REGIONAL WATER QUALITY NEWSLETTER

DATE: Report for December 2009
Sampling conducted December 8, 2009
A Phoenix, Tempe, Glendale, Peoria, CAP, SRP – ASU Regional Water Quality Partnership

http://enpub.fulton.asu.edu/pwest/tasteandodor.htm

DISTRIBUTION: Ronald.Feathers@chandleraz.gov; ACTarvers@FTMCDOWELL.ORG; mary.reker@phoenix.gov; knghiem@csaei.com; Kandis.Knight@asu.edu; gary_moore@tempe.gov; sandra_dewittie@tempe.gov; kspooner@citlink.net; bardizzone@carollo.com; wtrask@mwdh2o.com; jnafsey@mwdh2o.com; JJWilliams@GLENDALEAZ.com; raghunatha.komaragiri@phoenix.gov; mxerxis@scottsdaleaz.gov; mnguyen@ndep.nv.gov; RussellGRhodes@MissouriState.edu; paul.kinshella@phoenix.gov; brian.fayle@phoenix.gov; paul.zelenka@phoenix.gov; patricia.puryear@phoenix.gov; Wontae.Lee@hdrinc.com; kjacobs@ag.arizona.edu; k.kruger@asu.edu; addotson@gmail.com; Hye.Moon@asu.edu; Pedram.Shafieian@asu.edu; Daisuke.Minakata@asu.edu; Billt@gilbert.az.us; Braden.Allenby@asu.edu; Rittmann@asu.edu; Jeffrey.Stuck@amwater.com; nina.miller@amwater.com; wayne.janis@asu.edu; jim.holway@asu.edu; gober@asu.edu; rscott@glendaleaz.com; safischer@fs.fed.us; aimee.conroy@phoenix.gov; alan.martindale@cityofmesa.org; allison.shepherd@phoenix.gov; AGhosh@PIRNIE.COM; antoniot@ci.gilbert.az.us; arrw716@earthlink.net; awirtz@fs.fed.us; bakerenv@earthlink.net; bardizzone@carollo.com; bhenning@cap-az.com; btalabi@scottsdaleaz.gov; bkmoorhe@srpnet.com; BobCarlson@scwater.com; bonnie.smith@phoenix.gov; Bradley_fuller@tempe.gov; brian.fayle@phoenix.gov; brian.k.watson@phoenix.gov; carl.meyer@phoenix.gov; carlos.padilla@phoenix.gov; cseidel@dswa.net; chennemann@carollo.com; chris.rounseville@phoenix.gov; christenson.kara@epa.gov; cwilson@scottsdaleaz.gov; D'Ann.O'Bannon@phoenix.gov; diwanski@goodyearaz.gov; davev@peoriaaz.com; dempster@asu.edu; dlopez@fs.fed.us; dorothyo@peoriaaz.com; drcrosby@cap-az.com; dwalker@Ag.arizona.edu; dxprigge@srpnet.com; edna.bienz@phoenix.gov; erin.pysell@phoenix.gov; mario_esparza_soto@hotmail.com; francisco.gonzalez@phoenix.gov; frank.blanco@phoenix.gov; gjloomis@fs.fed.us; GMaseeh@PIRNIE.COM; Gregg.Elliott@srpnet.com; goelliot@srpnet.com; grant_osburn@tempe.gov; Greg.Ramon@Phoenix.Gov; gtday@amwater.com; GThelin@carollo.com; guy.carpenter@hdrinc.com; huqiang@asu.edu; jdoller@carollo.com; jeffrey.van.hoy@phoenix.gov; jennifer.calles@phoenix.gov; jjwilliams@glendaleaz.com; JohnRK@PeoriaAz.Com; josh_berdeaux@msn.com; kremmel@ci.glendale.az.us; laxman.devkota@phoenix.gov; Linda.Bezy-Botma@peoriaaz.gov; lroberts@buckeyeaz.gov; luis.manriquez@phoenix.gov; Marisa.Masles@asu.edu; mark.roye@phoenix.gov; matthew.rexing@cityofmesa.org; maureen.hymel@phoenix.gov; mdehaan@dswa.net; Mdew1@mail.ci.tucson.az.us; mhelton@scottsdaleaz.gov; Michael_Bershad@tempe.gov; Milton.Sommerfeld@asu.edu; MURPHYSP@wattsind.com; nicholas.silides@cityofmesa.org; nicoleta.buliga@phoenix.gov; ANUNEZ@SCOTTSDALEAZ.GOV; paul.burchfield@phoenix.gov; paulwestcott@appliedbiochemists.com; pdent@cap-az.com; pfenner@fs.fed.us; Randy.Gottler@phoenix.gov; raymond.schultz@phoenix.gov; robert.hollander@phoenix.gov; robert_eck@ci.mesa.az.us; ron.jennings@phoenix.gov; rsgooch@srpnet.com; rscott@glendaleaz.com; rcarpenter@glendaleaz.com; sgrendahl@SCOTTSDALEAZ.GOV; shan.miller@phoenix.gov; sherman_mccutcheon@tempe.gov; SRot@ci.glendale.az.us; srottas@cap-az.com; sacquafredda@dswa.net; steven.schoen@phoenix.gov; susan.potter@phoenix.gov; tara_ford@tempe.gov; terrance.piekarz@phoenix.gov; tgillogly@carollo.com; THockett@GLENDALEAZ.com; thomas.martin@phoenix.gov; thomasdempster@hotmail.com; tjeffer1@ci.tucson.az.us; tkacerek@cap-az.com; tom.doyle@phoenix.gov; Tom_Hartman@tempe.gov; troy.hayes@phoenix.gov; vlee@carollo.com; waerma@bv.com; walid.alsmadi@phoenix.gov; warrens@sgm-inc.com; wes.taylor@phoenix.gov; wtaylor@mwdh2o.com; William.Hughes@cityofmesa.org; swilson@scottsdaleaz.gov; Youngll.Kim@asu.edu; yu.chu.hsu@phoenix.gov; LindaW@PeoriaAz.Com; Yongsheng.Chen@asu.edu; keli@asu.edu; jcritt@asu.edu; uiyer@glendaleaz.com; Michael.Helton@amwater.com; Kim.Caggiano@cityofmesa.org; Keith.Greenberg@amwater.com; harry.brown@AMwater.com; mnguyen@ndep.nv.gov; bzachman@dswa.net; hdurbin@dswa.net;paul.zelenka@phoenix.gov; agrochowski@cap-az.com; bradley_fuller@tempe.gov; JBryck@PIRNIE.COM; Susanne.Neuer@asu.edu; Mohan.Seetharam@asu.edu; Chao-An.Chiu@asu.edu; susan.michael@peoriaaz.gov; tammy.perkins@phoenix.gov; ZChowdhury@PIRNIE.COM; Shari.Lange@phoenix.gov; nmegonnell@calgoncarbon-us.com; Cynthia.Bain@peoriaaz.gov; Ryan.Rhoades@CH2M.com; jim.kudlinski@srpnet.com; Gambatese.Jason@epamail.epa.gov; charolotte.jones@phoenix.gov; Graham.Symmonds@gwresources.com; scott.lee@gwresources.com; dswilliams@dswa.net; kowolf@srpnet.com; allison.shepherd@phoenix.gov; grant_osburn@tempe.gov; michael_bershad@tempe.gov; thomas.martin@phoenix.gov; carl.meyer@phoenix.gov; ben.hill@phoenix.gov; Ray.Schultz@phoenix.gov; *mdhubble@srpnet.com;* paul.zelenka@phoenix.gov; tom.doyle@phoenix.gov; bradley_fuller@tempe.gov; RScott@GLENDALEAZ.com; chris.rounseville@phoenix.gov; Norman_Clark@tempe.gov; Stephen.Bontrager@peoriaaz.gov; steve.lutringer@amwater.com; kmckinne@amwater.com; anupa.jain@chandleraz.gov; chris.kincaid@chandleraz.gov; jackie.strong@chandleraz.gov; larry.duffy@chandleraz.gov; lori.mccallum@chandleraz.gov; nancy.milan@chandleraz.gov; robert.goff@chandleraz.gov; victoria.sharp@chandleraz.gov; wendy.chambers@chandleraz.gov; wes.cannon@chandleraz.gov; JJWilliams@GLENDALEAZ.com; mgross@carollo.com; JYoung@mail.maricopa.gov; kim.eberenz@gwresources.com; CHe@carollo.com; PChao@carollo.com; Tom.Sands@srpnet.com; jamohler@asu.edu; John.Woolschlager@asu.edu; Craig_Caggiano@tempe.gov; kobrickjd@cdm.com; Calkins.John@azdeq.gov; ekaupanger@mail.maricopa.gov; CMeyer@carollo.com; AnnDenise.Taylor@SRPMIC-nsn.gov; greg.robinson@phoenix.gov; lsjohnso@srpnet.com; ; gnbrusse@srpnet.com; Pierre.Herckes@asu.edu; Rolf.Halden@asu.edu; ptarran@asu.edu; aramarui@dswa.net; macler.bruce@epa.gov; Amy.Miguel@srpmic-nsn.gov; meyerdw@bv.com; greg.ramon@phoenix.gov; yuchu.hsu@phoenix.gov; rwyatt@glendaleaz.com; pete@kroopnick.com; brooke.mayer@asu.edu; tony.mardam@hdrinc.com; Philip_Brown@Tempe.gov; paul.mally@amwater.com; michael.kennedy@mesaaz.gov; terri.baack@phoenix.gov; landrews@glendaleaz.com; cynthia.seelhammer@phoenix.gov; catherine.webster@phoenix.gov; mshapiro@cap-az.com; jperkins@scottsdaleaz.gov; melinda.jacobson@phoenix.gov

SUMMARY: EVALUATION AND RECOMMENDATIONS

1. MIB plus geosmin levels above 10 ng/L in finished water lead to noticeable earthy-musty odors by customers. Currently MIB+geosmin levels are below 10 ng/L. Lake Pleasant and CAP water have roughly 2 to 6 ng/L of MIB+Geosmin.
2. Dissolved organic carbon (DOC) concentrations in the reservoirs are ~ 3 mg/L (Lake Pleasant and Bartlett) and slightly higher 4.75 mg/L in the Salt River (Saguaro Lake)
3. EPA is taking a hard look at regulating perchlore (ClO_4^-). Perchlorate is present in CAP water at 2 to 8 µg/L. However, perchlorate can also form in hypochlorite solutions. Basically – if you store hypochlorite at warm temperatures for extended periods you could be forming levels of perchlorate that might exceed future regulatory limits. Most people don't store hypochlorite solutions for weeks – but if the solutions are warm (which they may become in Arizona summer heat – then be careful.
4. New reports and news on EDC/PPCPs are out:
   - http://pubs.usgs.gov/sir/2009/5200/ for characterizing the occurrence of anthropogenic organics in source water (groundwater) and the associated finished water
   - Washington Post ran a decent story in their Tuesday Health Section on drug disposal:
   - http://www.washingtonpost.com/wp-dyn/content/article/2009/12/04/AR2009120403823.html
   - Plastic containers are also in the news: plastics containers out of the kitchen!
   - http://www.nytimes.com/2009/12/06/opinion/06kristof.html?_r=1&em
5. Lake Mead and Colorado River (CAP Source): environmental group said it filed the petition in an attempt to limit the amount of toxins and potentially harmful chemicals released into the wash, and subsequently the lake, via area waste water treatment plants.

Table 1a Summary of WTP Operations December 8, 2009

	Verde WTP	Union Hills	24th Street WTP	N.Tempe J.G. Martinez	Deer Valley	Glendale Cholla WTP [3]	Peoria Greenway WTP	Val Vista	South Tempe
	Verde River	CAP Canal	Arizona Canal					South Canal	
PAC Type and Dose			Calgon WPH, 15 ppm	MWV Aqua Nuchar 15 ppm	None	None			
Copper Sulfate			Stopped in mid-Nov		None	None			
PreOxidation			None		None	None			
Alum Dose Alkalinity pH			50 ppm 159/128 6.8-7.0	42 ppm 164 7.3	48 ppm 161/133 6.9	20 ppm 148 6.75			
Finished water DOC DOC removal[2]		2.2 mg/L 21%	1.75 mg/L 52%	2.4 mg/L 29%	2.6 mg/L 29%	2.5 mg/L 30%	2.3 m/L 28%		
Average turbidity over last 7 days			2-4 NTU	~ 3 NTU	3-6 NTU	2.4 NTU		Offi-line Until Dec 22	
Notes from operators									
Recommendations	Deer Valley and 24th Street WTPs had very similar water quality and coagulation, yet 24th Street used PAC and achieved better DOC control.								

[1] Ferric chloride instead of alum; plus ppm sulfuric acid

[2] Calculated based upon influent and filtered water DOC (note that DOC and not TOC is used in this calculation)

[3] Sample from finished water includes a blend of surface and ground water sources sometimes

JGM will be shutting down for it's annual maintenance shutdown as of January 6, 2010 and will startup on April 1, 2010. **Chandler WTP: currently offline for SRP canal dry-up**

Table 1b - SRP/CAP OPERATIONS - Values in cfs, for December 8, 2009

System	SRP Diversions	CAP
Arizona Canal	287	0
South Canal	0	0
Pumping	81	0
Total	368	0

- **SRP is releasing water from both Verde and Salt River Systems**. Salt River release from Saguaro Lake: 156 cfs; Verde River release from Bartlett Lake: 100 cfs.

Taste and Odor Data

Table 2 - Water Treatment Plants – December 7, 2009

Sample Description	MIB (ng/L)	Geosmin (ng/L)	Cyclocitral (ng/L)
24th Street WTP Inlet	2.6	5.4	<2.0
24th Street WTP Treated	<2.0	2.2	<2.0
Deer Valley Inlet	2.3	3.9	<2.0
Deer Valley WTP Treated	2.2	4.0	<2.0
Val Vista Inlet			
Val Vista WTP Treated –East			
Val Vista WTP Treated -West			
Union Hills Inlet	2.9	2.7	<2.0
Union Hills Treated	2.6	3.1	<2.0
Tempe North Inlet	2.6	4.2	3.3
Tempe North Plant Treated	<2.0	3.2	6.7
Tempe South WTP			
Tempe South Plant Treated			
Greenway WTP Inlet	<2.0	2.9	<2.0
Greenway WTP Treated	<2.0	3.2	<2.0
Glendale WTP Inlet	2.0	4.1	4.4
Glendale WTP Treated	<2.0	<2.0	<2.0
Glendale WTP Treated (Lab)			

MIB plus geosmin levels above 10 ng/L in finished water lead to noticeable earthy-musty odors by customers. Currently MIB+geosmin levels are below 10 ng/L.

Table 3 - Canal Sampling – December 7, 2009

System	Sample Description	MIB (ng/L)	Geosmin (ng/L)	Cyclocitral (ng/L)
CAP	Waddell Canal	**2.5**	**2.7**	**<2.0**
	Union Hills Inlet	**2.9**	**2.7**	**<2.0**
	CAP Canal at Cross-connect			
	Salt River @ Blue Pt Bridge			
	Verde River @ Beeline			
AZ	AZ Canal above CAP Cross-connect	**2.5**	**4.8**	**<2.0**
Canal	AZ Canal below CAP Cross-connect	**2.4**	**5.5**	**<2.0**
	AZ Canal at Highway 87	**2.6**	**4.7**	**<2.0**
	AZ Canal at Pima Rd.	**3.2**	**6.5**	**<2.0**
	AZ Canal at 56th St.	**<2.0**	**4.8**	**<2.0**
	AZ Canal - Inlet to 24th Street WTP	**2.6**	**5.4**	**<2.0**
	AZ Canal - Central Avenue	**2.3**	**4.0**	**2.8**
	AZ Canal - Inlet to Deer Valley WTP	**2.3**	**3.9**	**<2.0**
	AZ Canal - Inlet to Glendale WTP	**2.0**	**4.1**	**4.4**

Table 4 - Reservoir Samples – December 8, 2009

Sample Description	Location	MIB (ng/L)	Geosmin (ng/L)	Cyclocitral (ng/L)
Lake Pleasant (Nov09)	Eplimnion	**6.6**	**<2.0**	**<2.0**
Lake Pleasant (Nov09)	Hypolimnion	**5.9**	**<2.0**	**<2.0**
Lake Pleasant (8Dec09)	Epi-near dock	**6.5**	**<2.0**	**<2.0**
Verde River @ Beeline				
Bartlett Reservoir	Epilimnion			
Bartlett Reservoir	Epi-near dock	**<2.0**	**<2.0**	**<2.0**
Bartlett Reservoir	Hypolimnion			
Salt River @ BluePt Bridge				
Saguaro Lake	Epilimnion			
Saguaro Lake	Epi - Duplicate			
Saguaro Lake	Epi-near dock	**3.0**	**2.4**	**<2.0**
Saguaro Lake	Hypolimnion			
Lake Havasu		**3.6**	**3.0**	**<2.0**
Verde River at Tangle Creek (Oct09)		**17.8**	**6.5**	**<2.0**

Organic Matter in Water Treatment Plants

Table 2 - Water Treatment Plants – December 08, 2009

Sample Description	DOC (mg/L)	UV254 (1/cm)	SUVA (L/mg-m)	TDN		DOC removal (%)
24th Street WTP Inlet	**3.63**	**0.083**	**2.28**	**0.67**		
24th Street WTP Treated	**1.75**	**0.022**	**1.23**	**0.38**		**52**
Deer Valley Inlet	**3.66**	**0.077**	**2.11**	**0.50**		
Deer Valley WTP Treated	**2.58**	**0.043**	**1.65**	**0.37**		**29**
Val Vista Inlet						
Val Vista WTP Treated –East						
Val Vista WTP Treated -West						
Union Hills Inlet	**2.79**	**0.040**	**1.42**	**0.57**		
Union Hills Treated	**2.19**	**0.218**	**9.95**	**0.44**		**21**
Tempe North Inlet	**3.40**	**0.074**	**2.17**	**0.41**		
Tempe North Plant Treated	**2.41**	**0.037**	**1.54**	**0.37**		**29**
Tempe South WTP						
Tempe South Plant Treated						
Greenway WTP Inlet	**3.15**	**0.067**	**2.13**	**1.55**		
Greenway WTP Treated	**2.28**	**0.029**	**1.28**	**2.94**		**28**
Glendale WTP Inlet	**3.56**	**0.077**	**2.16**	**0.42**		
Glendale WTP Treated	**2.48**	**0.042**	**1.68**	**0.44**		**30**

DOC = Dissolved organic carbon
UV254 = ultraviolet absorbance at 254 nm (an indicator of aromatic carbon content)
SUVA = UV254/DOC
TDN = Total dissolved nitrogen (mgN/L)

Sample Description	DOC (mg/L)	UV254 (1/cm)	SUVA (L/mg-m)	TDN
Waddell Canal	**2.71**	**0.040**	**1.46**	**0.57**
Union Hills Inlet	**2.79**	**0.040**	**1.42**	**0.57**
CAP Canal at Cross-connect				
Salt River @ Blue Pt Bridge				
Verde River @ Beeline				
AZ Canal above CAP Cross-connect	**3.40**	**0.072**	**2.12**	**0.48**
AZ Canal below CAP Cross-connect	**3.41**	**0.071**	**2.09**	**0.46**
AZ Canal at Highway 87	**3.50**	**0.075**	**2.15**	**0.41**
AZ Canal at Pima Rd.	**3.53**	**0.077**	**2.18**	**0.40**
AZ Canal at 56th St.	**3.58**	**0.079**	**2.21**	**0.69**
AZ Canal - Inlet to 24th Street WTP	**3.63**	**0.083**	**2.28**	**0.67**
AZ Canal - Central Avenue	**3.50**	**0.076**	**2.18**	**0.48**
AZ Canal - Inlet to Deer Valley WTP	**3.66**	**0.077**	**2.11**	**0.50**
AZ Canal - Inlet to Glendale WTP	**3.56**	**0.077**	**2.16**	**0.42**
AZ Canal - Inlet to Greenway WTP	**3.15**	**0.067**	**2.13**	**1.55**

Table 4 - Reservoir Samples – December 08, 2009

Sample Description	Location	DOC (mg/L)	UV254 (1/cm)	SUVA (L/mg-m)	TDN
Lake Pleasant	Eplimnion	**2.94**	**0.042**	**1.43**	**0.37**
Lake Pleasant	Hypolimnion	**3.00**	**0.042**	**1.41**	**0.37**
Verde River @ Beeline					
Bartlett Reservoir	Epilimnion	**3.06**	**0.067**	**2.18**	**0.40**
Bartlett Reservoir	Epi-near dock				
Bartlett Reservoir	Hypolimnion				
Salt River @ BluePt Bridge					
Saguaro Lake	Epilimnion	**4.74**	**0.095**	**2.00**	**0.45**
Saguaro Lake	Epi - Duplicate				
Saguaro Lake	Epi-near doc				
Saguaro Lake	Hypolimnion				
Verde River at Tangle					
Havasu		**2.55**	**0.040**	**1.58**	**0.50**

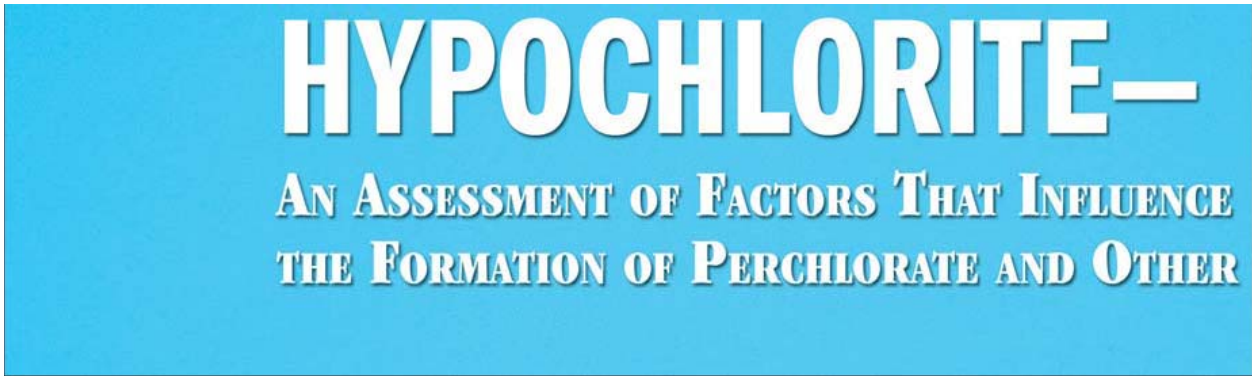
EPA is taking a hard look at regulating perchlore (ClO_4^-)

Perchlorate is present in CAP water at 2 to 8 µg/L. However, perchlorate can also form in hypochlorite solutions. **Basically – if you store hypochlorite at warm temperatures for extended periods you could be forming levels of perchlorate that might exceed future regulatory limits. Most people don't store hypochlorite solutions for weeks – but if the solutions are warm (which they may become in Arizona summer heat – then be careful**.

The report below is an excellent resource, which has the following primary research objectives designed to provide the data necessary to determine the mechanisms, and to develop a predictive model, for perchlorate formation in hypochlorite solutions:

1. Determine the analytical method(s) most appropriate for measurement of oxyhalide anions in bulk hypochlorite solutions, OSG solutions, and utility water samples.
2. Determine the impact of co-occurring oxyhalide anions on the formation of perchlorate.
3. Determine the impact of pH, ionic strength, transition metals, and temperature on perchlorate formation.
4. Determine the detailed chemical rate law to predict perchlorate formation in hypochlorite solutions. Additional secondary objectives were also developed to address concerns regarding operational considerations (i.e., hypochlorite sources, on-site generation, and other factors):
5. Compare perchlorate concentrations in bulk hypochlorite and different OSG systems, including those operated in mixed oxidant mode.
6. Determine the contribution of perchlorate in finished waters originating from hypochlorite addition.
7. Provide recommendations for water utilities to minimize the presence of perchlorate, bromate, chlorate, and chlorite in hypochlorite solutions.

http://www.awwa.org/files/GovtPublicAffairs/PDF/HypochloriteAssess.pdf



Snyder et al., 2009

$$\log(k_{calc}) = 0.0788(I) + \log(2.084\times10^{10}\times T\times e^{\frac{-1.01\times10^{5}}{RT}}\times e^{\frac{-106}{R}}) \qquad \textbf{(4.14)}$$

Thus, the predicted *rate* of perchlorate formation for any stepwise change in hypochlorite and chlorate ion concentrations can be calculated by a rearrangement of Equation 4.10 to yield Equation 4.15. By proxy, the concentration of perchlorate can also be calculated at any time point *provided the concentration of hypochlorite ion and chlorate ion can be predicted using Bleach 2001.*

$$Rate = \frac{dClO_4^-}{dt} = k_{calc} \times [OCl^-]^1 \times [ClO_3^-]^1 \qquad \textbf{(4.15)}$$

Using the "Predictive Model" shown in Equation 4.14, calculated rate constants (k_{calc}) for perchlorate formation at specific ionic strength and temperatures were compared to experimentally observed rate constants (k_{obs}) and are summarized in Table 4.5. The percent error was calculated by taking the difference between k_{calc} and k_{obs}, then dividing the difference by k_{obs} and multiplying by 100%. The average variability between observed and predicted rate constants is less than 20% across three temperatures (30 °C, 40 °C, and 50°C) and with ionic strength ranging from 1.8 mol/L to 6.9 mol/L.

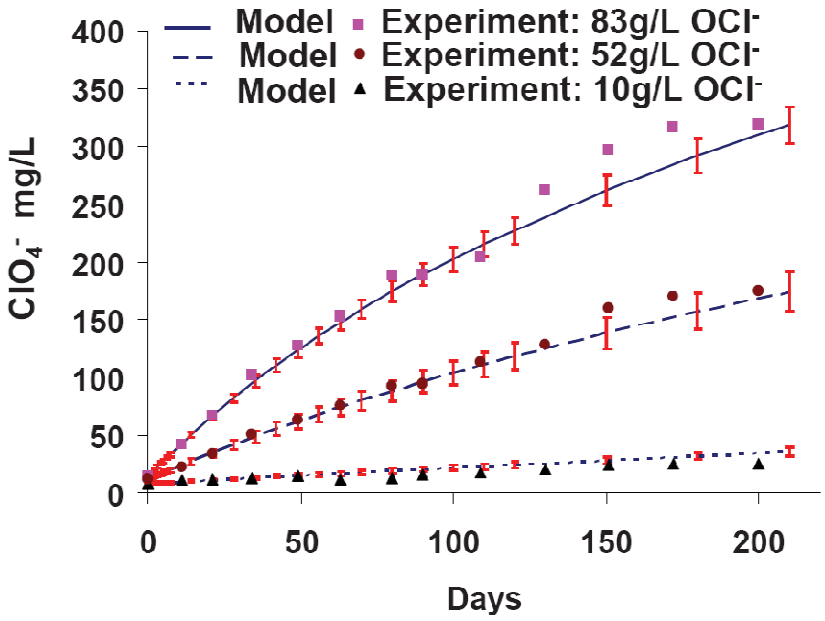


Figure 4.12 Overlaid plot of perchlorate formation experiment vs. predicted at 30 °C

Group seeks ‘imperiled’ status for Southern Nevada waterways

Tiffany Brown / File photo

A national conservation group is asking the Nevada Division of Environmental Protection to limit toxins and chemicals in Lake Mead and other Southern Nevada waterways.

By *Stephanie Tavares* (contact)

Monday, Nov. 16, 2009 | 1:27 p.m.

The Center for Biological Diversity has petitioned the Nevada Division of Environmental Protection to name the Las Vegas Wash, Las Vegas Bay and Lake Mead "imperiled waterways."

The environmental group said it filed the petition in an attempt to limit the amount of toxins and potentially harmful chemicals released into the wash, and subsequently the lake, via area waste water treatment plants.

The organization cites numerous environmental, water quality and wildlife studies completed in the past decade that show traceable or dangerously high levels of certain chemicals known or suspected to cause reproductive or other ailments in wildlife. Some of the chemicals could also harm humans, the petition states.

The Nevada Division of Environmental Protection is the state agency authorized by the U.S. Environmental Protection Agency to enforce and implement the requirements of the Clean Water Act.

The chemicals that the Center for Biological Diversity listed as being present in the wash, bay, lake or all three that could harm endangered wildlife or humans include several pesticides banned decades ago but which persist in the ecosystem, caffeine, byproducts of pharmaceuticals and nicotine, selenium, and byproducts of industrial paint, perfumes and household cleaners.

Although chemicals in the water might be at levels that are harmful to fish and birds, the Southern Nevada Water Authority says residents shouldn't lose sleep over their tap water that is drawn from the lake.

"We keep a very close eye on these things," said SNWA spokesman JC Davis."The short answer is no, we're not worried. That's not because we don't care about source water quality, but from a drinking water perspective we have some of the most advanced treatment processes in the world. We use ozone disinfectant in addition to filtration. One of the nice side effects is that ozone is extremely effective at destroying these types of compounds."

The Center for Biological Diversity is an Arizona-based national conservation group that aims to preserve critical habitat for endangered and threatened species.