Albuquerque Bernalillo County Water Utility Authority

Effects of Upstream Events/Sources on the Rio Grande (Alameda)

March 28, 2012

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1. Overview of the San Juan-Chama Drinking Water Project (SJCDWP)

2. Description of Water Authority Monitoring (including USGS)

3. Review of Data from USGS and Water Authority

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San Juan-Chama Drinking Water Project Overview

- 1963 Albuquerque contracted for annual rights for water from southern Colorado that would eventually into the Rio Grande via a series of pipelines, tunnels and reservoirs.
- 1990's Scientific studies showed that Albuquerque's aquifer was being "mined"… therefore proposed use of water for drinking.

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San Juan-Chama Drinking Water Project Overview (continued)

- 2008 SJCDWP Completed –
  Grand Opening in December 2008

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The San Juan-Chama Drinking Water Project

- An adjustable diversion dam and intake structure on the Rio Grande.

- Funding to preserve the endangered Rio Grande silvery minnow and habitat, and inclusion of fish screens and passages at the diversion site.

- Raw Water Pump Station on the Rio Grande.

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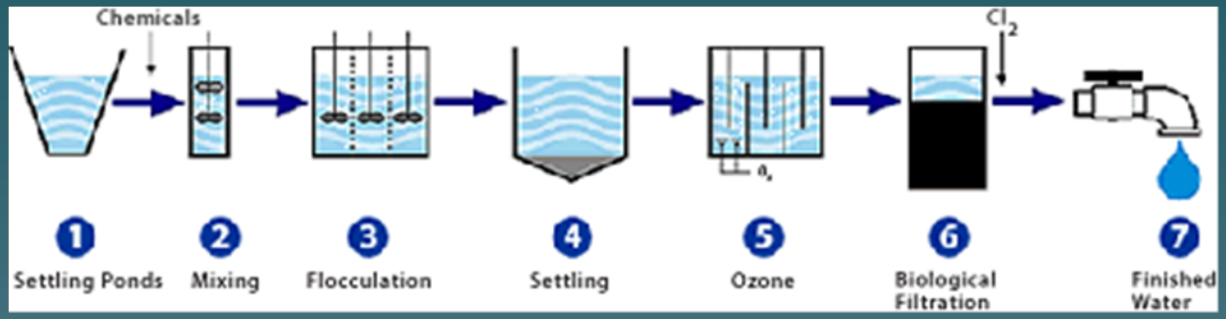
The San Juan-Chama Drinking Water Project (continued)

- Eight miles of raw water pipeline to transport water from the Raw Water Pump Station
- Water Treatment Plant and transmission lines
  - State of the art technology.
  - 90 MGD capacity.
  - Chemical + mechanical processes to remove sediment and other contaminants.



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Safe Drinking Water Act

- Maximum Contaminant Levels - focused on quality of finished drinking water.
- Treatment techniques require some monitoring of the source water. (e.g. *Cryptosporidium*, E. Coli, Total Organic Carbon)

Testing Events By Entity and Location			
Location		Monitoring Period	No. of Events
USGS - Rio Grande at Alameda		2004 - 2011	24
Source	Pilot	2007 - 2008	35
	SRC/INTKCT	2008 - 2011	6
Finished Water	Pilot	2007 - 2008	36
	EPTDS	2008 - 2011	33

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	Safe Drinking Water Act Required Monitoring	Water Authority Voluntary Monitoring
Location	**# of Substances**	
Source/Surface Water	4	> 400*
Entry Points (including WTP)	74	129
Distribution System	9	28
Total	**87**	**> 550**

* includes USGS monitoring of Rio Grande at Alameda Bridge

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USGS Monitoring –

- Determine seasonal, annual, and long-term variations in water quality of source water for City of Albuquerque surface-water diversion.
  - fall/winter baseflow (Nov through Feb)
  - snowmelt runoff (Mar through Jun)
  - irrigation/monsoon season (Jul through Oct)

Substances

major ions, trace elements

nutrients

organic carbon

dissolved solids

pH, specific conductance, dissolved oxygen, and temperature

radioisotopes

pesticides, poly-chlorinated biphenyls, volatile organic compounds, semi-volatile organic compounds

waste-water compounds

bacteria

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Review of Data from USGS and Water Authority

- Flow (Discharge)
- Turbidity
- Organic Carbon
- Radiological Parameters
- Organics
- Bacteriological

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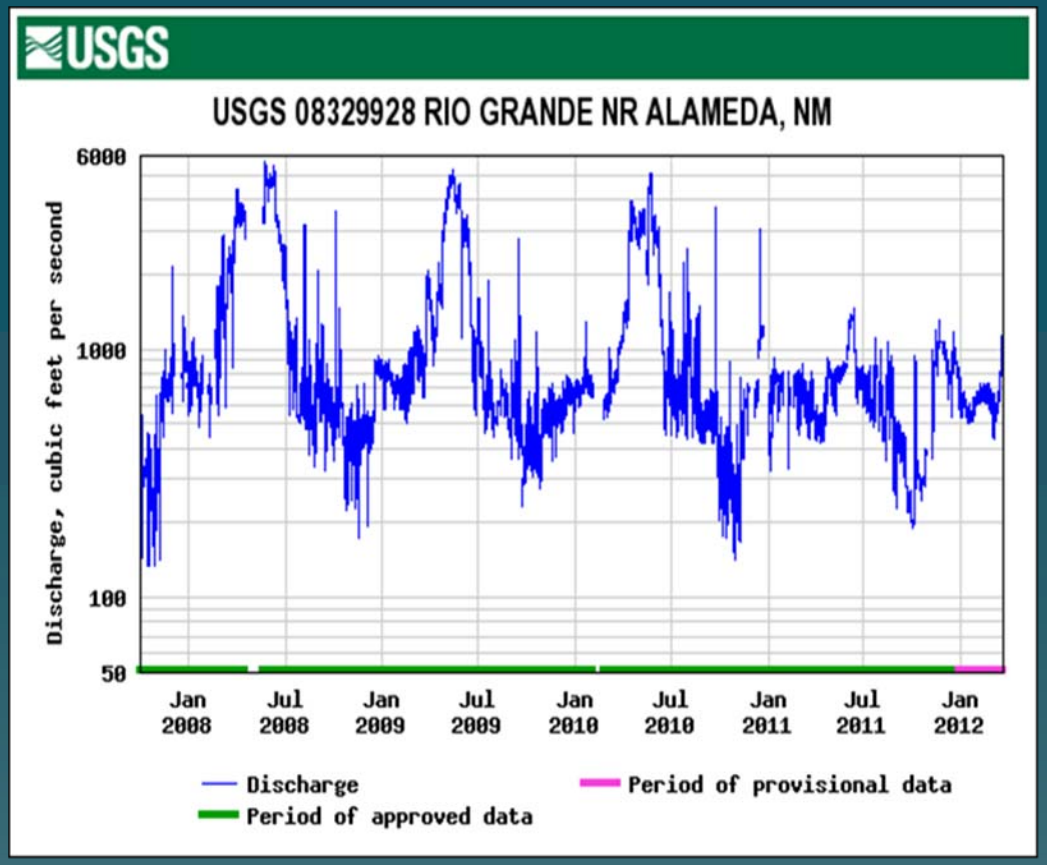
Effects on the Rio Grande at Alameda from Upstream Events/Sources

Flow (Discharge) in Rio Grande varies seasonally due to management and weather.

Changes in water quality typically noticed when stream flow fluctuates significantly



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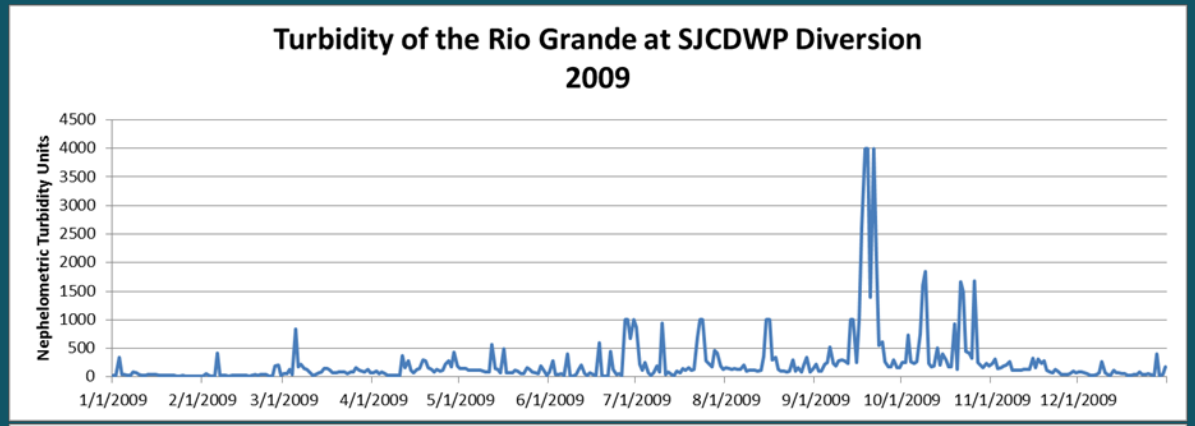

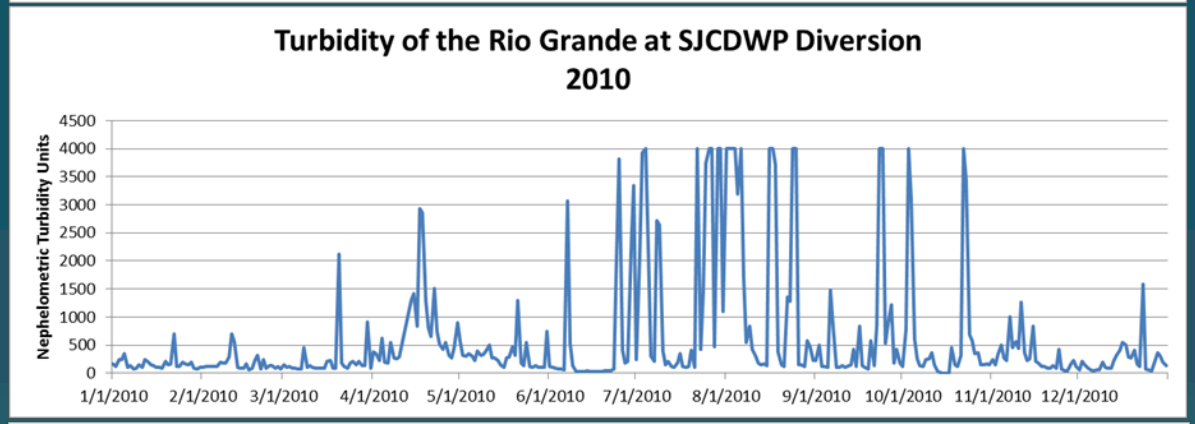

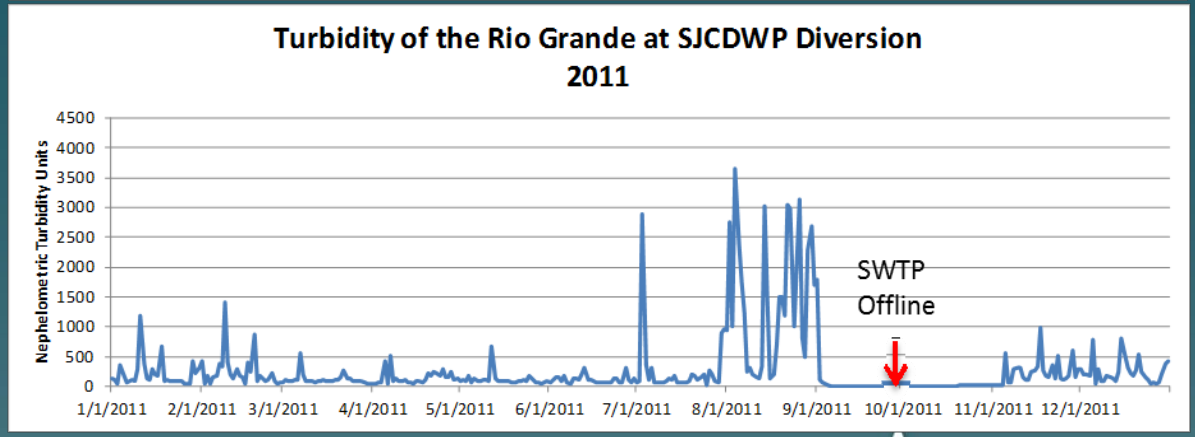

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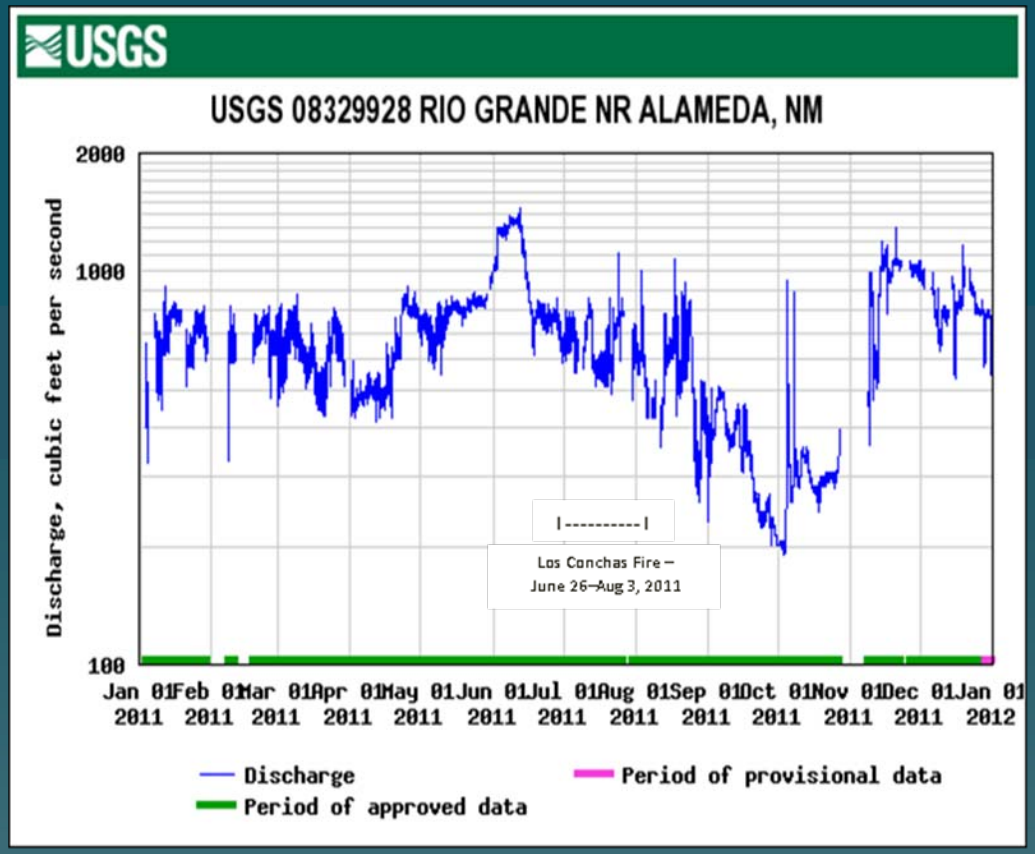
Effects on the Rio Grande at Alameda from Upstream Events/Sources

In 2011, stream flow of the Rio Grande at Alameda ranged between 200 to 1600 cubic feet per second (cfs).

Vary narrow range when compared with previous three years. E.g. 2008 – range was 150 to 6000 cfs.



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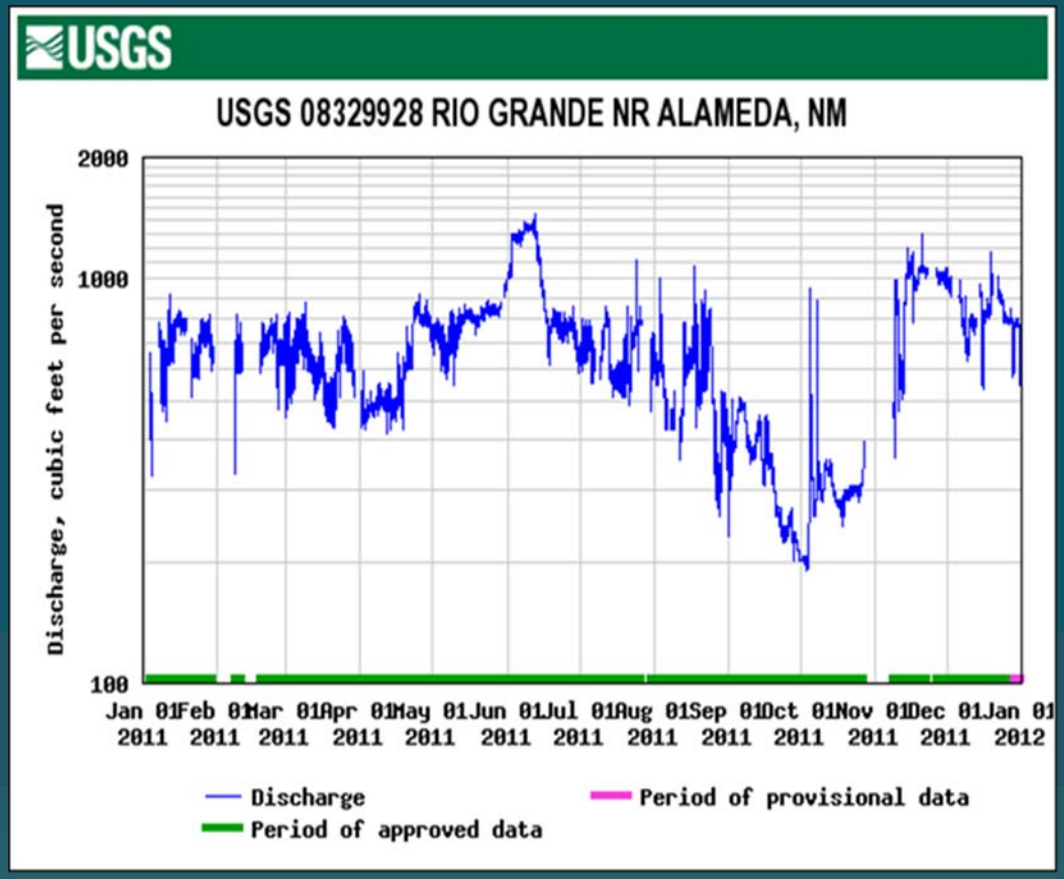
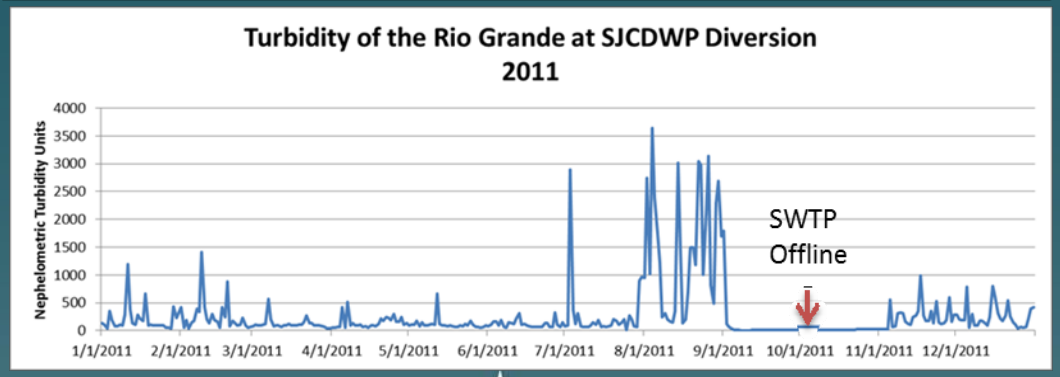
Turbidity compared to stream flow rate in 2011.

Turbidity increase tracks or lags increase in stream flow rate.





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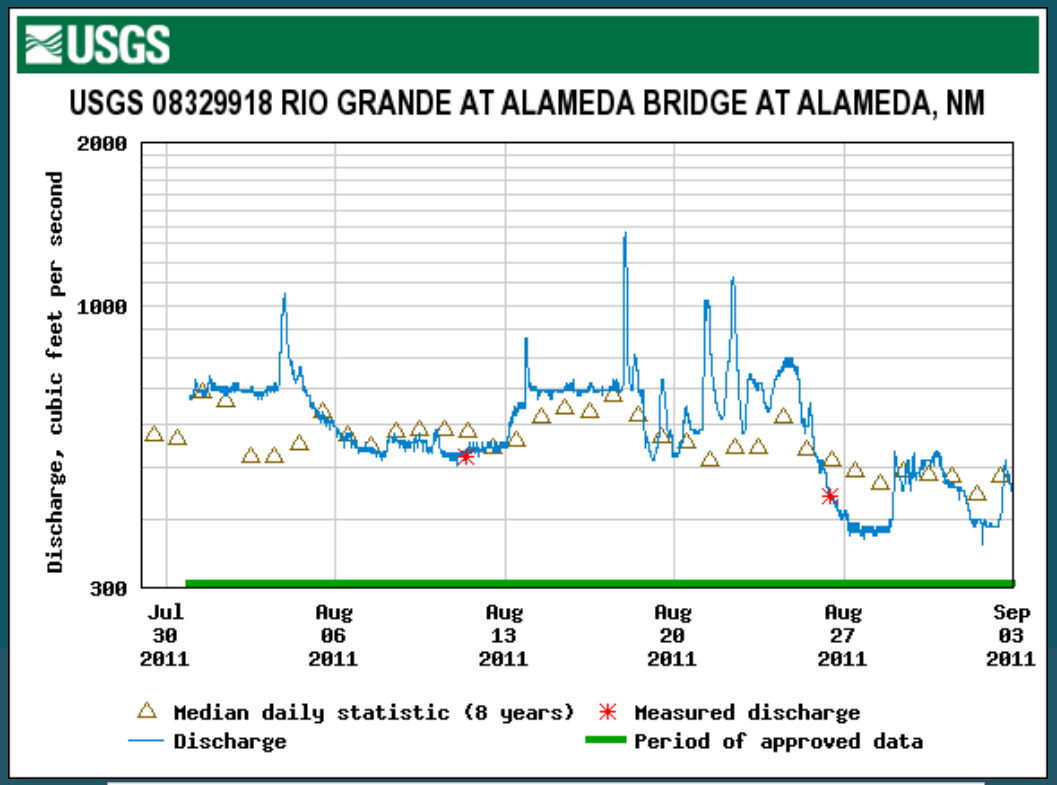
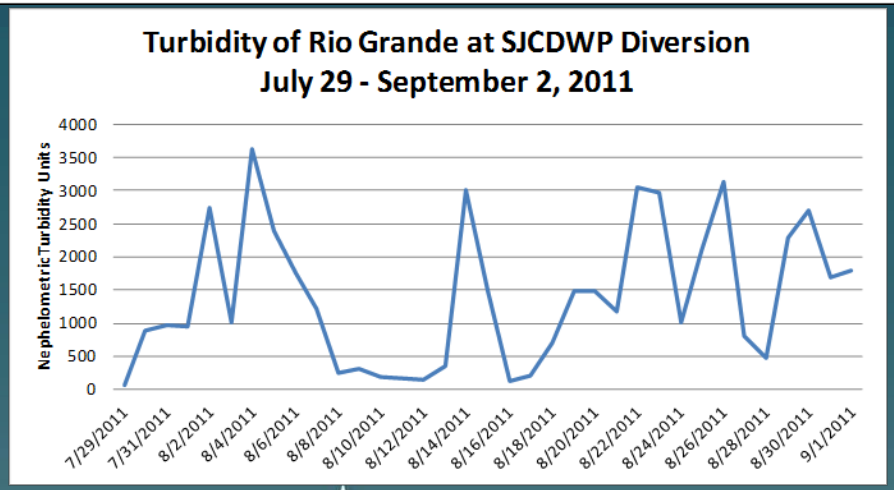
Turbidity compared with stream flow rate

July – September 2011





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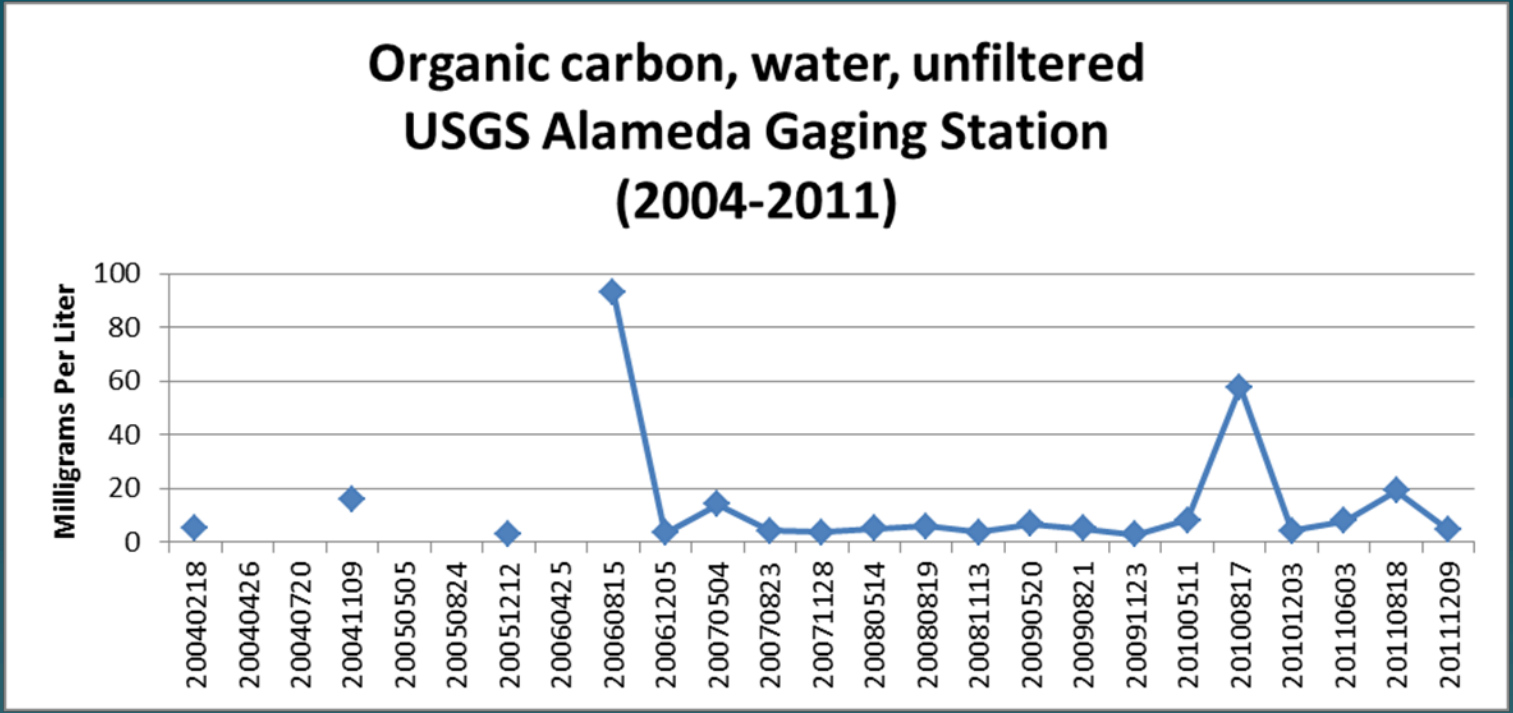

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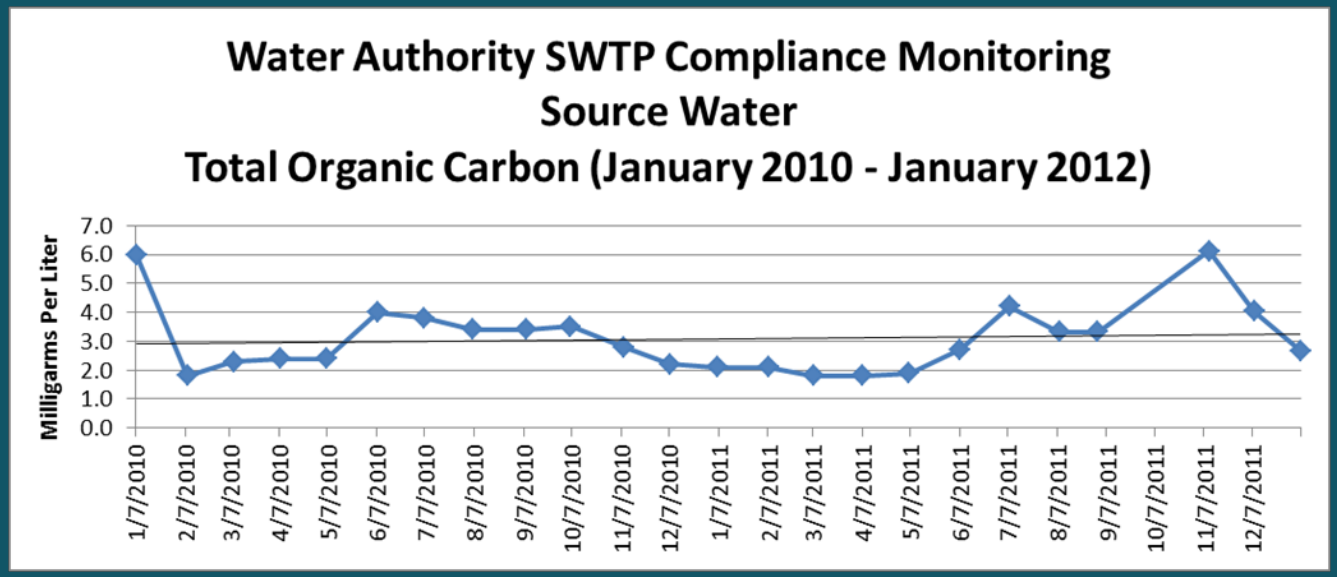

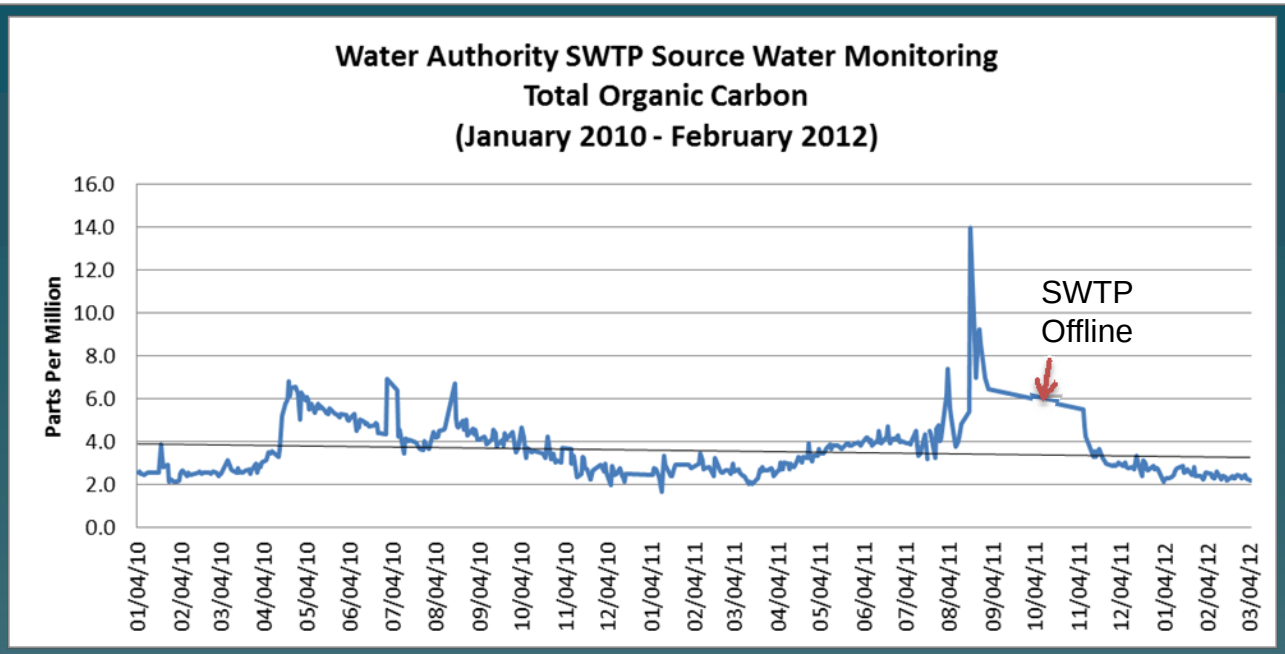

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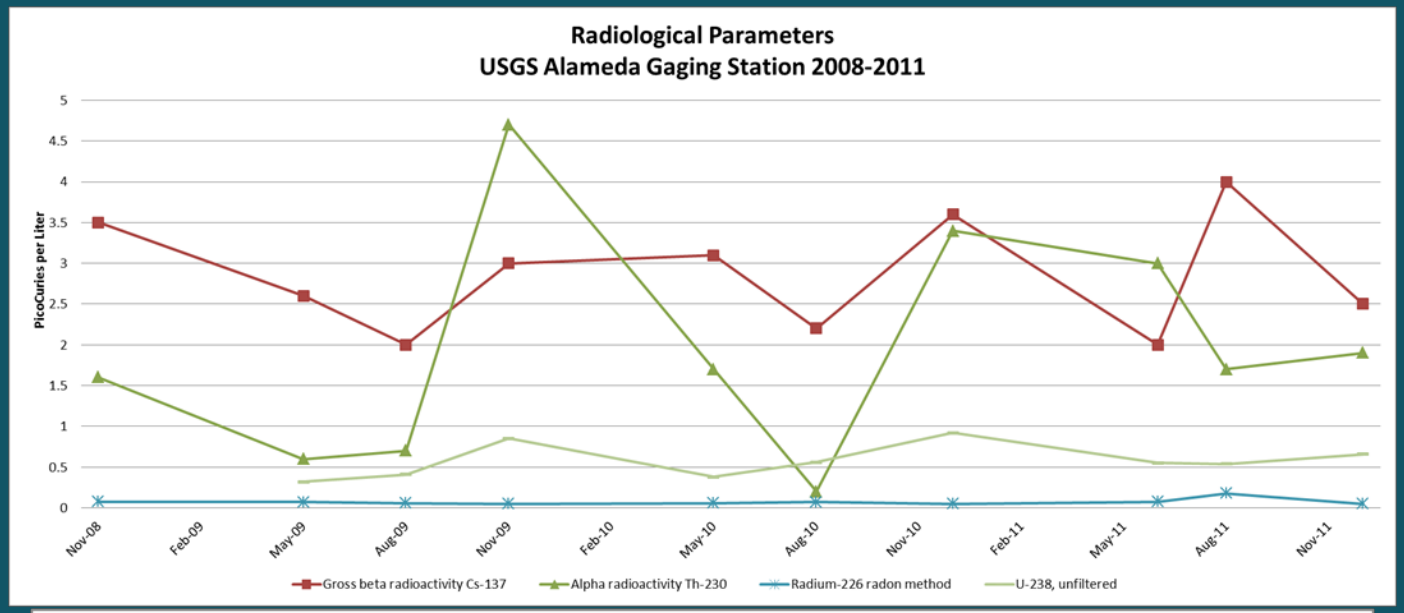
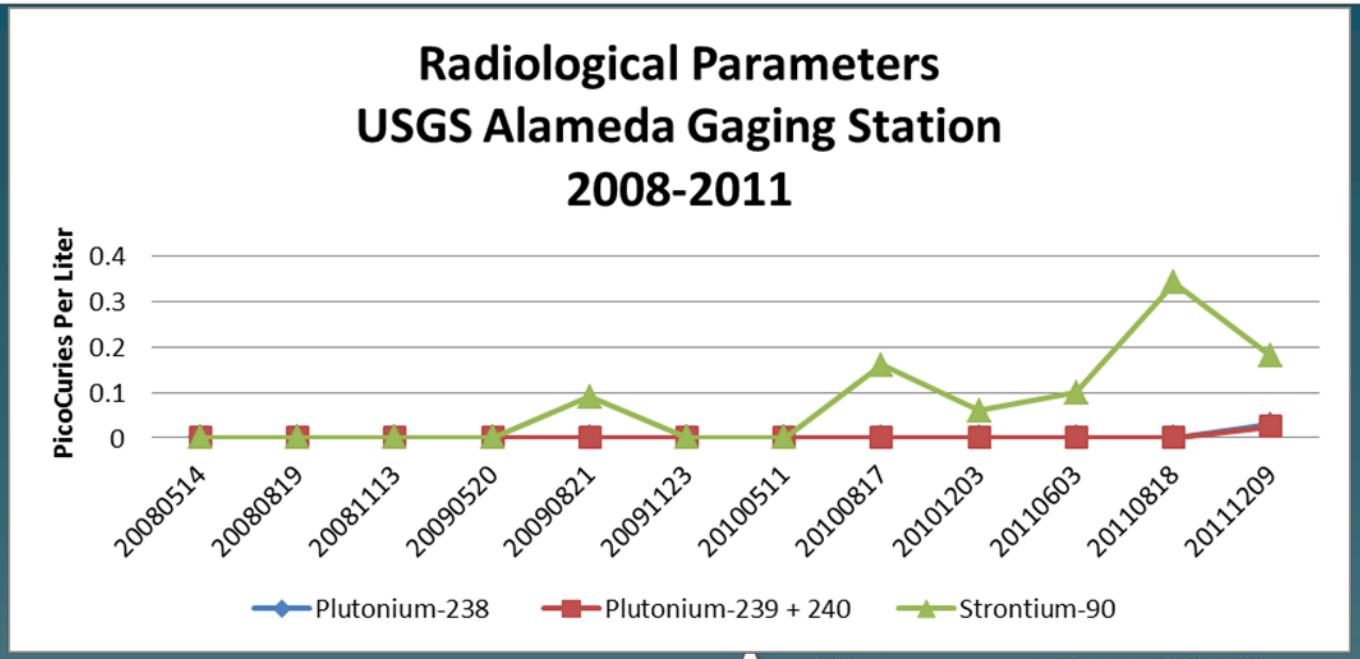
Fluctuations noted, however, levels below finished drinking water levels





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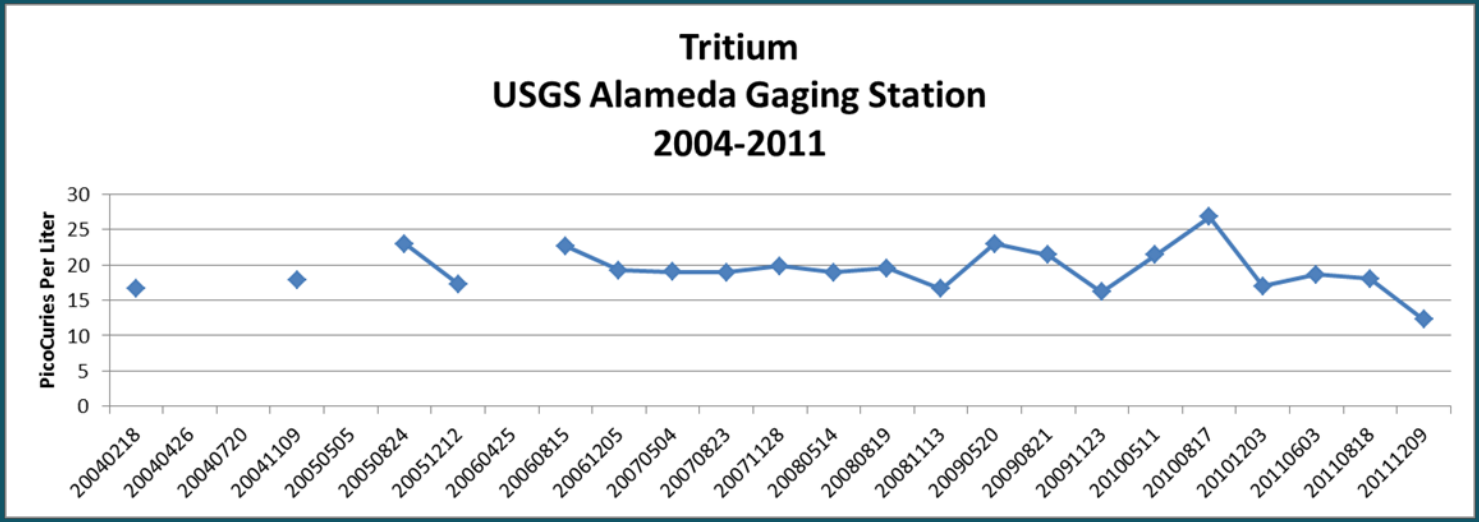

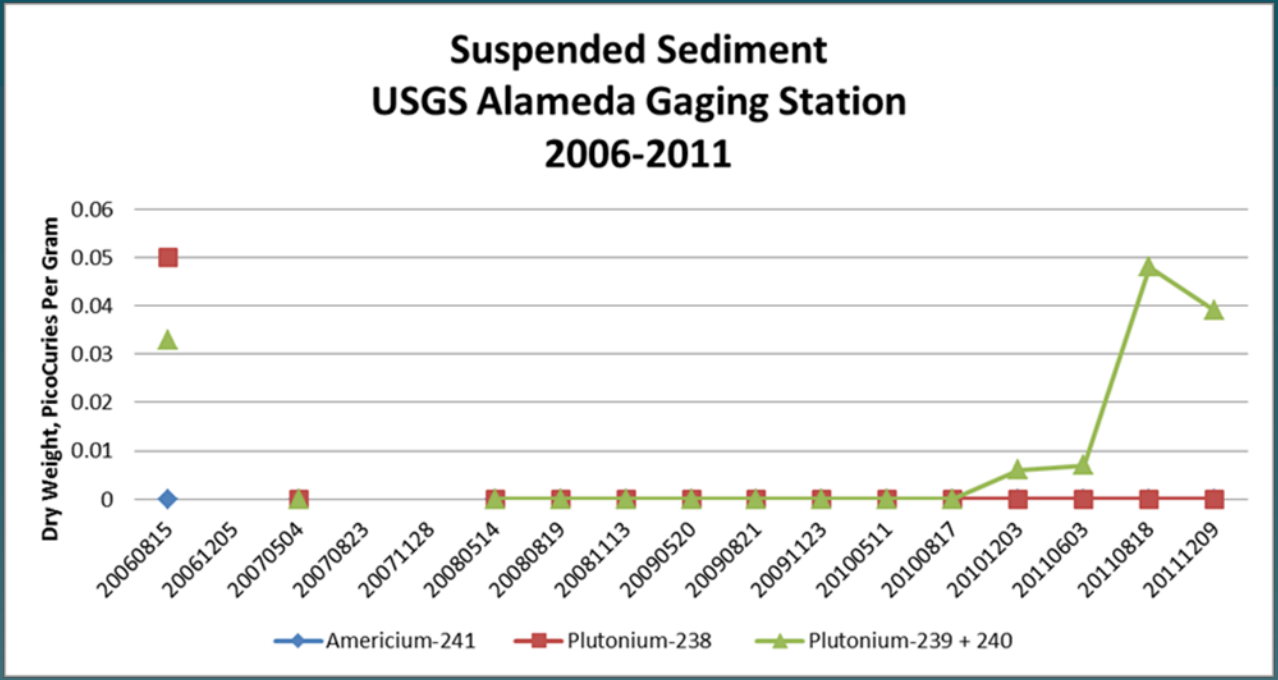

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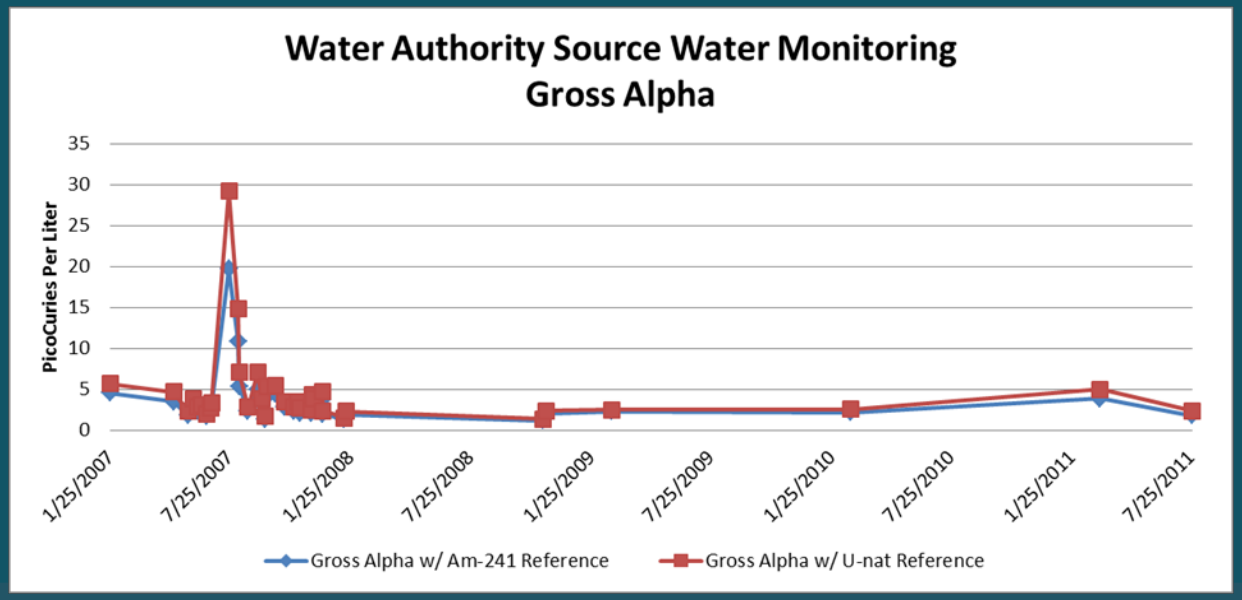
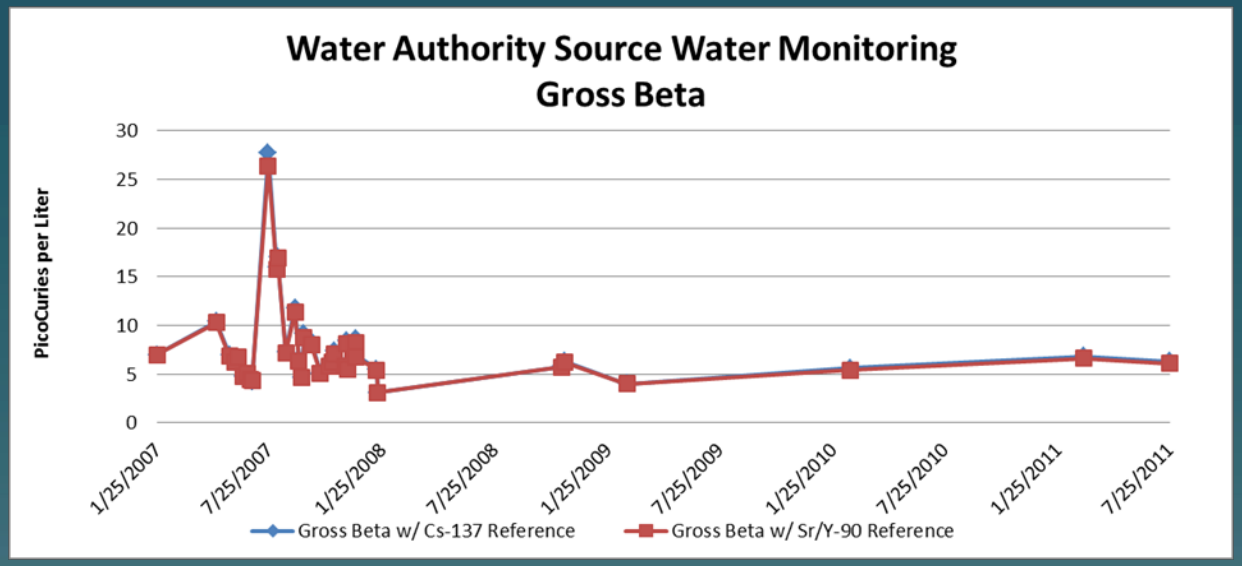
Results from Water Authority Pilot Study (2007-2008) and Monitoring (2008-2011)



Levels fluctuate, but still far below required finished water levels.

Gross Alpha – 15 pCi/L

Gross Beta – 50 pCi/L



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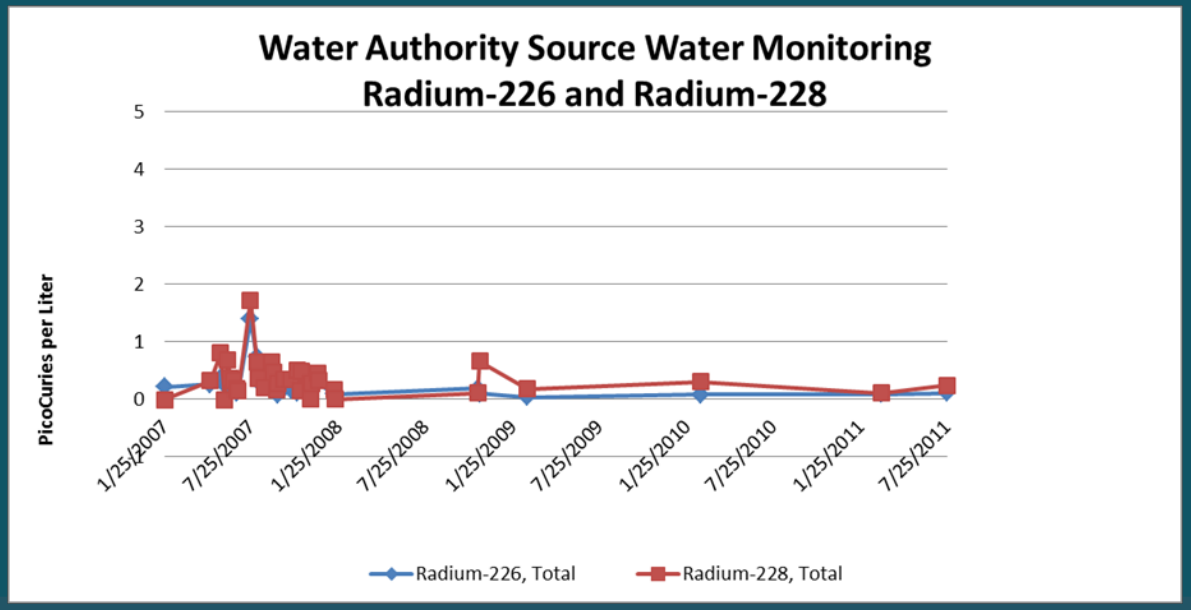
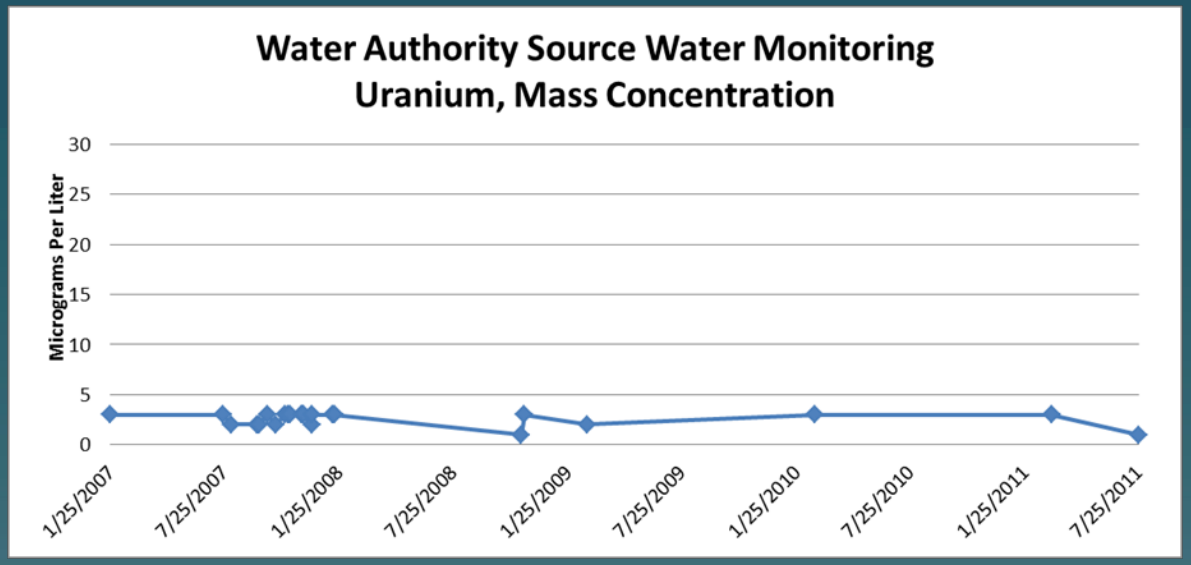
Radium-226 + Radium-228 – 5 pCi/L

Uranium – 30 µ/L





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ORGANICS - Majority were not detected

Following substances either detected just above detection level or estimated below detection level

Camphor	Benzo[a]pyrene	Fluoranthene
Carbazole	Benzo[b]fluoranthene	Hexahydrohexamethyl cyclopentabenzopyran
DEET	Benzo[ghi]perylene	Indeno[1,2,3-cd]pyrene
p-Cresol	Benzophenone	Indole
1-Methylnaphthalene	Benzyl n-butyl phthalate	Isophorone
2-Methylnaphthalene	beta-Sitosterol	Phenanthrene
3-Methyl-1H-indole	beta-Stigmastanol	Phenol
Caffeine	Pyrene	Cholesterol
Sulfamethoxazole	4-tert-Octylphenol diethoxylate	
Chrysene	Triclosan	9,10-Anthraquinone
Di-n-butyl phthalate	Tris(2-butoxyethyl) phosphate	
4-Nonylphenol (sum of all isomers)		
4-Nonylphenol diethoxylate (sum of all isomers)		

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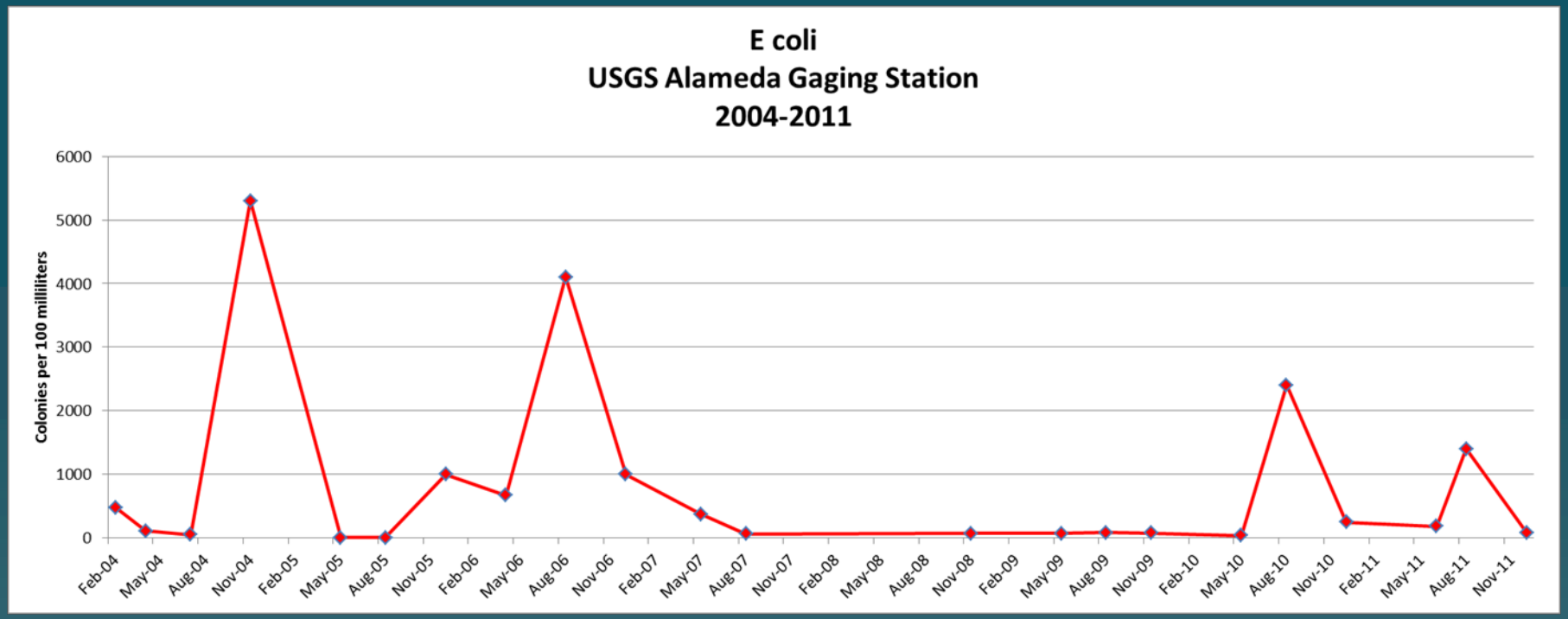

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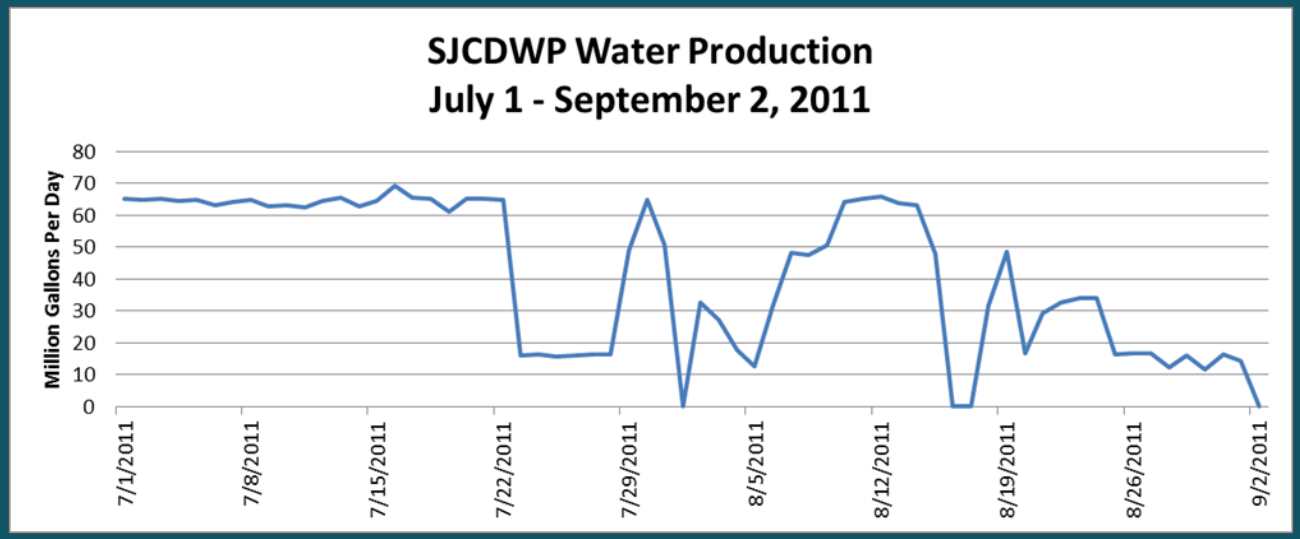

- Ash made it difficult to treat the water.
- Required additional chemicals and treatment time.
- Water Authority practice to reduce withdrawal when the darkest water passed by diversion.
- Debris and mud clogged diversion.

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Conclusions

- Changes in water quality due to upstream events are noticed by change in stream flow rate
- Increases are relatively short-term
- SJCDWP able to treat varying levels of quality, however additional chemicals or time may be needed
- Water Authority will stop withdrawal if turbidity exceeds certain level

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