



February 7, 2012

## Summary of Pinedale Anticline Chemical and Field Data 2000-2011

Monitoring on the New Fork River by the Sublette County Conservation District (SCCD) began in 2000 prior to any exploration or development in the Pinedale Anticline Project Area (PAPA). Three sites (NF4, NF19 and NF30) were established on the New Fork River in 2001 to monitor the effects of the PAPA. With increased activity in the PAPA additional sampling sites were established:

- NF40 - established in 2004 to monitor any effects of Sand Springs and Alkali Draws on the New Fork River
- NF50 – established in 2007 downstream of the confluence of the East Fork River with the New Fork River
- NF60 – established in 2007 upstream of the confluence of the East Fork River with the New Fork River
- NF70 – established in 2007 downstream of the confluence of Pole Creek with the New Fork River
- NF80 – established in 2008 to represent a control site upstream of PAPA activity. NF80 replaced NF01 which was the original control site on the upper New Fork River for the PAPA.
- NF90 – established in 2010 to represent a control site upstream of PAPA activity. NF90 replaced NF80 due to drilling activity west of Pinedale and upstream of the location of NF80. NF80 will continue as a surface water monitoring site for the PAPA.

Surface water samples collected at the Pinedale Anticline (PA) sites are analyzed at an Environmental Protection Agency (EPA) certified laboratory. Each sample is analyzed for the following parameters: Alkalinity, Bicarbonate, Calcium, Carbonate, Chloride, Magnesium, Nitrogen, (Nitrate + Nitrite as N), Phosphorus, Sodium, Sulfate, Hardness, Total Dissolved Solids (TDS) and Total Suspended Solids (TSS). The Anions, Cations and Anion/Cation balance are calculated at the laboratory for quality assurance of data. Each sample is analyzed for BTEX (Benzene, Ethylbenzene, m+p-Xylenes, methyl-tertbutyl ether, o-Xylene and Toluene), Gasoline Range Organics (GRO) and Diesel Range Organics (DRO).

Duplicate samples are collected every 10<sup>th</sup> sample to ensure analysis is accurately conducted by the laboratory. Blank samples (using distilled water) are sent with every 10<sup>th</sup> sample as another quality control/quality assurance measure. Temperature blanks accompany every shipment of samples to ensure the samples remain under 4°C. (Sublette County Conservation District Pinedale Anticline Chemical Data 2000-2011).

Field data collected by Sublette County Conservation District staff include the following parameters: pH, Turbidity, Conductivity, Total Dissolved Solids (TDS), Temperature (C°) and Dissolved Oxygen (mg/L and %). Flows are measured when SCCD staff is able to safely do so. Photos are taken each time samples are collected as well as equipment used, personnel sampling, etc. Duplicate meter readings are collected every 10th sample collected. (Sublette County Conservation District Pinedale Anticline Field Data 2000-2011).

The Wyoming Department of Environmental Quality has established surface water quality standards for all streams in the state. No exceedances of these standards have been detected from the data collected by the SCCD from 2000-2011 at the PA surface water sampling sites. **Non-detections** of all hydrocarbon parameters were observed for the same time frame.

<b><u>Parameter</u></b>	<b><u>Wyoming DEQ Water Quality Standard</u></b>
Alkalinity	None available
Bicarbonate	None available
Calcium	None available
Carbonate	None available
Chloride	Aquatic Life Chronic Value (EPA) 230,000 mg/l
Conductivity	None available
Dissolved Oxygen	5 mg/L Early life stages 1 day minimum 4 mg/L All other stages 1 day minimum
Hardness	None available
Magnesium	None available
Nitrate + Nitrite as N	10 mg/l
pH	6.5 – 9.0
Phosphorus	≤ 1.0 mg/l (Streams not flowing directly into lakes or reservoirs)
Potassium	None available
Sodium	None available
Sulfate	None available
Temperature	Class 1, 2AB, and 2B waters - If ambient stream temperature is above 60 degrees F man-caused effluent shall not be discharged in amounts which will result in an increase of more than 2 degrees F (1.1 degree C) in existing temperatures
Total Dissolved Solids (TDS)	None available
Total Suspended Solids (TSS)	None available
Turbidity	In all cold water fisheries and drinking water supplies the discharge of substances attributable to or influenced by the activities of man shall not result in a turbidity increase of more than ten (10) nephelometric turbidity units (NTUs).
Oil & Grease	Oil and grease content not to exceed 10 mg/L. The formation of a visible sheen or visible deposits on the bottom or shoreline, or damage or impairment of the normal growth, function or reproduction of human, animal, plant or aquatic life.

Please note: Generally surface water quality standards are based upon fresh water fishery requirements for reproduction and juvenile and adult growth and survival.

Macroinvertebrates (aquatic insects) are collected at all nine PA surface water sites once per year. Macroinvertebrate samples collected at each PA surface water site are sent to a contract laboratory for identification. SCCD staff collected eight samples at each site during the 2011 field season using eight individual Surber samplers. All data collected were sent to an aquatic ecologist for identification and analysis. An assessment report will be prepared using the 2011 macroinvertebrate samples with a projected completion date of fall 2012.

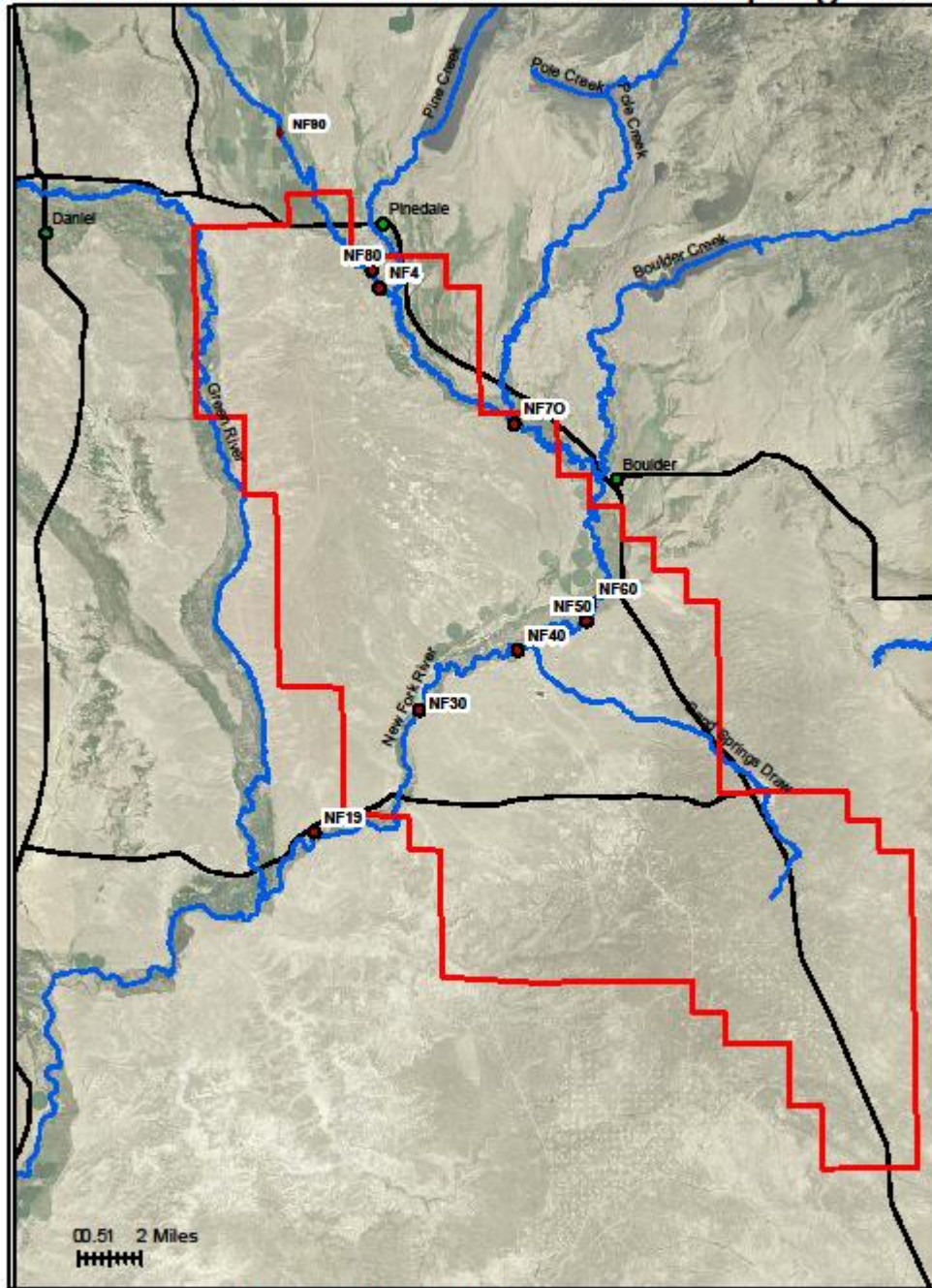
#### References

[http://deq.state.wy.us/wqd/watershed/surfacestandards/Downloads/Triennial/8-0464\\_Draft\\_%20Chapter\\_1.pdf](http://deq.state.wy.us/wqd/watershed/surfacestandards/Downloads/Triennial/8-0464_Draft_%20Chapter_1.pdf)

<http://www.epa.gov/waterscience/standards/>

[http://www.blm.gov/wy/st/en/field\\_offices/Pinedale/pawg/DataResults.html](http://www.blm.gov/wy/st/en/field_offices/Pinedale/pawg/DataResults.html)

# Sublette County Conservation District Pinedale Anticline Surface Water Sampling Sites

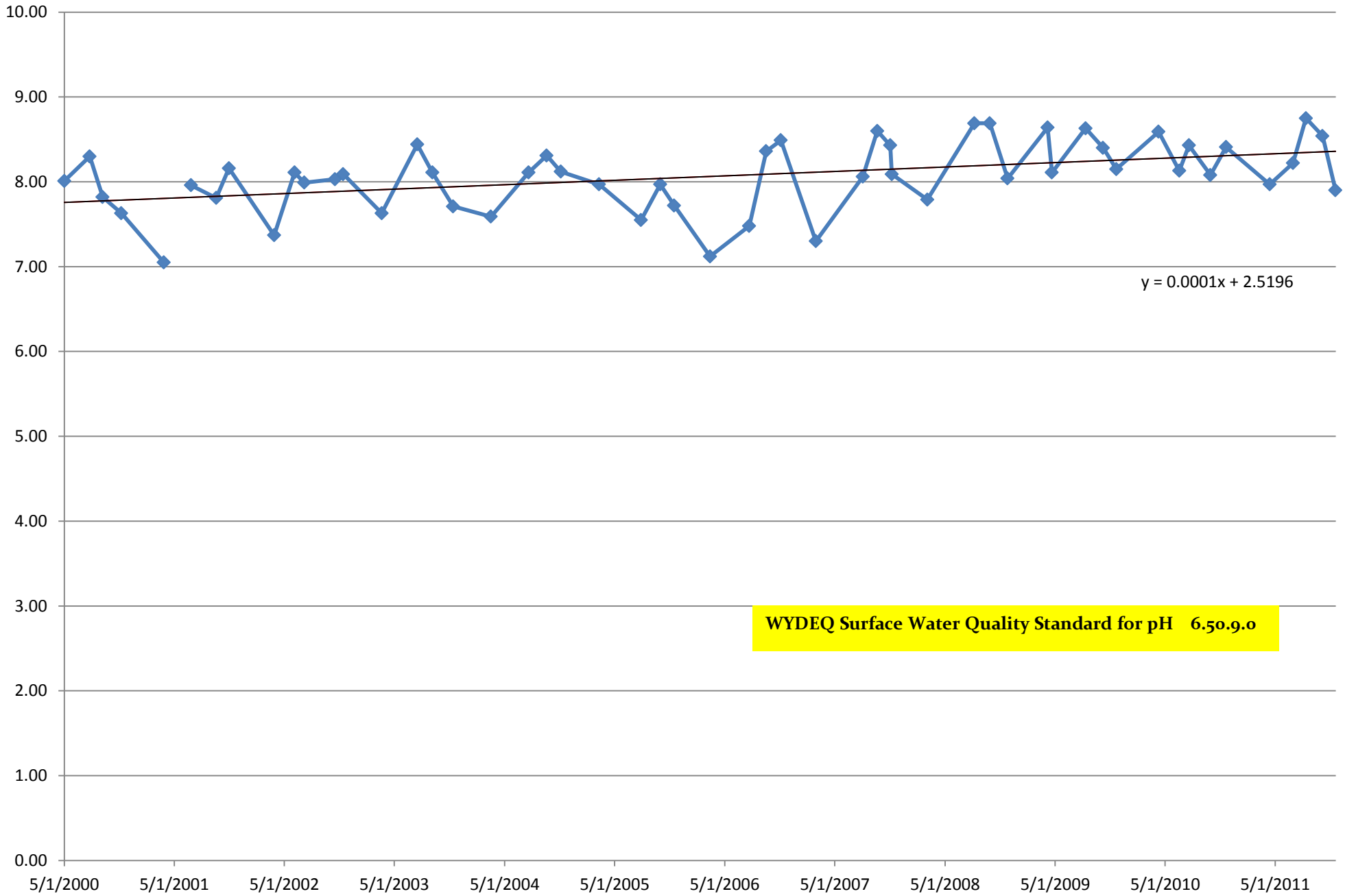


- PAS Surface Water Sites
- PAPA Boundary
- Streams

Prepared by:  
Sublette County Conservation District  
October 2011

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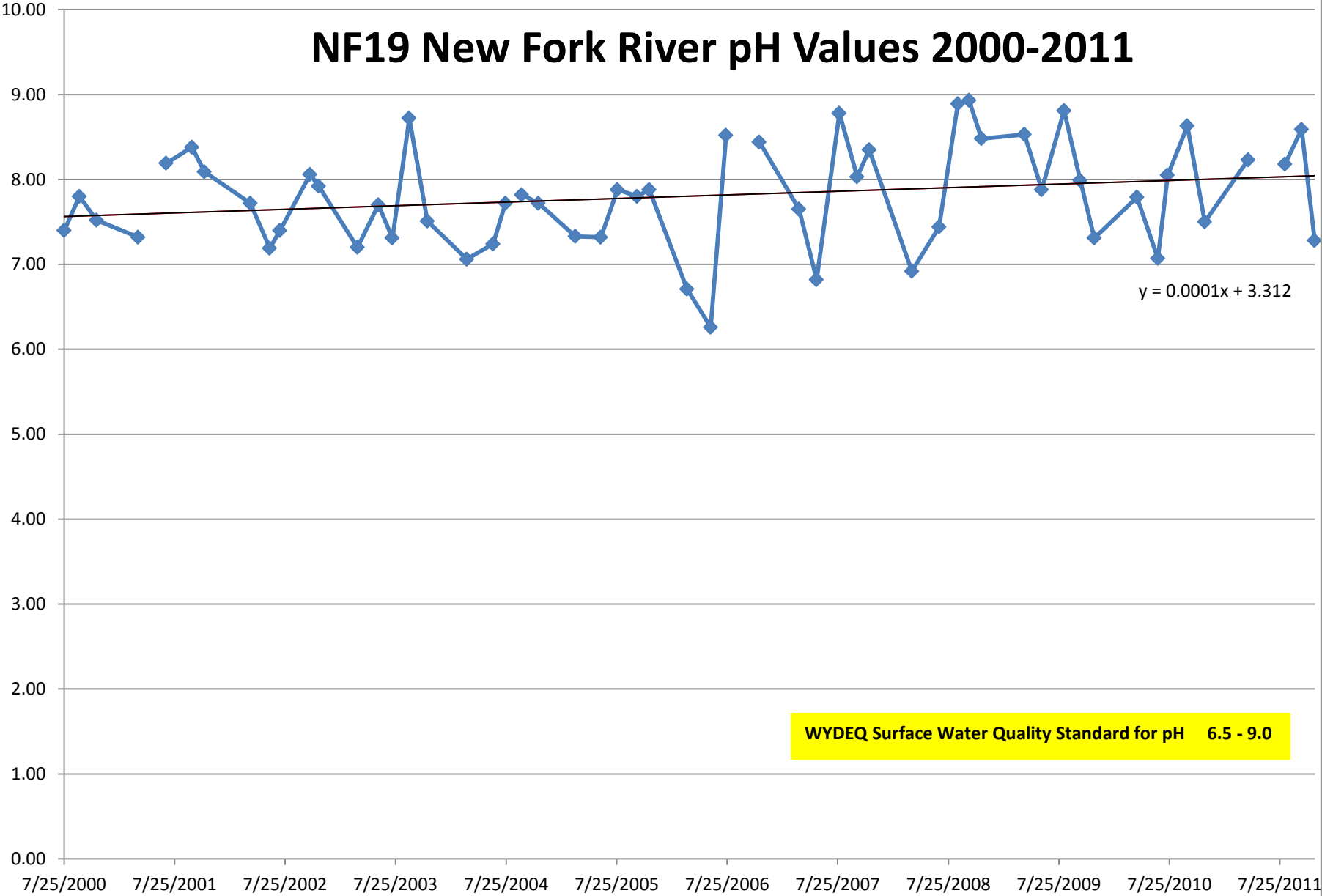
# NF4 New Fork pH Values 2000-2011



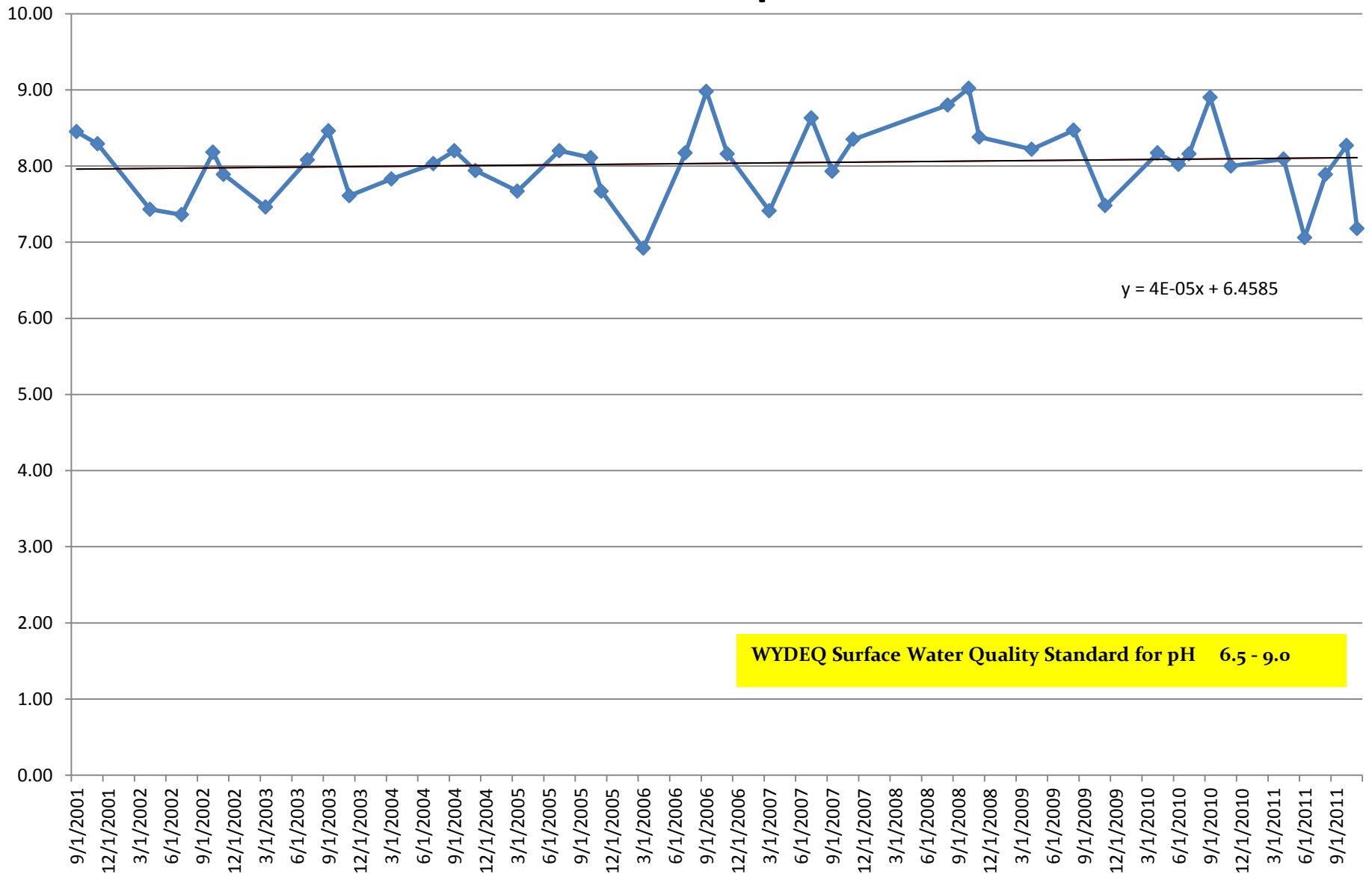
$y = 0.0001x + 2.5196$

WYDEQ Surface Water Quality Standard for pH 6.5-9.0

# NF19 New Fork River pH Values 2000-2011



# NF30 New Fork pH Values 2001-2011



WYDEQ Surface Water Quality Standard for pH 6.5 - 9.0

$y = 4E-05x + 6.4585$

# NF4 and NF19 pH Values 2000-2011

