

**ARIZONA-MEXICO COMMISSION  
ENVIRONMENT COMMITTEE AND WATER COMMITTEE  
DECEMBER 2009 JOINT ACTION ITEM**

**FINAL REPORT**

Prepared by Hans Huth  
Arizona Department of Environmental Quality (ADEQ)  
Office of Border Environmental Protection (OBEP)

In coordination with

Q.B. Veronica Meranza  
Nogales, Sonora Municipal Pretreatment Program Administrator  
Nogales, Sonora Water and Wastewater Utility (OOMAPAS-NS)

Presented: June 3, 2011

## EXECUTIVE SUMMARY

The Nogales International Wastewater Treatment Plant (NIWTP) serves communities in both Arizona and Sonora and is an important factor in protecting the water quality of the Santa Cruz River. In April 2008, water quality monitoring by the Friends of the Santa Cruz River (FOSCR) detected cadmium 1.5 miles downstream of the plant's outfall at levels suggesting river impairment. Three additional detections in 2009 indicated the river was approaching chronic impairment for aquatic wildlife. During this period, the U.S. International Boundary and Water Commission notified ADEQ as required by their Arizona Pollutant Discharge Elimination System (AZPDES) permit that the NIWTP was discharging cadmium to the Santa Cruz River at concentrations in excess of the permissible limits. Discharges were related to lack of pretreatment of wastewater influent and the plant's inability to treat or remove metals.

As stipulated in Minute Number 276, the U.S. and Mexico Sections of the International Boundary and Water Commission are obligated to take appropriate actions to prevent the discharge of untreated industrial wastewater into the wastewater conveyance system to preserve the efficiency of the NIWTP.

In December 2009, ADEQ worked with the State of Sonora Water Commission (CEA), the Arizona Department of Water Resources (ADWR), and the U.S. International Boundary and Water Commission (IBWC) on an action item for the Arizona-Mexico Commission (AMC). The AMC is a public-private partnership comprised of several committees and chaired by Gov. Jan Brewer of Arizona. It has a sister organization, the Sonora-Arizona Commission (CSA), that is chaired by Gov. Guillermo Padrés Elías of Sonora. The particular action item developed focuses on source characterization and mitigation of metals impacting binational wastewater in Nogales, Arizona and Nogales, Sonora, often referred to as Ambos Nogales.

In support of the action item, ADEQ directly engaged the regulated community in Nogales, Sonora regarding cadmium with the support of officials in Sonora. FOSCR's monitoring data was shared at conferences and professional meetings as evidence regarding the impact of metals on the NIWTP and the Santa Cruz River. These activities highlighted the importance of pretreatment to the regulated community while the Nogales, Sonora Potable Water and Wastewater Utility (OOMAPAS-NS) pursued source characterization through oversight monitoring of industrial outfalls. ADEQ also engaged the City of Nogales, Arizona in regards to regulation of the industrial sector north of the border.

In 2010, OOMAPAS-NS identified a metal plating facility as a source of cadmium in wastewater discharges. Regulatory actions resulted in the installation of new pretreatment equipment for wastewater discharge from the facility. In addition, OOMAPAS-NS indicates that the facility no longer discharges process water from cadmium plating tanks to the wastewater conveyance. Coincidentally, the U.S. IBWC witnessed an 89 percent reduction in the loading of cadmium from Nogales, Sonora between August 2009 and October 2010.

Progress realized through this action item demonstrates that one-on-one engagement and support of municipal stakeholders in Sonora can lead to mitigation of pollution impacting the NIWTP and the Santa Cruz River. Sustainability of recent successes requires the following elements:

direct engagement of the regulated community regarding the binational significance of wastewater pollution; providing resources and training to the Nogales, Sonora Pretreatment Program for monitoring and water quality analyses; and holding quarterly meetings with both regulators and the regulated community regarding the quality of influent sourced to Sonora.

The U.S. and Mexico Sections of IBWC must fund, implement and maintain an effective pretreatment program to ensure short-term successes realized continue and that discharges from the NIWTP do not adversely impact the Santa Cruz River.

## **ACTION ITEM**

Objective: To protect the recent upgrades to the Nogales International Wastewater Treatment Plant, an investment of \$65 million, a source characterization of binational wastewater discharges will be performed. Based on results of the evaluation, an action plan will be developed by pertinent authorities to address identified issues.

Action Item Target Completion Date: December 2010

Tactic A: Conduct a qualitative evaluation of both the industrial and commercial sectors of Ambos Nogales in order to identify potential sources of contaminants in wastewater that pose an operational risk to the Nogales International Wastewater Treatment Plant.

Responsible party (Arizona and Sonora): International Boundary and Water Commission (IBWC) in coordination with Arizona Department of Environmental Quality (ADEQ) and the State of Sonora Water Commission (CEA).

Tactic Target Completion Date: April 2010

Tactic B: Use the qualitative evaluation to guide water quality monitoring within the binational wastewater conveyance.

Responsible party (Arizona and Sonora): International Boundary and Water Commission (IBWC) in coordination with Arizona Department of Environmental Quality (ADEQ) and the State of Sonora Water Commission (CEA).

Tactic Target Completion Date: September 2010

Tactic C: Develop an action plan to mitigate sources of contaminants in binational wastewater, implement highest priority action, and report on progress.

Responsible party (Arizona and Sonora): International Boundary and Water Commission (IBWC) in coordination with Arizona Department of Environmental Quality (ADEQ) and the State of Sonora Water Commission (CEA).

Tactic Target Completion Date: December 2010

*Note that the use of the term “responsible party” refers to the completion of tasks associated with the Action Item by one or more organization.*

## **ACTION ITEM PROGRESS – TACTIC A**

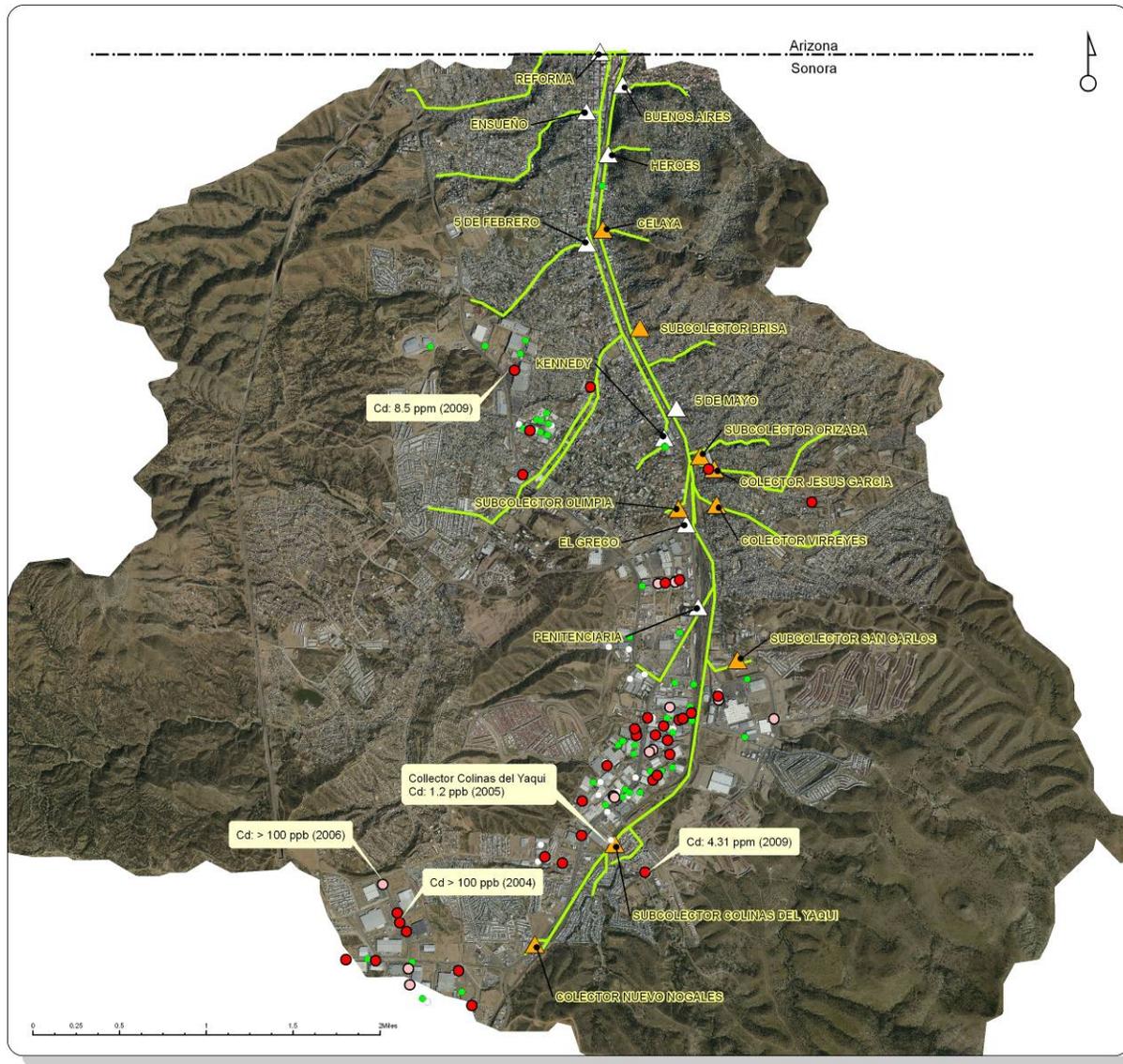
### ***CADMIUM SOURCES IN AMBOS NOGALES WASTEWATER***

The Nogales Pretreatment Program is an important component for protecting the quality of wastewater treated and discharged by the NIWTP. OOMAPAS-NS is required to submit an annual report on pretreatment to the U.S. Environmental Protection Agency (EPA) as a contingency for receipt of Border Environment Infrastructure Funds (BEIF). The most recent pretreatment report was submitted to EPA on July 23, 2010 for calendar year 2009.

Given its superior anti-corrosive and pigmentation properties, cadmium is used in a variety of industrial processes. Based on a review of the OOMAPAS-NS 2009 pretreatment database, potential sources of cadmium were flagged. Within the 135 permitted facilities identified, 64 were identified as *potentially* having cadmium on site. Of these, 37 use water in their processing. Of these, four have historically discharged cadmium in wastewater, and two at levels above Mexico's own regulatory limits. Industrial processes outlined in the Nogales, Sonora, pretreatment database are somewhat vague, so facilities and sites may be incorrectly classified as source areas with numbers biased on the high end.

ADEQ has exported the Nogales, Sonora pretreatment database to a geographic information system (GIS). Maps generated from the GIS show the geographic distribution of historical sources of cadmium based on available data. Most of these facilities are operating in the southern half of the basin and are expected to have their wastewater treated in Sonora once the Los Alisos Wastewater Treatment Plant comes online, anticipated to be in the first quarter of 2012. In this context, mitigation of cadmium sources carries added binational interest. Figure 1 was created in support of the AMC Action Item (Tactic A) focused on developing a qualitative characterization of cadmium sources.

The Nogales, Arizona, Pretreatment Program is another important component for protecting the quality of wastewater treated and discharged by the NIWTP. The city's responsibilities include collector monitoring for source characterization of any contamination that may be impacting the NIWTP. The city is working with ADEQ to perform an industrial source characterization at this time. In the interim, Figure 2 is based on a field survey conducted by ADEQ in December 2010 for the primary industrial/commercial area in Nogales, Arizona. The preliminary survey suggests that although Nogales, Arizona, is less important as a source of metals in binational wastewater, it does host facilities that may impact wastewater quality.



# Nogales, Sonora Base Map

Potential Sources of Cadmium  
Last updated August 16, 2010

Figure 1

Given its superior anti-corrosive and pigmentation properties, cadmium is used in a variety of industrial processes. In this context, processes employed by permitted facilities in Nogales, Sonora were reviewed and flagged as potential cadmium sources. Within the 135 permitted facilities identified in the Nogales 2009 pretreatment database, 64 were flagged. Of these, 37 use water in their processing. Of these, four have historically discharged cadmium in wastewater, and two at levels above Mexico's own regulatory limits.

## Legend

- 2010 GPS Facilities Cd\*
- 2010 GPS Facilities Cd H<sub>2</sub>O\*\*
- 2010 GPS Permitted Facilities\*\*\*
- 2010 GPS Facilities closed
- ▲ 2007 Manholes Sampled 2005
- △ 2007 Manholes
- Wastewater Collectors

\*Facilities have the potential to use equipment or materials exposed to or containing cadmium.

\*\*Facilities have the potential to use equipment or materials exposed to or containing cadmium AND expose their process to water.

\*\*\*Not all known industrial facilities are shown given missing GPS data not reflected in the Nogales, Sonora 2009 pretreatment database.

Please note that industrial processes outlined in the Sonora's pretreatment database are somewhat vague. Based on the conservative approach considered by staff, these numbers may be biased on the upper end. OOMAPAS-NS will be engaged for further guidance on flagged facilities.

Last updated: August 16, 2010 by Hans Huth: 520-628-6711

# Nogales, Arizona Commerical/Industrial Zone

Figure 2



0 250 500 1,000 Feet

Last Updated by Hans Huth: 520-628-6711  
December 22, 2010

## **ACTION ITEM PROGRESS – TACTIC B**

### ***WASTEWATER COLLECTOR MONITORING IN NOGALES, SONORA***

OOMAPAS-NS notes that it may not have records of all potential industrial or commercial sources that may be impacting wastewater in Nogales, Sonora. Some facilities are hidden from view and/or have not filed appropriate paperwork with the municipality. In this context, Tactic B of the Action Item was adopted with the goal of better characterizing respective sources.

Although the State of Sonora Water Commission (CEA) is identified as a responsible party for execution, CEA must rely on OOMAPAS-NS for monitoring in the conveyance. To address this, a letter was forwarded from CEA to OOMAPAS-NS recognizing adoption of the Action Item and soliciting support for its completion. A copy of the letter is included as Attachment A.

At the December 2009 AMC plenary meeting, IBWC committed \$60,000 to support respective monitoring activities. IBWC's monetary commitment decreased to \$1,800 by the end of its fiscal year. IBWC's revised commitment would support the collection of 60 samples to be analyzed for cadmium, chromium, and zinc as opposed to a more comprehensive characterization of the wastewater collection system if they had met their original commitment. In response, OOMAPAS-NS planned to have two autosamplers collecting 24-hour composites for 30 days downstream of two important industrial sites. The monitoring was originally scheduled to take place October 14 through November 10, 2010 to coincide with IBWC's monitoring of the International Outfall Interceptor (IOI). In doing so, any contamination associated with a specific industrial site could potentially be linked to detection in the IOI. The locations selected by OOMAPAS-NS for monitoring are summarized in Table 1 and shown in Figure 3.

Table 1. Manholes Selected by OOMAPAS-NS for Wastewater Collector Monitoring

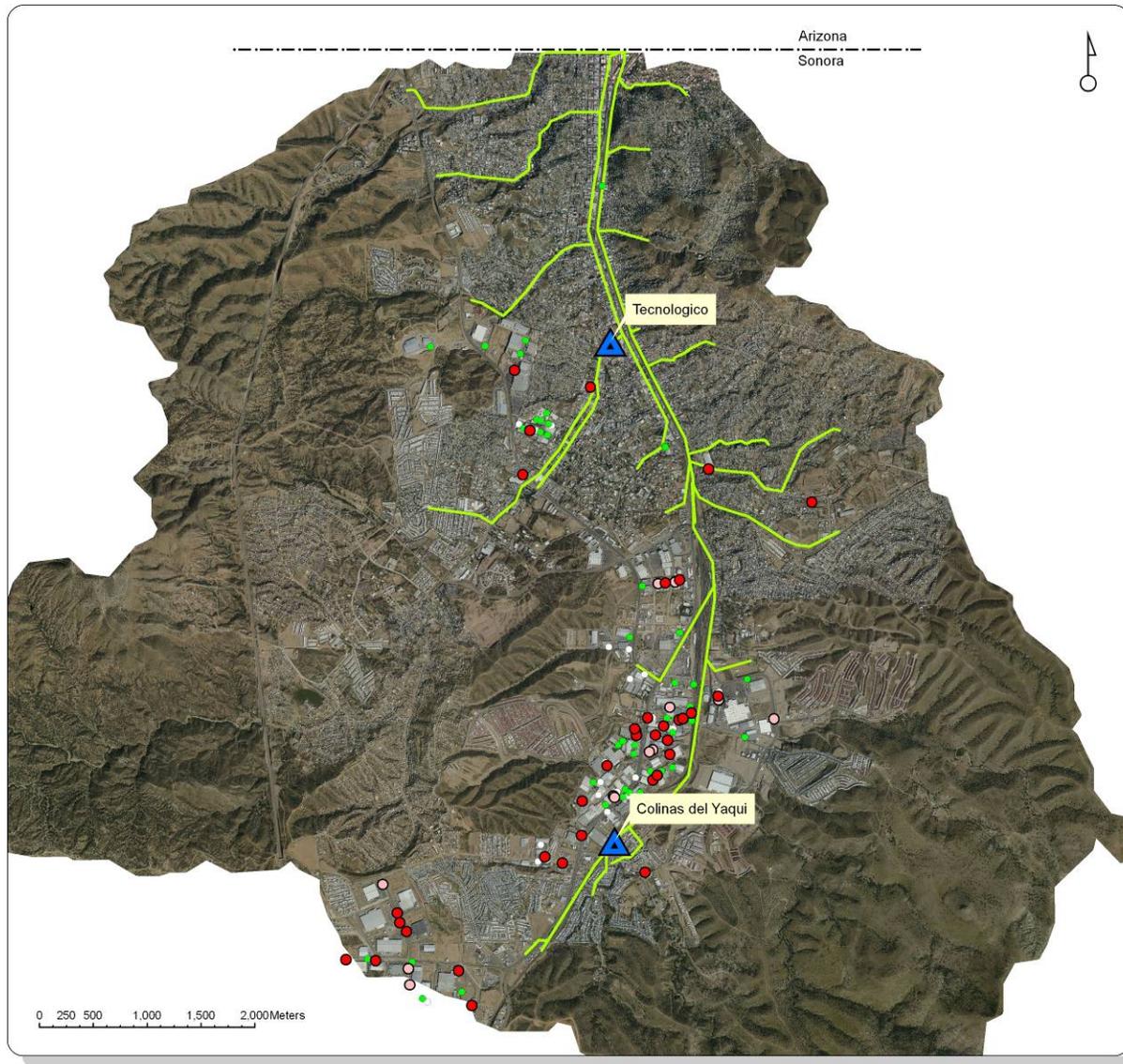
Collector	GPS X	GPS Y	Elevation (m)
Colinas del Yaqui	505297	3459164	1264
Tecnologico	505258	3463789	1205

In support of this activity, ADEQ coordinated with the City of Phoenix Pretreatment Program in securing two rehabilitated autosamplers and two HACH spectrophotometers for wastewater monitoring and analysis. ADEQ also assisted in the development of a sample plan and delivery of samples to an Arizona laboratory for analyses. ADEQ was also on site in Nogales, Sonora, to provide technical support on an as-needed basis. Copies of letters of appreciation from the municipality to the City of Phoenix and the HACH Company are included as Attachment B.

Respective monitoring was initiated in Nogales, Sonora, on October 18, 2010 and concluded on November 2, 2010. Wastewater quality analyses for cadmium, chromium and zinc were received from IBWC on December 6, 2010. Twenty-four hour composite samples associated with the Colinas del Yaqui collector showed detections of cadmium ranging from 1 to 10 parts per million and at levels up to 10 times the Mexican federal standard for an industrial point discharge (ECO-1996-NOM-002). Photos associated with the sampling activities are presented as Attachment C.

On January 25, 2011, ADEQ received quarterly monitoring data for wastewater quality in the IOI. The IBWC reported a spike in cadmium loadings on October 26, 2010 at the border with Mexico (0.0587 parts per million). This correlates with a spike in cadmium detected in the Colinas del Yaqui collector during the same time period (9.91 parts per million). The spike at the border translates to a total loading of 2.07 kg of cadmium entering from Sonora on October 26, 2011. This is significantly higher than the total influent allowable head works loadings (AHL) for the Nogales International Wastewater Treatment Plant (NIWTP). The overall AHL for cadmium is 0.19 kg/day. That level is set for the protection of the plant's biosolids.

Results from this monitoring demonstrate that facilities discharging to the Colinas del Yaqui collector are an important source of cadmium in binational wastewater. Consequently, OOMAPAS-NS has conducted regular inspections and enforcement actions of upstream sources.



# Nogales, Sonora Base Map

October Monitoring Locations  
Last updated October 8, 2010

Figure 3

Given its superior anti-corrosive and pigmentation properties, cadmium is used in a variety of industrial processes. In this context, processes employed by permitted facilities in Nogales, Sonora were reviewed and flagged as potential cadmium sources. Within the 135 permitted facilities identified in the Nogales 2009 pretreatment database, 64 were flagged. Of these, 37 use water in their processing. Of these, four have historically discharged cadmium in wastewater, and two at levels above Mexico's own regulatory limits.

## Legend

-  OOMAPAS-NS Monitoring Sites
-  2010 GPS Facilities Cd H2O\*\*
-  2010 GPS Facilities Cd\*
-  2010 GPS Permitted Facilities\*\*\*
-  2010 GPS Facilities Closed
-  Wastewater Collectors

\*Facilities have the potential to use equipment or materials exposed to or containing cadmium.

\*\*Facilities have the potential to use equipment or materials exposed to or containing cadmium AND expose their process to water.

\*\*\*Not all known industrial facilities are shown given missing GPS data not reflected in the Nogales, Sonora 2009 pretreatment database.

Please note that industrial processes outlined in the Sonora's pretreatment database are somewhat vague. Based on the conservative approach considered by staff, these numbers may be biased on the upper end. OOMAPAS-NS will be engaged for further guidance on flagged facilities.

Last updated: October 8, 2010 by Hans Huth: 520-628-6711

## **ACTION ITEM PROGRESS – TACTIC C**

### ***ACTION PLAN FOR METALS MITIGATION IN BINATIONAL WASTEWATER***

In January 2010, OOMAPAS-NS began developing and implementing an action plan for metals mitigation with assistance from ADEQ. In support of the action item, both entities directly engaged the regulated community in Nogales, Sonora, regarding the cadmium challenge. As evidence regarding the impact of metals on the NIWTP and the Santa Cruz River, FOSCR's monitoring data was shared at conferences and professional meetings in Sonora, in coordination and with the support of officials in Sonora. This highlighted the importance of pretreatment to the regulated community in Sonora. Additionally, OOMAPAS-NS pursued source characterization through oversight monitoring of industrial outfalls. A summary of ADEQ engagement of Sonoran stakeholders is included in Attachment D.

Oversight monitoring by OOMAPAS-NS identified a metal plating facility in Sonora as one important source of cadmium. This facility is subcontracted by other local industrial operations. Negotiations between OOMAPAS-NS and the facility resulted in the installation of new pretreatment equipment for cadmium control. In April 2010, wastewater entering Arizona via the IOI showed a 50 percent decrease in average daily loadings of cadmium as compared to August 2009. Daily loadings decreased from 2.65 kg/day to 0.99 kg/day. This decrease correlates with the installation of pretreatment equipment by the metal plating facility in Nogales, Sonora.

Although this data shows a significant improvement, the April results were still higher than the combined influent allowable head works loading for cadmium of 0.19 kg/day, by a factor of five. April monitoring data also showed that Arizona was impacted by unprecedented spikes in the loadings of cadmium on every other Tuesday. One possibility was that the metal plating facility had decreased its daily discharges of cadmium through the installation of new pretreatment equipment, but was not maintaining it properly.

In response, OOMAPAS-NS conducted a follow-up inspection. OOMAPAS-NS discovered that the facility was maintaining its new pretreatment equipment by flushing it through its old pretreatment works. The municipality then required the facility to handle all of its process water associated with cadmium plating through the use of evaporation cells. Arizona subsequently witnessed significant reductions in cadmium loadings sourced to Sonora. Between August 2009 and October 2010, the total reduction of cadmium sourced to Sonora has diminished by 89 percent. Table 2 summarizes progress associated with implementation of the action plan between August 2009 and October 2010.

Progress realized in 2010 demonstrates that binational one-on-one engagement and support of municipal wastewater stakeholders in Sonora can lead to mitigation of pollution impacting the NIWTP and the Santa Cruz River. Although ADEQ and the City of Phoenix have provided substantial support in these areas, the U.S. and Mexico Sections of IBWC are obligated to take appropriate actions to prevent the discharge of untreated industrial wastewater into the wastewater conveyance system to preserve the efficiency of the NIWTP. This obligation is formally outlined in Minute 276 between the United States and Mexico Sections of the International Boundary and Water Commission entitled *Conveyance, Treatment and Disposal of*

*Sewage from Nogales, Arizona and Nogales, Sonora Exceeding the Capacities Allotted to the United States and Mexico Under Minute Number 227.*

Table 2. IBWC AZPDES Monitoring Results for Total Cadmium at Manhole 1; August 2009 – October 2010.

Month	Average Daily Loading (kg/day)	Total Monthly Loading (kg)
August 2009	2.65	76.76
October 2009	2.25	67.60
January 2010	1.14	34.08
April 2010	0.99	29.82
August 2010	0.06	1.93
October 2010	0.28	8.38

An important factor for maintaining wastewater quality is the Nogales, Sonora, municipal pretreatment program, which falls under the jurisdiction of OOMAPAS-NS. CILA does communicate IBWC’s concerns regarding the quality of binational wastewater to OOMAPAS-NS. It does not, however, provide the municipality with technical, personnel, or material support to address these issues. Nogales, Sonora, faces tremendous challenges related to overtaxed wastewater infrastructure, severe monsoonal flooding, and providing potable water to a growing residential and industrial footprint. In this context, concerns communicated by IBWC through CILA must compete with other priorities. Expecting the municipality to address a federal wastewater quality issue in the absence of support from IBWC or CILA is challenging.

Over the last five years, various U.S. stakeholders have supported OOMAPAS-NS in the development of its program. Contributing stakeholders include the City of Phoenix Pretreatment Program, EPA’s Border 2012 Environmental Program, ADEQ’s Office of Border Environmental Protection (OBEP), FOSCR, private corporations including ISCO and HACH, and volunteers. Coordinating these stakeholders has taken place through OBEP. OOMAPAS-NS has responded by pursuing modifications to Sonora state laws under its authority to strengthen the municipal pretreatment program, and investing in a water quality laboratory for wastewater analyses.

Continuation of these efforts by IBWC to ensure sustainability of past successes is vital for the protection of the NIWTP and the Santa Cruz River. For the benefit of IBWC and CILA, strategies for metals mitigation in binational wastewater are outlined here based on the successes realized in 2010.

- Ensuring there is direct engagement of the regulated community regarding the binational significance of wastewater pollution.
- Providing resources, training, and technical support to the Nogales, Sonora, Municipal Pretreatment Program for monitoring and water quality analyses.
- Participating in regular meetings with both regulators and the regulated community regarding the quality of influent sourced to Sonora.

With respect to engaging the regulated community, two main organizations that OOMAPAS-NS and ADEQ have received support from in terms of relaying information to their members are the Sonora Association of Maquiladoras (Asociacion de Maquiladoras de Sonora) and the Association of Environmental Safety Professionals of Sonora (Asociacion de Profesionales en

Seguridad Ambiental). Additionally, there are organizations and individuals that have supported efforts associated with this action item. The points of contact for these organizations are noted in the tables below.

Table 3. Industry Organizations in Nogales, Sonora to Engage in Binational Water Quality Issues

Contact	Organization	Email	Phone
Ing. Jesus Montoya, Executive Director	Asociacion de Maquiladoras de Sonora (AMS)	<a href="mailto:direccion@amsnogales.com.mx">direccion@amsnogales.com.mx</a>	(631) 314-0111 (631) 341-0112
Nelly Fuentes Current President	Asociacion de Profesionales de Seguridad Ambiental (APSA)	<a href="mailto:Nelly.Fuentes@mtproducts.com">Nelly.Fuentes@mtproducts.com</a>	(631) 314-2991

Table 4. Contacts that can Facilitate Purchase and/or Donations of Equipment

Contact	Organization	Email	Phone
Ing. Roberto Molina Border Affairs Coordinator	Comisión Estatal del Agua (CEA)	<a href="mailto:virreyes3@hotmail.com">virreyes3@hotmail.com</a>	011-52-662-289-5700 ext.105
Q.B. Veronica Meranza Nogales, Sonora Pretreatment Administrator and recipient of donations	Organismo Operador de Agua Potable, Alcantarillado y Saneamiento de Nogales, Sonora (OOMAPAS-NS)	<a href="mailto:veronica.meranza@oomapasnogales.gob.mx">veronica.meranza@oomapasnogales.gob.mx</a>	011-52-631-314-7272
Roger Vail, Senior Pretreatment Inspector	City of Phoenix Municipal Pretreatment Program	<a href="mailto:roger.vail@phoenix.gov">roger.vail@phoenix.gov</a>	(602) 534-2920
Dennis and Amy Gamache	Western Environmental Equipment Company	<a href="mailto:argamache@weeci.com">argamache@weeci.com</a>	(480) 607-2884
Sarajane Grandia HACH Donations Committee	Hach Love Foundation	<a href="mailto:donations@hach.com">donations@hach.com</a>	Coordinate communications through Roger Vail.

Additional details regarding contacts, equipment needs, engagement of the Sonora stakeholders, and/or recommendations summarized in this report are available upon request.

Attachment A:

Letter from CEA to OOMAPAS-NS recognizing adoption of the  
Action Item and soliciting support for its completion.



**Oficio No. DDFI-10-007**

Hermosillo, Sonora, a 10 de Febrero de 2010.  
"2010: Año del Bicentenario de la Revolución  
Y Centenario de la Independencia"

**ING. FRANCISCO GASTELUM CEBALLOS**

Director General  
OOMAPAS Nogales  
Presente.-

Por medio del presente me permito manifestarle nuestra preocupación por los reportes de caracterización de aguas residuales que nos envió el Sr. Hans Huth de la Agencia de Calidad Ambiental de Arizona (ADEQ por sus siglas en Inglés), en los que se indica que las aguas residuales de Nogales, Sonora, enviadas a la PITAR (Planta Internacional de Tratamiento de Aguas Residuales de Nogales, Arizona) contienen cantidades significativas de Cadmio. Por lo anterior, y en congruencia con la Línea de Acción Conjunta #1 de la Comisión Sonora-Arizona, solicito de la manera más atenta su asistencia para que se realicen las acciones necesarias para confirmar esta situación; y que nos envíe su calendario de actividades con el fin de brindarles nuestro apoyo y dar seguimiento cabal a este asunto.

Reconocemos los esfuerzos realizados por el Organismo Operador, que tiene a bien dirigir, y reiteramos el apoyo de esta Comisión para resolver este asunto a la mayor brevedad.

Sin otro particular de momento, quedo de usted.

**ATENTAMENTE**

**ING. JESÚS ROBERTO MOLINA ACEDO**  
Director General de Desarrollo y  
Fortalecimiento Institucional

c.c.p. Expediente.



**CEA. COMISIÓN ESTATAL DEL AGUA** | Ocampo No. 49, Col. CENTENARIO C.P 83260 | TEL. +52 (662) 289-5700  
HERMOSILLO, SONORA. MÉXICO | [www.ceasonora.gob.mx](http://www.ceasonora.gob.mx)



Attachment B:

Letters of appreciation from the Municipality of Nogales, Sonora to City of Phoenix and the HACH Company for equipment support.



Organismo Operador Municipal  
de Agua Potable, Alcantarillado  
y Saneamiento de Nogales, Sonora.



H. Ayuntamiento de  
Nogales, Sonora  
2009 - 2012



H. Nogales, Sonora a 07 de Octubre de 2010.

**Sarajane Grandia**  
**Hach Donations Committee,**  
Lab Technical Support  
Hach Company.

Por medio del presente, me dirijo a usted y a su representada para hacer un especial agradecimiento en nombre de este Organismo Operador Municipal de Agua Potable, Alcantarillado y Saneamiento de Nogales, a **HACH COMPANY**, por la donación estupenda de dos espectrofotómetros Hach (DR-2700 y DR-2800), con un valor aproximado de \$2,800.00 dls. c/u.

Con su apoyo, el Programa de Pretratamiento Industrial de la ciudad de Nogales, Sonora y su laboratorio de calidad del agua, será fortalecido y presentara una mejor capacidad, para continuar con su labor.

Sin más por el momento, me despido, no sin antes reconocer sinceramente su voluntad y su apoyo, con este programa.

**ATENTAMENTE**

*Organismo Operador Municipal de Agua Potable, Alcantarillado y Saneamiento de  
Nogales, Sonora*

**ING. FRANCISCO OCTAVIO GASTELUM CEBALLOS**  
Director General.

**ORGANISMO OPERADOR MUNICIPAL  
DE AGUA POTABLE, ALCANTARILLADO  
Y SANEAMIENTO DE NOGALES, SONORA**  
Av. Obregón 472 Nogales, Sonora.

C.c.p. Archivo.

AV. Obregón 472  
Col. Fundo Legal  
Tel: Conmutador (631) 311-2900 a 2908 y 2950 al 2958; Fax: (631) 311-2909 y 2977

Bvd. Luis Donaldo Colosio N° 2300  
Col. Unidad Deportiva  
H. Nogales, Sonora, México  
Correo:

H. Nogales, Sonora, México  
Correo:



Organismo Operador Municipal  
de Agua Potable, Alcantarillado  
y Saneamiento de Nogales, Sonora.



H. Ayuntamiento de  
Nogales, Sonora  
2009 - 2012



H. Nogales, Sonora a 07 de Octubre de 2010.

**Ing. Roger Vail,**

Pollution Control Division Industrial Pretreatment Program,  
City of Phoenix.

Por medio del presente, me dirijo a usted y a su representada para hacer un especial agradecimiento en nombre de este Organismo Operador Municipal de Agua Potable, Alcantarillado y Saneamiento de Nogales, al **Ing. Roger Vail del City of Phoenix**, por la donación estupenda de dos muestreadores automáticos (SIGMA900).

Con su apoyo, el Programa de Pretratamiento Industrial de la ciudad de Nogales, Sonora y su laboratorio de calidad del agua, será fortalecido y presentara una mejor capacidad, para continuar con su labor.

Sin más por el momento, me despido, no sin antes reconocer sinceramente su voluntad y su apoyo, con este programa.

ATENTAMENTE

*Organismo Operador Municipal de Agua Potable, Alcantarillado y Saneamiento de  
Nogales, Sonora.*

ING. FRANCISCO OCTAVIO GASTELUM CEBALLOS  
Director General.

ORGANISMO OPERADOR MUNICIPAL  
DE AGUA POTABLE, ALCANTARILLADO  
Y SANEAMIENTO DE NOGALES, SONORA  
Av. Obregón 472 Nogales, Sonora.

C.c.p. Archivo.

Attachment C:

Photos associated with sampling activities in Nogales, Sonora.

## Photos Demonstrating Collection of Wastewater Sampling in Nogales, Sonora



Photo 1: OOMAPAS-NS pretreatment van at the manhole identified as Colinas del Yaqui. This location is downstream of a historical source of cadmium.



Photo 3: This image shows the outfall for the Colinas del Yaqui collector within the manhole. This configuration is typical of most manholes in Nogales, Sonora. For this reason, composite samples are time-weighted rather than flow-weighted.



Photo 2: This is a SIGMA-900 autosampler that has been modified to fit in the smaller diameter manholes commonly associated with wastewater collectors in Nogales, Sonora. The pump and CPU have been removed from the original sampler housing and are bolted to a plywood board. The board is suspended from an iron cross anchored at the top of the manhole. A composite sample bottle is suspended from the plywood backing through the use of cables and hooks. To facilitate continuous monitoring, a single composite bottle is lined with ISCO ProPak disposable polyethylene bags, and pre-preserved with 25 ml of undiluted nitric acid. The bottle is suspended from a hook on the plywood backing.

OOMAPAS-NS saves on battery costs through the purchase of standard 12V marine batteries that are inserted in original equipment Sigma housing. The housing is then duct-taped shut and attached to the plywood backing.

## Photos Demonstrating Collection of Wastewater Sampling in Nogales, Sonora



Photo 4: This show the modified autosampler installation in the manhole. The autosampler is covered in a garbage bag to prevent damage from humidity. The sample bottle is suspended from the plywood backing.



Photo 5: Over time, fatigue associated with the intake tubing resulted in samples being missed. In this photo, OOMAPAS-NS is using duct tape to compensate for tubing fatigue. An ISCO GLS compact autosampler would resolve this issue.



Photo 6: This shows the extraction of the autosampler after a 24-hour composite. Samples are typically composited at a rate of 100 ml every 20 minutes. As per the sample plan, the composited sample will be tested for pH. If necessary, additional acid will be added to the sample to bring its pH down to 2. OOMAPAS-NS will also collect a grab sample for field parameter testing.

## Photos Demonstrating Collection of Wastewater Sampling in Nogales, Sonora



Photo 7: This is the site associated with El Tecnológico Wash. As a result of a faulty sensor, the modified Sigma autosampler would not calibrate for collection of a 100 ml sample. OOMAPAS-NS replaced the Sigma with one of its two compact autosamplers. OOMAPAS-NS operates its entire oversight monitoring program with only two compact autosamplers.

Additional rehabilitated autosamplers were provided to OOMAPAS-NS by the City of Phoenix, but were too large to work with the smaller manholes in Nogales. As such, they are currently on loan to colleagues supporting the Agua Prieta Municipal Pretreatment Program in Sonora. Agua Prieta is located just south of Douglas, Arizona.



Photo 8: Since OOMAPAS-NS is not using an original equipment battery pack, the sampler housing will not close properly. The autosampler is sealed with duct-tape to protect its CPU from damage caused by humidity.



Photo 9: This is the OOMAPAS-NS water quality laboratory. This facility was constructed to house a flame atomic absorption spectrophotometer shown under the L-shaped metal vent. This unit was purchased through an EPA Border 2012 grant. OOMAPAS-NS more than doubled EPA's investment through the construction of the water quality laboratory.

Attachment D

ADEQ Engagement of Sonoran Stakeholders in Support of the AMC Action Item

## ADEQ Engagement of Sonora Stakeholders in Support of the AMC Action Item

November 2009 – December 2010

Date	Entity	Forum	Scope
11/25/2009	Association of Environmental Safety Engineers (APSA)	Monthly Meeting	Regulated community briefed on wastewater quality challenges.
12/4/2009	Arizona-Mexico Commission (AMC)	December Plenary	Action item on source characterization and mitigation of metals in wastewater is developed.
2/10/2010	Nogales, Sonora Public Works Department (OOMAPAS-NS)	Interagency Meeting	Briefing on AMC action item.
2/10/2010	APSA	Monthly Meeting	Regulated community engaged on action item and asked for assistance with source characterization.
3/3/2010	Association of Maquiladoras of Sonora (AMS)	Board of Directors	Plant managers briefed on wastewater quality challenges and goals of AMC action item.
4/30/2010	OOMAPAS-NS	Interagency Meeting	Progress report on AMC action item is prepared.
6/10/2010	City of Phoenix Pollution Control Division	Interagency Meeting	Summarized equipment limitation of the Nogales, Sonora Pretreatment Program.
6/25/2010	State of Sonora Water Commission (CEA)	Interagency Meeting	CEA requested progress report on AMC action item and offers support as needed.
6/30/2010	OOMAPAS-NS	Interagency Meeting	Updated progress report on AMC action item, and compiled list of equipment needs for pretreatment monitoring.
6/30/2010	APSA	Monthly Meeting	Regulated community updated on AMC action item progress.
8/18/2010	OOMAPAS-NS	Interagency Meeting	Discussed source characterization and regulatory actions.
9/23/2010	APSA	Annual Meeting	Regulated community briefed on wastewater quality challenges and progress related to AMC action item.
12/10/2010	AMS	Board of Directors	Plant managers briefed on progress associated with AMC action item.