

# Dunkard Creek Aquatic Life Kill September 2009

ORSANCO Technical Committee Meeting  
February, 2010

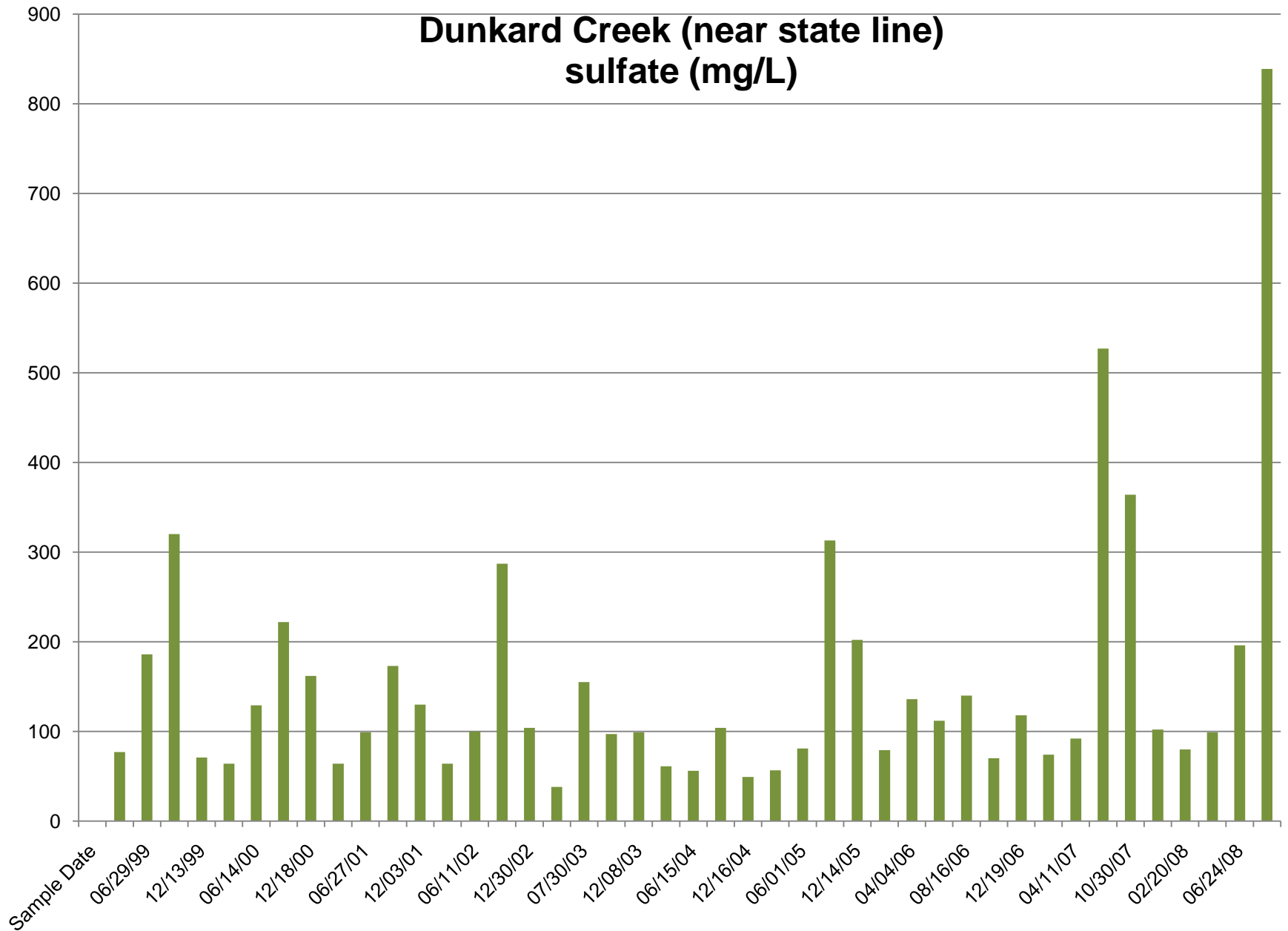




## Major AMD treatment Plants



**Dunkard Creek (near state line)  
sulfate (mg/L)**



# Background

## 2000-2010

- Scrubber Blowdown (20,000-40,000 mg/L TDS)
- Marcellus Well fracturing water (100,000-300,000 mg/L TDS)
- Deep Mine Discharges (5,000-15,000 mg/L TDS)
- Oil and Gas Industry Water withdrawals (conventional and Marcellus)
- Assimilative Capacity limitations

# Background (cont.)

- Spring 2008 draft TDS Permitting Strategy
- Fall 2008 Monongahela River TDS problem
- April 2009 TDS Strategy finalized
- Fall 2009 Dunkard Creek Aquatic Life kill
- Winter 2009 Draft TDS Regulations



# The Future

- In PA, the proposed regulations limit TDS and Sulfate at 500 mg/L and 250 mg/L respectively. Final regs will depend on responses to comments received.
- In WV, TDS control proposal in House Bill 4001 introduced on 1/13/10
- Major Oil and Gas producers finding ways to recycle majority of frac water rather than discharge. TDS treatment plants to help clean the water for recycling under construction in WV and PA
- EPA evaluating Zero Liquid Discharge alternatives for scrubber blowdown
- Mine water TDS treatment plant under construction in VA, plans for similar plant(s) in WV

# Data

- RAIN Conductivity Network
- USGS Conductivity Network
- PADEP Mon River and Dunkard Creek sample results
- WVDEP sample results
- Stream studies
- Permitting Strategy



# References

- PA Sample results from Mon River and Dunkard Creek can be found at [http://www.depweb.state.pa.us/portal/server.pt/community/southwest\\_regional\\_office/13775/community\\_information/593161](http://www.depweb.state.pa.us/portal/server.pt/community/southwest_regional_office/13775/community_information/593161)
- WV Sample results can be found at <http://www.dep.wv.gov/Pages/default.aspx>
- TDS permitting strategy and stream studies can be found at [http://www.portal.state.pa.us/portal/server.pt/community/marcellus\\_shale\\_wastewater\\_partnership/18683](http://www.portal.state.pa.us/portal/server.pt/community/marcellus_shale_wastewater_partnership/18683)
- Penn State Extension Office  
<http://naturalgas.extension.psu.edu/Publications.htm>  
[http://www.portal.state.pa.us/portal/server.pt/community/marcellus\\_shale\\_wastewater\\_partnership/18683](http://www.portal.state.pa.us/portal/server.pt/community/marcellus_shale_wastewater_partnership/18683)











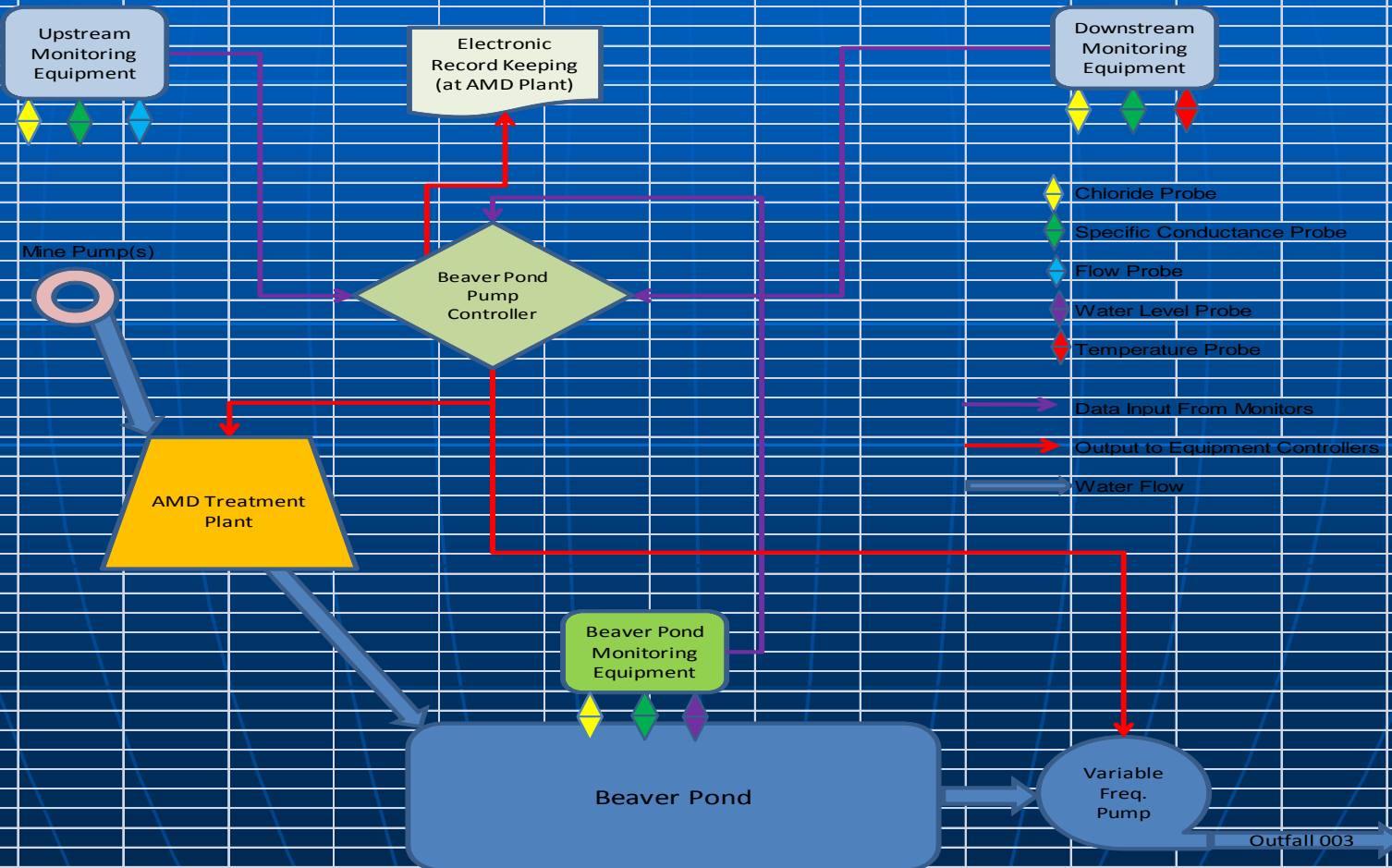






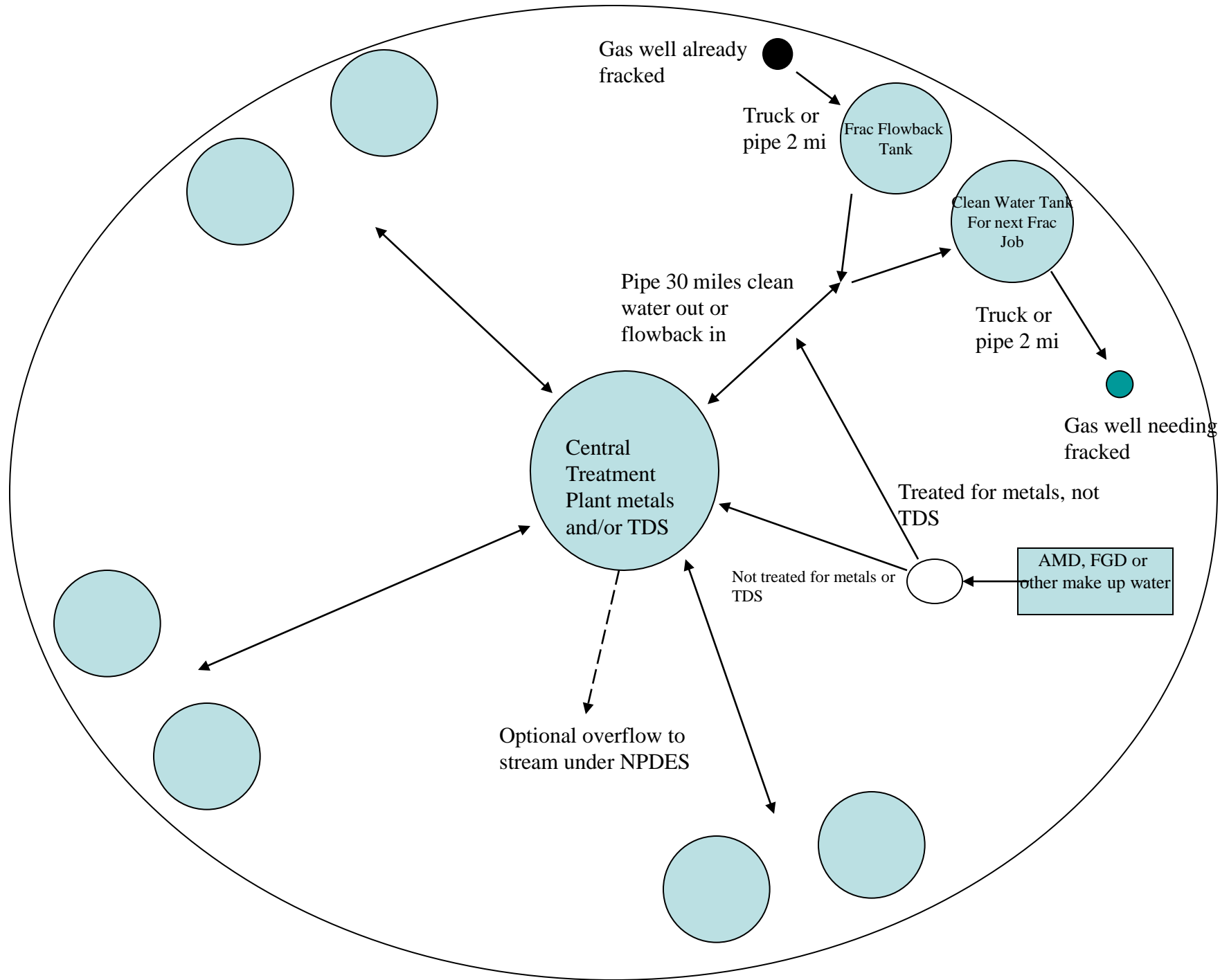
# Managed Discharge System

Blacksville No. 2 Managed Discharge Control Equipment Schematic



Source	Disch(gpm)	TDS Load to Dunkard (lb/day)	Resultant TDS Concentration in Dunkard Downstream at low flow (mg/L)	Resultant TDS Concentration in Dunkard Downstream at Q7-10 (mg/L)	Resultant TDS Concentration in Mon Downstream at low flow (mg/L)	Resultant TDS Concentration in Mon Downstream at Q7-10 (mg/L)
Background	450	1,351.08	8.29	25.25	467.33	917.24
St. Leo	150	15,132.10	101.12	308.10	470.42	923.30
BV2	500	74,255.36	556.68	1,696.05	485.59	953.08
Patriot	250	15,012.00	648.78	1,976.65	488.66	959.10
AMDRI	3,725	553,202.41	4,042.66	12,316.88	601.67	1,180.91
	Total:	658,952.94				





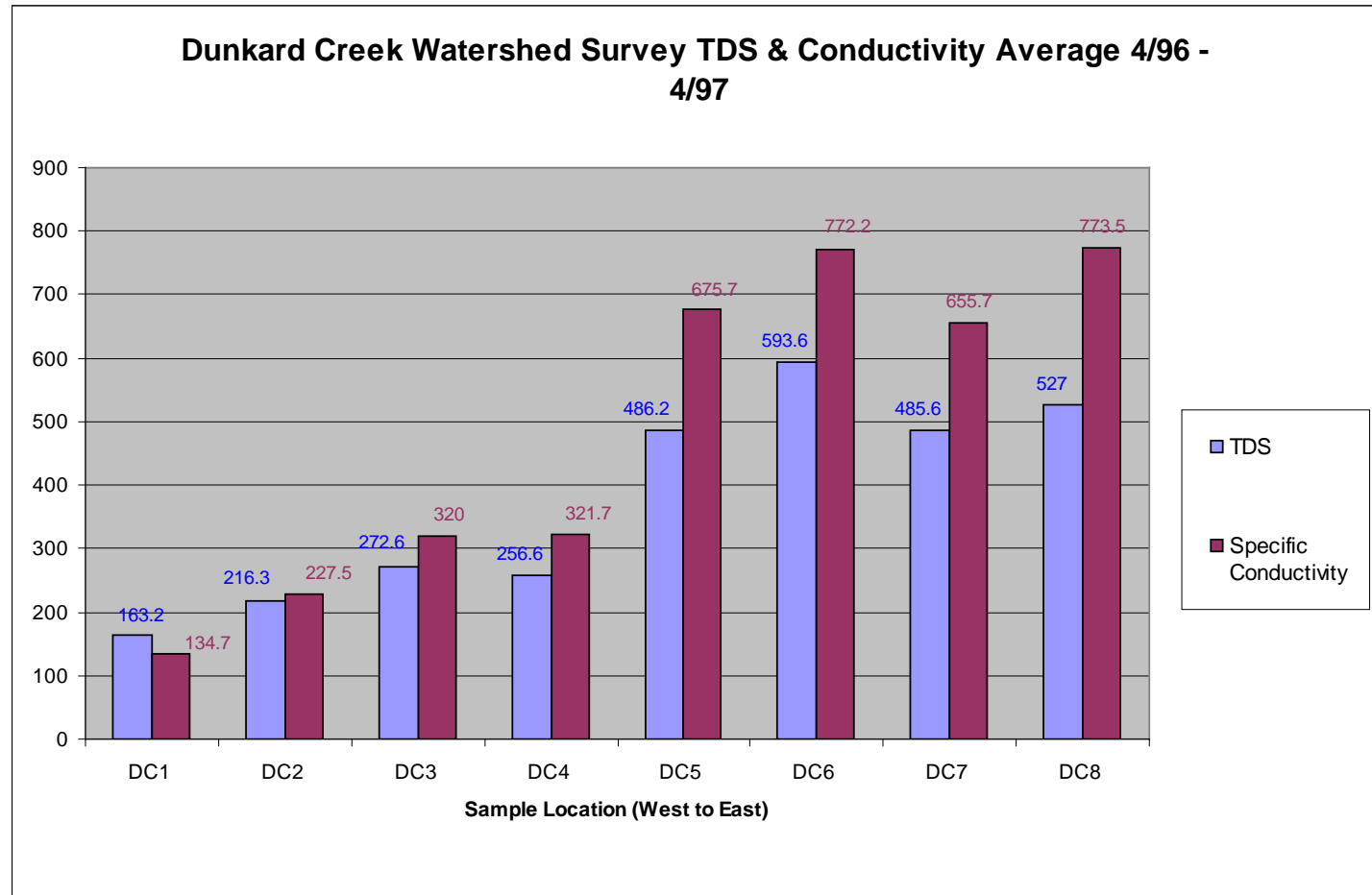
# Dunkard Creek Watershed Survey

## 4/96 - 4/97



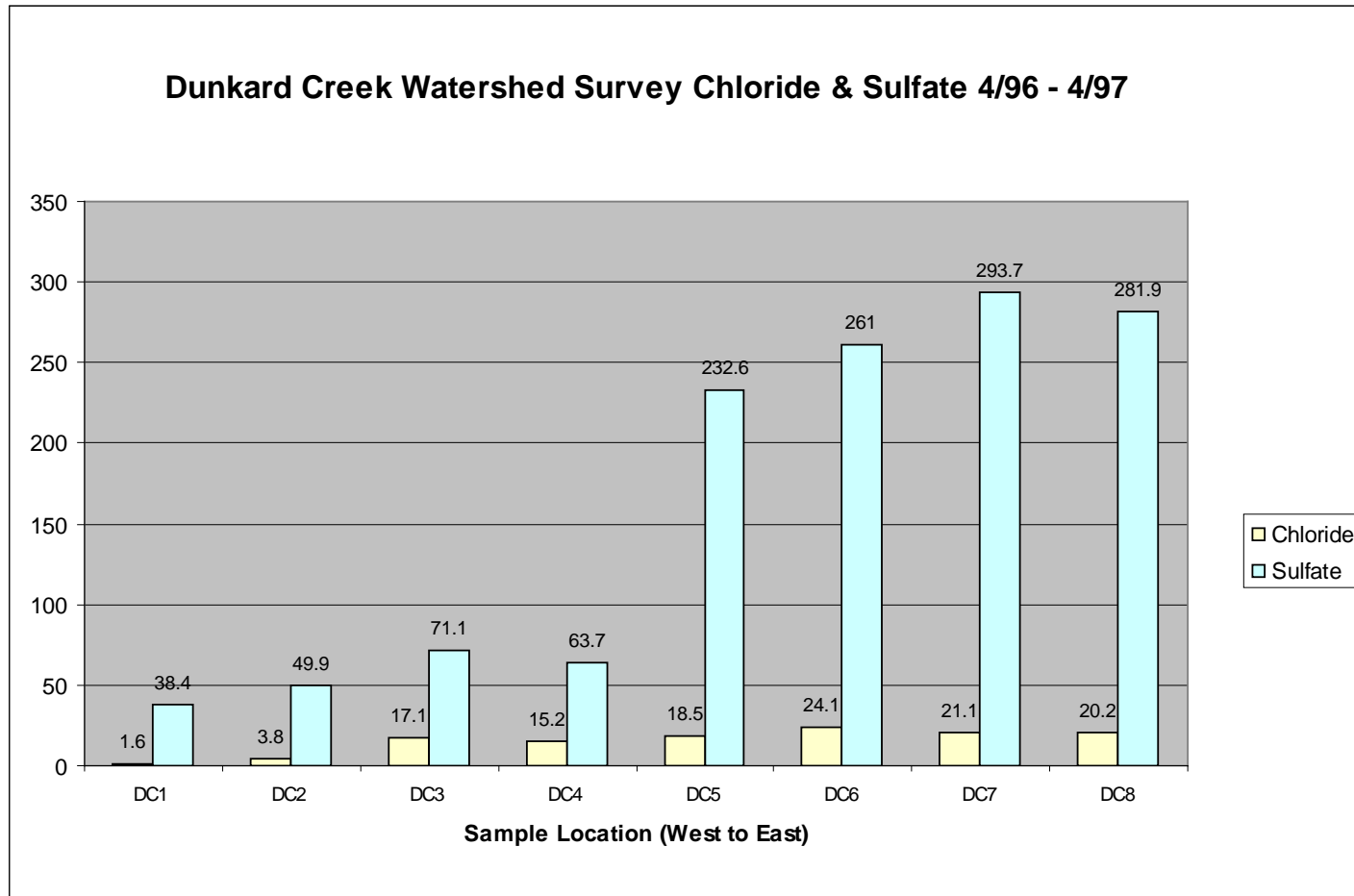
# Dunkard Creek Watershed Survey

## 4/96 4/97



# Dunkard Creek Watershed Survey

## 4/96 4/97





# WQN 714 Data Review



# Consol Historic Permit Data

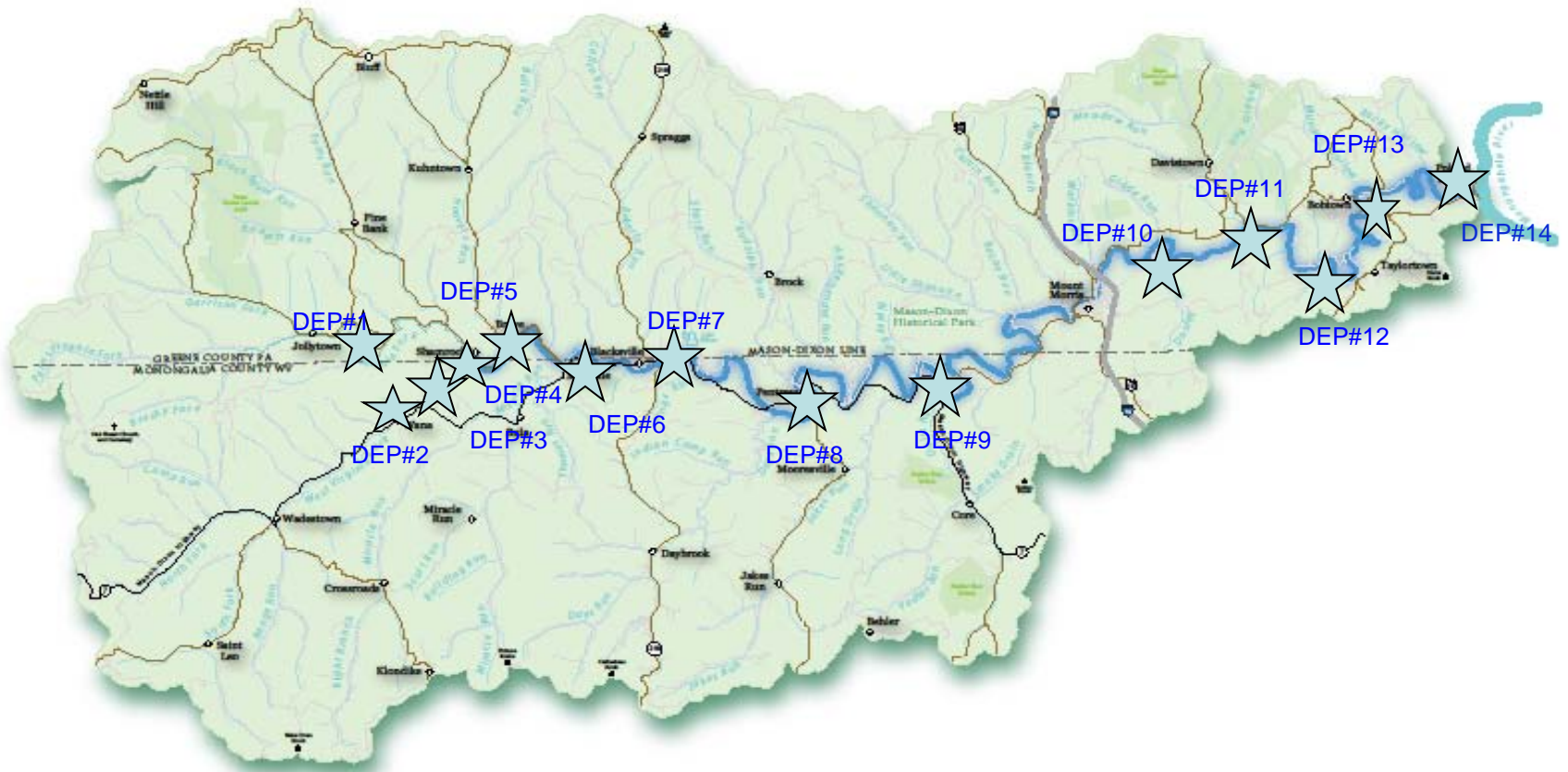
- 1992 -1993  
Blacksville #2 Stream  
Sampling Averages:

	WV Fork US Blacksville	WV Fork DS Blacksville
Conductivity (umhos)	371.6	522.6
Sulfate (mg/L)	131.2	235.2
TDS (mg/L)	242.3	358.7

- 8/2006 – 12/2006  
Blacksville #2 Stream  
Sampling Averages:

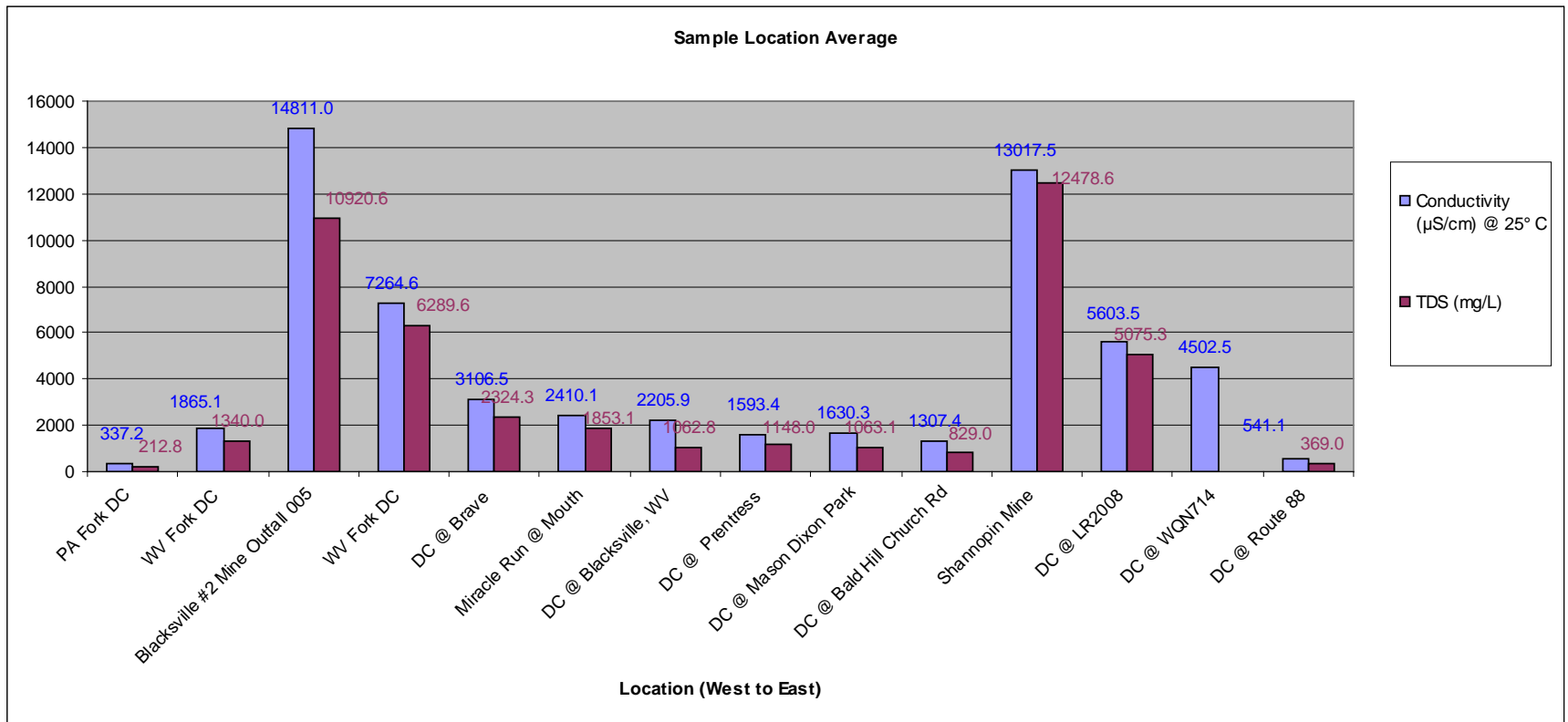
	WV Fork US Blacksville	WV Fork DS Blacksville
Conductivity (umhos)	1224	1277
Sulfate (mg/L)	376	389
Chloride (mg/L)	94	107

# DEP Samples Following Fish Kill



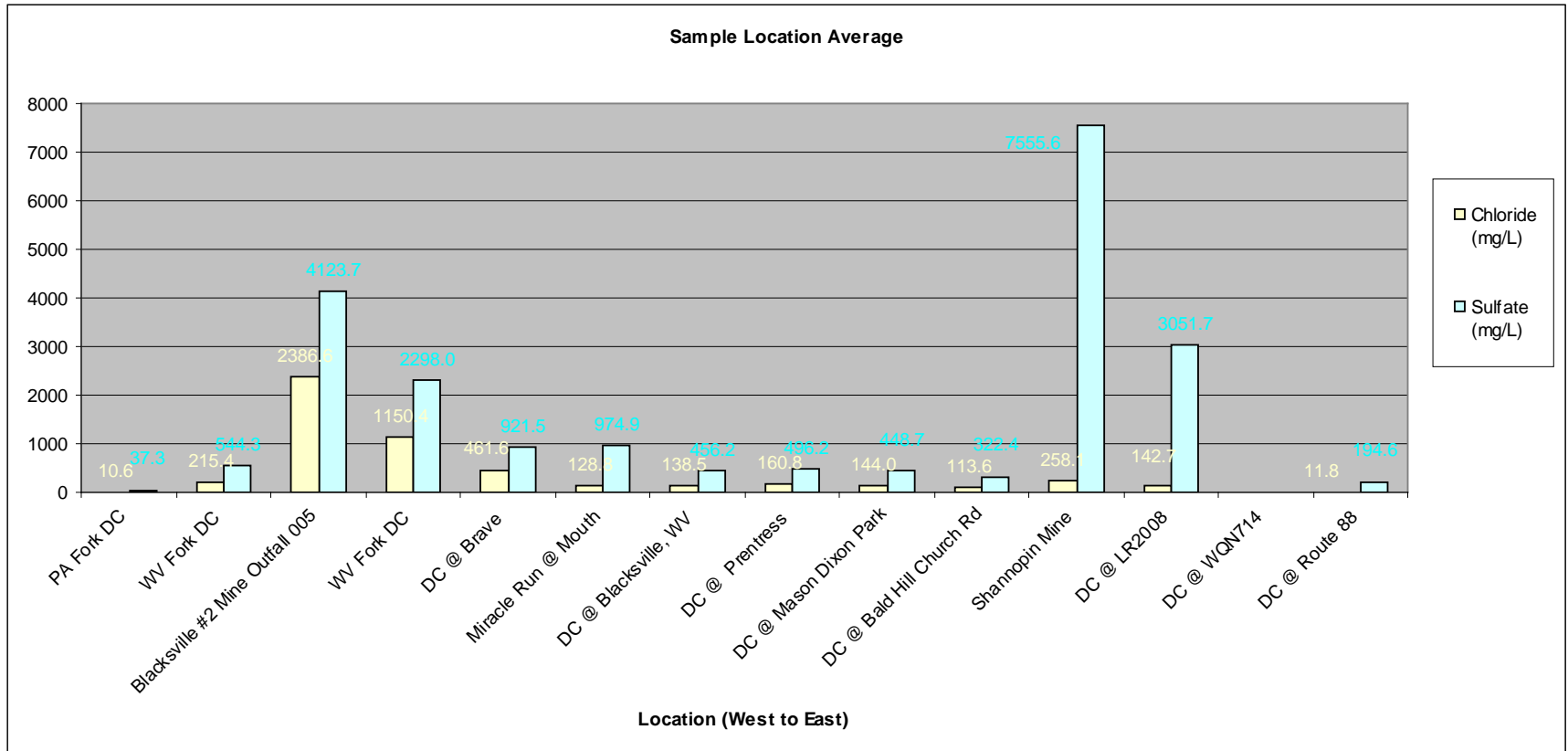
# DEP Samples Following Fish Kill

## Average Conductivity & TDS



# DEP Samples Following Fish Kill

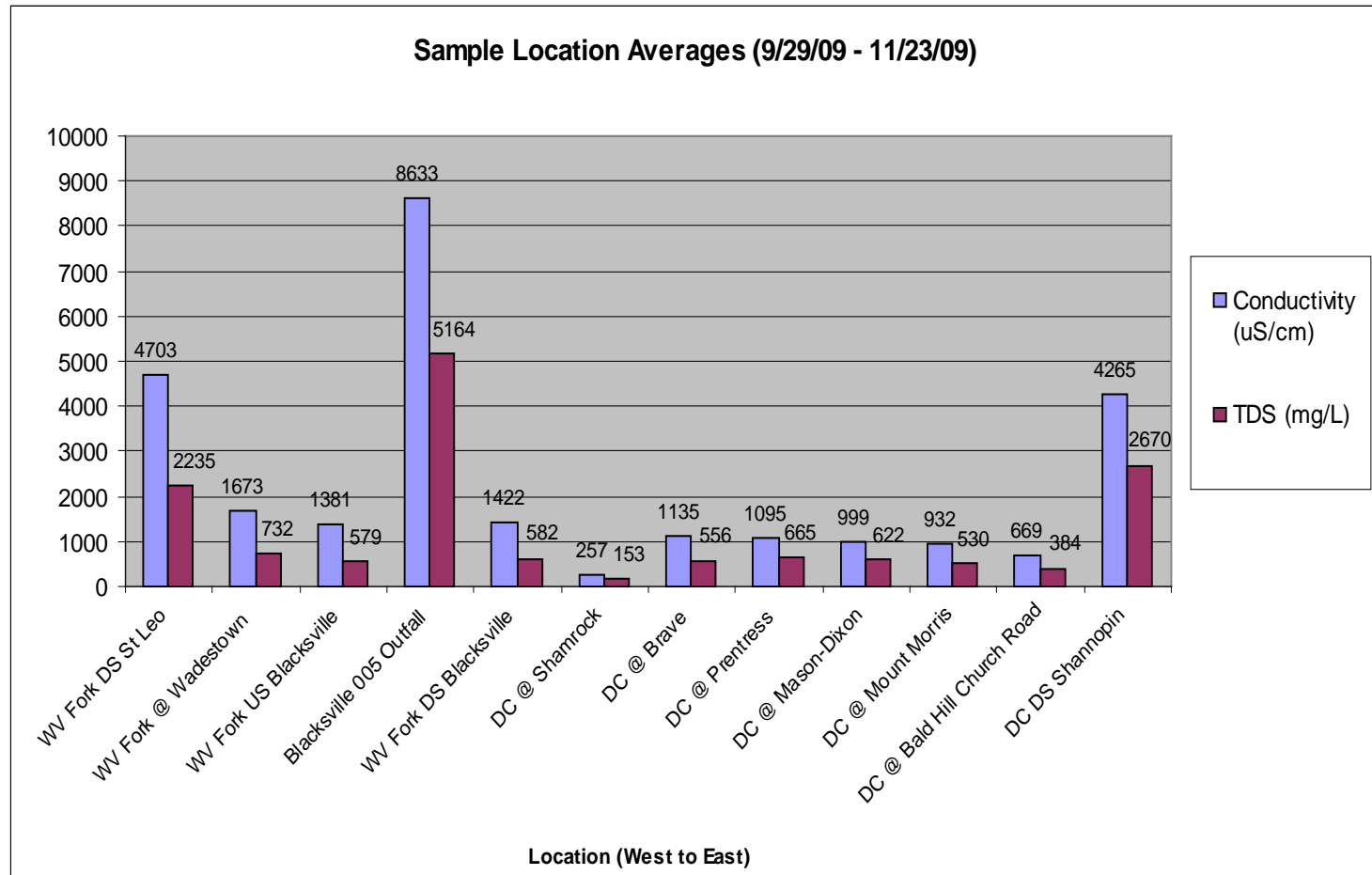
## Average Chloride & Sulfate





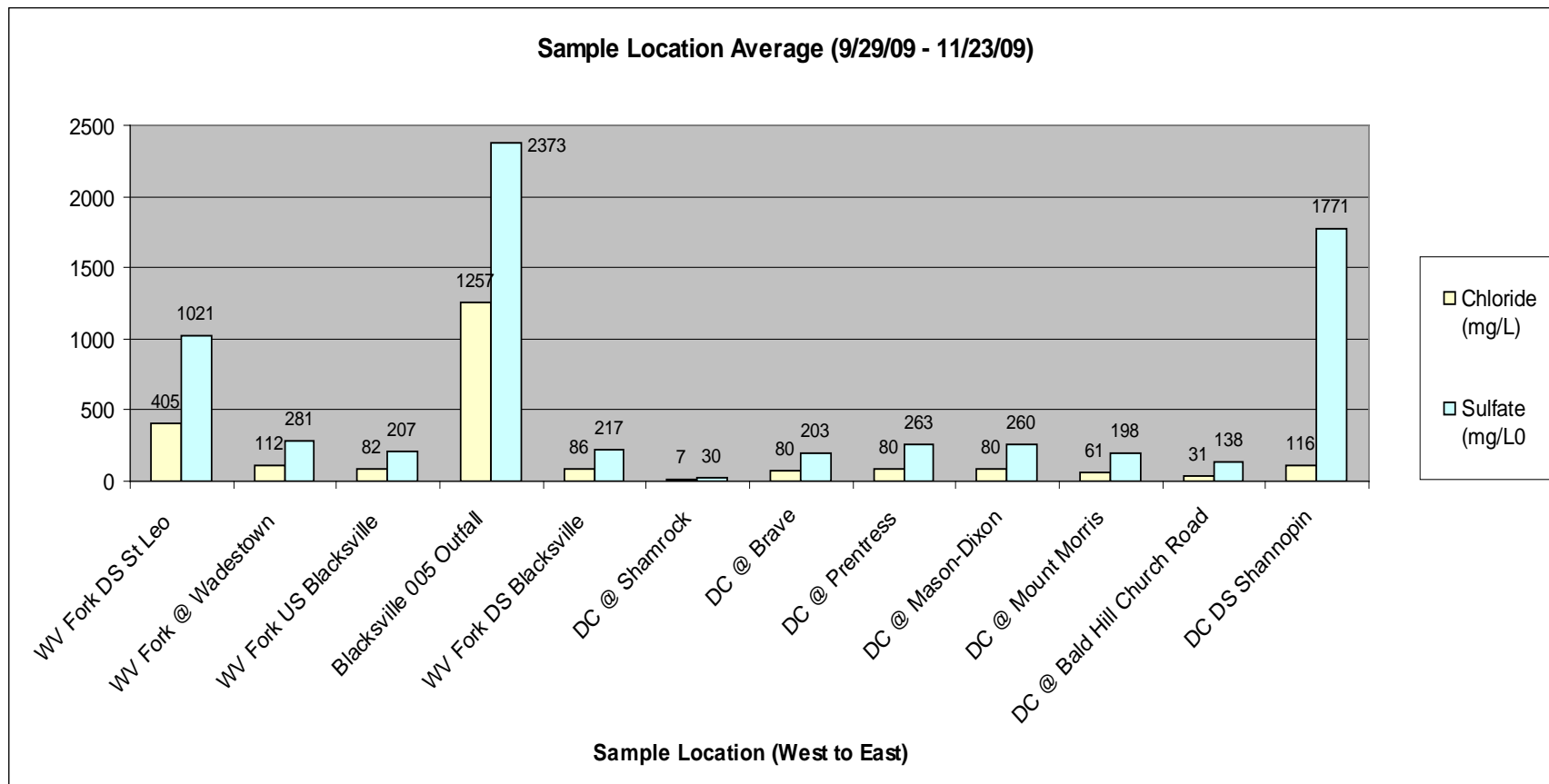
# Consol Samples Following Fish Kill

## Average Conductivity & TDS



# Consol Samples Following Fish Kill

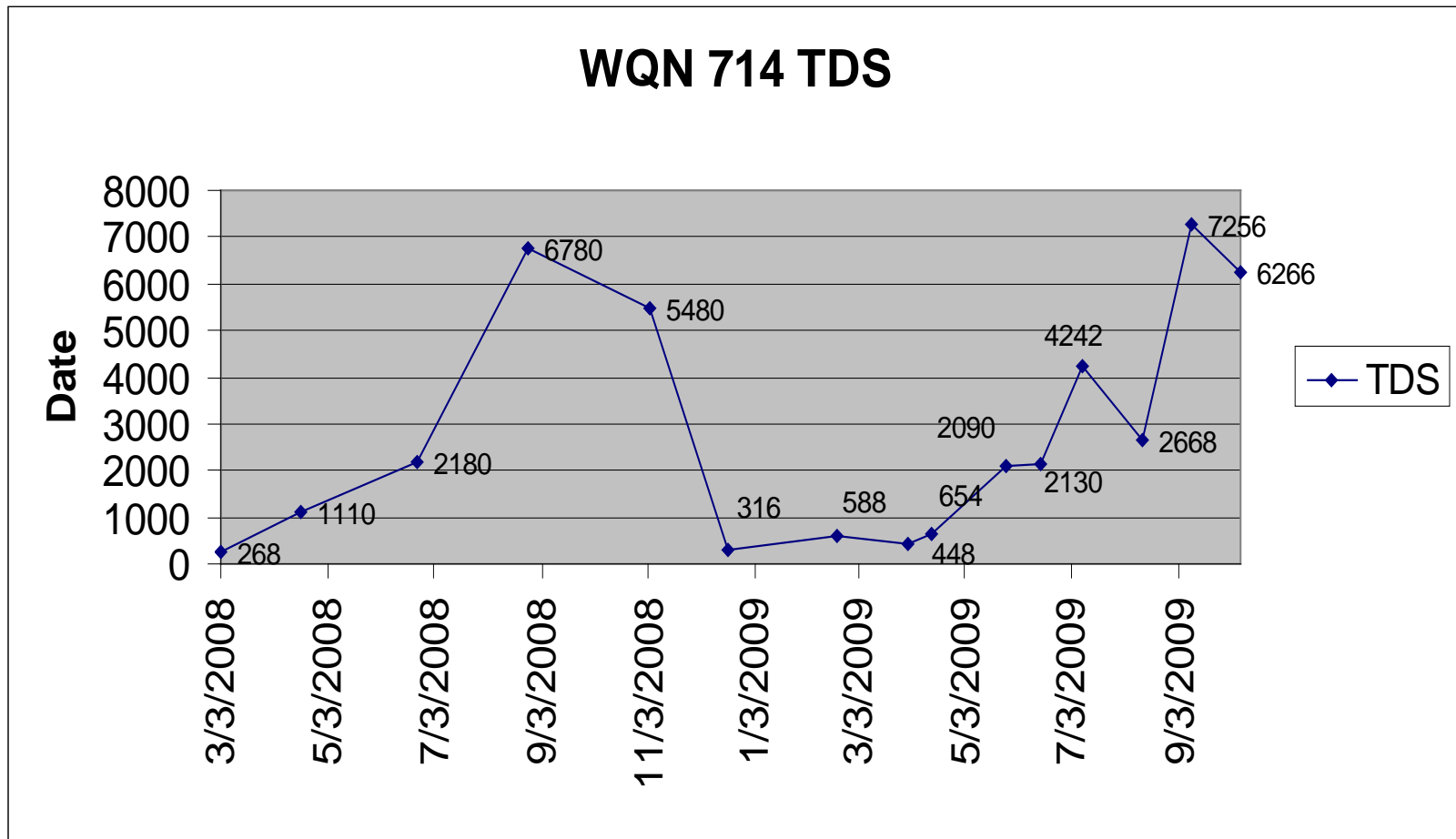
## Average Chloride & Sulfate



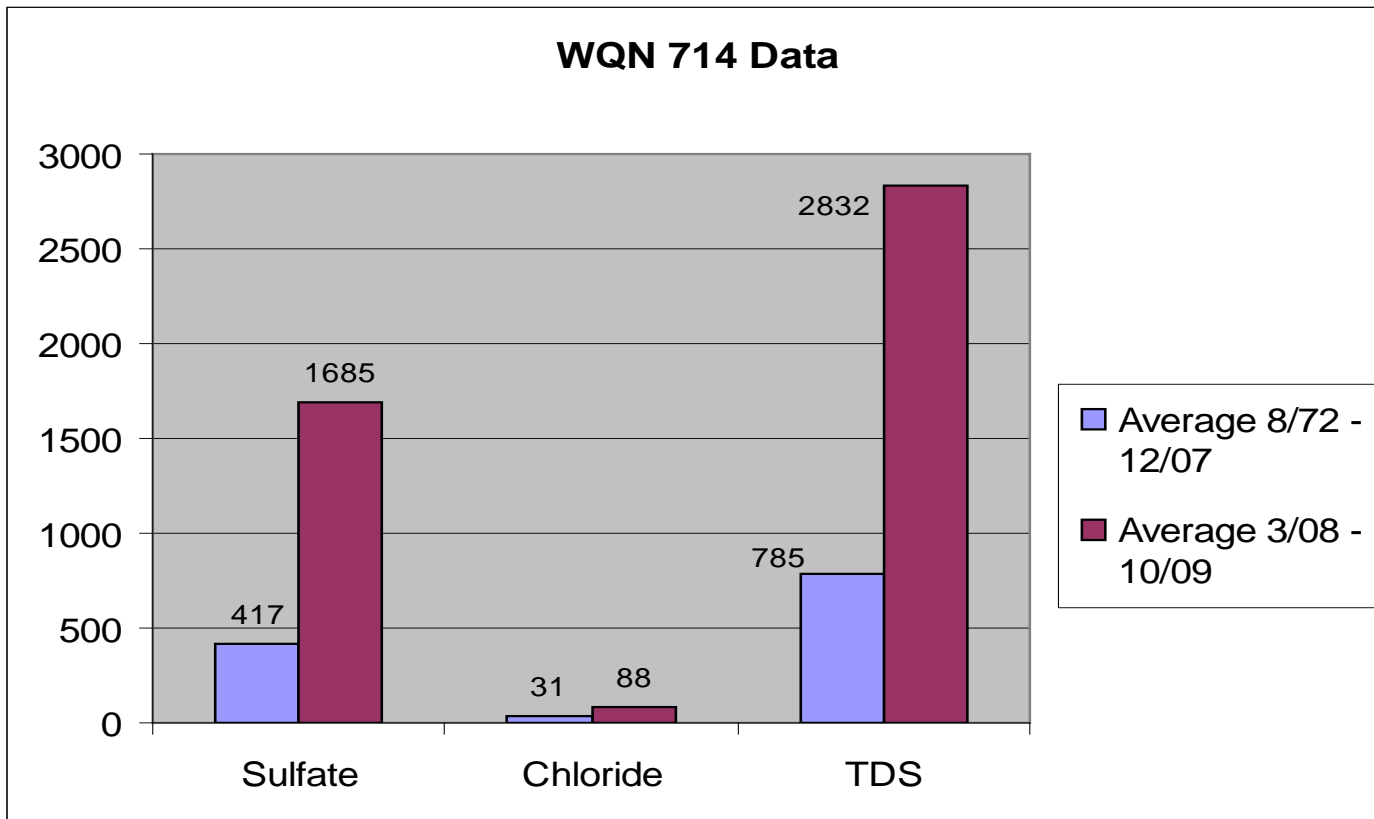
# WQN 714 Data 3/08 – 10/09

	Average	Maximum	Minimum
Sulfate (mg/L)	1685	4365	95
Chloride (mg/L)	88	193	18.1
TDS (mg/L)	2832	7256	268

# WQN 714 3/08 – 10/09

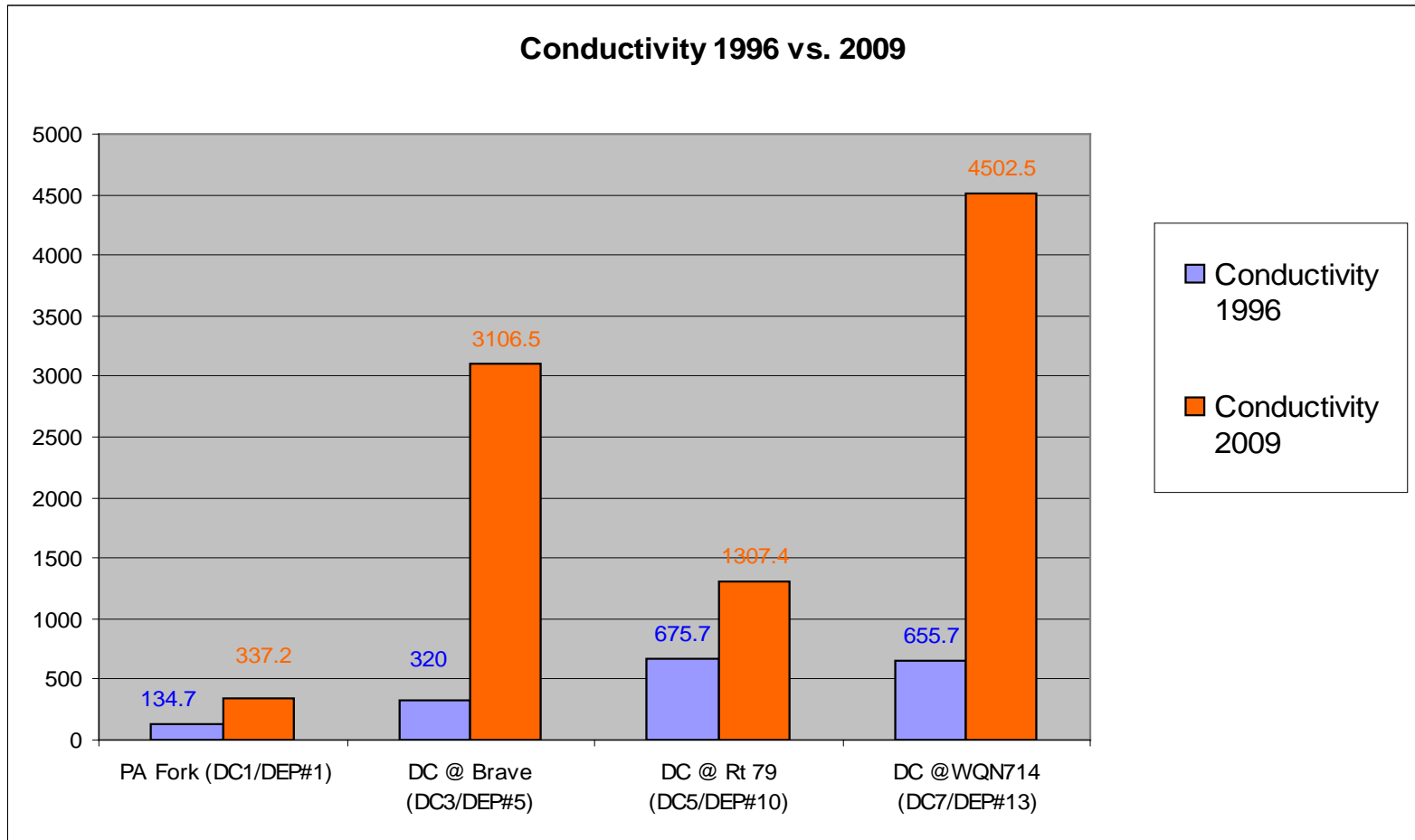


# WQN 714 Comparison

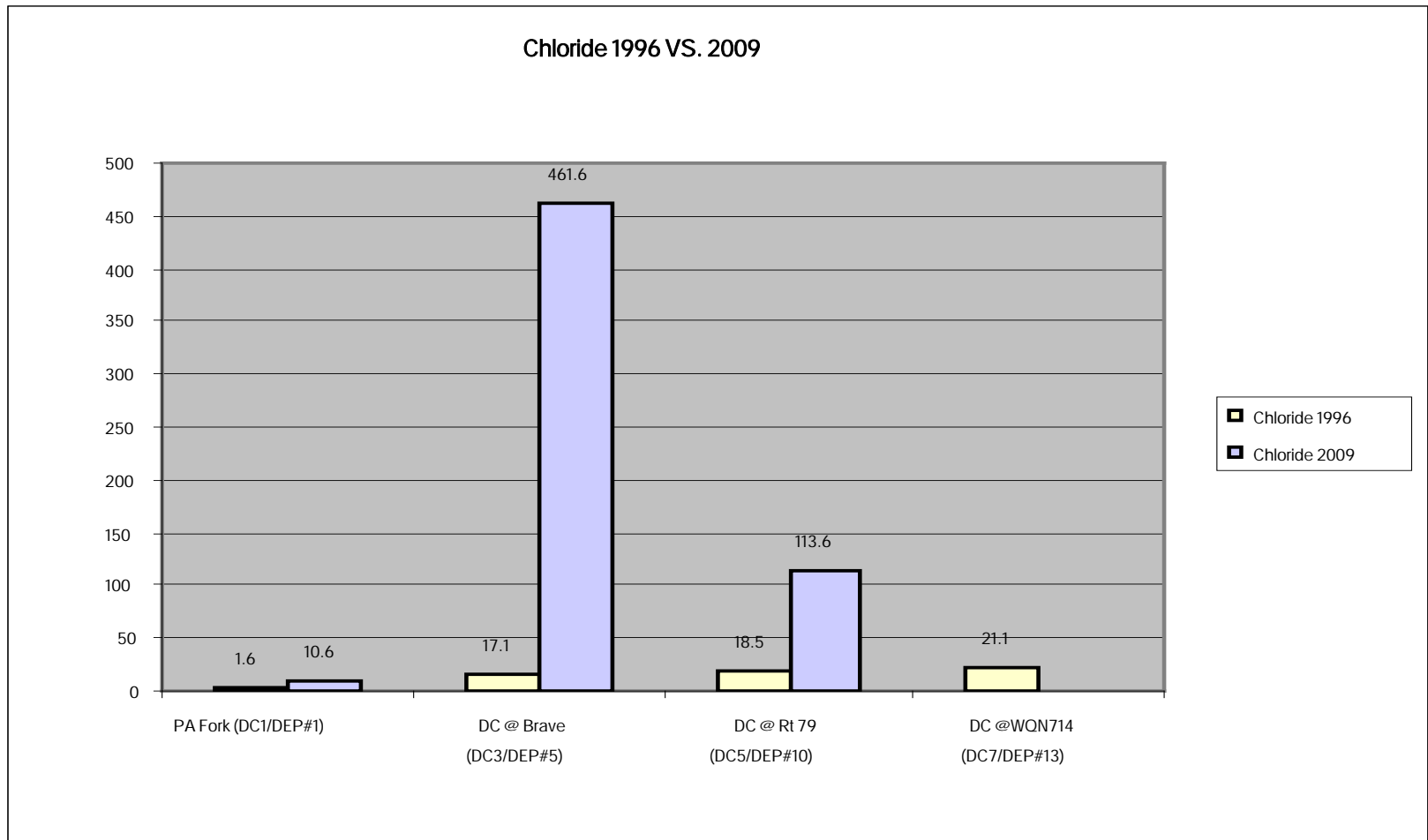




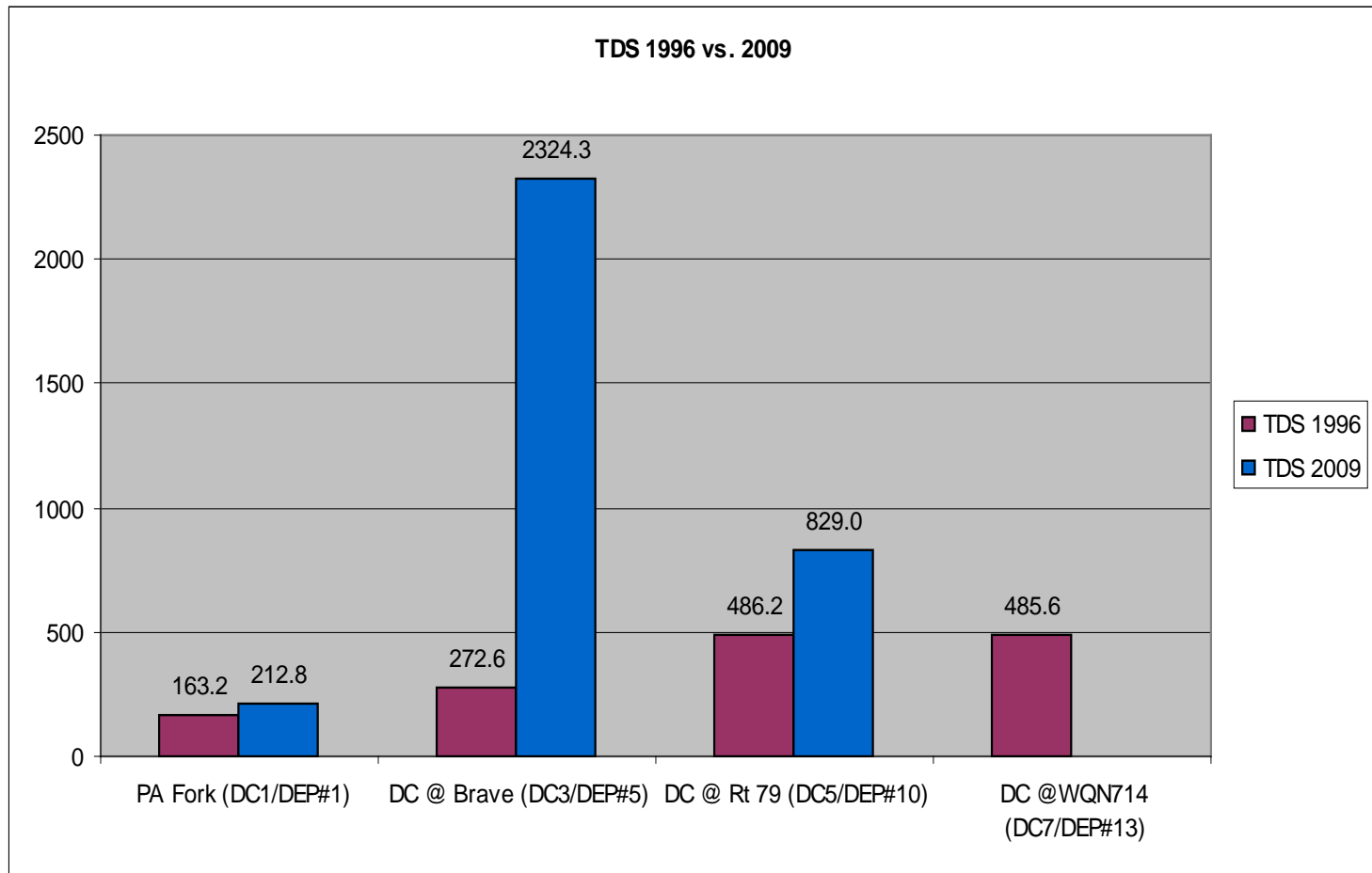
# 1996 DEP Data Vs. 2009 DEP Data



# 1996 DEP Data Vs. 2009 DEP Data



# 1996 DEP Data Vs. 2009 DEP Data



# 1996 DEP Data Vs. 2009 DEP Data

