulations in 40 CFR 503.

POTW Configuration – The South Dayton Valley wastewater treatment plant consists of two treatment trains: a sequencing batch reactor ("SBR") and extended aeration lagoons. The City of Dayton generates an average of 220,000 gpd of domestic sewage. The domestic sewage feeds at a constant 140,000 gpd rate into the SBR. The remaining domestic flows are diverted through a splitter to the extended aeration lagoons. The SBR provides aerobic degradation, nitrification, and denitrification. In addition, the Dayton Valley business park generates an average of 60,000 gpd of process-related wastewaters and domestic sewage. Business park wastewaters, excess domestic sewage from city averaging 80,000 gpd, and the aerobic digester sludge from the SBR feed into the first of four lagoons. Primary Ponds #1 and #2 are aerated lagoons in series. Secondary Ponds #A and #B are facultative lagoons operated one at a time. The facultative lagoons discharge without chlorination to a rapid infiltration basin. The SBR discharges without chlorination to a golf course for reclaim.

1.7 Legal Authorities

NDEP Permit for Lyon County - Permit NEV10017 does not require Lyon County to obtain an approved pretreatment program. This is in keeping with the Federal regulations in 40 CFR 403.8(a) that allow for, but do not mandate, States or EPA to require small POTWs with design capacities under 5.0 mgd to obtain approved pretreatment programs. The permit also does not impose any pretreatment provisions. NDEP has the authority to assume some or all of the functions of the pretreatment program under 40 CFR 403.10(e,f). However, NDEP has recommended that Lyon County obtain an approved pretreatment program. Lyon County has drafted a sewer use ordinance that has been reviewed by EPA. Lyon County cannot issue its own local industrial user permits until the ordinance is adopted and the pretreatment program is funded by the Lyon County supervisors.

NDEP Permit for Bruce Industries - Permit NEV87021 establishes self-monitoring requirements and ground water protection-based limits for the discharges from Bruce Industries to the Lyon County sewers.

1.8 Photo Documentation

Arthur took nine digital photos during this inspection, recorded as the jpeg files named *bruce1.jpg* through *bruce9.jpg*. Those not published in this report are duplicates.

1.9 Sampling Record

So far, all compliance samples are self-collected by Bruce Industries from the outside clarifier at IWD-BR1. ***See*** Appendix 3 for a summary of the 2004-2006 sampling.

2.0 Sewer Discharge Standards and Limits

Federal categorical pretreatment standards (where they exist), national prohibitions, State groundwater, and the local limits (where they exist) must be applied to the sewered discharges from industrial users. (40 CFR 403.5 and 403.6).

Summary

The Federal categorical pretreatment standards for metal finishing in 40 CFR 433 apply to all process wastewater discharges from Bruce Industries through IWD-BR1. Lyon County has not issued its own enforceable sewer discharge permit and the NDEP ground water protection permit does not accurately state the discharge requirements. However, Bruce Industries is subject to the self-implementing authority of the Federal metal finishing standards in 40 CFR 433 and the national prohibitions in 40 CFR 403.5(a)(b). In addition, once Lyon County obtains pretreatment program approval, its local limits would be technically-based on the State ground water limits and Federal sludge standards that apply to the South Dayton Valley wastewater treatment plant. The application of Federal standards, national prohibitions, and State and local limits was determined through visual inspection. ***See*** Appendix 2.

Requirements

- The Federal standards for new source metal finishing in 40 CFR 433 must be applied to the discharges through IWD-BR1.
- The permit must prohibit dilution as a substitute for any treatment that is necessary to comply with Federal standards, as well as prohibit the bypassing of any treatment necessary to comply with either Federal standards or local limits.
- Any permit must apply technically-based local limits derived from the regulatory requirements that now apply to the South Dayton Valley wastewater treatment plant.

Recommendations

- Bruce Industries should determine the percentage of the overall process-related discharge to the sewers that is generated by the cyanide-bearing chromium conversion coating step.
- Bruce Industries should re-install a final discharge tank large enough to hold an average day's worth of wastewater and establish a new sample point there for Federal standards.

2.1 Classification by Federal Point Source Category

Bruce Industries qualifies as a metal finisher subject to the Federal metal finishing standards in 40 CFR 433. The NDEP permit did not classify Bruce Industries under any Federal point source category. Federal standards are self-implementing which means they apply to regulated waste streams whether or not they are implemented in a permit. The Federal rules in 40

CFR 403.6 define domestic sewage and non-contact wastewaters to be dilution waters. Bruce Industries does not qualify under the Federal plastics forming standards because 40 CFR 463 does not apply to sewer discharges, or the Federal luminescent materials standards because 40 CFR 469 Subpart D applies to the manufacturing of fluorescent coatings.

New or Existing Sources – Bruce Industries qualifies as a new source because it was constructed after the August 31, 1982 promulgation date of the rule.

2.2 Local Limits and National Prohibitions

Local limits, national prohibitions, and the State ground water protection limits, are meant to express the limitations on non-domestic discharges necessary to protect the sewers, treatment plants, treatment plant sludges, and their receiving waters from adverse impacts. Generally, technically-based numerical local limits supplant State limits and national prohibitions.

National Prohibitions – For POTWs to surface waters, the national prohibitions in 40 CFR 403.5 prohibit discharges that can cause the pass-through of pollutants into the receiving waters, operational interference of the treatment works, sewage sludge contamination, sewer worker health and safety risks, fire or explosive risks, and corrosive sewer damage. Pass-through and interference, however, as defined in the Federal regulations only occur when NPDES permit limits are violated. So with no NPDES permit for Lyon County, the national prohibitions cannot prohibit discharges that result in violations of the NDEP ground water permit either through pass-through or operational interference. They do however prohibit discharges that cause unpermitted discharges or bypasses to surface waters.

Local Limits – However, local limits should protect the POTW from adverse impacts including violations of all Federal and State permits. In this case, technically-based local limits would be approved if they also can restrict discharges that can cause the pass-through of pollutants and operational interference resulting in violations of the NDEP ground water permit for Lyon County. Lyon County local limits still need to be re-adopted based on the performance of the wastewater treatment plants and the current regulatory requirements as expressed in the NDEP permit and the Federal sludge regulations. Once they have been adopted they would apply to all non-domestic discharges in its service area. They would also replace the direct application of the State ground water limits in the NDEP permit to Bruce Industries. ***See*** Appendix 2 for the national prohibitions, State, and local limits that apply.

2.3 Federal Categorical Pretreatment Standards
New Source Metal Finishing - 40 CFR 433.17

40 CFR 433.17	Cd	Cr	Cu	Pb	Ni	Ag	Zn	CNt	CNa	TTO
daily-maximum (mg/l)	0.11	2.77	3.38	0.69	3.98	0.43	2.61	1.20	0.86	2.13
month-average (mg/l)	0.07	1.71	2.07	0.43	2.38	0.24	1.48	0.65	0.32	-

Applicability - Under 40 CFR 433.10(a), the metal finishing standards apply to the process wastewaters from Bruce Industries because the facility's operations involve chromium

conversion coating (a form of chemical coating) and deoxidation (a form of chemical etching). The metal finishing standards "... apply to plants that perform ..." the core operations of electroplating, electroless plating, etching, anodizing, chemical coating, or printed circuit board manufacturing and they extend to other on-site operations, such as cleaning, deburring, painting, machining, and assembly associated with metal finishing and specifically listed in 40 CFR 433.10(a). If any of the core operations are performed, the new source metal finishing standards apply to discharges from any of the core or associated operations. As a result, the metal finishing standards apply to the process wastewater discharges to IWD-BR1.

Basis of the Standards - The new source metal finishing standards were based on a model pretreatment unit that comprises metals precipitation, settling, sludge removal, source control of toxic organics, no discharge of cadmium-bearing wastewaters, and if necessary, cyanide destruction and chromium reduction. The best-available-technology standards were set where metal finishers with model treatment operated at a long-term average and variability that achieved a compliance rate of 99% (1 in 100 chance of violation).

Adjustments – Under 40 CFR 433.12(c), the cyanide standards as applied to metal finishing wastewater discharges must be adjusted to account for dilution from non-cyanide bearing waste streams (Federally-regulated and unregulated). For Bruce Industries, cyanide-bearing wastewaters are generated by chromium conversion coating. As a result, the cyanide standards as applied to the discharges through IWD-BR1 must be adjusted proportionally downward to account for dilution from the non-cyanide bearing waste streams. EPA estimates the dilution at IWD-BR1 to be ~15:1 based on the number of treated wastewater batches. As a result, the daily-maximum and monthly-average metal finishing standards for amenable cyanide adjust downward to 0.057 and 0.021 mg/l.

Compliance Deadline - New sources were required to comply on the first day of discharge.

2.4 Federal Prohibitions

The Federal standards in 40 CFR 403.6(d) and 403.17(d) prohibit dilution as a substitute for treatment, and the bypassing of any on-site treatment necessary to comply with standards, respectively. The NDEP permit does not include a provision against the bypassing treatment necessary to comply but does require notification of changes.

2.5 Point(s) of Compliance

Local Limits - Local and State limits and the national prohibitions apply end-of-pipe to all non-domestic flows from Bruce Industries. The NDEP permit sample point for the outside clarifier designated in this report as IWD-BR1 is a suitable end-of-pipe sample point representative of the day-to-day non-domestic wastewater discharges.

Federal Standards - Federal categorical pretreatment standards apply end-of-process-after-treatment to all Federally-regulated discharges to the sewers. The sample point IWD-BR1

may be a suitable sample point representative of the day-to-day discharge of Federally-regulated wastewaters. However, it is not verifiable that there are no other waste streams contributing to the discharges through the outside clarifier. It would be better to install a holding tank to capture all untreated and treated wastewaters and work sink drainages for combined discharge to the sewers, and to establish the holding tank outlet as a second sample point for Federal standards (designated in this report as IWD-BR2). In other words, treatment would operate in batch, but the final holding tank would discharge continuously.

2.6 Compliance Sampling

Local limits and the national prohibitions are instantaneous-maximums and are comparable to samples of any length including single grab samples. The State limits and the Federal categorical pretreatment standards are daily-maximums comparable to 24-hour composite samples. The 24-hour composite samples can be replaced with single grabs or manually-composited grabs that are representative of the sampling day's discharge.

2.7 Pollutants of Concern

The pollutants of concern for Bruce Industries comprise those regulated by the Federal standards, the national prohibitions, and certain site-specific pollutants for which there is a potential to cause the South Dayton Valley wastewater treatment plant to violate its NDEP permit or Federal sludge limits.

Federal Standards – The pollutant regulated by the metal finishing standards are cadmium, chromium, copper, lead, nickel, silver, zinc, cyanide (total or amenable), and total toxic organics.

National Prohibitions – From this inspection, EPA determined that the pollutant measures regulated by the national prohibitions at Bruce Industries include pH for corrosivity, *40 CFR 403.5(b)(2)*, closed-cup flashpoint for explosivity, *40 CFR 403.5(b)(1)*, and oil & grease for sewer obstructions, *40 CFR 403.5(b)(3)*.

Local Limits – Site-specific pollutants can cause violations of the NDEP permit or Federal sludge limits in two ways. First, the pollutants could cause an operational interference of the treatment works which results in either (1) the unauthorized release of untreated or partially treated sewage or (2) the violation of permit limits for pollutants that measure performance such as BOD. Second, the pollutants could pass-through the treatment works into either the WWTP sludge or the receiving waters at levels exceeding permit or regulatory limits. From this inspection, EPA determined that the pollutants of concern at Bruce Industries likely include the following:

- pH, total suspended solids, surfactants, sulfides, oil & grease – *as a risk of adversely affecting the treatment works*.
- specific conductivity, oil & grease, cadmium, chromium, copper, lead, nickel, zinc, and possibly other metals – *as a risk of pass-through*.

3.0 Compliance with Federal Standards

Industrial users must comply with the Federal categorical pretreatment standards that apply to their process wastewater discharges. 40 CFR 403.6(b).

Categorical industrial users must comply with the prohibition against dilution of the Federally-regulated waste streams as a substitute for treatment. 40 CFR 403.6(d).

Industrial users must comply with the provision restricting the bypass of treatment necessary to comply with any pretreatment standard or requirement. 40 CFR 403.17(d).

Summary

It is unlikely that a metal finisher like Bruce Industries can comply with the full list of Federal metal finishing standards without also increasing the capability and capacity of treatment. Bruce Industries employs batch treatment that is not equivalent in design to the best-available-technology ("BAT") treatment used in setting the Federal standards, and this under-designed treatment only handles small volumes of some chem-film spents. In effect, nearly all wastewaters are discharge without treatment to remove metals or cyanide. As a result, the sample results (all reported as in compliance) are invalidated by dilution from the use of continuously overflowing rinses. ***See*** Appendix 3.

Requirements

- The overflowing rinses must be operated only on-demand or treated prior to discharge.

Recommendations

- Overflow rinses should be retrofitted with conductivity-controls or kick-plate switches.
- Non-chrome bearing spent solutions and rinses should be batch treated to remove metals.
- The batch treatment unit should be retrofitted to provide chemical-aided settling prior to final cartridge filtration, and to direct filter press filtrate back through treatment.
- Bypasses from batch treatment to the sewer connection sump should be eliminated.

3.1 Sampling Records

The 2004-2006 sample records for Bruce Industries at IWD-BR1 consists of monthly self-monitoring samples for chromium and total suspended solids, quarterly samples for other metals, pH, and oil and grease, and annual samples for total cyanide, trace metals, COD, and total toxic organics. The sample results are not usable for determining compliance with the Federal standards for three reasons. First, the overflowing rinses that make up the typical discharges to the sewers operate continuously during working hours irrespective of whether

there are parts undergoing processing. This results in samples that are diluted by excess make-up water, a practice which is prohibited by the Federal rule against dilution as a substitute for treatment. Second, the highest strength wastewaters are batch treated very infrequently, resulting in a preponderance of samples that represent only diluted waste streams. Third, total toxic organics and cyanide were sampled just once per year.

Composite sampling for all Federally-regulated pollutants from IWD-BR1, or even better, from IWD-BR2 (upon installation of effluent equalization), would become usable to determine compliance with the Federal BAT standards once the overflow rinses either are retrofitted to operate on-demand or metals/cyanide treatment is installed to handle all wastewater discharges. Representative sampling over time also would require samples to be collected both on days when the discharge to the sewers consists of the treated/retrofitted rinses and on days when the discharge also includes the batch treated wastewaters. See sections 3.3 and 5.0 below.

3.2 Best-Available-Technology Treatment

Bruce Industries usually discharges only untreated dilute rinses and work sink drainage through IWD-BR1. At times, Bruce Industries also discharges ~200 gallons of batch treated spents. Only chromium-bearing and deoxidation-related spents, around half of the batch treated spents, undergo full treatment to remove metals. Alkaline cleaner spents are only adjusted for pH. As a result, sampling at IWD-BR1 cannot indicate compliance with the Federal standards because of the preponderance of diluted rinses.

Untreated Overflow Rinses – Bruce Industries does not treat the overflow rinses to remove metals or destroy cyanide through BAT treatment or any other controls considered equivalent in performance (such as evaporation with slurry off-hauling or dedicated ion exchange columns). Nearly all chromium conversion operations need to employ BAT or its equivalent in order to achieve consistent compliance with the Federal standards because (1) their operations generate the Federally-regulated pollutants and, (2) the difficulties inherent in controlling pollutants through operations alone. However, because of dilution, it cannot be ascertained from past sampling whether the rinses at Bruce Industries require treatment.

Treated Wastewaters – Bruce Industries provides batch metals removal and pH adjustment for less than 5% of the total wastewater volume generated. Batch pH adjustment alone is not equivalent in design to the BAT used in setting the Federal standards because it does not employ metals precipitation and settling. Batch treatment unit for chromium is also not equivalent in design to BAT because it does not employ settling. The effluent quality for treatment involving metals precipitation depends on the formation of metals precipitates and the efficiency of solids removal. BAT treatment incorporates gravity clarification to remove precipitated solids, modified, in general with flocculant and/or coagulant aids, and at times with (Lamella) plate settling. The batch treatment at Bruce Industries uses the much less efficient method of filter press removal followed by limited capacity cartridge filters to remove solids.

Cyanide Treatment – Chromium conversion coating imparts stable complexed cyanides which are not amenable to the BAT alkaline chlorination treatment for cyanide. In recognition of complexed cyanides, the Federal standards allow the replacement sampling of amenable cyanide for total cyanide. The standards also must be proportionally adjusted downward to account for dilution because the standards apply only to the cyanide-bearing waste streams. In addition, local limits usually advance total cyanide restrictions. Complexed cyanide can be removed through the addition of ferrous sulfate at pHs between 5.0 and 6.0, in order to further the iron precipitation of ferrocyanides.

3.3 Dilution as a Substitute for Treatment

The Federal standards in 40 CFR 403.6(d) prohibit "dilution as a substitute for treatment" in order to prevent compromising BAT model treatment with dilute waste streams. This prohibition specifically applies when sample results for a diluted waste stream are below the Federal standards and the apparent compliance is used to justify discharge without treatment. There are two conditions that need to be established in order to make a determination of non-compliance with this prohibition. First, some or all of the Federally-regulated wastewaters must discharge without undergoing BAT model treatment or its equivalent. Second, there must be some form of excess water usage within a Federally-regulated process.

Bruce Industries meets the first condition of non-compliance since most of the Federally-regulated rinses waters discharge untreated for metals and cyanide. Bruce Industries also meets the second condition since a number of overflowing rinses discharge continuously irrespective of whether there are parts undergoing processing. The most common methods of linking rinsing to production include conductivity-controlled make-up water inlet valves and on-demand kick-plate switches, although there are many others.

3.4 Bypass Provision

The Federal standards in 40 CFR 403.17 prohibit the bypassing of any on-site treatment necessary to comply with standards unless the bypass was unavoidable to prevent the loss of life, injury, or property damage, and there were no feasible alternatives. This provision explicitly prohibits bypasses that are the result of a short-sighted lack of back-up equipment for normal downtimes or preventive maintenance. It also explicitly prohibits bypasses that could be prevented through wastewater retention or the procurement of auxiliary equipment. It specifically allows bypasses that do not result in violations of the standards as long as there is prior notice and approval from the sewerage agency or State.

No comprehensive determination can be made because nearly all of the Federally-regulated wastewaters discharge untreated. However, the batch treatment unit is designed with side and bottom tap connections that are hard-plumbed to the sewer connection sump, thereby providing a method of bypassing treatment.

4.0 Compliance with Local Limits and National Prohibitions

All non-domestic wastewater discharges to the sewers must comply with local limits and the national prohibitions. 40 CFR 403.5(a,b,d).

Industrial users must comply with the provision restricting the bypass of treatment necessary to comply with any pretreatment standard or requirement. 40 CFR 403.17(d).

Summary

Compliance with the Federal requirements would be expected to also result in compliance with expected local and State limits. Discharges but are unlikely to (but could) pose a risk of causing the pass-through of toxics or salts to the receiving ground waters or the sludge. No definitive conclusions regarding compliance can be made until (1) technically-based local limits for the pollutants of concern are enacted in a permit and (2) comprehensive sampling begins.

Requirements

- None.

Recommendations

- The permit should add a local limit for surfactants.
- Bruce Industries should install continuous final pH metering.

4.1 National Objectives

The general pretreatment regulations were promulgated in order to fulfill the national objectives to prevent the introduction of pollutants that:

(1) cause operational interference with sewage treatment or sludge disposal,
(2) pass-through sewage treatment into the receiving waters or sludge,
(3) are in any way incompatible with the sewerage works, or
(4) do not improve the opportunities to recycle municipal wastewaters and sludge.

This inspection did not include an evaluation of whether achievement of the national objectives in 40 CFR 403.2 have been demonstrated by the Lyon County wastewater treatment plant through consistent compliance with their sludge and discharge limits.

4.2 Flammability

Flammability would not be expected because the discharges to the sewer are expected to entrain only negligible amounts of volatile organics.

4.3 Local Limits for Oxygen Demanding Pollutants and The National Prohibition Against Interference

The process-related wastewaters discharged to the sewers are not expected to be high enough in organics strength to pose a risk of interference, with wastewater strengths significantly less than domestic sewage.

4.4 State and Local Limits for Toxic Metals, Cyanide, and Other Pollutants and The National Prohibition Against Pass-Through

Federally-Regulated Metals – The corrective actions necessary to achieve consistent compliance with the Federal prohibition against dilution as a substitute for treatment, would be expected to also result in compliance with the local limits expected for metals. ***See*** section 3.2 of this report.

Total or Amenable Cyanide – Again, the corrective actions necessary to achieve consistent compliance with Federal standards and prohibitions would be expected to also result in compliance with the local limits expected for cyanide. Since the wastewaters would be expected to contain complexed cyanides from chromium conversion steps, consistent compliance could be achieved simply through the application of amenable cyanide limits instead of total cyanide limits. ***See*** section 3.2 of this report.

Other Pollutants – No conclusions can be made since local limits have not been advanced for Bruce Industries. Nevertheless, the risk of pass-through to the ground water from the Bruce Industries is expected to be negligible since the wastewaters are not expected to entrain significant levels of suspended solids, antimony, arsenic, barium, molybdenum, selenium, or total toxic organics. Technically-based local limits would be expected for these pollutants because the Federal sludge standards and the NDEP permit for Lyon County contain limits.

Salts – The pass-through risk for salts is unknown because there are no sample results for either chlorides, total dissolved solids, or specific conductivity as an indicator measurement for salts. Technically-based local limits for chlorides, total dissolved solids, or specific conductivity would be expected because the NDEP permit for Lyon County limits chlorides in the ground water monitoring wells.

4.5 Local Limits for pH and Sulfides, and The National Prohibitions Against Safety Hazards and Corrosive Structural Damage

Sewer collection system interferences related to the formation of hydrogen sulfide and the resulting acidic disintegration of the sewers are not expected because the treated wastewaters are not high-strength in biodegradable organics, and are adjusted through the treatment to not be acidic in nature. However, continuous final pH metering should be installed because most discharges are untreated and those that are neutralized were initially composed of treated acidic and alkaline process wastewaters.

5.0 Compliance with Federal Monitoring Requirements

Significant industrial users must self-monitor for all regulated parameters at least twice per year unless the sewerage agency monitors in place of self-monitoring. 40 CFR 403.12(e) & 403.12(g).

Each sample must be representative of the sampling day's operations. Sampling must be representative of the conditions occurring during the reporting period. 40 CFR 403.12(g) and 403.12(h).

Summary

The sample record for Bruce Industries for the pollutants of concern is not representative of the sampling day's discharge or representative of the sampling day's operations because of excess make-up in the overflow rinses and the intermittent discharge of batch treated spents. A sample record that results in more than 10 samples per year would likely be statistically representative over the reporting period if the discharge of the treated batch spents and overflowing rinses are essentially random. Otherwise, if there is a statistical bias from certain significant discharges occurring on schedules, then the number minimum number of samples has to increase to account for the scheduled bias. Discharge flow rate and pH need to be continuously monitored as long as overflowing rinses discharge without treatment.

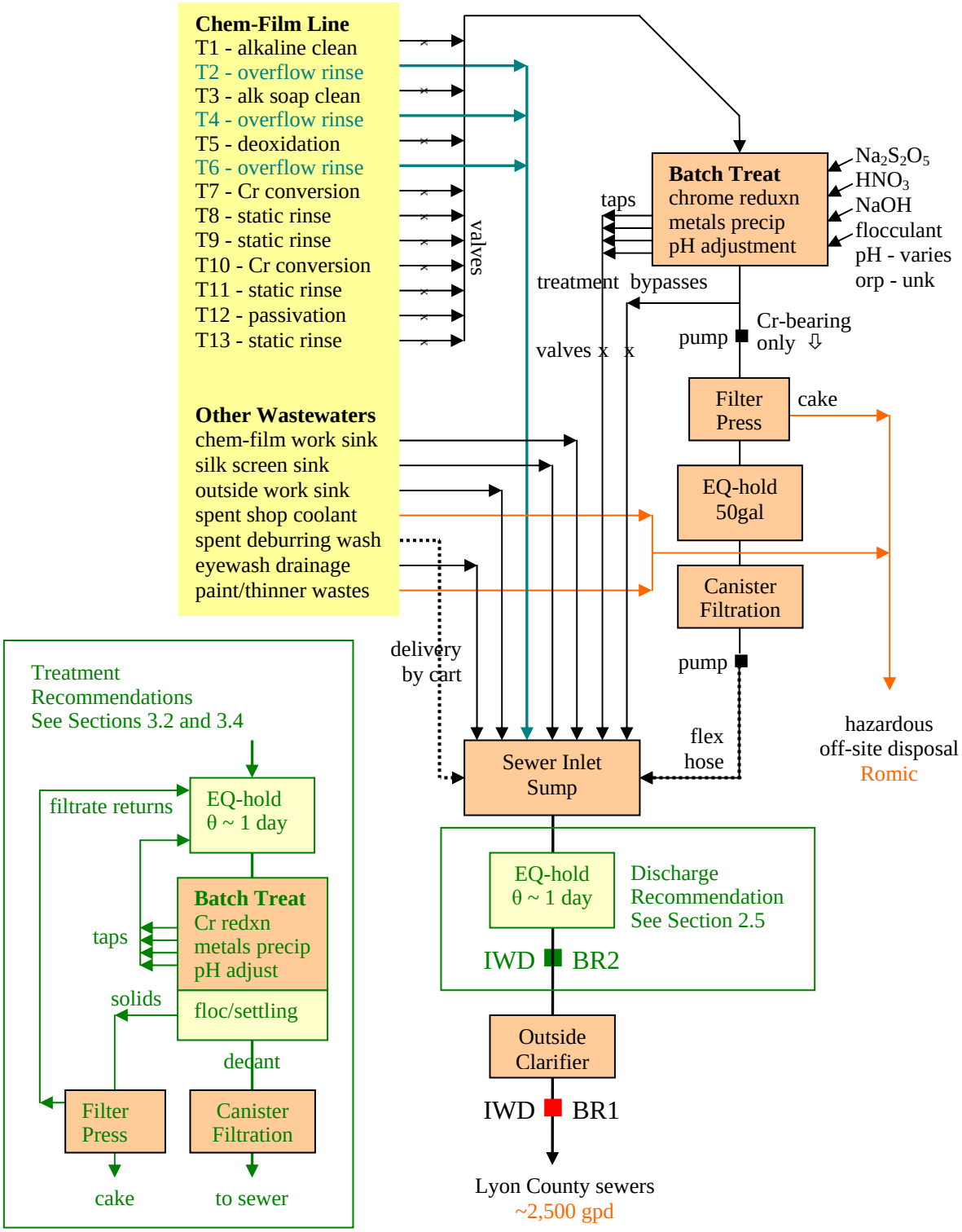
Requirements

- See Appendix 2 for the expected self-monitoring requirements for IWD-BR1.
- The self-monitoring must capture each type of treated batch discharge at least once per reporting period.

Recommendations

- See Section 2.5 of this report.
- See Section 4.5 of this report.

Appendix 1
Bruce Industries
Schematic of the Wastewater Collection and Treatment



Appendix 2
Sewer Discharge Standards and Limits
Bruce Industries @ IWD-BR1

pollutants of concern (mg/l)	Fed Categorical Standards (d-max)	(mo-avg)	NDEP ⑥ Permit (d-max)	Nat'l ⑥ Prohibtns (instant)	Proposed LocLimits (instant)	Proposed Monitoring Frequency
flow (gpd)	-	-	6500	-	-	continuous
pH (s.u.)	-	-	6.0-9.0	<5.0 su.	5.5-10.0	continuous
EC (µmohs/cm)	-	-	-	-	-	quarterly
explosivity	-	-	-	① ②	-	④
oil&grease - petroleum	-	-	-	-	150	quarterly
sulfides	-	-	-	-	0.1	④
BOD/COD	-	-	-	-	1000	④
total suspended solids	-	-	60	-	1000	④
cadmium	0.11	0.07	0.7	-	③	quarterly
chromium	2.77	1.71	4.0	-	③	monthly
copper	3.38	2.07	2.7	-	③	monthly
iron	-	-	-	-	③	quarterly
lead	0.69	0.43	0.4	-	③	monthly
mercury	-	-	-	-	③	④
molybdenum	-	-	-	-	③	④
nickel	3.98	2.38	2.6	-	③	quarterly
selenium	-	-	-	-	③	④
silver	0.43	0.24	-	-	③	quarterly
zinc	2.61	1.48	2.6	-	③	monthly
total cyanide	0.080	0.043	-	-	③	twice-year
amenable cyanide	0.057	0.021	-	-	③	monthly
total toxic organics	2.13	-	-	-	③	twice-year
temperature (°F)	-	-	-	⑤	③	④

① National-prohibitions - Closed-cup flash point <140°F and pH <5.0 su.
② Narrative prohibition against the introduction of flammable or explosive substances
③ Potential technically-based local limits to be re-adopted to ensure POTW permit compliance.
④ As part of periodic priority pollutant scans in order to identify changes in discharge quality
⑤ National-prohibitions - Not causing >104°F at POTW's wastewater treatment plant
⑥ Prohibitions against interference, pass-through, obstruction, sludge contamination, groundwater contamination, objectionable odors, the release of toxic vapors or fumes, etc.

Proposed Self-Monitoring Frequency red - increase black - no change green - decrease

Appendix 3
Bruce Industries @ IWD-BR1
January 2004 – January 2006

pollutants ① (µg/l)	effluent sampling results			violation rate ② ③			sample count	loading (lbs/yr)
	mean	99th%	max	d-max	mo-avg	inst ④		
aluminum	330.6	750.7	610	-	-	-	10	unk
antimony	<20	<20	<20	-	-	-	2	unk
arsenic	<30	<30	<30	-	-	-	2	unk
barium	30.0	112.4	55	-	-	-	2	unk
beryllium	<1	<1	<1	-	-	-	2	unk
boron	250.0	283.0	260	-	-	-	2	unk
cadmium	0.2	1.2	1.4	0/10	0/9	-	10	unk
chromium	16.5	87.3	110	0/24	0/22	-	24	unk
copper	5.3	7.8	8.4	0/10	0/9	-	10	unk
iron	2950	8416	7500	-	-	-	10	unk
lead	6.0	17.7	16	0/10	0/9	-	10	unk
manganese	12.3	24.5	16	-	-	-	2	unk
mercury	<0.1	<0.1	<0.1	-	-	-	2	unk
molybdenum	<10	<10	<10	-	-	-	2	unk
nickel	<10	<10	<10	0/10	0/9	-	10	unk
silver	<5	<5	<5	0/2	0/2	-	2	unk
zinc	54.0	284.0	260	0/10	0/9	-	10	unk
total cyanide	9.5	24.3	14	0/2	0/2	-	2	unk
total tox organics	59.5	239.1	114	0/2	0/2	-	2	unk
COD (mg/l)	20.8	77.5	66	-	-	-	7	unk
oil&grease (mg/l)	2.3	7.0	6.1	-	-	-	8	unk
TSS (mg/l)	8.6	87.3	29	-	-	-	22	unk
flow (gpd)	2555	2944	2609	-	-	-	7	-
pH (s.u.)	7.8 ⑤	- -	7.4 min 7.9 max	-	-	0/8	8	-

① No sample results for the following pollutants of concern:
sulfides, explosivity, conductivity, temperature, amenable cyanide
② Viol rates cannot be determined with certainty because of dilution from excess untreated rinses
③ Monthly-averages calculated from all samples collected during a calendar month
④ No local limits in effect as of yet
⑤ pH median