UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

Oct 08, 2004

In Reply Refer To: WTR-7

Wayne Mullin, Safety Coordinator
Wrex Products
25 Wrex Court
Chico, California 95928

Dear Mr. Mullin:

Enclosed is the report for EPA's June 10 and 11, 2004, compliance sampling inspection of Wrex Products. We request that you submit a short response to each specific finding in the numbered items 2.0 - 5.0 of this report by November 30, 2004.

This inspection was one of many that we conducted as part of our evaluation of the City's program to control non-domestic discharges into its sewers. EPA will issue an overall report to the City later this month. The main findings regarding Wrex Products are summarized below:

1 The Chico permit has for the most part applied the applicable Federal standards and local limits correctly to Wrex Products, however some baseline information is needed in order to determine the phenol limits for die casting and cadmium limits for finishing.

2 Three unidentified waste streams need to be traced from source to discharge point. The source of selenium in the die casting discharge needs to be identified.

3 Metals removals must increase in both treatment units to achieve consistent compliance with Federal standards. Both fall short in design of the models used to set the standards.

4 Compliance with the Federal toxic organics standards for die casting should be determined by sampling for total toxic organics and not for oil & grease.

We thank you for your cooperation during our inspection. Please send copies of any submittal to the City of Chico as well as to us. If you have any questions, please feel free to contact me at (415) 972-3504 or by e-mail at arthur.greg@epa.gov.

Sincerely yours,

Original signed by:
Greg V. Arthur

Greg V. Arthur, Envr. Engr.
CWA Compliance Office

Enclosure

cc: Ron Manwill, City of Chico

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION 9

CLEAN WATER ACT COMPLIANCE OFFICE

NPDES COMPLIANCE EVALUATION INSPECTION REPORT

Industrial User:	Wrex Products 25 Wrex Court, Chico, California 95928 Aluminum and Zinc Casting (40 CFR 464AD) Metal Finishing (40 CFR 433)
Treatment Works:	Chico Water Pollution Control Plant (NPDES Permit CA0079081)
Dates of Inspection:	June 10 and 11, 2004

Inspection Participants:

US EPA:	Greg V. Arthur, CWA Compliance Office, (415) 972-3504
RWQCB:	No Representative
City of Chico:	Ron Manwill, Industrial Waste Inspector, (530) 895-4967
Wrex Products:	Wayne Mullin, Safety Coordinator, (530) 895-3838 Barry Berryhill, Wastewater Supervisor, (530) 895-3838

Report Prepared By:	Greg V. Arthur, Environmental Engineer September 30, 2004

Section 1

Introduction and Background

1.0 Scope and Purpose

On June 10-11, 2004, EPA conducted a compliance sampling inspection of Wrex Products in Chico. The purpose was to ensure compliance with the Federal regulations covering the discharge of non-domestic wastewaters into the sewers. In particular, it was to ensure:

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

Wrex Products is one of three significant industrial users ("SIUs") and three other industries in Chico service area whose compliance was assessed as part of EPA's 2004 evaluation of the Chico pretreatment program. Chico and Wrex Products received individual reports. The inspection participants are listed on the title page. Arthur conducted the inspection on June 10 and collected samples on June 11.

1.1 Process Description

Wrex Products is a non-ferrous die casting and plastic injection molding facility operating in three buildings in the 200 block of Meyers Street in Chico. Wrex Products also has installed, to soon begin operating, a powder coating line that involves aluminum preparation steps.

- Die Cast Bldg - water-jacket cooled die casting (five die cast machines, dedicated melt pots, hydraulic oil presses, no mold release), water spray cast quenching, cooling tower

- Injection Bldg - plastic injection molding (hydraulic oil presses, spray mold release), tooling (die repair by mechanical abrasion), machining using water-soluble coolant, warehouse, cooling tower

- Finishing Bldg - vibratory deburring, sanding, grinding, trimming, drill press, CNC machining, aluminum preparation (tanks listed below), dry-booth powder coating line

Tank 1 – alkaline soap cleaning	500 gallons
Tank 2 – first-stage static rinse for T1	500 gallons
Tank 3 – hydrofluoric/phosphoric-acid brightening	500 gallons
Tank 4 – first-stage drag-out static rinse for T3	500 gallons
Tank 5 – second-state static rinse for T3	500 gallons
Tank 6 – potassium permanganate conversion coating	500 gallons

Section 1 – Introduction and Background

Wrex Products die casts approximately 40,000 lbs/month, of which 95% is aluminum and 5% is zinc. The rework rate is roughly 15%. Outside suppliers provide the plastic pellets melted for injection molding.

1.2 Waste Streams

Die Cast Cooling - Cooling water circulates through the water-jacketed die cast machines to a cooling tower. Cooling tower blowdown is used to spray quench castings with the over-spray discharged to the Die Cast industrial wastewater treatment unit (IWT), the first of three IWTs in operation on-site. Excess cooling tower blow-down discharges by pipe to the Final IWT, located outside of the Injection Bldg. Diethyldithiocarbamate, sodium hypochlorite, hydroxyethylidene, and diphosphoric acid are the cooling tower additives for biocide protection, descaling, and corrosion inhibition.

Injection Mold Cooling - Cooling water circulates through the injection molding machines to a second cooling tower. Cooling tower blowdown discharges to a sump that pumps into a pipe that lifts over the building to an unknown disposal point. The same additives are used in both cooling towers.

Vibratory Deburring - Deburring generates tailwater overflows from the deburring machines and rinse waters from the hand washing of finished deburred parts. The deburring waste-waters entrain metal flecks, precipitated metal slimes, surface impurities on the parts and an alkaline soap additive containing 2-butoxy ethanol. The deburring wastewaters drain into floor drain troughs leading to the Finishing Bldg IWT.

Oily Waste Streams – The hydraulic oil presses for metals die casting and plastic injection molding generate hydraulic press leakage and oily mop waters, which drain to or are carted over to the Die Cast IWT. Machining coolants spents are hauled off-site for recycling.

Powder Coat Preparation - The imparted contamination from the processing of parts and the progressive drop in solution strength usually results in the generation of spent solutions. Since the preparation line at Wrex Products was not in operation on the date of this inspection, it is not known yet whether the process solutions will be regenerated strictly through additions or if spents will be generated for disposal either through on-site treatment or off-hauling as hazardous. It is also not know whether the three rinse tanks will be operated to overflow to on-site treatment or as static tanks for batch on-site treatment or off-hauling. Wrex Products has determined that the waste streams generated by the potassium permangante conversion coating step will be incompatible with the on-site treatment. Finally, the prohibition against dilution as a substitute for treatment means that the rinses cannot operate continuously irrespective of whether parts are being rinsed.

Section 1 – Introduction and Background

1.3 Wastewater and Waste Handling

Process wastewaters discharge into the sewers through two identified sewer inlets. All wastewaters discharged to the sewers are treated through either the Die Cast and Final IWTs for disposal through compliance sampling point IWD-1 or the Finishing IWT for disposal through compliance sampling point IWD-2. Spent coolants and ITW residuals are all hauled off-site for disposal. See Appendix 1 for a schematic of wastewater handling.

Die Cast and Final IWTs – The wastewaters related to die casting and injection molding are treated through two industrial treatment units operated in series. The first, the Die Cast IWT, located in the Die Cast Bldg, removes oils and settleable solids, and hydroxide precipitated metals. The Die Cast IWT comprises adsorbant belt oil skimming, un-aided oily solids settling in a 600-gallon tank, gravity oil skimming in another 600-gallon tank, plate coalescing of oils, and cartridge filtration of oils, followed by batch metals precipitation, coagulation, and flocculation in a 450-gallon batch reaction tank, and filter press removal of the solids and precipitates. The press filtrate fills a 500-gallon polyethylene tote which is hauled by forklift to the second IWT, known as the Final IWT. Wrex Products indicated that it hauls between one and two 330-gallon totes per week from the Die Cast IWT to the Final IWT. The Final IWT provides hydrogen peroxide reduction of phenols in a 200-gallon tank, preceded and followed by cartridge filters, of the Die Cast IWT totes and the die casting cooling tower blowdown. The Final IWT discharges to the sewers through a sewer inlet located outside of the Injection Bldg. The wastewaters treated in the Die Cast and Final IWTs for discharge to the sewers through compliance sampling point IWD-1 are the following:

- hydraulic press leakage from die casting machines
- spray quench overspray from die casting
- mop waters from die casting and injection molding areas
- excess cooling tower blowdown from water-jacketed cooling of the die casting machines

Finishing IWT – The wastewaters related to vibratory deburring are treated by a third IWT to remove settleable solids, and hydroxide precipitated metals. The Finishing IWT, located in the Finishing Bldg, comprises equalization in an 1,800-gallon tank, followed by metals hydroxide precipitation, coagulation, flocculation, incline plate settling, and sludge thickening in an integrated treatment unit, and a filter press. The wastewaters treated in the Finishing IWT for discharge to the sewers through compliance sampling point IWD-2 are the following:

- deburring tailwater overflows
- final hand rinsing of deburred parts

Off-hauling - Machining coolants spents and the residuals from the oil removal portion of the Die Cast IWT are hauled off-site for recycling at Chico Drain and Oil. Filter press cake from the Die Cast and the Finishing IWTs are hauled off-site as hazardous to AC Industrial.

Section 1 – Introduction and Background

The waste streams hauled for off-site disposal are the following:

- skimmed oil from the absorbant belt skimmer in the Die Cast IWT
- settled solids from the Die Cast IWT tanks
- tramp oil skimmed from the Die Cast IWT tanks and clarifier
- spent filter cartridges from the Die Cast IWT
- filter press cake from the Die Cast IWT
- filter press cake from the Finishing IWT
- spent machining water-soluble coolants
- oily spills

Unknown - The disposal of the following wastewaters has not been determined by Wrex Products or the City nor could it be determined by EPA at the time of this inspection:

- alkaline soap cleaning spents and rinses
- acid etching spents and rinses
- passivation spents
- injection molding cooling tower blowdown

1.4 Build-up of Contamination and Salts

The build-up of contamination and salts in the passivation steps cannot be determined as of yet until operations begin and the procedures for rinsing and disposal are established. Nevertheless, each passivation step must have an outlet for the build-up of salts introduced by make-up water or generated by cross-contamination between steps. This means there will have to be some solution loss from each step either through the off-hauling of spents or the drag-out to rinses that are disposed or there must be some method of removing salts from rinse waters. No distillation unit or reverse osmosis system is in place to remove salts from rinse waters.

1.5 Wastewater Discharge Permitting

Chico issued permit No. 005 to Wrex Products authorizing the discharge of process wastewaters to the sewers through two sewer inlets. The first sample point is the final sump of the Final IWT located just outside of the Injection Bldgs, designated in the permit as Discharge 001, and referred to in this report as IWD-1. The second sample point is the outlet compartment of the inlet/outlet sump for the Finishing IWT located inside the Finishing Bldg, designated in the permit as Discharge 002, and referred to in this report as IWD-2. The permit establishes separate limits and self-monitoring requirements for IWD-1 and IWD-2. The permit also specifies sampling protocols and includes the general provisions of the Chico municipal code (§15.40.020) that apply to all non-domestic discharges to the Chico sewers.

Section 2

Sewer Discharge Standards and Limits

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

2.0 Summary

The Federal standards for aluminum and zinc casting apply to the discharges through IWD-1. No Federal standards apply to the discharges through IWD-2 although the Federal metal finishing standards would apply once passivation starts. The local limits apply to IWD-1 and IWD-2. The Chico permit for the most part correctly applies the Federal standards and local limits. The application of Federal standards, national prohibitions and local limits was determined through visual inspection. See Appendix 2 for the discharge requirements.

Requirements

- To establish the Federal standards at IWD-1 for total phenols, the percentage of waste-water treated in the Die Casting IWT from hydraulic press leakage must be determined.
- To establish the Federal standards at IWD-2 for cadmium, it must be determined if the configuration of the deburring lines has or has not changed since 1983.
- Since the Federally-regulated wastewaters discharge at IWD-1 in batches, the Federal standards are comparable to grab samples when only the treated batches are discharged.

Recommendations

- The discharge point for the blowdown from the injection building cooling tower should be identified and, if it is to the sewers, incorporated into the permit.
- The two unidentified inlet pipes to the clean-out between the belt oil skimmer and the pump feeding the oil removal treatment tanks should be identified.

2.1 Classification by Federal Point Source Category

Wrex Products qualifies as an aluminum and zinc casting operation subject to the Federal standards in 40 CFR 464, Subparts A and D. The Federal pretreatment standards are identical for new sources (“psns”) in 40 CFR 464.16 and 464.46 and existing sources (“pses”) in 40 CFR 464.15 and 464.45. As a result, the same standards apply to the die casting line no matter when Wrex Products began operations. Wrex Products also will

qualify as a metal finisher subject to the Federal standards in 40 CFR 433 upon start-up of its passivation line. The expected discharges from the passivation line will be subject to the Federal standards for new sources ("psns") in 40 CFR 433.17. Either the new source standards or the nearly identical existing source ("pses") standards in 40 CFR 433.16 would apply to the deburring-related wastewaters depending on whether the deburring operations have remained unchanged in configuration since 1983. Prior to start-up of the passivation line, no Federal standards apply to the finishing line.

The Federal aluminum and zinc casting standards and the Federal metal finishing standards are self-implementing which means they apply to regulated waste streams irrespective of whether they are implemented in a local or State permit. The Federal regulations also define domestic sewage, non-contact cooling waters, and other wastewaters not that do not come in contact with the work pieces, to be dilution waters, 40 CFR 403.6(e). See Appendix 2 and Sections 2.3 and 2.4 for the applicable Federal standards. As a result, the wastewater discharges from Wrex Products into the Chico sewers fall into the following classifications:

Type of Non-Domestic Wastewater	Sample Point	Pre-passivate	Post-passivate
• hydraulic press leakage	IWD-1	464AD psns	464AD psns
• casting quench tailwaters	IWD-1	464AD psns	464AD psns
• excess die cast cooling tower blowdown	IWD-1	dilution	dilution
• mop waters	IWD-1	unregulated	unregulated
• deburring tailwaters and hand rinses	IWD-2	unregulated	433 psns/es
• passivation line spents and rinses	IWD-2	n/a	433 psns
• injection cooling tower blowdown	unk	dilution	dilution

2.2 Local Limits and National Prohibitions

Local limits and the national prohibitions are meant to express the limitations on non-domestic discharges necessary to protect the sewers, treatment plants and their receiving waters from adverse impacts. In particular, they prohibit discharges that can cause the pass-through of pollutants into the receiving waters or into reuse, the operational interference of the sewage treatment works, the contamination of the sewage sludge, sewer worker health and safety risks, fire or explosive risks, and corrosive damage to the sewers. The national prohibitions apply nationwide to all non-domestic sewer discharges. The Chico local limits apply to non-domestic discharges in its service area. See Appendix 2 for the applicable local limits and national prohibitions.

2.3 Federal Categorical Pretreatment Standards
Metal Molding and Casting - 40 CFR 464 Subparts A and D

Applicability - The Federal metal molding and casting standards apply to the casting of final or intermediate metal products. The metal molding and casting standards do not apply to the casting of ingots, billets, or other shapes related to metals manufacturing or metals forming

Section 2 – Sewer Discharge Standards and Limits

performed on-site. For example, the casting of recycled scrap into ingots or the casting of billets for on-site extrusion would not be covered by 40 CFR 464. The metal molding and casting standards include separate sets of pretreatment new source standards for aluminum or aluminum alloy casting in Subpart A, copper or copper alloy casting in Subpart B, ferrous casting in Subpart C, and zinc or zinc alloy casting in Subpart D. All of the subparts apply production-based standards for the discharges of certain specifically defined wastewaters to the sewers. The specifically defined Federally regulated wastewaters for Subpart A for aluminum casting and Subpart D for zinc casting follow below:

Subpart A - Aluminum Casting (psns)	Rule Citation
• casting cleaning of casting-related surface impurities	464.16(a)
• contact quench of aluminum castings	464.16(b)
• wastewaters associated with aluminum die casting	464.16(c)
• dust-collection scrubber blowdown	464.16(d)
• grinding scrubber blowdown	464.16(e)
• wastewaters associated with investment casting	464.16(f)
• melting furnace scrubber blowdown	464.16(g)
• mold contact cooling waters	464.16(h)

Subpart D – Zinc Casting (psns)	Rule Citation
• contact quench of zinc castings	464.46(a)
• wastewaters associated with zinc die casting	464.46(b)
• melting furnace scrubber blowdown	464.46(c)
• mold contact cooling waters	464.46(d)

At Wrex Products, the same die casting machines are used for aluminum and zinc. They generate two Federally-regulated wastewaters – casting quench tailwater and hydraulic press leakage associated with die casting. The casting quench also provides inadvertent cooling of the molds and cleaning of surface impurities associated with die casting. The hydraulic press leakage includes washdown from the clean-up of press leakage. As a result, the Federal standards allocate maximum loadings for the discharge from IWD-1 for cast cleaning, casting quench, die casting, and mold cooling in 40 CFR 464.16(a)(b)(c)(h) for aluminum, and casting quench, die casting, and mold cooling in 40 CFR 464.46(a)(b)(d) for zinc.

Production - The maximum allocations are based on the production in pounds of metal poured through die casting. Wrex Products provided current estimates of the pounds of metal poured per month, the percentage of aluminum and zinc, the number of batch waste-water discharges per month, and the rework percentage of remelted metal.

.

P*wrexZn* = (40,000 lbs/mo x 95% Zn) + 15% rework

$$= \frac{43{,}700 \text{ lbs}}{\text{month}} \times \frac{\text{month}}{6.5 \text{ batches}} = 6{,}723 \text{ lbs-Zn/batch}$$

.

P*wrexAl* = (40,000 lbs/mo x 5% Al) + 15% rework = 354 lbs-Al/batch

Section 2 – Sewer Discharge Standards and Limits

Site-Specific Standards - The standards for new sources in 40 CFR 464.16 and 464.46 for the Federally-regulated wastewaters that are discharged from Wrex Products to the sewers follow below. See Appendix 6 for example calculations.

Daily-Maximum Allocations in mg/batch discharge

Citation	Production/batch	Cu	Pb	Zn	TTO	O&G	Phenols
464.16(a)	354 lbs-Al	12	13	18	-	-	-
464.16(b)	354 lbs-Al	2	2	2	5	58	
464.16(c)	354 lbs-Al	1	1	1	5	42	1.2
464.16(h)	354 lbs-Al	48	49	71	150	1867	-
464.46(a)	6,723 lbs-Zn	105	72	104	284	4095	-
464.46(b)	6,723 lbs-Zn	20	14	20	60	791	22.6
464.46(d)	6,723 lbs-Zn	929	639	917	2509	36060	-
Allocations for Wrex @ IWD-1		1117	790	1133	3013	42913	23.8

Daily-Maximum Allocations in mg/batch discharge

Citation	Production/batch	Cu	Pb	Zn	TTO	O&G	Phenols
464.16(a)	354 lbs-Al	7	6	7	-	-	-
464.16(b)	354 lbs-Al	1	1	1	1	20	-
464.16(c)	354 lbs-Al	1	1	1	2	14	0.4
464.16(h)	354 lbs-Al	26	24	27	49	621	-
464.46(a)	6,723 lbs-Zn	57	35	39	93	1363	-
464.46(b)	6,723 lbs-Zn	11	7	8	20	264	7.9
464.46(d)	6,723 lbs-Zn	507	315	348	819	12040	-
Allocations for Wrex @ IWD-1		610	389	431	984	14322	8.3

Both the casting quench tailwaters and the hydraulic press leakage are Federally regulated for copper, lead, zinc, and either total toxic organics or oil & grease as an alternative. Only the hydraulic press leakage is Federally regulated for total phenols.

Basis of the Standards - The Federal metal molding and casting standards were based on a model treatment unit that comprises oil/water separation to control toxic organics, metals hydroxide precipitation, settling, media filtration and wastewater recycling. The recycling rates used in setting the standards were generally >95% and would result in a normalized discharge flow rate at Wrex Products of 22 gallons per 354 lbs-Al cast and 360 gallons per 6,723 lbs-Zn cast, for a benchmark total of 382 gallons per batch. As a result, the recycling rates at Wrex Products are better than the rates used in setting the standards since the actual 330 gallons discharges are less than the benchmark. The model best-available-technology standards were set where casting 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 - The Federal categorical pretreatment standards at IWD-1 do not have to be adjusted to account for dilution wastewaters because the standards are production based and because the excess cooling tower blowdown is estimated to amount to nearly nothing per

batch discharge. However, the Federal standards at IWD-1 have to be adjusted in two and possibly three ways to account for the treatment of the unregulated wastewaters using the combined wastestream formula in 40 CFR 403.6(e). First, because the unregulated mop waters do not qualify as Federally-regulated under 40 CFR 464, the allocations for metals and organics must be proportionally adjusted upward to account for the removal through treatment of metals and organics from the mop waters. EPA estimates that mop waters account for 2-3 gallons per day, which results in approximately 7-10 gallons per batch discharge, and increases the allocations by ~3%. Second, because the mop waters and the casting quench tailwaters are not regulated for phenols, the allocations for phenols must also be proportionally adjusted upward to account for the removals through treatment of phenols from the mop waters and casting quench tailwaters. This means the Federal standards for phenols cannot be established without determining the flow rate of hydraulic press leakage. Finally, the Federal standards at IWD-1 may also have to be adjusted to account for the treatment of any flows from the unidentified pipes to the clean-out after the belt oil skimmer.

See Figure 3 for example calculations. The estimated flow rates for the wastestreams from Wrex Products through IWD-1 follows below.

Type of Non-Domestic Wastewater	Sample Point	Est. Flow Rate
• hydraulic press leakage	IWD-1	unk/batch
• casting quench tailwaters	IWD-1	n/a
• excess die cast cooling tower blowdown	IWD-1	~ 0 gal/batch
• mop waters	IWD-1	~10 gal/batch
• unidentified pipes to clean-out	IWD-1	unk/batch

Compliance Deadline - New source metal molding and casting operations are required to comply with all Federal casting standards upon start-up.

2.4 Federal Categorical Pretreatment Standards
Metal Finishing - 40 CFR 433

Applicability - Under 40 CFR 433.10(a), the metal finishing standards would apply to the process wastewaters from the Finishing Bldg because the powder coat preparation line will involve chemical coating (passivation), and etching (acid brightening). 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 (alkaline soap), machining, tumbling (vibratory deburring), grinding, polishing, and painting (powder coating), associated with metal finishing and specifically listed in 40 CFR 433.10(a). If any of the core operations are performed, the standards apply to discharges from any of the core or associated operations.

Under 40 CFR 433.10(b), the metal finishing standards do not apply to wastewaters regulated under other Federal categorical standard rules. As a result, the metal finishing standards do not apply to the die casting wastewater discharges regulated under the Federal metal molding

Section 2 – Sewer Discharge Standards and Limits

and casting standards in 40 CFR 464. The application of the metal finishing standards also does not depend on whether any of the core operations discharge wastewaters to the sewers, only on whether any of them are performed on-site. As a result, once Wrex Products begins operating the powder coat preparation line, even if there are no wastewater discharges related to passivation or acid brightening, the Federal metal finishing standards would still apply to the wastewater discharges from vibratory deburring, grinding, polishing, machining, powder coat painting, or any of the specifically listed associated operations.

Standards - The standards for new and existing sources in 40 CFR 433.15 and 433.17 for the metal finishing wastewater discharges at Wrex Products to the sewers follow below.

Existing Source ("pses") Standards from 40 CFR 433.15

(in mg/l)	Cd	Cr	Cu	Pb	Ni	Ag	Zn	CN(t)	CN(a)	TTO
Daily-Max	0.69	2.77	3.38	0.69	3.98	0.43	2.61	1.20	0.86	2.13
Month-Avg	0.26	1.71	2.07	0.43	2.38	0.24	1.48	0.65	0.32	-

New Source ("psns") Standards from 40 CFR 433.17

(in mg/l)	Cd	Cr	Cu	Pb	Ni	Ag	Zn	CN(t)	CN(a)	TTO
Daily-Max	0.11	2.77	3.38	0.69	3.98	0.43	2.61	1.20	0.86	2.13
Month-Avg	0.07	1.71	2.07	0.43	2.38	0.24	1.48	0.65	0.32	-

Under 40 CFR 433.12(c), cyanide standards must be adjusted to account for dilution from non-cyanide bearing wastestreams. However, at facilities like Wrex Products without cyanide-bearing wastestreams, the unadjusted cyanide standards apply by default. Amenable cyanide standards do not apply at because Wrex Products does not treat for cyanide.

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 – Most of the Federal metal finishing standards at IWD-2 do not have to be adjusted to account for dilution or multiple Federal categories because all of the wastewaters through this compliance sampling points qualify as Federally-regulated under the metal finishing. However, if the deburring line proves to be an existing source operating unchanged in configuration since 1983, then the existing source ("pses") and new source ("psns") standards for cadmium have to be flow-weighted averaged to apply to IWD-2. The Federal metal finishing standards do not apply to IWD-1 because the wastewaters through this point are unregulated by the metal finishing standards.

Compliance Deadline - New sources are required to comply on the first day of discharge. The powder coating line would qualify as a new source upon start-up. It cannot be determined if deburring also qualifies as a new source without establishing when operations started-up and whether the operations have remained unchanged in configuration since 1983.

Section 2 – Sewer Discharge Standards and Limits

2.5 Point(s) of Compliance

See section 1.5 for the descriptions and locations of IWD-1 and IWD-2. Federal categorical pretreatment standards apply end-of-process-after-treatment to all Federally-regulated flows at IWD-1 and IWD-2. Local limits and national prohibitions apply end-of-pipe to all non-domestic flows from Wrex Products at IWD-1 and IWD-2. At IWD-1, the Federal standards only apply when the Federally-regulated wastewaters discharge in batches, and apply without further adjustment as long as there are no other wastewaters discharged at the same time.

2.6 Compliance Sampling

Federal standards are daily-maximums and are comparable to 24-hour composite samples collected either manually or automatically to be representative of the sampling day's operations. At IWD-1, since the Federally-regulated wastewaters discharge in batches, the Federal standards are comparable to grab samples when only the batches are discharged. Local limits and the national prohibitions are instantaneous-maximums and are comparable to samples of any length including single grab samples.

2.7 Pollutants of Concern

@ IWD-1 - The permit appropriately advances local limits and self-monitoring requirements for arsenic, chromium, copper, lead, molybdenum, nickel, selenium, and zinc, since the wastewater discharges through IWD-1 include these pollutants and Chico is regulated for them by the NPDES permit and the Federal sludge standards. The Chico permit also appropriately advances local limits for pH and oil & grease since the discharges through IWD-1 include alkaline, acidic, and oily wastewaters. There are no other identified pollutants of concern for IWD-1.

@ IWD-2 - The permit appropriately advances local limits and self-monitoring requirements for arsenic, chromium, copper, lead, molybdenum, nickel, selenium, and zinc, since the wastewater discharges through IWD-2 includes these pollutants and Chico is regulated for them by the NPDES permit or the Federal sludge standards. The Chico permit also appropriately advances local limits for pH and oil & grease since the discharges through IWD-2 include alkaline, acidic, and oily wastewaters. There are no other identified pollutants of concern for IWD-2.

Other Pollutants – The permit advances additional local limits for pollutants that are present in the discharge but for which Chico is not regulated by the NPDES permit nor the Federal sludge standards. For IWD-1, these pollutants present are antimony, chloroform, cyanide, and ethyl benzene. For IWD-2, these pollutants present are antimony, benzene, dichloro-methane, and ethyl benzene. The permit also advances additional local limits for additional pollutants that are not present: beryllium, cadmium, carbondisulfide, chloroethane, chloroform, chloromethane, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, dichloromethane, hexachloroethane, mercury, silver, tetrachloroethylene, and toluene.

Section 3

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).

3.0 Summary

One treatment unit falls short in design to the models used in setting the applicable Federal standards while the other is equivalent in design to the models but slightly compromised in efficiency. As a result, there are numerous violations at IWD-1 and a potential to violate at IWD-2. The sample record appears usable to determine compliance. There is no evidence of dilution as a substitute for treatment nor of bypassing treatment. See Appendices 3 and 4 for sampling summaries for IWD-1 and IWD-2 and Appendix 5 for EPA sampling results.

Requirements

- Metals removal rates must be increased in both treatment units in order to achieve consistent compliance with all Federal standards at IWD-1 and IWD-2.

Recommendations

- Compliance with the toxic organics standards at IWD-1 should be determined by sampling for the total toxic organics listed in 40 CFR 464 and not for oil & grease.
- Metals removal in the Die Casting IWT should be improved by (1) operating the batch reaction tank to provide settling, by (2) decanting through media (sand) filtration, (3) by filter pressing only settled sludge, and (4) returning the press filtrate for retreatment.
- The cooling tower blowdown should be routed around the phenol destruction tank for physically separate or time-staggered discharge to IWD-1.
- Metals removal in the Finishing IWT should be improved by returning the press filtrate and sludge decant for retreatment.

Section 3 – Compliance with Federal Standards

3.1 Sampling Records

The 2001-2004 sample record for Wrex Products consists of three representative samples per year from both IWD-1 and IWD-2 for toxic metals, cyanide, volatile organics, semi-volatile organics, and oil & grease. The sample record includes a 2004 EPA sample collected from both IWD-1 and IWD-2 for toxic metals, cyanide, oil & grease, and minerals. The sample record also includes follow-up samples collected after violations for specific pollutants. The sample record did not include any 2004 samples collected by the City of Chico or by Wrex Products because none were available before the end of the EPA evaluation of the city program in July 2004. All samples from both IWD-1 and IWD-2 appear to be usable for determining compliance with the Federal standards as long as the samples from IWD-1 are of only the batch treated wastewaters. See section 2.5, 2.6 and 5.1 regarding the conditional use of sample results for IWD-1.

3.2 Compliance at IWD-1 – Die Casting Operations

Toxic Organics or Oil & Grease – Wrex Products would be expected to consistently comply with the Federal standards for toxic organics at IWD-1 because the oil removal step exceeds in design the models used in setting the Federal standards. Of the Federally-regulated toxic organics listed in 40 CFR 464.16 and 464.46, only chloroform and bis(2-ethylhexyl)phthalate were detected, and together they were found at concentrations well below the standards for total toxic organics. The rule allows compliance with alternate oil & grease limits because the Federally-regulated toxic organics are entrained in oily wastewaters and the model treatment technology for the control of toxic organics is oil/water separation. At Wrex Products, the average and calculated 99th% peak are 80 and 356 mg/l oil & grease, which results in a >60% and ~75% statistical chance of violating the alternate daily-maximum and monthly-average Federal standards. As a result, this means the application of the alternate standards at Wrex Products often results in false indications of violation since the total toxic organics sampling independently confirms compliance. See Appendix 8 for the list of toxic organics.

Toxic Metals – Wrex Products would not be expected to consistently comply with the Federal standards for toxic metals at IWD-1 because the metals removal steps fall short in design to the models used in setting the Federal standards. Wrex Products provides part of the model treatment technology for the control of metals with oil/water separation preceding metals precipitation and wastewater recycling. However, the model treatment also includes settling and media filtration which together can remove the flocculated metal precipitates far more efficiently than can the filter press and paper cartridge filters in use at Wrex Products. The average and calculated 99th% peak are 0.48 and 2.44 mg/l zinc, which results in a >25% and >50% statistical chance of violating the daily-maximum and monthly-average Federal standards. The averages and calculated 99th% peaks for copper and lead are low enough to result in a negligible <1% chance of exceeding Federal standards.

Phenols – It cannot be determined whether Wrex Products would consistently comply with the Federal standards for phenols at IWD-1 because the standards are not known at this time.

Section 3 – Compliance with Federal Standards

The smaller the percentage of the discharge through IWD-1 from hydraulic press leakage, the higher will be the Federal standards for phenols. The average and calculated 99th% peak are 0.10 and 0.34 mg/l phenols which means there is <1% chance of exceeding the Federal standards if the hydraulic press leakage accounts for <6% of the total discharge through IWD-1. Diverting the unregulated cooling tower blowdown around phenol treatment would increase the efficiency of the peroxide destruction step and thus increase the chance of achieving consistent compliance with the Federal phenol standards. See sections 2.0 and 2.3 of this report for a discussion of the phenol standards.

3.3 Compliance at IWD-2 – Metal Finishing Operations

Toxic Metals – With minor changes, Wrex Products would be expected to consistently comply with the Federal standards for toxic metals at IWD-2 once they take effect, because the metals removal steps are equivalent in design to the models used in setting the Federal standards. However, the efficiency of the metals removal steps is slightly compromised by the discharge of the press filtrate and sludge decant to the outlet side of the sump to the sewer. The Federal standards are based on the discharge of clear decant from settling, not on the discharge of the murkier filter press filtrate or sludge holding tank decant. The average and calculated 99th% peak are 0.98 and 3.38 mg/l zinc, which results in a >5% and >25% statistical chance of violating the Federal daily-maximum and monthly-average standards. The averages and calculated 99th% peaks for the other toxic metals are low enough to result in a negligible <1% chance of exceeding Federal standards.

Cyanide and Toxic Organics – The averages and calculated 99th% peaks for cyanide and toxic organics are low enough to result in a negligible <1% chance of exceeding the Federal standards.

3.4 Salts Build-up

It cannot be determined yet whether the passivation line is designed and operated to prevent the build-up of salts. See Section 1.4 of this report.

3.5 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 the model best-available-technology treatment with dilute wastestreams. In particular, this prohibition applies when samples of a diluted waste stream are found to be below the Federal standards and the apparent compliance is used to justify a discharge without treatment. There are two conditions that need to be established in order to make a determination of non-compliance with the prohibition against dilution as a substitute for treatment. First, some or all of the Federally-regulated wastewaters must discharge without undergoing best-available-technology treatment or its equivalent. Second, there must be some form of excess water usage within a Federally-regulated process. Wrex

Section 3 – Compliance with Federal Standards

Products does not meet the first condition at either IWD-1 or IWD-2 because all Federally-regulated discharges are treated.

3.5 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 bypassing of treatment necessary to comply was observed.

Section 4

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).

4.0 Summary

The discharges nearly always comply with the local limits. The rare violations are expected to be corrected through the efforts taken to achieve consistent compliance with the Federal standards. One 2001 sample for IWD-1 had a spike of selenium. See Appendices 3 and 4 for sampling summaries for IWD-1 and IWD-2 and Appendix 5 for EPA sampling results.

Requirements

- The sources of selenium in the discharge through IWD-1 must be identified.

Recommendations

- Non-flammability should be demonstrated at IWD-1 using the closed cup flashpoint test.

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 evaluation did not include an evaluation of whether achievement of the national objectives in 40 CFR 403.2 have been demonstrated by consistent compliance with the sludge and discharge limits at the Chico wastewater treatment plant. That analysis will be available later as part of the EPA evaluation report for Chico expected for release in late October 2004.

Section 4 – Compliance with Local Limits and National Prohibitions

4.2 Local Limits for Oil & Grease, Toxic Metals, and Other Pollutants

Oil and Grease @ IWD-1 – Eighteen of 19 samples (95%) complied with the local limits for oil & grease. It would be expected that the upgrades of the Die Cast IWT to improve metals removal would also marginally improve the removal of both free oils and clay-adsorbed oils.

Toxic Metals @ IWD-1 – Eleven of 12 samples (92%) complied with the local limits for toxic metals. A single sample far exceeded the local limit for selenium but met the limits for the other metals. All other sample results were at or near the detection limit for selenium. It would be expected that the significant upgrades of the Die Cast IWT to improve metals removal in order to comply with the Federal standards would reduce selenium levels. However, the single sample far over the local limit appears to be a spike unrelated to the performance of the treatment unit. As a result, the source of selenium should be identified and controlled.

Toxic Metals @ IWD-2 – Ten of 11 samples (91%) complied with the local limits for toxic metals. One sample exceeded the local limit and Federal standards for zinc, but met the local limits for other metals. The minor upgrades of the Finishing IWT to achieve consistent compliance with Federal standards should also result in consistent compliance with local limits.

Other Pollutants @ IWD-1 – All eight samples (100%) complied with the local limit for total cyanide. All six samples (100%) complied with the local limits for various toxic organics. The only locally-regulated toxic organics detected were carbon disulfide, and chloroform.

Other Pollutants @ IWD-2 – All All ten samples (100%) complied with the local limit for total cyanide. All six samples (100%) complied with the local limits for various toxic organics. The locally-regulated toxic organics detected in at least one sample were benzene, ethylbenzene, chloroform, and dichloromethane. All ten samples (100%) complied with the local limit for oil & grease with an average and calculated peak of 11.7 and 28.4 mg/l.

4.3 Local Limits for Solvents and
The National Prohibition Against Flammability

Flammability is not expected to be a risk because of the lack of organic solvents in the waste streams. However, there are no sampling results for closed cup flashpoint that would demonstrate that the removed oils in the IWD-1 discharge are not flammable.

4.4 Local Limits for pH and
The National Prohibition Against Corrosive Structural Damage

The discharges do not involve the introduction of acids and it is not known if there would be acidic contributions upon start-up of passivation. However, no matter what wastewaters are generated, treatment involves caustic additions. As a result, the discharges could but are not be expected to pose a risk of causing corrosive structure damage to the Chico sewers.

Section 5

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) & 403.12(h).

5.0 Summary

The sample records for both sample points satisfy the Federal minimum requirement for Wrex Products to self-monitor twice per year. The only need beyond the Federal minimum involves either time-sequenced or physically segregated sampling of the treated batches at IWD-1 to determine compliance with Federal standards which means the other wastewaters discharged through IWD-1 must be separately self-monitored. The only parameter of concern not evident in the sample record is pH.

Requirements

- Compliance with the Federal standards at IWD-1 must be determined by sampling only when only the treated batches are discharged to the sewer through the Final IWT.
- Compliance with the local limits at IWD-1 must be determined separately for the discharges of the treated batches and the cooling tower blowdown.

Recommendations

- Wrex Products should submit a toxic organics management plan for the finishing operations discharging through IWD-2 under the requirements of 40 CFR 433.12.
- Each treated batch discharge through IWD-1 should be self-monitored for pH. The treated discharge through IWD-2 should be self-monitored for pH each week.

5.1 Federal Minimum Self-Monitoring Requirements

Qualifying for the minimum frequency requires each sample to be representative of the sampling day and the sample record to be statistically representative over the reporting period, which is every six months for both IWD-1 and IWD-2 as required by the Chico permit to Wrex Products.

Section 5 – Compliance with Federal Monitoring Requirements

The sample record for IWD-1 meets the first qualifier because the wastewaters are batch treated and batch discharged. The sample record for IWD-1 cannot meet the second qualifier since the samples to determine compliance with the Federal standards must be collected only of the treated batches from the totes. This means that the treated batches and the cooling tower blowdown discharged through IWD-1 must be separately sampled. The sample record for IWD-2 meets both qualifiers, as long as the treatment unit return streams are retreated, because there are no significant variabilities in water quality or flow rate into the treatment unit and the influent equalization. As a result, the minimum self-monitoring requirements for the process wastewaters are the following:

- Tote Contents Only @ IWD-1 – Twice per year for the Federally-regulated pollutants (*copper, lead, zinc, total toxic organics*) and for the other locally-regulated pollutants of concern *(arsenic, chromium, molybdenum, nickel, selenium, oil & grease*).

- Cooling Tower Blowdown @ IWD-1 – Twice per year for the locally-regulated pollutants of concern *(arsenic, chromium, copper, lead, molybdenum, nickel, selenium, zinc, oil & grease*).

- Finishing IWT @ IWD-2 – Twice per year for the Federally-regulated pollutants (*cadmium, chromium, copper, lead, nickel, zinc, cyanide, and total toxic organics*) and for the other locally-regulated pollutants of concern *(arsenic, molybdenum, selenium, oil & grease*).

5.2 Self-monitoring for pH

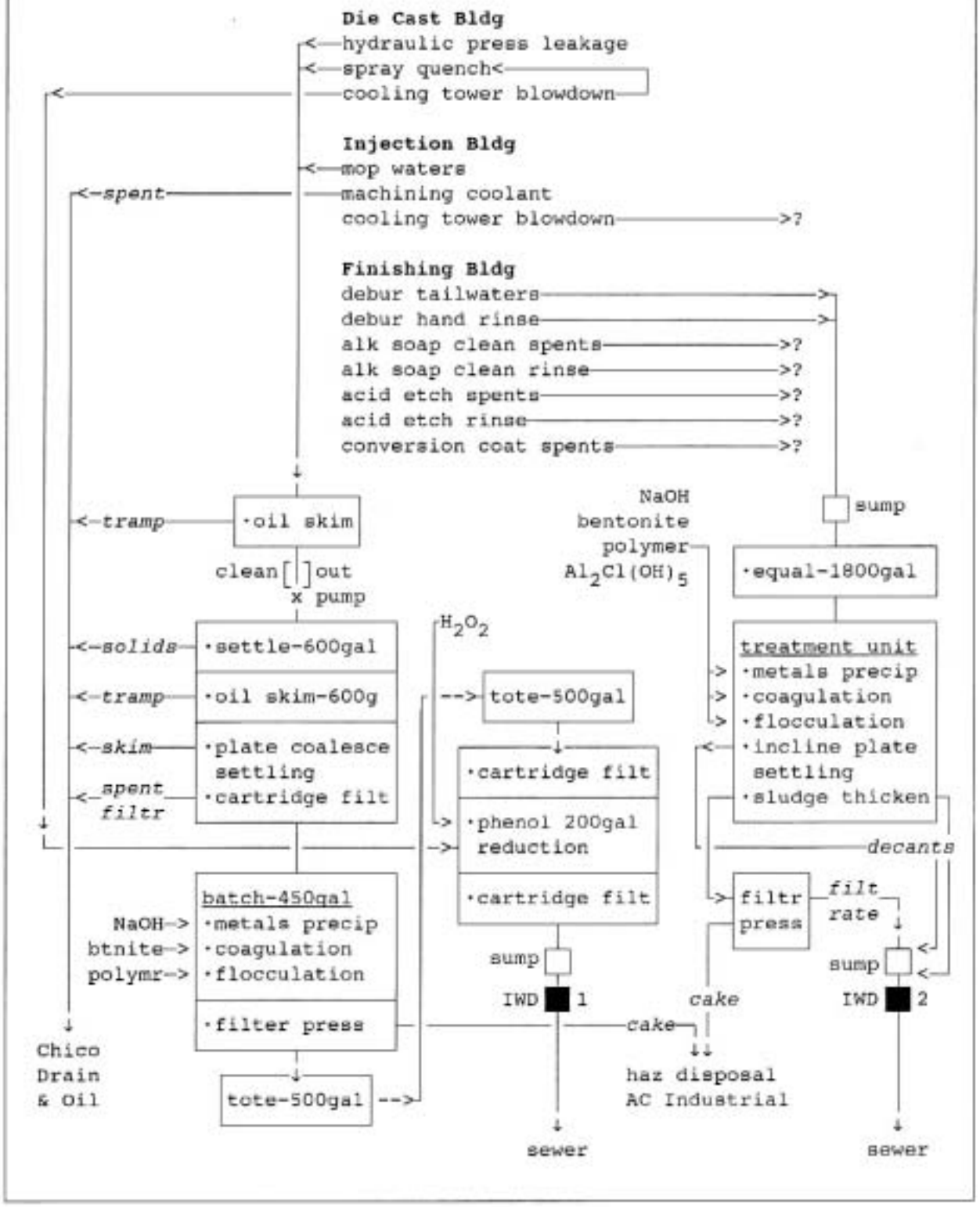
pH is an indicator measure of the risk of corrosional structural damage and chemical reactivity posed by discharges to the sewer as well as of the operational completion of treatment steps. As a result, the measurement of pH can provide an easily obtained positive indication of the continually benign nature of the discharges to the sewers. As a result, the permit should require Wrex Products to measure the pH of (1) each treated batch discharged through IWD-1, (2) the treated discharge through IWD-2 once per week, and (3) the cooling tower blowdown discharged through IWD-1 twice per year.

5.3 Self-Certifications

The Federal standards allow self-certifications twice per year instead of self-monitoring at IWD-2 for total toxic organics with the submittal of a toxic organics management plan under 40 CFR 433.12. The “TOMP” would have to state that there is no opportunity for any of the toxic organics to be discharged because they are not used on-site, or physically separated from the sewer system.

Appendix 1

Wrex Products, Chico, California
Schematic of the Wastewater Collection and Treatment



Appendix 2

Clean Water Act Requirements - Wrex Products, Chico
Die Cast @ IWD-1 and Finishing @ IWD-2

Specific Numeric Limits (mg/l)	Fed Cat Stds @ IWD-1 only d-max	Fed Cat Stds @ IWD-1 only mo-av	Fed Cat Stds @ IWD-2 only d-max	Fed Cat Stds @ IWD-2 only mo-av	Nat'l a/ Prohib inst	Local Limits inst
antimony	-	-	-	-	-	7.043
arsenic	-	-	-	-	-	0.266
cadmium	-	-	0.11	0.07	-	0.17
chromium	-	-	2.77	1.77	-	1.71
copper	0.92	0.50	3.38	2.07	-	2.6
lead	0.65	0.32	0.69	0.43	-	1.55
nickel	-	-	3.98	2.38	-	1.19
selenium	-	-	-	-	-	0.05
silver	-	-	0.43	0.24	-	1.74
zinc	0.94	0.36	2.61	1.48	-	3.03
cyanide-total	-	-	1.20	0.65	-	0.29
oil+grease	35.4 b/	11.8 b/	-	-	-	300.
benzene	-	-	-	-	-	0.13
ethylbenzene	-	-	-	-	-	1.59
phenols-total	c/	c/	-	-	-	-
total toxic organics	2.49 b/	0.81 b/	2.13 d/	-	-	-
pH min (s.u.)	-	-	-	-	5.0	5.0
pH max (s.u.)	-	-	-	-	-	11.5
closed cup flashpoint	≥140°F	-	-	-	-	-
Regulations	40 CFR 464A psns 40 CFR 464D psns		40 CFR 433 psns		Muni Code e/ Chapt 15.40.060	

a/ National prohibitions and Chico local limits also include narrative prohibitions against pass-through, interference, sludge contamination, obstruction, toxic gases/fumes, fire/explosion hazard, or causing heat >104°F at the municipal wastewater treatment plant

b/ Alternate Federal oil & grease standards may replace Federal standards for total toxic organics at IWD-1

c/ Federal phenol standards depend on percent % flow (q) at IWD-1 from hydraulic press leakage

$$\text{Phenol}_{d\text{-max}} = \frac{23.8 \times 100/q}{330 \times 3.785}\ \text{mg/l} \qquad \text{Phenol}_{mo\text{-av}} = \frac{8.3 \times 100/q}{330 \times 3.785}\ \text{mg/l}$$

d/ Federal standards allow self-certification to following an approved toxic organics management plan in lieu of self-monitoring for total toxic organics

e/ Additional Chico local limits for the following pollutants not present in the discharges -- beryllium, carbon disulfide, chloroethane, chloroform, chloromethane, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, dichloromethane, hexachloroethane, mercury, tetrachloroethylene, toluene

Appendix 3

Discharge Quality at IWD-1
Wrex Products, Chico - Die Casting Operations

Pollutants (µg/l)	Jan-2001 to Aug-2004 mean	99%*	max	Fed-Violations-Local d-max	mo-av	inst	sampl count
aluminum			<80.	ns	ns	ns	1
antimony	2.2	11.8	11.	ns	ns	0/10	10
arsenic	7.8	46.8	58.	ns	ns	0/11	11
barium			20.	ns	ns	ns	1
beryllium	0.2	1.7	2.0	ns	ns	0/10	10
cadmium			<1.0	ns	ns	0/1	1
chromium	1.0	5.2	5.9	ns	ns	0/10	10
cobalt			<4.0	ns	ns	ns	1
copper	15.2	48.6	44.	0/10	0/9	0/10	10
cyanide	8.3	14.9	14.	ns	ns	0/8	8
iron			63.	ns	ns	ns	1
lead	1.9	13.4	16.	0/10	0/9	0/10	10
manganese			5.4	ns	ns	ns	1
mercury	<0.03	<0.03	<0.03	ns	ns	0/10	10
molybdenum			9.1	ns	ns	ns	1
nickel	4.1	26.1	31.	ns	ns	0/10	10
phenols	103	342	340	n/a	n/a	ns	19
selenium	35.7	271	340	ns	ns	→1/11	11
silver	0.2	0.8	1.0	ns	ns	0/11	11
TTO (tox organics)	233	1069	940	0/6	0/4	0/6	6
zinc	483	2444	2790	→2/12	→3/10	0/12	12
(mg/l)	mean	99th%	max	d-max	mo-av	inst	count
boron			0.07	ns	ns	ns	1
chloride			19.	ns	ns	ns	1
hardness			150	ns	ns	ns	1
oil & grease	80.2	356	480	→9/19	→11/16	→1/19	19
phosphorus			4.6	ns	ns	ns	1
sodium			27.	ns	ns	ns	1
sulfates			6.1	ns	ns	ns	1
TDS (dsslvd solids)			340	ns	ns	ns	1

ns no standard
n/a not available
* Computed statistics

→ Computed Statistical Probability of Violation

limits	mean	std dev	probability		percent
Fed-O&G (dmax)	μ = 80.2	σ = 119.4	α(35.4)	= 0.6462	65%
Fed-O&G (moav)	μ = 66.4	σ = 79.8	α(11.8)	= 0.7530	75%
Loc-O&G (inst)	μ = 80.2	σ = 119.4	α(300)	= 0.0328	3%
Fed-Zn (dmax)	μ = 483.4	σ = 848.5	α(940)	= 0.2953	30%
Fed-Zn (moav)	μ = 480.7	σ = 868.1	α(360)	= 0.5553	56%
Loc-Se (inst)	μ = 35.7	σ = 101.6	α(50)	= 0.4440	44%

Appendix 4

Discharge Quality at IWD-2
Wrex Products, Chico - Finishing Building

Pollutants (µg/l)	Jan-2001 to Aug-2004 mean	99%*	max	Fed-Violations-Local d-max	mo-av	inst	sampl count
aluminum			14000	ns	ns	ns	1
antimony	2.5	10.9	9.5	ns	ns	0/10	10
arsenic	72.1	434	480	ns	ns	0/11	11
barium			0.7	ns	ns	ns	1
beryllium	<1.0	<1.0	<1.0	ns	ns	0/10	10
cadmium			<1.0	0/10	0/9	0/10	10
chromium	2.8	7.8	5.7	0/10	0/9	0/10	10
cobalt			12.	ns	ns	ns	1
copper	98.4	369	380	0/10	0/9	0/10	10
cyanide	<10.	<10.	9.0	0/10	0/9	0/10	10
iron			73.	ns	ns	ns	1
lead	6.2	20.5	14.	0/10	0/9	0/10	10
manganese			12.	ns	ns	ns	1
mercury	0.11	0.63	0.70	ns	ns	0/10	10
molybdenum			5.6	ns	ns	ns	1
nickel	4.2	15.9	14.	0/10	0/9	0/10	10
selenium	18.8	111	130	ns	ns	0/11	11
silver	<1.0	<1.0	<1.0	0/10	0/9	0/10	10
TTO (tox organics)	271	1274	1144	0/6	0/4	0/6	6
zinc	975	3381	3900	→1/11	→1/10	→1/11	11
(mg/l)	mean	99th%	max	d-max	mo-av	inst	count
boron			0.07	ns	ns	ns	1
chloride			97.	ns	ns	ns	1
hardness			<2.3	ns	ns	ns	1
oil & grease	11.7	28.4	22.0	ns	ns	0/10	10
phosphorus			<0.30	ns	ns	ns	1
sodium			200	ns	ns	ns	1
sulfates			12.	ns	ns	ns	1
TDS (dsslvd solids)			590	ns	ns	ns	1

ns no standard
* Computed statistics

→ Computed Statistical Probability of Violation

limits	mean	std dev	probability	percent
Fed-Zn (dmax)	μ = 974.6	σ = 1041.6	α(2610) = 0.0582	6%
Fed-Zn (moav)	μ = 1034.4	σ = 1063.2	α(1480) = 0.3375	34%
Loc-Zn (inst)	μ = 974.6	σ = 1041.6	α(3030) = 0.0242	2%

Appendix 5

Sampling Results - Wrex Products, Chico
June 11, 2004

Sample Results (mg/l)	Wrex Die Cast @ IWD-1	Wrex Finishing @ IWD-2	Chico WWC Influent @ IWD-CH1	Chico WCP Influent @ IWD-CH1
aluminum	<0.080	14.0	0.810	0.880
antimony	<0.0010	0.0095	<0.0010	<0.0010
arsenic	0.00220	0.00390	0.00068	0.00080
barium	0.0200	0.0007	0.0310	0.0330
beryllium	<0.0005	<0.0005	<0.0005	<0.0005
cadmium	<0.0010	<0.0010	<0.0010	<0.0010
chromium	0.0059	0.0016	0.0021	0.0022
cobalt	<0.004	0.012	<0.002	<0.002
copper	0.0230	0.1400	0.0082	0.0110
iron	0.063	0.073	0.820	0.880
lead	0.0012	0.0140	0.0025	0.0028
manganese	0.0054	0.0120	0.0200	0.0210
mercury	<0.00003	0.00030	0.00026	0.00037
molybdenum	0.0091	0.0056	0.0016	0.0020
nickel	<0.0080	0.0026	0.0031	0.0029
selenium	<0.00100	<0.00100	0.00093	0.00089
silver	<0.0005	<0.0005	0.0008	0.0010
vanadium	0.047	0.033	0.020	0.020
zinc	0.170	0.110	0.086	0.092
cyanide-total	<0.010	<0.010	-	-
hardness	150	<2.3	140	140
boron	0.070	0.072	0.200	0.200
sodium	27.0	200.	82.0	82.0
chloride	19	97	-	-
ammonia as N	-	-	-	-
nitrate as N	-	-	-	-
oil & grease	<5.0	<5.0	-	-
phosphorus-total	4.6	<0.30	-	-
sulfate	6.1	12	-	-
total dissolved solids	340	590	520	490
pH (s.u.)	-	-	-	-
EC (µmohs/cm)	-	-	-	-
closed cup flashpoint (°F)	-	-	-	-
Sample Number	CH001	CH002	CH009	CH011
Date	06/11/04	06/11/04	07/06/04	07/06/04
Type	grab	24-h comp	4-h comp	dupe 009

All samples collected, kept in custody, and delivered to the laboratory by Greg V. Arthur. Samples analyzed by EPA Richmond Lab. Sampling documentation including chain of custody and quality control results are part of the April 2004 pretreatment program evaluation report for Yuba City.

Appendix 6

Wrex Products, Chico, California
Example Calculations of Federal Standards

For Metals and Organics

· Step 1 – Look up standards from 40 CFR 464.16 and 464.46

Daily-Maximum Allocations in lbs-Cu per million lbs cast

464.46a	cast quench	Cu_{46a}	=	0.0344 lbs / million lbs-Zn
464.46b	die casting	Cu_{46b}	=	0.0066 lbs / million lbs-Zn
464.46d	mold cool	Cu_{46d}	=	0.304 lbs / million lbs-Zn
464.16b	cast clean	Cu_{16a}	=	0.0771 lbs / million lbs-Al
464.16b	cast quench	Cu_{16b}	=	0.0093 lbs / million lbs-Al
464.16c	die casting	Cu_{16c}	=	0.0066 lbs / million lbs-Al
464.16h	mold cool	Cu_{16h}	=	0.297 lbs / million lbs-Al

· Step 2 – Convert standards into site-specific allocations based on production rates per batch wastewater discharge

$\dot{P}_{wrexZn}$ = 6723 lbs-Zn/batch

$\dot{P}_{wrexAl}$ = 354 lbs-Al/batch

Daily-Maximum Allocations for Cu in mg/batch

$$\dot{C}u_{wrex46a} = \dot{P}_{wrexZn} \times Cu_{46a}$$

$$= \frac{6723 \text{ lbs-Zn}}{\text{batch}} \times \frac{0.0344 \text{ lbs-Cu}}{10^6 \text{ lbs-Zn}} \times \frac{10^6 \text{ mg}}{2.2 \text{ lbs}}$$

$$= 105.1 \text{ mg-Cu/batch}$$

$\dot{C}u_{wrex46b} = \dot{P}_{wrexZn} \times Cu_{46b} = 20.2$ mg-Cu/batch

$\dot{C}u_{wrex46d} = \dot{P}_{wrexAl} \times Cu_{16d} = 929.0$ mg-Cu/batch

$\dot{C}u_{wrex16a} = \dot{P}_{wrexAl} \times Cu_{16a} = 12.4$ mg-Cu/batch

$\dot{C}u_{wrex16b} = \dot{P}_{wrexAl} \times Cu_{16b} = 1.5$ mg-Cu/batch

$\dot{C}u_{wrex16c} = \dot{P}_{wrexAl} \times Cu_{16c} = 1.1$ mg-Cu/batch

$\dot{C}u_{wrex16h} = \dot{P}_{wrexAl} \times Cu_{16h} = 47.8$ mg-Cu/batch

Appendix 6 - continued

Wrex Products, Chico, California
Example Calculations of Federal Standards

For Metals and Organics (continued)

· Step 3 - Add allocations

Total Daily-Maximum Allocation for Cu in mg/batch

$$\dot{C}uwrex = \dot{C}uwrex46a + \dot{C}uwrex46b + \dot{C}uwrex16d + \dot{C}uwrex16a + \dot{C}uwrex16b + \dot{C}uwrex16c + \dot{C}uwrex16h$$

$$= 105.1 + 20.2 + 929.0 + 12.4 + 1.5 + 1.1 + 47.8$$

$$= 1117 \text{ mg-Cu/batch}$$

· Step 4 - Adjust allocations to account for treatment of the unregulated wastewaters for oils and metals using the combined wastestream formula in 40 CFR 403.6(e)(1)(ii)

Total Daily-Maximum Allocation for Cu in mg/batch

$$Cuwrex = \dot{C}uregulated \times \frac{Qtotal - Qdilution}{Qregulated}$$

$Qtotal$ = 330 gal/batch
$Qdilution$ = $Qblowdown$ = 0 gal/batch
$Qunregulated$ = $Qmopwater$ = 10 gal/batch
$Qregulated$ = $Qtotal - Qdilution - Qunregulated$

$$= 1117 \text{ mg-Cu/batch} \times 1.03125 = 1152 \text{ mg-Cu/batch}$$

· Step 5 - Convert total allocation into concentration

Federal Discharge Limit at IWD-1 for Cu in mg/l

$$Cuwrex = \dot{C}uwrex \;/\; ToteVolume batch$$

$$= \frac{1152 \text{ mg-Cu}}{\text{batch}} \times \frac{\text{batch}}{330 \text{ gals}} \times \frac{\text{gal}}{3.785 \text{ l}}$$

$$= 0.922 \text{ mg/l-Cu}$$

Appendix 6 - continued

Wrex Products, Chico, California
Example Calculations of Federal Standards

For Total Phenols

· Step 4 - Adjust allocations to account for treatment of the unregulated wastestreams for total phenols using the combined wastestream formula in 40 CFR 403.(e)(1)(ii)

$$\dot{P}henol_{wrex} = \dot{P}henol_{diecast} \times \frac{Q_{total} - Q_{dilution}}{Q_{diecast}}$$

$Phenol_{diecast}$ = $Phenol_{wrex46b}$ + $Phenol_{wrex16c}$
$Q_{diecast}$ = gal/batch from press leakage
Q_{total} = 330 gal/batch
$Q_{dilution}$ = 0 gal/batch

$$= \frac{23.8 \text{ mg-phenol}}{\text{batch}} \times \frac{330 \text{ gal} - 0 \text{ gal}}{Q_{diecast}}$$

= 119 mg-phenol/batch @ $Q_{diecast}$ = 20% Q_{total}
= 238 mg-phenol/batch @ $Q_{diecast}$ = 10% Q_{total}
= 476 mg-phenol/batch @ $Q_{diecast}$ = 5% Q_{total}
= 1190 mg-phenol/batch @ $Q_{diecast}$ = 2% Q_{total}
= 2380 mg-phenol/batch @ $Q_{diecast}$ = 1% Q_{total}

· Step 5 - Convert total allocation into concentration

Federal Discharge Limit at IWD-1 for total phenol in mg/l

$$\dot{P}henol_{wrex} = \dot{P}henol_{wrex} / ToteVolume_{batch}$$

$$= \frac{(?) \text{ mg-phenol}}{\text{batch}} \times \frac{\text{batch}}{330 \text{ gals}} \times \frac{\text{gal}}{3.785 \text{ l}}$$

= 0.10 mg/l-phenol @ Qdiecast = 20% Qtotal
= 0.19 mg/l-phenol @ Qdiecast = 10% Qtotal
= 0.38 mg/l-phenol @ Qdiecast = 5% Qtotal
= 0.95 mg/l-phenol @ Qdiecast = 2% Qtotal
= 1.91 mg/l-phenol @ Qdiecast = 1% Qtotal

Appendix 7

Definition of Total Toxic Organics - 40 CFR 464.16(a,b,c,h) and 464.46

Total toxic organics is the summation of all quantifiable values greater than 0.010 mg/l for the following toxic organics:

acenaphthene	phenol	indeno(1,2,3-cd)pyrene
benzene	bis(2-ethylhexyl) phthalate	pyrene
chlorobenzene	butyl benzyl phthalate	tetrachloroethylene
1,1,1-trichloroethane	di-n-butyl phthalate	toluene
2,4,6-trichlorophenol	diethyl phthalate	trichloroethylene
parachlorometa cresol	benzo(a) anthracene 1,2-benzanthracene	endosulfan sulfate
chloroform	benzo(a)pyrene	endrin
2,4-dimethylphenol	benzo(ghi)perlene	endrin aldehyde
2,4-dinitrotoluene	benzo(k)fluoranthene	PCB-1242 a/
1,2-diphenylhydrazine	chrysene	PCB-1254
ethylbenzene	acenaphthylene	PCB-1221
fluoranthene	anthracene	PCB-1232
methylene chloride	fluorene	PCB-1248
isophorone	phenanthrene	PCB-1260
naphthalene		PCB-1016
n-nitrosodimethylamine		

a/ polychlorinated biphenyls

Appendix 8

Definition of Total Toxic Organics - 40 CFR 433.11(3)

Total toxic organics is the summation of all quantifiable values greater than 0.010 mg/l for the following toxic organics:

acenaphthene	4-chlorophenyl phenyl ether	chrysene
acrolein	4-bromophenyl phenyl ether	acenaphthylene
acrylonitrile	bis(2-chloroisopropyl) ether	anthracene
benzene	bis(2-chloroethoxy) methane	1,12-benzoperylene
benzidine	methylene chloride	fluorene
carbon tetrachloride	methyl chloride	phenanthrene
chlorobenzene	methyl bromide	1,2,5,6-dibenzanthracene
1,2,4-trichlorobenzene	bromoform	indeno(1,2,3-cd)pyrene
hexachlorobenzene	dichlorobromomethane	pyrene
1,2-dichloroethane	chlorodibromomethane	tetrachloroethylene
1,1,1-trichloroethane	hexachlorobutadiene	toluene
hexachloroethane	hexachlorocyclopentadiene	trichloroethylene
1,1-dichloroethane	isophorone	vinyl chloride
1,1,2-trichloroethane	naphthalene	aldrin
1,1,2,2-tetrachloroethane	nitrobenzene	dieldrin
chloroethane	2-nitrophenol	chlordane
bis(2-chloroethyl)ether	4-nitrophenol	4,4-DDT
2-chloroethyl vinyl ether	2,4-dinitrophenol	4,4-DDE
2-chloronaphthalene	4,6-dinitro-o-cresol	4,4-DDD
2,4,6-trichlorophenol	n-nitrosodimethylamine	alpha-endosulfan
parachlorometa cresol	n-nitrosodiphenylamine	beta-endosulfan
chloroform	n-nitrosodi-n-propylamine	endosulfan sulfate
2-chlorophenol	pentachlorophenol	endrin
1,2-dichlorobenzene	phenol	endrin aldehyde
1,3-dichlorobenzene	bis(2-ethylhexyl) phthalate	heptachlor
1,4-dichlorobenzene	butyl benzyl phthalate	heptachlor epoxide
3,3-dichlorobenzidine	di-n-butyl phthalate	alpha-BHC a/
1,1-dichloroethylene	di-n-octyl phthalate	beta-BHC
1,2-trans-dichloroethylene	diethyl phthalate	gamma-BHC
2,4-dichlorophenol	dimethyl phthalate	delta-BHC
1,2-dichloropropane	1,2-benzanthracene	PCB-1242 b/
1,3-dichloropropylene	benzo(a)pyrene	PCB-1254
2,4-dimethylphenol	3,4-benzofluoranthene	PCB-1221
2,4-dinitrotoluene	11,12-benzofluoranthene	PCB-1232
2,6-dinitrotoluene		PCB-1248
1,2-diphenylhydrazine		PCB-1260
ethylbenzene		PCB-1016
fluoranthene		Toxaphene
		2,3,7,8-tetrachlorodibenzo-p-dioxin

a/ hexachlorocyclohexane b/ polychlorinated biphenyls