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

February 27, 2010 In Reply Refer To: WTR-7

Carrie Hurlbut, Environmental, Health & Safety Manager
L3 Electro-Optics Systems
1215 South 52nd Street
Tempe, Arizona 85281

**Re: September 24, 2009 Clean Water Act Inspection**

Dear Ms. Hulrbut:

Enclosed is the February 27, 2010 report for our September 24, 2009 inspection of L3 Electro-Optics Systems. Please submit a short response to the findings in Sections 2 through 5, to EPA, Tempe, and ADEQ, by **April 30, 2010**. The main findings are summarized below:

**1** L3 Electro-Optics qualifies as an existing source metal finisher under 40 CFR 433, and not under any subpart of 40 CFR 469 for electrical and electronic components.

**2** On-site treatment for the main discharge to the sewers is equivalent to the models used in setting the Federal standards. Operational controls which improve performance are also employed, most notably the satellite collection systems for hazardous wastes, segregation by strength and treatability, sulfide precipitation, and multi-stage pH adjustment. Chromium, lead, nickel, and cyanide sources need to be identified and assessed for treatment. As a result, sampling has nearly but not quite demonstrated consistent compliance.

**3** The monitoring is representative over the sampling day and the reporting period. Some pollutant could be monitored less frequently because of low levels in the outfalls. The pollutants present at concentrations approaching the Federal standards and local limits do need to be monitored more frequently on multiple consecutive days per quarter (*arsenic, chromium, lead, nickel, zinc, cyanide*).

I appreciate your helpfulness extended to me during this inspection. I remain available to the City of Tempe, 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,

*Original signed by:*

Greg V. Arthur
CWA Compliance Office

Enclosure

cc: Mike Golden, EC Supervisor, City of Tempe
Gregory French, WQ Compliance, ADEQ

**U.S. ENVIRONMENTAL PROTECTION AGENCY**

**REGION 9**

**CLEAN WATER ACT COMPLIANCE OFFICE**

# NPDES COMPLIANCE EVALUATION INSPECTION REPORT

| | |
|---|---|
| Industrial User: | L3 Electro-Optics Systems<br>1215 South 52nd Street, Tempe, Arizona 85281<br>Existing Source Metal Finishing (40 CFR 433) |
| Treatment Works: | City of Phoenix<br>91st Avenue Wastewater Treatment Plant<br>NPDES Permit No. AZ0020524 |
| Pretreatment Program: | City of Tempe |
| Date of Inspection: | September 24, 2009 |

---

Inspection Participants:

| | |
|---|---|
| US EPA: | Greg V. Arthur, Region 9, CWA Compliance Office, (415) 972-3504 |
| Arizona DEQ: | Gregory French, Inspector, WQ Compliance, (602) 771-7667 |
| City of Tempe: | Mike Golden, Environmental Compliance Supervisor, (480) 350-2674<br>Chris Garcia, Environmental Compliance Inspector, (480) 350-2602 |
| L3 Electro-Optics: | Carrie Hurlbut, Envr Health & Safety Manager, (480) 375-3649 |

---

| | |
|---|---|
| Report Prepared By: | Greg V. Arthur, Environmental Engineer<br>February 27, 2010 |

## 1.0 Scope and Purpose

On September 24, 2010, EPA and the City of Tempe conducted a compliance evaluation inspection of L3 Electro-Optics Systems, in Tempe, Arizona. 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 sampling points;
- Consistent compliance with the standards; and
- Fulfillment of Federal self-monitoring requirements.

L3 Electro-Optics is a significant industrial user ("SIU") within sewer service areas administered by the City of Tempe whose compliance was assessed as part of an on-going EPA evaluation of industrial users in EPA Region 9 by sector. The inspection participants are listed on the title page. Arthur conducted the inspection.

***See*** Appendix 1 on page 17 for a schematic of the layout and configuration of wastewater handling. ***Also*** see Appendix 2 on page 18 for a waste and wastewater inventory. Photo documentation of this inspection follows in Section 1.7 on pages 5 and 6.

## 1.1 Process Description

L3 Electro-Optics fabricates image intensifiers for night vision goggles. The production-related operations involve MCP fabrication, photo cathode fabrication, phosphor screen production, vacuum intensifier tube assembly and sealing, and optical components (glass lens) fabrication. Support operations include chem room equipment cleaning and waste accumulation, a machine shop, fume scrubbers, a DI water plant, and cooling towers.

- MCP Fabrication (glass fiber wafer) – glass fiber drawing, air quench, fiber stacking, multi-drawing to shape, fiber bundle oven fusion, parts solvent cleaning, wire sawing into glass fiber wafers, wafer beveling, wafer polishing, wafer funnel acid cleaning (HF), final wafer acid etching (HCl), final cleaning (NaOH), ultrasonic cleaning, drying (isopropyl alcohol), oven hydrogen reduction to remove all moisture, vacuum vapor deposition ($Al_2O_3$, Ni/Cr), and lacquering, along with glassware washing.

- Photo Cathode Fabrication – epitaxial layering and sputtering on GaAs wafers, ultrasonic soap cleaning, epitaxial-layered wafer to face plate bonding, chemical wafer substrate removal (HF, $H_2O_2$, $NH_3$[aq], $H_2SO_4$), edge contacts sputtering (Cr), and finish vapor deposition (Au), along with glassware etching ($H_2SO_4$, $H_2O_2$), and activated carbon arsine fume scrubbing.

- Phosphor Screen Production – vapor degreasing of optics assemblies, soap dishwashing, drying (isopropyl alcohol), sputtering (Cr, Ag/Cr), spin cleaning (toluene, alcohol), lacquering, phosphor application, oven curing, sealing, vacuum deposition (Al), indium ring assembly, final finish plating (Au).

- Vacuum Intensifier Tube Sealing – final etch of vacuum tube (bleach, alcohol rinse, HCl, $H_2SO_4$, $H_2O_2$), epoxy potting, tube sealing, under nitrogen atmosphere.

- Chem Room (cleaning of racks, crucibles, equipment, materials) – acid cleaning (HCl, $HNO_3$), ultrasonic cleaning, solvent cleaning (methyl ethyl ketone), vapor deposition shield etching (ceric ammonium nitrate), aluminum oxide strip (NaOH), acid etch (HF), and acid bright dipping ($HNO_3$, HCl, acetic).

- Optical Components – wire sawing of glass fiber bundles, glycol coolant, beveling, polishing ($ZrO_2$ polishing compound), glass pallet grinding, anode polishing.

- Other Processes – DI water production, activated carbon fume scrubbing, cooling tower, machine shop.

L3 Electro-Optics owns the components fabricated and finished on-site. Operations began in 1976. L3 Electro-Optics discharges non-domestic wastewaters to the Tempe domestic sewers through two sewer connections under Tempe permit 091109-02. Domestic sewage discharges through separate connections downstream of the industrial wastewater connection.

### 1.2 Facility SIC Code

L3 Electro-Optics is assigned the SIC code for electron tubes (SIC 3671).

### 1.3 Facility Wastewater Sources

The image intensifier fabrication lines and supporting operations generate spents, rinses, wash downs, sink wash, drainage, bleeds, and residuals. There are two non-domestic connections to the sewers receiving contributions from separate industrial wastewater treatment plants ("IWTPs"). The 2009 Tempe permit identifies the sewer connections as outfalls 5023.010 on the south side of the facility and 5023.011 on the north.

The operations generate (1) fluoride-bearing acidic spents, rinses, and sink wash, (2) acidic and alkaline spent etchants and cleaners, rinses, and sink wash, (3) sawing, grinding, and polishing slurry waters, (4) solvent-based spent cleaners, and sink wash, (5) fume scrubber blowdown, (6) cooling tower bleeds, (7) DI reject, (8) mop waters, and (9) residuals. The wastewaters generated on-site and found during this inspection are listed in Appendix 2 on page 18 of this report.

### 1.4 Facility Process Wastewater Handling

Discharge – Most process wastewaters from L3 Electro-Optics are treated through the North IWTP for discharge to one of two sewer connections into the Tempe domestic sewers. A smaller portion of the process wastewaters are treated through the South IWTP for discharge to the second sewer connection. Certain specified wastewaters are collected for off-site

disposal. A final Parshall flume in the north-side sample vault is identified in the Tempe permit as the first compliance sample point, designated in this report, after the permit outfall number as IWD-5023.011. A final Parshall flume in the south-side sample vault is identified in the permit as the second compliance sample point, designated in this report, after the permit outfall number as IWD-5023.010. The permit limits the peak discharge to the sewers through the North IWTP to 190,700 gpd. Effluent metering averaged 30,000 gpd since 2007. ***See*** Photos #1 and #2 in Section 1.7 on page 5.

Composition - The process-related wastewaters listed in section 1.3 above would be expected to contain arsenic, chromium, lead, nickel, fluoride, acidity, solvents, surfactants, polishing compounds, and the trace minerals entrained in the water supply.

Delivery – Most of the wastewaters, sink wash, rinses, spent reagents, bleeds, blowdowns, wash downs, and drainage, are hard-plumbed to the North IWTP, the South IWTP, or the HF-acid collection holding tanks. Some selected spent solutions are collected into barrels and carboys at satellite waste collection stations located in clearly demarcated and labeled areas throughout the facility. The L3 Electro-Optics environmental staff services the satellite waste collection stations. One floor drain in the photo cathode shop, identified as used for janitorial mop waters, was identified during this inspection to drain to an undetermined connection to the sewer. ***See*** Photos #3 and #4 in Section 1.7 of this report on page 5.

Treatment – The North IWTP provides sulfide metals precipitation and flocculant-aided clarification for the wastewaters from the optical components shop and the photo cathode glassware cleaning stations. The North IWTP also provides 3-stage pH adjustment for all of the discharged wastewaters except cooling tower bleeds and fume scrubber blowdown, the former of which bypasses the North IWTP for discharge through the compliance sample point, IWD-5023.011, to the north outfall. The South IWTP provides single-stage pH adjustment for the fume scrubber blowdowns. The slurry-bearing wastewaters from the optical components shop are pretreated to remove solids through centrifuging followed by two decant holding tanks, prior to further treatment through the North IWTP. Fluoride-bearing acidic wastewaters are delivered to two HF-acid holding tanks for off-site disposal as hazardous. The other collected wastewaters are off-hauled as hazardous.

***See*** Appendix 1 on page 17 of this report for the configuration and lay-out of the wastewater handling on-site. ***Also see*** Sections 3.2 and 3.3 of this report on pages 11 and 12, and Photos #5 to #9 in Section 1.7 of this report on page 6.

## 1.5 Sampling Record

L3 Electro-Optics self-monitors continually for pH and discharge flow rate as required by the City of Tempe permit. Tempe collects its own samples quarterly for arsenic, cadmium, copper, lead, mercury, selenium, silver, zinc, benzene, chloroform, total cyanide, and total toxic organics. Tempe used to collect samples for beryllium, boron, chromium, manganese, molybdenum, and nickel.

## 1.6 POTW Legal Authorities

The City of Tempe has enacted an ordinance to implement a pretreatment program within the city limits, with the service area sewered either to Tempe's Kyrene Water Reclamation Plant, or to Phoenix's 91st Avenue Wastewater Treatment Plant. Under this authority, in Chapter 27 of the Tempe City Code, the City of Tempe issued permit No.091109-02 authorizing discharge of non-domestic wastewater from L3 Electro-Optics to the sewers. L3 Electro-Optics discharges into the city domestic sewers leading to the 91st Avenue Wastewater Treatment Plant and does not contribute to the Kyrene Water Reclamation Plant.

## 1.7 Photo Documentation

Nine of the 11 photographs taken during this inspection are depicted below and saved as *L3eos-01.jpg through -11.jpg.*


*Photo #1: North IWTP Discharge – IWD-5023.011*
*Taken By: Greg V. Arthur*
*Date: 09/24/09*


*Photo #2: South IWTP Discharge – IWD-5023.010*
*Taken By: Greg V. Arthur*
*Date: 09/24/09*

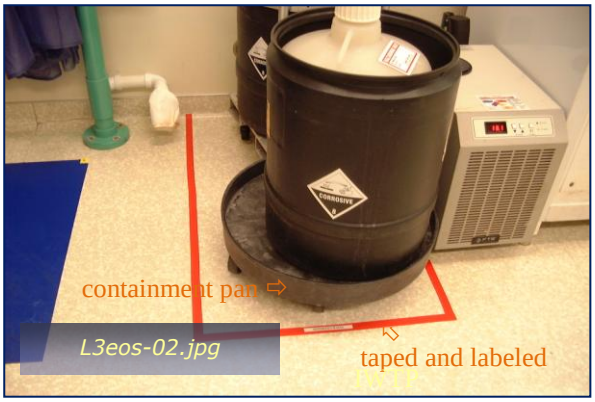



*Photo #3: Satellite Collection Station for HF*
*Taken By: Greg V. Arthur*
*Date: 09/24/09*


*Photo #4: Floor Drain in Photo Cathode Fab Shop*
*Taken By: Greg V. Arthur*
*Date: 09/24/09*

Additional photographs taken during this inspection are depicted below.

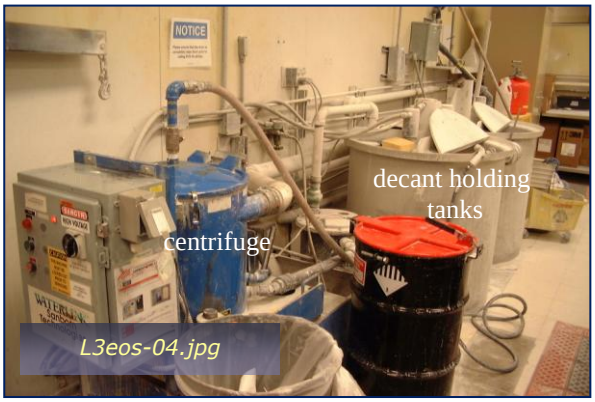



*Photo #5: Solids Removal of OCS Slurry Waters*
*Taken By: Greg V. Arthur*
*Date: 09/24/09*

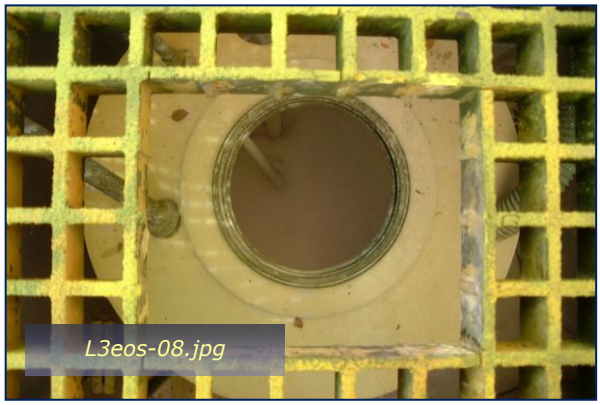



*Photo #6: North IWTP 1000 gal Influent Surge*
*Taken By: Greg V. Arthur*
*Date: 09/24/09*


*Photo #7: North IWTP Metals Precipitation/Settling*
*Taken By: Greg V. Arthur*
*Date: 09/24/09*


*Photo #8: South IWTP pH Adjustment Tank*
*Taken By: Greg V. Arthur*
*Date: 09/24/09*


*Photo #9: HF-Acid Collection Tanks*
*Taken By: Greg V. Arthur*
*Date: 09/24/09*

## 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***

L3 Electro-Optics qualifies for regulation under 40 CFR 433 for existing source metal finishing. L3 Electro-Optics does not qualify under 40 CFR 469 for semiconductors, electronic crystals, cathode ray tubes, or luminescent materials. The Tempe permit applied the local limits and the Federal standards for semiconductors and electronic crystals, and thus does not accurately state the discharge requirements for L3 Electro-Optics. The application of Federal categorical standards, national prohibitions, and local limits was determined through visual inspection. ***See*** Appendix 3 on page 19 of this report for the permit limits.

***Requirements***

- Federal standards for metal finishing must be applied to the discharges as adjusted for dilution using the combined wastestream formula.
- The Federal cyanide standards must be applied to just the cyanide-bearing wastewaters or adjusted at a combined point to account for dilution from non-cyanide bearing flows.

***Recommendations***

- L3 Electro-Optics should determine the percentage of the discharges for both sample points that are (1) regulated under 40 CFR 433, (2) cyanide-bearing, and (3) unregulated as dilution waters.
- The floor drain in the photo cathode shop should be labeled and its connection with on-site treatment should be verified.
- L3 Electro-Optics should determine whether a toxic organics management plan could be approved by the City of Tempe for either the north or south outfalls or for both.

## 2.1 Classification by Federal Point Source Category

Categorical Standards - L3 Electro-Optics qualifies under 40 CFR 433 for metal finishing. Support documents identify image intensifiers as transmitting vacuum tubes regulated under metal finishing. ***See*** *Development Document for Effluent Limitations Guidelines for the Electrical and Electronic Components, Phase II, December 1983;* www.epa.gov/nscep/.

Specifically, L3 Electro-Optics does not qualify under 40 CFR 469 Subpart A for semiconductors because the image intensifier tubes as well as their individual components, are not solid-state devices. L3 Electro-Optics does not qualify under 40 CFR 469 Subpart B for

electronic crystals because the operations involve the use but not the manufacturing of gallium arsenide electronic crystals. L3 Electro-Optics does not qualify under 40 CFR 469 Subpart C for cathode ray tubes because image intensifier tubes are identified as a form of transmitting vacuum tubes, specifically exempted under 40 CFR 469.31(a) from the rule. L3 Electro-Optics also does not qualify under 40 CFR 469 Subpart D for luminescent materials because it applies the luminescent phosphor salts to the screens but does not manufacture the luminescent materials themselves.

The Tempe permit applied the standards for both semiconductor wafer fabrication in 40 CFR 469 Subpart A and electronic crystals in 40 CFR 469 Subpart B. The permit did not apply the existing source standards for metal finishing in 40 CFR 433. Federal standards are self-implementing which means they apply to regulated wastestreams whether or not they are implemented in a local permit. The Federal rules in 40 CFR 403.6 define domestic sewage and non-contact waters as dilution waters.

New or Existing Sources – In 40 CFR 403.3(k), a metal finishing process constructed after August 31, 1982 is a new source (1) if it entirely replaces a process which caused a discharge from an existing source or (2) if it is substantially independent of the existing sources on-site. The preamble to the 1988 Federal rule states that new source standards apply when "an existing source undertakes major construction that legitimately provides it with the opportunity to install the best and most efficient production process and wastewater treatment technologies" (*Fed Register, Vol.53, No.200, October 17, 1988, p.40601*). So after the 1982 deadline, the new source standards apply to new installations of metal finishing lines, rebuilt or moved lines, lines temporarily removed to install secondary containment, or existing lines converted to do new operations. New source standards generally do not apply to the piecemeal replacement of tanks in otherwise intact lines.

L3 Electro-Optics staff indicated that the facility has operated in its current configuration manufacturing the same electronic components since 1976, although the product design has changed. As a result, L3 Electro-Optics would qualify as an existing source.

## 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 Tempe local limits apply to non-domestic discharges in the service areas of the City treatment plants. Tempe adopted the local limits developed and implemented by the City of Phoenix.

## 2.3 Federal Categorical Pretreatment Standards
## Existing Source Metal Finishing - 40 CFR 433.15

| 40 CFR 433.15 | Cd | Cr | Cu | Pb | Ni | Ag | Zn | CNt | CNa | TTO |
|---|---|---|---|---|---|---|---|---|---|---|
| daily-maximum (mg/l) | 0.69 | 2.77 | 3.38 | 0.69 | 3.98 | 0.43 | 2.61 | 1.20 | 0.86 | 2.13 |
| month-average (mg/l) | 0.26 | 1.71 | 2.07 | 0.43 | 2.38 | 0.24 | 1.48 | 0.65 | 0.32 | - |

Applicability – The metal finishing standards apply to the process wastewaters at L3 Electro-Optics because the operations involve electroplating, chemical coating, and etching. Under 40 CFR 433.10(a), 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, sputtering, machining, polishing, and vapor plating, vacuum metalizing, and solvent degreasing, associated with metal finishing and specifically listed in 40 CFR 433.10(a). If any of the core operations are performed, the metal finishing standards apply to discharges (including fume scrubber blowdown) from any of the core or associated operations. At L3 Electro-Optics, the metal finishing standards apply to all process wastewater discharges to the sewer, through both IWD-5023-010 and IWD-5023-011.

Basis of the Standards – The existing source metal finishing standards were based on a model pretreatment unit that comprises metals precipitation, settling, sludge removal, source control of toxic organics, 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).

Compliance Deadline – Existing sources were required to comply by February 15, 1986.

## 2.4 Combined Federal Standards and Adjustments

The Federal categorical pretreatment standards must be adjusted to account for dilution, if it exists, and for multiple Federal categories, if more than one applies. ***See*** Appendix 3 on page 19 of this report for the permit limits.

Multiple Categories – Not applicable.

Dilution – Under 40 CFR 403.6(d,e), Federal categorical pretreatment standards must be adjusted using the combined wastestream formula to account for any dilution from non-contact cooling waters, boiler blowdown, water preconditioning, and domestic sewage. Both non-contact cooling water bleeds and deionized water reject, which are listed as dilution waters in 40 CFR 403.6(e), were identified during this inspection as discharging through the north outfall, IWD-5023-011. However, their proportions of the total are unknown.

Cyanide Standards – Under 40 CFR 433.12(c), the Federal cyanide standards apply only to cyanide-bearing flows, with the cyanide standards adjusted for dilution from any non-cyanide bearing wastewaters. Existing sources standards for total cyanide apply by default without

adjustment to the discharges at both IWD-5023-011 and IWD-5023-010 because there are no identified cyanide-bearing sources. However, cyanide was detected at both sampling points.

Toxic Organics Standards – The Federal standards in 40 CFR 433.12(a,b) allow facilities with an approved toxic organics management plan to certify instead of sample for toxic organics. The City of Tempe does not require L3 Electro-Optics to conduct self-monitoring for toxic organics but rather conducts all of the monitoring itself, twice per year at both IWD-5023.010 and IWD-5023.011. With an approved toxics organics management plan, L3 Electro-Optics could certify the non-existence or the physical barrier to discharge over a full or partial list of toxic organics pollutants, and thus shorten or eliminate the list of pollutants to be sampled by Tempe in lieu of self-monitoring.

## 2.6 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 Tempe permit establishes the prohibition against the dilution as a substitute for treatment (Part 5§A-8), and against bypassing treatment necessary to comply (Part 5§B-3).

## 2.7 Compliance Sampling and Point(s) of Compliance

The permit designates two Parshall flumes inside to separate sampling vaults as the locations of the compliance sampling points following industrial wastewater treatment (designated in this report as IWD-5023.010 and IWD-5023-011).

Federal Standards - Federal categorical pretreatment standards apply end-of-process-after-treatment to all Federally-regulated discharges to the sewers. Together both compliance sample points for discharge to the sewers, IWD-5023.010 and IWD-5023.011, are suitable end-of-process-after-treatment sample point representative of the day-to-day discharge of Federally-regulated wastewaters from L3 Electro-Optics. These compliance sample points are also suitable end-of-process-after-treatment sample point representative of the day-to-day discharge of cyanide-bearing wastewaters from as long as there are no cyanide-bearing flows discharging to the sewers.

Local Limits - Local limits and the national prohibitions apply end-of-pipe to non-domestic flows. The sample points IWD-5023.010 and IWD-5023.011 are suitable end-of-pipe sample point representative of the day-to-day non-domestic wastewater discharges from L3 Electro-Optics.

Sampling Protocols – The national prohibitions are instantaneous-maximums comparable to samples of any length. Federal categorical pretreatment standards are daily-maximums comparable to 24-hour composites. The 24-hour composites can be replaced with single grabs or manually-composited grabs representative of the sampling day's discharge. ***See*** Section 5.0 on page 16 and Appendix 3 on page 19.

## 3.0 Compliance with Federal Categorical 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).*

L3 Electro-Optics employs wastewater treatment equivalent to the models used in originally setting the Federal standards for wastewater discharges to the sewers requiring treatment for metals. Good built-in controls and operational procedures also further improve reliability and performance, most notably the satellite collection systems for hazardous wastes, segregation by wastestream strength and treatability, metals sulfide precipitation, and multi-stage pH adjustment. As a result, L3 Electro-Optics for the most part complies with the Federal standards at both the north and south outfalls. Consistent compliance will require targeted identification of sources and treatment improvements for chromium and nickel. ***See*** Section 2.0 on page 7 of this report. ***Also*** see Appendix 4 on pages 20 and 21 of this report for a summary of the compliance sampling.

***Requirements***

- None.

***Recommendations***

- Chromium, nickel, and cyanide sources into the wastestreams discharged through both outfalls should be identified and assessed for treatment.

## 3.1 Sampling Results

The three-year sample record consists of continuous self-monitoring for pH and discharge flow rate, and quarterly multi-day sampling collected by Tempe. All samples collected of the north and south outfall discharges through IWD-5023.011 and IWD-5023.010 were 24-hour composites. The samples for cyanide and total toxic organics were grab samples.

## 3.2 Best-Available-Technology Treatment North Outfall (IWD-5023.011)

An average of 30,000 gpd of process-related wastewaters discharges from the North Industrial wastewater treatment plant through the north outfall sewer connection. The North IWTP provides best-available-technology (“BAT”) model treatment. As a result, the sampling

results for IWD-5023.011, for the most part, consistently comply with Federal standards, with average and calculated 99th% peak concentrations of 0.002 and 0.009 mg/l cadmium, 0.337 and 2.191 mg/l chromium, 0.010 and 0.015 mg/l copper, 0.214 and 0.435 mg/l lead, 0.455 and 2.093 mg/l nickel, 0.009 and 0.032 mg/l silver, 0.045 and 0.153 mg/l zinc, 0.003 and 0.023 mg/l total cyanide, and 0.021 and 0.056 mg/l total toxic organics. The only violations of the Federal standards were the result of a single composite sample, which if counted by calendar month by the start of sampling would violate the Federal monthly-average standards for chromium and nickel as the lone sample in July 2007. This sample would not have resulted in violations of the monthly-average standards if counted by calendar month by the end of sampling since there are other sample results for August 2007.

These sampling results indicate that the statistical probabilities of violating any of the Federal standards are essentially 0% for any sampling day or any monthly-average for the north outfall discharge through IWD-5023.011. Not only is the treatment in-place equivalent in design to the model treatment but there are operational controls which would be expected to significantly further improve performance. A few minor deficiencies in the design and operation were observed during this inspection. The improvements (+) and deficiencies (-) are listed below.

+ Dual-stage treatment capacity with relatively pH-insensitive sulfide metals precipitation.
+ Segregated handling of polishing wastewaters through slurry removal pretreatment.
+ Satellite collection of high-strength and incompatible wastewaters for off-site handling.
+ Segregated collection of hydrofluoric acid-bearing wastewaters.
+ Multiple equalization tanks.
+ Labeling of lines and identification of sources.
+ Reaction end-point metering for pH.
- Reaction end-points metering is not telemetered to alarms or remote alerts.
- Treatment not operated to specifically handle chromium- and nickel-bearing wastewaters.

### 3.3 Best-Available-Technology Treatment Sout Outfall (IWD-5023.010)

An average of 20,000 gpd of fume scrubber blowdown discharges from the South industrial wastewater treatment plant through the south outfall sewer connection. The South IWTP does not provide best-available-technology (“BAT”) model treatment because fume scrubber blowdown would be expected to entrain minimal levels of metals and cyanides. As a result, the sample results for IWD-5023.010 consistently comply with Federal standards, with average and calculated 99th% peak concentrations of 0.002 and 0.011 mg/l cadmium, 0.021 and 0.144 mg/l chromium, 0.015 and 0.065 mg/l copper, 0.076 and 0.385 mg/l lead, 0.061 and 0.230 mg/l nickel, 0.003 and 0.018 mg/l silver, 0.072 and 0.388 mg/l zinc, 0.005 and 0.031 mg/l total cyanide, and 0.003 and 0.012 mg/l total toxic organics. A single sample approached the Federal daily-maximum lead standard. All other sampling results were far below the Federal daily-maximum and monthly-average standards.

These sampling results indicate that the statistical probabilities of violating any of the Federal standards are essentially 0% for any sampling day or any monthly-average for the south outfall discharge through IWD-5023.010.

### 3.4 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. In particular, this prohibition 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.

There is no certain evidence of “dilution as a substitute for treatment” since L3 Electro-Optics does not meet both conditions of non-compliance with certainty. However, it is a possibility. The first condition is met with certainty since not all Federally-regulated waters discharge through BAT model treatment. The second condition would also be met if the wastewaters that bypass metals precipitation treatment are generated by sources that overflow irrespective of whether there is processing. These bypassing wastewaters, if they are not operated as either on-demand or static, would dilute the discharge to the sewers with excess untreated water at the compliance sample point IWD-5023.011. Therefore it is possible that there is “dilution as a substitute for treatment” from the wastewaters bypassing metals precipitation.

The dilution from DI reject and cooling tower bleeds in the north outfall discharge must be accounted for through the use of the combined wastestream formula to proportionally adjust downward the Federal standards applied to IWD-5023.011. ***See*** Section 2.0 on page 7 and 2.4 on page 9 of this report.

### 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.

There were no observed methods of bypassing at L3 Electro-Optics because the delivery of all waste streams requiring treatment were observed to lead through the appropriate treatment for discharge through the permitted sample point.

## 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).*

The sample record indicates that L3 Electro-Optics consistently complies with its local limits for cyanide, organics, pH, and for all metals except lead. ***See*** Appendix 4 on pages 20 and 21 of this report. ***Also*** see Sections 3.0 and 5.0 on pages 11 and 16 of this report.

***Requirements***

- None.

***Recommendations***

- Lead sources into the wastestreams discharged through both outfalls should be identified and assessed for treatment.

## 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 Phoenix 91st Avenue and 23rd Avenue wastewater treatment plants through consistent compliance with their sludge and discharge limits.

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

<u>High-Strength Organics</u> - 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 the organics strength significantly less than domestic sewage.

<u>Metals and Cyanide</u> – For both discharges, IWD-5023.011 and IWD-5023.010, there were single violations for the local limit for lead, and no violations of the local limits for arsenic,

cadmium, copper, mercury, selenium, silver, zinc, and cyanide. There is no evidence that these discharges resulted in the operational interference of the Tempe and Phoenix collection systems and the Phoenix wastewater treatment plants.

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

Metals and Cyanide – For both discharges, IWD-5023.011 and IWD-5023.010, there were single violations of the local limit for lead, and no violations of the local limits for arsenic, cadmium, copper, lead, mercury, selenium, silver, zinc, and cyanide. There is no evidence that these discharges resulted in a pass-through of pollutants from the Phoenix wastewater treatment plants to the receiving waters.

Toxic Organics – For both discharges, IWD-5023.011 and IWD-5023.010, there were no violations of the local limits for benzene, chloroform, pesticides, and PCBs.

Oil and Grease – There are no local limits for oil and grease.

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

Corrosion - Sewer collection system interferences related to the formation of hydrogen sulfide and the resulting acidic disintegration of the sewers are possible but not expected. The wastewaters discharged to the sewers are not high-strength in biodegradable organics. The wastewaters are also not expected to entrain significant levels of dissolved sulfides. Both discharges through IWD-5023.011 and IWD-5023.010 are composed of pH controlled treated wastewaters from well designed industrial wastewater treatment units. L3 Electro-Optics also self-monitors continuously for pH as required by the Tempe permit.

Flammability - Flammability would not be expected because sampling shows that the discharges to the sewer entrain negligible amounts of volatile organics.

## 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).*

Permit Requirements – L3 Electro-Optics has successfully fulfilled the self-monitoring requirements set forth in the Tempe permit. These self-monitoring requirement are limited to continuous pH and discharge flow rate metering. The City of Tempe collects all other samples to determine compliance with the Federal standards and local limits, and does so on consecutive multiple days per quarter. Over the a recent two year period, the sample records for the north and south outfalls, IWD-5023.011 and IWD-5023.010, show that the City of Tempe (1) collected all samples from the designated compliance sampling points, (2) correctly obtained 24-hour composites for metals and grabs for the other pollutants, and (3) followed appropriate chain-of-custody procedures.

Representativeness – The sample records for IWD-5023.011 and IWD-5023.010 appear to be representative of the discharges to the sewers over the sampling day and the six-month reporting period. Some pollutants present at concentrations well below the Federal standards and local limits can be monitored less frequently even down to the Federal minimum level (*cadmium, copper, mercury, molybdenum, selenium, silver, toxic organics*). However, those pollutants found present in any sample at concentrations approaching the Federal standards or local limits should be monitored at the more frequent rate of multiple consecutive days per quarter (*arsenic, chromium, nickel, lead, cyanide, zinc*). Cyanide is included for frequent monitoring because there were samples above the detection limits from as of yet unidentified sources. ***See*** Section 2.4 on page 9 for a discussion of the cyanide standards.

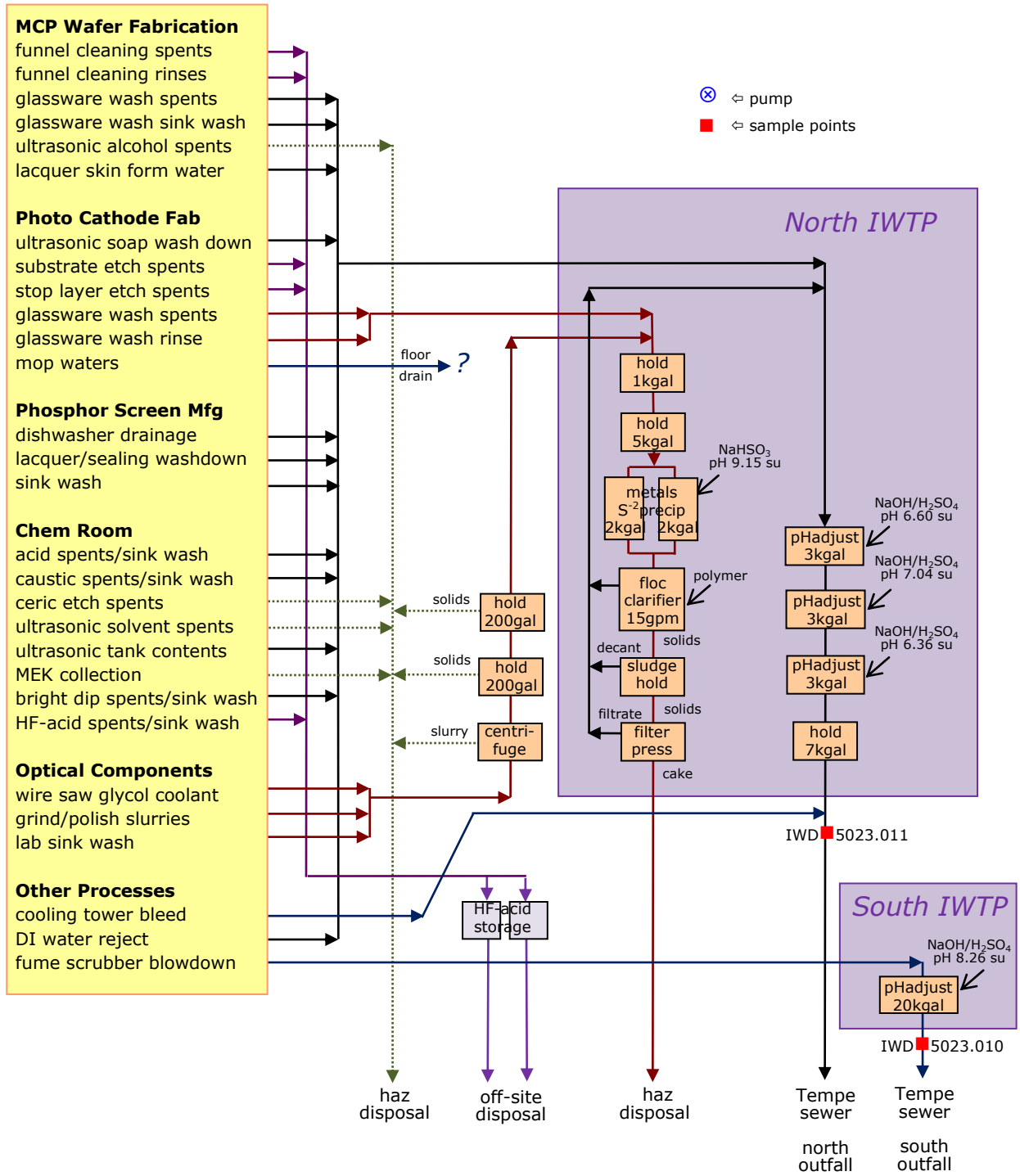
***Requirements***

- ***See*** Appendix 3 on page 19 of this report for the self-monitoring and city monitoring requirements for that would be considered to be representative of the discharges.

***Recommendations***

- Self-certification statements should include copies of the hazardous waste manifests documenting the off-hauling of spents, and residuals.

**Appendix 1**
L3 Electro-Optics - Configuration and Layout



**Appendix 2**
L3 Electro-Optics – Wastewater Generation and Delivery

| Delivery of Generated Wastewater | | FedCat |
|---|---|---|
| MCP (Glass Fiber) Wafer Fabrication | | |
| HF | Funnel Cleaning spent HF-acids | 433 |
| HF | Funnel Cleaning cascade rinses | 433 |
| NOR | MCP HCl-etch spents, rinses | 433 |
| NOR | MCP NaOH-clean spents, rinses | 433 |
| NOR | Glassware Wash sink drainage | 433 |
| BAR | Ultrasonic isopropyl alcohol spents | 433 |
| - | Ni/Cr and AlO3 vapor deposition | 433 |
| NOR | Lacquering skin formation water | 433 |
| n/a | Cooling water through chiller | dilution |
| Chem Room | | |
| NOR | HCl cleaning spents and sink wash | 433 |
| BAR | Ultrasonic solvent cleaner spents | 433 |
| NOR | Ultrasonic tank contents | 433 |
| HAZ | MEK Satellite collection | 433 |
| HAZ | Ceric ammonium nitrate etch spnts | 433 |
| NOR | $HNO_3$-clean spents, rinses, sink | 433 |
| NOR | Bright dip spents, sink wash | 433 |
| NOR | NaOH strip spents, sink wash | 433 |
| HF | HF etch spents, sink wash | 433 |
| Other Processes | | |
| SOU | Fume Scrubber blowdown | 433 |
| SWR | Cooling Tower bleeds | dilution |
| NOR | DI reject | dilution |

| Delivery of Generated Wastewater | | FedCat |
|---|---|---|
| Photo Cathode Fabrication | | |
| NOR | Utrasonic soap wash down | 433 |
| - | Epitaxial layering / sputtering | 433 |
| HF | Substrate $HF/H_2O_2/NH_3$-etchant | 433 |
| HF | Stop layer $HF/H_2O_2$/acid-etch | 433 |
| HAZ | Epitaxial scrubber spent carbon | 433 |
| NOR | Glassware Wash acid/$H_2O_2$-etch | 433 |
| NOR | Glassware Wash rinse | 433 |
| - | Cr sputtering edge contacts | 433 |
| - | Gold finish vapor deposition | 433 |
| n/a | Cooling water through chiller | dilution |
| SWR | Janitorial floor drain | 433 |
| Phosphor Screen Manufacturing | | |
| NOR | Optics Soap Dishwasher drainage | 433 |
| - | Ag/Cr sputtering | 433 |
| - | Al vacuum deposition | 433 |
| - | Gold plating final finishing | 433 |
| NOR | Lacquering/Sealing washdown | 433 |
| NOR | Sink wash | 433 |
| Vacuum Tube Sealing | | |
| n/a | Photo Cathode bleach polish spnt | 433 |
| n/a | Final alcohol rinse | 433 |
| n/a | Photo Cathode acid etch spents | 433 |
| Optical Components Shop | | |
| HAZ | Wire Saw spent glycol coolant | 433 |
| SLUR | Lab sink wash | 433 |
| SLUR | Pallet Grinder water coolant | 433 |
| SLUR | $ZrO_2$ Polishing wash down | 433 |
| SLUR | Anode Polishing wash down | 433 |

| Federal Category Key | |
|---|---|
| 433 | Metal Finishing *psns* |
| dilution | 40 CFR 403.6(e1i) |

| Delivery and Handling Key | |
|---|---|
| HF | HF-acid collection tanks for off-site disposal |
| NOR | Sewer lines to North IWTP for treated discharge to the sewers |
| BAR | Collection barrels delivered for off-site disposal |
| HAZ | Collection for off-site disposal as hazardous |
| SWR | Sewer lines bypassing the IWTPs into the sewers |
| SLUR | Grinding wastewaters pretreated for solids then to North IWTP |
| SOU | Sewer lines to South IWTP for treated discharge to the sewers |

**Appendix 3**
Sewer Discharge Standards and Limits for L3 Electro-Optics
North Outfall @ IWD-5023.011 and South Outfall @ IWD-5023.010

| Pollutants of concern | Fed stds (d-max) | Fed stds (mo-avg) | nat'l pro (instant) | local lim (inst/dmax) | monitoring frequency ① discharger | city |
|---|---|---|---|---|---|---|
| arsenic (mg/l) | - | - | - | 0.13 | ③ | 3/quarter |
| cadmium (mg/l) | 0.69 | 0.26 | - | 0.047 | ③ | 2/year |
| chromium (mg/l) | 2.77 | 1.71 | - | - | ③ | **3/quarter** |
| copper (mg/l) | 3.38 | 2.07 | - | 1.5 | ③ | 2/year |
| lead (mg/l) | 0.69 | 0.43 | - | 0.41 | ③ | 3/quarter |
| mercury (mg/l) | - | - | - | 0.0023 | ③ | 2/year |
| molybdenum (mg/l) | - | - | - | - | ③ | 2/year |
| nickel (mg/l) | 3.98 | 2.38 | - | - | ③ | **3/quarter** |
| selenium (mg/l) | - | - | - | 0.10 | ③ | 2/year |
| silver (mg/l) | 0.43 | 0.24 | - | 1.2 | ③ | 2/year |
| zinc (mg/l) | 2.61 | 1.48 | - | 3.5 | ③ | 3/quarter |
| amenable cyanide (mg/l) | 0.86 | 0.32 | - | - | ③ | n/a |
| total cyanide (mg/l) | 1.20 | 0.65 | - | 2.0 | ③ | **3/quarter** |
| total toxic organics (mg/l) | 2.13 ② | - | - | - | ④ | 2/year ④ |
| benzene (mg/l) | - | - | - | 0.035 | ③ | 2/year |
| chloroform (mg/l) | - | - | - | 2.0 | ③ | 2/year |
| pesticides and PCBs | - | - | - | ⑥ | ③ | 2/year |
| BOD (mg/l) | - | - | - | - | ③ | 3/quarter |
| TSS (mg/l) | - | - | - | - | ③ | 3/quarter |
| TDS (mg/l) | - | - | - | - | ③ | 3/quarter |
| fluoride (mg/l) | - | - | - | - | ③ | 3/quarter |
| flow (gpd) | - | - | - | 190,700 | continuous | n/a |
| pH (s.u.) | - | - | <5.0 | 5.0-10.5 | continuous | 1/year |
| explosivity | - | - | <140°F ⑤ | <10% LEL | ③ | ③ |

① Recommended reductions in green. Recommended **increases in red**.
② Concentration sum for all pollutants listed in 40 CFR 433.11(e).
③ As part of periodic priority pollutant scans in order to identify changes in discharge quality
④ Self-certification to following an approved toxic organics management plan is allowed in lieu of sampling. A City inspection could then qualify as an independent determination.
⑤ Closed-cup flashpoint
⑥ City ordinance prohibits the introduction of these pollutants in any amount.

**Appendix 4**
Wastewater Discharge Quality for L3 Electro-Optics – North Outfall @ IWD-5023.011

Sample Record Summary for IWD-5023.011 (01/01/07-09/30/09)

| pollutants (µg/l) | effluent sampling results | | | | violation rate ① | | | sample count |
|---|---|---|---|---|---|---|---|---|
| | mean | 99th% | min | max | d-max | mo-av | instant | |
| arsenic | 20.3 | 71.6 | 19 | 77 | - | - | 0/25 | 25 |
| beryllium | <1 | <1 | <1 | <1 | - | - | - | 11 |
| boron | 280.9 | 609.2 | 120 | 570 | - | - | - | 11 |
| cadmium | 1.5 | 8.9 | 0.3 | 11.6 | 0/22 | 0/10 | 0/25 | 25 |
| chromium | 336.7 | 2190.6 | <50 | 2700 | 0/11 | **1/6** ③ | 0/11 | 11 |
| copper | 10.0 | 15.2 | <10 | 18 | 0/22 | 0/10 | 0/22 | 22 |
| lead | 214.0 | 434.5 | 77 | 489 | 0/22 | 0/10 | **1/22** | 22 |
| mercury | <0.2 | <0.2 | <0.2 | <0.2 | - | - | 0/22 | 22 |
| manganese | 12.2 | 57.7 | <20 | 61 | - | - | 0/11 | 11 |
| molybdenum | <50 | <50 | <50 | <50 | - | - | 0/11 | 11 |
| nickel | 455.2 | 2092.7 | <50 | 2400 | 0/11 | **1/6** ③ | 0/11 | 11 |
| selenium | <20 | <20 | <20 | <20 | 0/22 | 0/10 | 0/22 | 22 |
| silver | 8.5 | 31.6 | <10 | 39 | 0/22 | 0/10 | 0/22 | 22 |
| zinc | 45.1 | 153.4 | 30 | 215 | 0/22 | 0/10 | 0/22 | 22 |
| total cyanide | 2.9 | 22.9 | <10 | 34 | **unk** ④ | **unk** ④ | 0/15 | 15 |
| total toxic organics ② | 20.7 | 56.0 | <0.5 | 60.1 | 0/21 | - | 0/21 | 21 |
| BOD (mg/l) | 135.5 | 364.4 | 28 | 471 | - | - | - | 21 |
| TSS (mg/l) | 7.8 | 28.2 | <10 | 30 | - | - | - | 21 |
| TDS (mg/l) | 633.8 | 1127.2 | 380 | 1200 | - | - | - | 21 |
| fluoride (mg/l) | 4.7 | 24.4 | 0.34 | 37.0 | - | - | - | 21 |
| flow (gpd) | 30036 | 85261 | 2600 | 107000 | - | - | 0/25 | 25 |
| pH (s.u.) | 6.35 min – 7.06 median – 8.93 max | | | | - | - | 0/25 | 25 |

Federal Standard Violations (01/01/07-09/30/09)

| sample dates | type | sampler | point | Fed standards / local limits ① | | viols | days |
|---|---|---|---|---|---|---|---|
| Jul 2008 | 24-h | POTW | 5023.011 | chromium –Fed mo-avg | 1.71 mg/l | 2.70 | 31 |
| Jul 2008 | 24-h | POTW | 5023.011 | nickel–Fed mo-avg | 2.38 mg/l | 2.40 | 31 |
| Local Limit Violations (07/31/07-09/12/09) | | | | | | | |
| 07/31/08 | 24-h | POTW + IU | 5023.011 | lead-local instant | 0.41 mg/l | 0.489 | 1 |
| | | | | | | **total days of violation** | **63** |

Statistical Violation Probabilities (01/01/07-09/30/09)

| violation probability ① | mean (µg/l) | std dev (µg/l) | statistical probability | percent |
|---|---|---|---|---|
| Fed – chromium (d-max) | µ = 336.7 | σ = 795.7 | α(2770) = 0.0011 | ~0% |
| Fed – nickel (d-max) | µ = 455.2 | σ = 702.8 | α(3980) = 0.0000 | ~0% |
| Local – lead (instant) | µ = 214.0 | σ = 94.6 | α(410) = 0.0191 | ~2% |

① Monthly averages calculated by calendar month of both self-monitoring and Tempe samples.
② TTO sampling covers benzene, chloroform, pesticides, PCBs - no violations recorded.
③ These calendar monthly-average violations would not apply if the sample started on July 31st and ending on August 1st were applied to the August 2007 averages.
④ Default Fed stds must be adjusted to account for dilution if cyanide sources are identified.

**Appendix 4**
Wastewater Discharge Quality for L3 Electro-Optics – South Outfall @ IWD-5023.010

Sample Record Summary for IWD-5023.011 (01/01/07-09/30/09)

| pollutants (µg/l) | effluent sampling results | | | | violation rate ① | | | sample count |
|---|---|---|---|---|---|---|---|---|
| | mean | 99th% | min | max | d-max | mo-av | instant | |
| arsenic | 4.2 | 24.0 | 2 | 44 | - | - | 0/24 | 24 |
| beryllium | <1 | <1 | <1 | <1 | - | - | - | 11 |
| boron | 202.7 | 457.1 | 110 | 430 | - | - | - | 11 |
| cadmium | 2.2 | 11.1 | 0.2 | 15.0 | 0/24 | 0/11 | 0/24 | 24 |
| chromium | 20.5 | 143.8 | <50 | 180 | 0/11 | 0/6 | 0/11 | 11 |
| copper | 15.7 | 65.3 | <10 | 92 | 0/24 | 0/11 | 0/24 | 24 |
| lead | 76.1 | 384.9 | <2 | 600 | 0/24 | 0/11 | **1/24** | 24 |
| mercury | <0.2 | <0.2 | <0.2 | 0.35 | - | - | 0/24 | 24 |
| manganese | <20 | <20 | <20 | <20 | - | - | 0/11 | 11 |
| molybdenum | <50 | <50 | <50 | <50 | - | - | 0/11 | 11 |
| nickel | 60.7 | 230.0 | <50 | 230 | 0/11 | 0/6 | 0/11 | 11 |
| selenium | 2.1 | 12.1 | <2 | 21 | 0/24 | 0/11 | 0/24 | 24 |
| silver | 3.0 | 18.4 | <10 | 30 | 0/23 | 0/11 | 0/23 | 23 |
| zinc | 72.7 | 388.1 | 20 | 630 | 0/24 | 0/11 | 0/24 | 24 |
| total cyanide | 5.0 | 30.8 | <10 | 39 | **unk** ③ | **unk** ③ | 0/17 | 17 |
| total toxic organics ② | 3.2 | 11.7 | <0.5 | 11.7 | 0/21 | - | 0/21 | 21 |
| BOD (mg/l) | 40.4 | 118.6 | <4 | 125 | - | - | - | 25 |
| TSS (mg/l) | 8.2 | 68.1 | <10 | 130 | - | - | - | 25 |
| TDS (mg/l) | 542 | 846 | 330 | 760 | - | - | - | 25 |
| fluoride (mg/l) | 2.5 | 13.5 | 0.25 | 20 | - | - | - | 25 |
| flow (gpd) | 19014 | 76455 | 2800 | 94000 | - | - | - | 28 |
| pH (s.u.) | 6.69 min – 8.01 median – 8.28 max | | | | - | - | 0/28 | 28 |

Federal Standard Violations (01/01/07-09/30/09)

| sample dates | type | Sampler | point | Fed standards / local limits ① | | viols | Days |
|---|---|---|---|---|---|---|---|
| | | | 5023.010 | all parameters | | n/a | 0 |
| Local Limit Violations (07/31/07-09/12/09) | | | | | | | |
| 10/15/08 | 24-h | POTW | 5023.010 | lead-local instant | 0.41 mg/l | 0.600 | 1 |
| | | | | | **total days of violation** | | **1** |

Statistical Violation Probabilities (01/01/07-09/30/09)

| violation probability ① | mean (µg/l) | std dev (µg/l) | statistical probability | Percent |
|---|---|---|---|---|
| Local – lead (instant) | µ = 76.1 | σ = 132.5 | α(410) = 0.0059 | ~1% |

① Monthly averages calculated by calendar month of both self-monitoring and Tempe samples.
② TTO sampling covers benzene, chloroform, pesticides, PCBs - no violations recorded.
③ Default Fed stds must be adjusted to account for dilution if cyanide sources are identified.