CAMBRIA AMD TASK FORCE
PASSIVE TREATMENT SYSTEM EVALUATION
Prepared By:
Jeffrey J. Westrick P.E., Rich Beam P.G., Max Scheeler
May 30, 2008

PROJECT NO: AMD 56(2524)102.1
PROJECT NAME: KOONTZTOWN (OVEN RUN SITE "B")
PROJECT LOCATION: SHADE TOWNSHIP, SOMERSET COUNTY
RECEIVING STREAM: OVEN RUN TO STONYCREEK RIVER

PROJECT GOALS:

- Improved Water Quality in Oven Run and the Stonycreek River
- Restoration of ten (10) miles of trout fishery
- Improved water supply for Hooversville Borough
- Improved recreational potential

PROJECT INFORMATION:

- Project was designed by Gwin, Dobson and Foreman, Inc., Consulting Engineers, Altoona, PA
- Project design was modified in construction by BAMR staff: Max Scheeler, Steve Helsel, and Tom Malesky.
- Construction engineer: Steve Helsel
- Inspector supervisor: Allen Pletcher
- Project inspector: Earl Ropp
- Construction completed: 1998-1999
- Final construction cost of $1,101,947.83

PROJECT DESIGN INFORMATION:

- Passive treatment system consisting of two (2) SAPS and two (2) sedimentation basins
- Design life of twenty (20) years with a design flow of 350 gallons per minute (gpm)
- System capable of hydraulically handling a flow of 1,100 gpm
- Influent pH ranges from 2.7 to 3.0
- Influent flow ranges from 100 to 1,083 gpm
- Influent acidity concentration ranges from 500 to 800 mg/l
- Influent iron concentration ranges from 50 to 90 mg/l
- Influent aluminum concentration ranges from 35 to 55 mg/l

PROJECT DESCRIPTION:

- Treatment system schematic is shown in Appendix A.
- AMD discharge from three (3) sealed deep mine entries is collected in Pond 1.
- Influent flow is measured at the end of the center pipe.
- Flow is directed to SAP 1; then to a sedimentation (sed) basin; then to SAP 2 and the final sedimentation basin.
- Flow from SAP 1 is measured at the flow control structure discharging to the first sed basin.
- Piping schematic for SAP 1 is shown in Appendix B.
- Flow from SAP 2 is measured at the flow control structure discharging to the final sed basin.
- Piping schematic for SAP 2 is shown in Appendix C.

PROJECT OPERATION, MAINTENANCE AND REPLACEMENT (OM&R) INFORMATION:

- System water sampling is performed quarterly.
- Flow data is not available for all sampling dates.
- Sampling point IDs are shown in Appendixes E and F.
- Sampling point locations are shown in Appendixes A and G.
- System flushing is performed two (2) to three (3) times per year.
- Flow distribution pipe was added to SAP 1 by the BAMR BD crew on July 24, 2001 (see Appendixes B and D).
- Iron accumulation was removed from SAP 1 and SAP 2 compost layer and fresh compost added by the BAMR BD crew and the Bureau of Forestry in October 2001 at a cost of $2,901.97.
- Broken seal around flow control structure caused Pond 3 liner to float - BD crew fixed October-November 2006 at a cost of $1,288.10.
- Broken flow control structure on Pond 3 was fixed by the BAMR BD crew June 2007.

WATERSHED RESTORATION INFORMATION:

- This project was one (1) of six (6) projects completed as part of a larger restoration effort in the Stonycreek River Watershed (see Appendix H).
- BAMR completed Project No. OSM 56(2524)101.1 (Oven Run Site "C") in 1997 at a final cost of $730,001.41. The project reclaimed a 57.6 acre surface mine; backfilled 3,400 linear feet (l.f.) of dangerous highwall; eliminated a source of water infiltration to the deep mines; and backfilled three (3) mine openings.
- Funding Partners:
  1. USDA NRCS PL-566 Small Watershed Program (Sites D, E, F)
  2. PA DEP BAMR Title IV and Ten-Percent (10%) Set Aside Programs (Sites B and C)
  3. US EPA/PA DEP 319 Funds (Sites D and F)
  4. PA DEP Growing Greener Funds (Site A)

PROPERTY OWNER INFORMATION:

- The property ownership information on the As-Bid Drawings and the Consent for Right of Entry agreement drawings is not clear.
- The Consent for Right of Entry agreements obtained for this project are standard construction easements for building the treatment system and are more than ten (10) years old.

SYSTEM PERFORMANCE EVALUATION:

- Site Inspection: March 17, 2008
- Completed By: Jeffrey J. Westrick; Rich Beam; Max Scheeler
- Observations:
  1. Full flow from the collection basin (Pond 1) is directed to the treatment system.
  2. Water level in SAP 1 is very low; exposing much of the compost layer to the atmosphere.
  3. Possible AMD flow paths on surface of SAP 1 causing short circuiting.
  4. Seep through lower embankment of SAP 1.
  5. Apparent preferential flow paths through compost layer over top of perforated piping system particularly at cleanout locations.
  6. Broken cleanout on back end of SAP 2 allows short circuiting.
  7. Dewatering valve on Pond 3 is not functioning; thereby decreasing settling time for suspended solids in the flush water.
  8. Flushing discharge rate on flush pipe #3 appears slower than #1 and #2.
  9. Flushing discharge rate on flush pipe #4 and # 5 appears fine; but broken cleanout on back end of SAP 2 allows short circuiting.
  10. Access ramp to flow control structure on Pond 3 is under water.
  11. Cleanout pipes are located in the ponds instead of along the sides.

- Water Quality Trends and System Performance:
  1. Influent water quality has improved over time since the reclamation of Oven Run Site "C" (see Appendixes I through L).
  2. System performance decreased after March 2001 but has stabilized (see Appendixes M through P).
  3. System effluent pH ranges from 3.3 to 4.7.
  4. System still removing 200 to 300 mg/l of acidity; 30 to 40 mg/l of iron and 5 to 20 mg/l of aluminum.
  5. System flow rates periodically exceed design flow rates (see Appendix Q).

- Project Success:
  1. Since the construction of the six (6) projects in the watershed, the Stonycreek River has recovered and is a stocked trout fishery.
  2. The Oven Run Site "B" passive treatment system is not currently producing water quality as good as originally anticipated. However, it is still providing substantial benefit to the receiving streams by removing approximately 110 tons of acidity; 15 tons of iron; and 6.5 tons of aluminum per year.

TASK FORCE RECOMMENDATIONS:

- The Consent for Right of Entry agreements obtained for this project are standard construction easements for building the treatment system and are more than ten (10) years old.
- The O&M Section should have the Realty Department refresh the property ownership information to check for current ownership.
- New Right of Entry agreements should be obtained for OM&R activities if deemed necessary by the Realty and/or Legal Departments.
- A BAMR BD project is recommended to fix the observed problems with the system and to try to improve system performance by increasing retention times for the AMD in the SAPS.
- As-Built Drawings need to be completed and recorded; particularly relating to the piping systems and critical system elevations.
- Any changes made during OM&R operations to the piping systems, valves, cleanouts, water levels, etc. need to be added to the original As-Built Drawings and recorded as revised As-Builts with dates.
- System water sampling needs to be performed consistently and at regular time intervals to provide for reliable system analysis.
- Accurate flow data needs to be collected at the same time as system water sampling to provide for reliable system analysis.
- Water sampling data needs to be recorded in one (1) central location and reviewed on a regular basis by the O&M Section to monitor system performance.
- Flow measurements, sample collection and data recording should be done by one (1) or two (2) people in the O&M Section to ensure reliability and accountability.
- All Right of Entry agreements; As-Built Drawings, sampling location points and descriptions, SIS IDs, sampling data and analysis, OM&R operations, system changes, dates, costs, etc. for each treatment system need to be recorded in one (1) central location by the O&M Section.
- A continuous flow recorder should be installed at any future site during project development to provide more accurate flow data to the project designer and could be reused over and over.
- A continuous flow recorder should be designed and built into the treatment system to provide more accurate and reliable flow data for system analysis by the O&M Section.

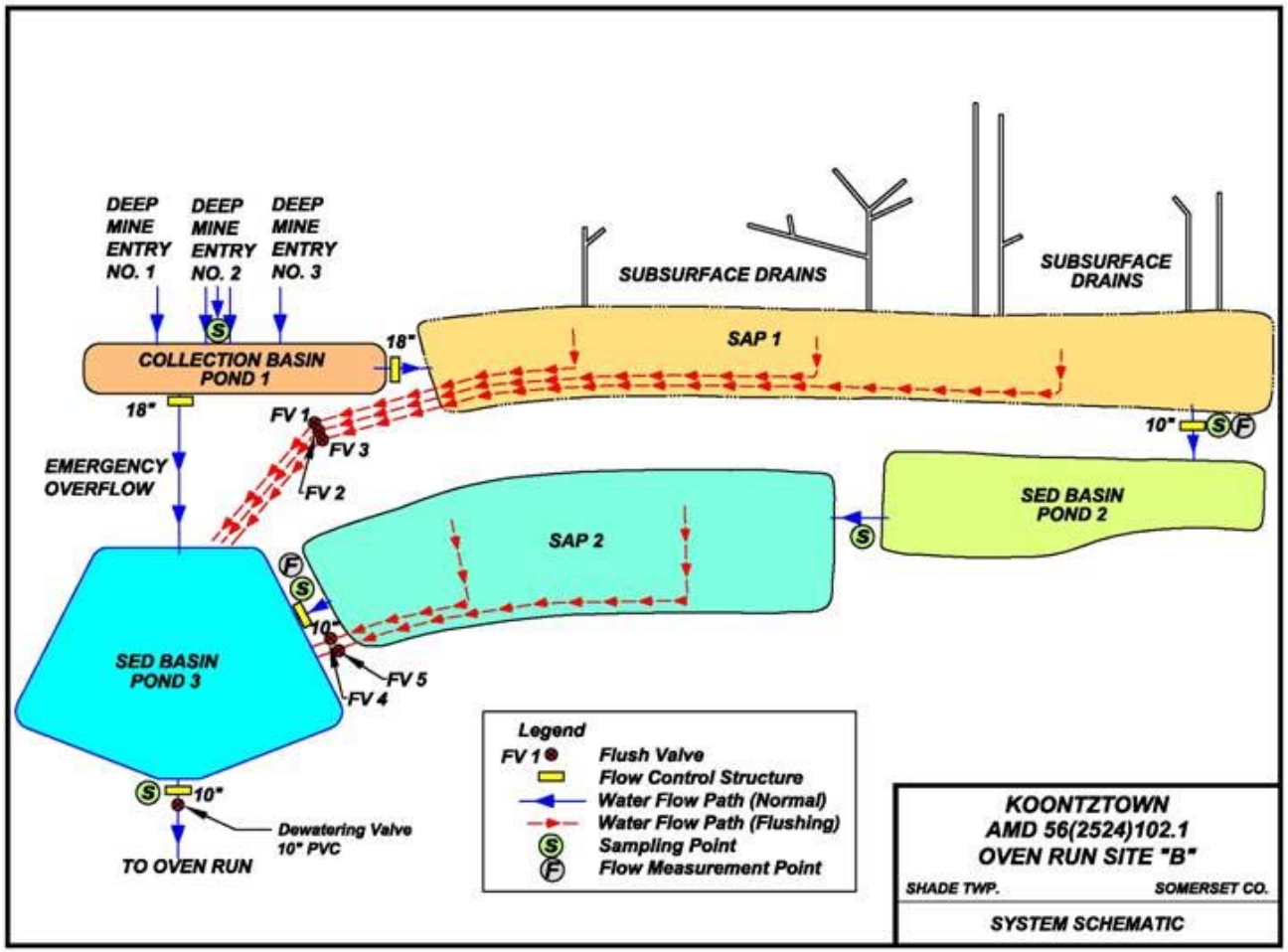
SCOPE OF WORK RECOMMENDED:

- Dewater Pond 3 and replace the broken butterfly dewatering valve with a PVC **gate** valve.
- Build up the height of the access ramp to the flow control structure on Pond 3 approximately two feet (2').
- Divert the system inflow to the emergency spillway of Pond 1 and treat the discharge with caustic soda or soda ash briquettes.
- Dewater both SAPS and power clean all of the flush pipes.
- Power clean all of the other SAPS pipes via the exposed cleanouts.
- Cut off all cleanouts just below the compost layer and install adapters and reinstall the existing screw caps – fix broken cleanout at back of SAP 2.
- Separate the SAP discharge header pipes from the perforated flushing pipes (by cutting and capping all of the six-inch (6") perforated pipes) to conform with current design practices for SAP systems to reduce preferential flow paths.
- Install two (2) plywood baffles on SAP 1 and one (1) plywood baffle on SAP 2 with tops of the baffles approximately one foot (1.0') below the top of embankment elevation. See Appendixes R and S for proposed baffle locations.
- An estimated list of materials needed for the proposed BD project is included in Appendix T.
- O&M Section shall observe and note the extent of limestone coating at cleanouts; header pipe and baffle locations.
- Dig additional test pits as directed by O&M Section to check extent of limestone coating.
- Have BAMR surveyors do an As-Built survey to record all cleanout locations; the header pipe changes; the flow distribution pipe; and obtain elevations on all flow control boxes, spillways and embankments. Install metal markers on SAP embankments in line with the cleanouts.
- Fluff the compost layer of SAP 1 and SAP 2 and replace compost in any areas as needed.
- Using the survey results, adjust the stop log elevations in the flow control boxes on the collection basin (Pond 1) to prevent overloading the treatment system beyond the designed flow rate of 350 gpm. The emergency spillway elevation should be three inches (3") higher than the primary discharge.

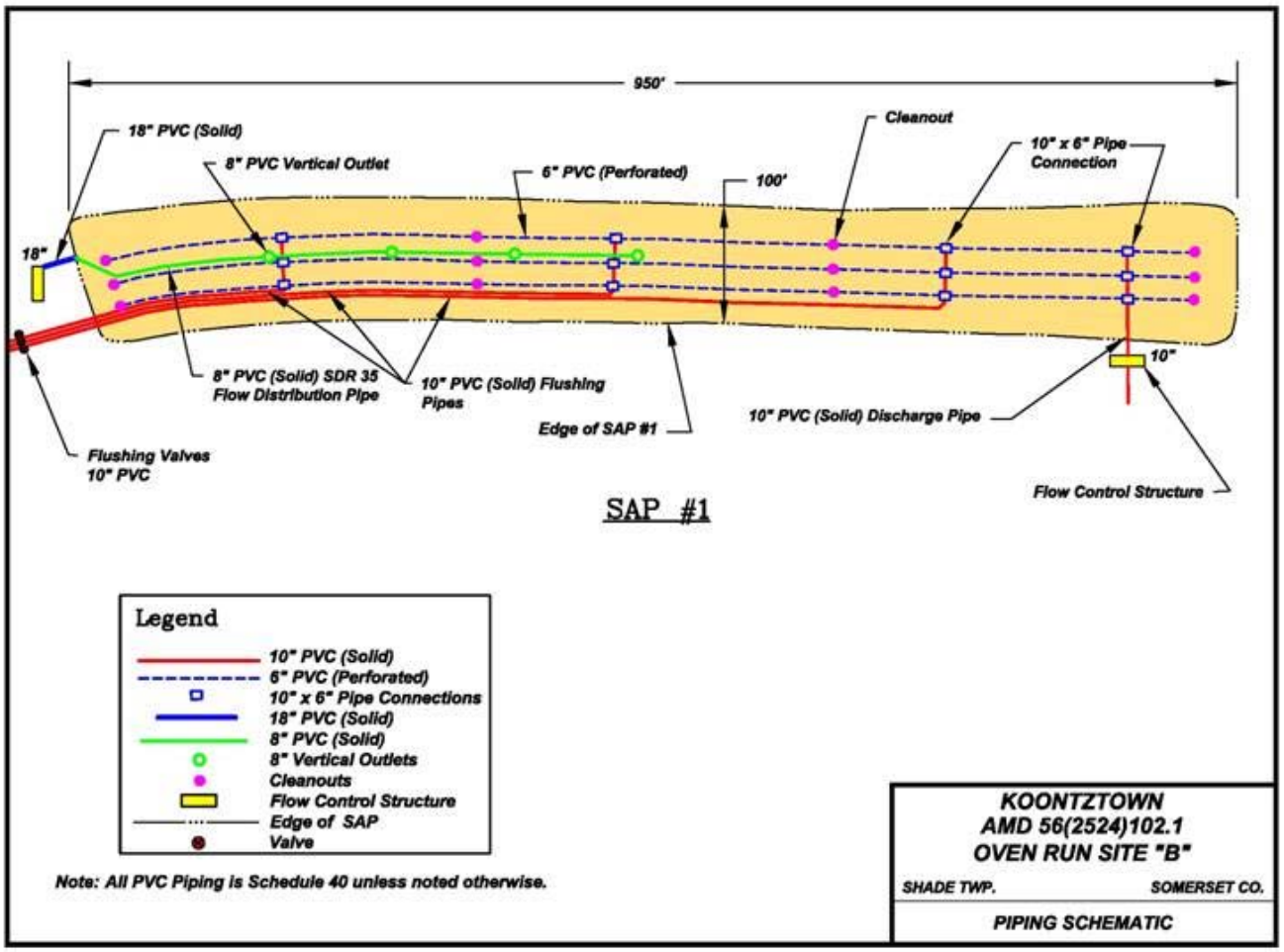
ATTACHMENTS:

- Appendix A: Treatment System Schematic
- Appendix B: Piping Schematic SAP #1
- Appendix C: Piping Schematic SAP #2
- Appendix D: Flow Distribution Pipe Details
- Appendix E: SIS Sampling Point IDs
- Appendix F: SIS Sampling Point Inventory Form
- Appendix G: Oven Run Sampling Locations Upstream and Downstream of Site "B"
- Appendix H: Oven Run Location Map
- Appendix I: Influent Flow To System
- Appendix J: Influent Acidity
- Appendix K: Influent Iron Concentrations
- Appendix L: Influent Al Concentrations
- Appendix M: Influent pH vs. Effluent pH
- Appendix N: Influent Acidity vs. Effluent Acidity
- Appendix O: Influent Iron vs. Effluent Iron
- Appendix P: Influent Al vs. Effluent Al
- Appendix Q: System Flow Rates vs. Design Flow Rate
- Appendix R: Proposed Baffle Locations And Header Pipe Separation SAP #1
- Appendix S: Proposed Baffle Location And Header Pipe Separation SAP #2
- Appendix T: Estimated List of Materials for BD Project for Oven Run Site "B"
- Appendix U: Directions to the Project Site

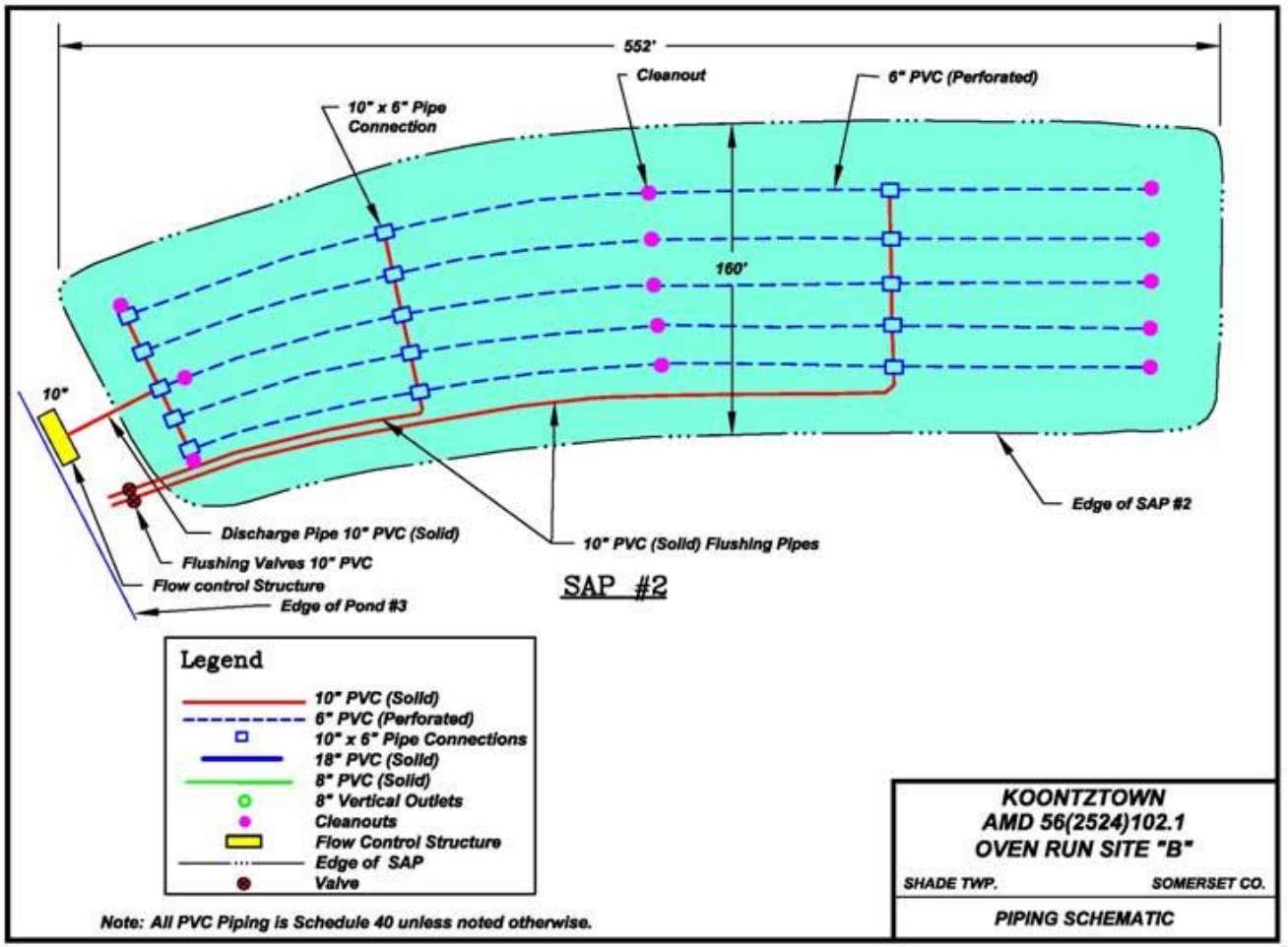
TREATMENT SYSTEM SCHEMATIC



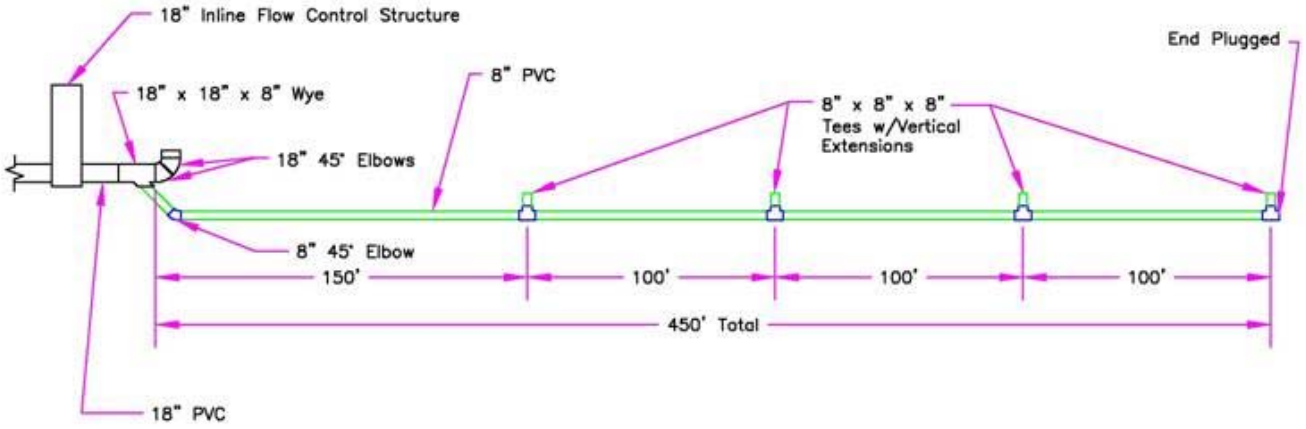
PIPING SCHEMATIC SAP #1

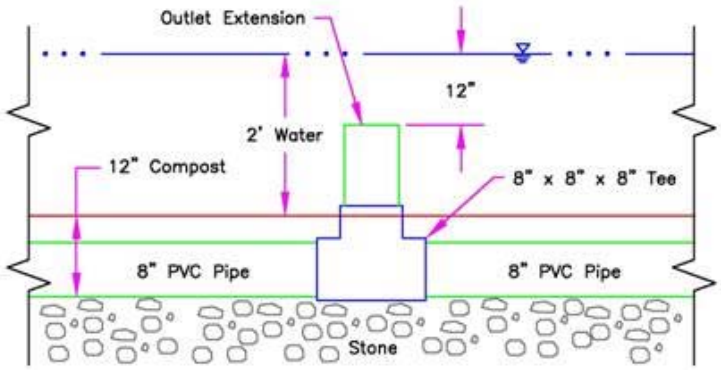


PIPING SCHEMATIC SAP #2



FLOW DISTRIBUTION PIPE DETAILS





OVEN RUN SAP 1 SDR 35 PVC FLOW DISTRIBUTION PIPE

SIS SAMPLING POINT ID'S

DEP Laboratory Sample Submission Sheet

LAB USE ONLY
Date Received:

Bureau of Abandoned Mine Reclamation
Cambria Office
286 Industrial Park Road
Ebensburg, PA 15931-4119

Telephone: 814-472-1800

Program: 0015

Funding Link: 038

Reason: 01

Collector ID: 7485

Date Collected: (MM-DD-YY)

SAC: 719

Routine Monitoring Form

Project (Name/Number)**:OVENRUN / Oven Run Watershed Project**

Seq. # (001-999)	Time: (HH:MM)	Monitoring Point ID Alias:	Point Description: *	Field Measurements: pH	D.O. (mg/l)	Cond. (umho/cm)	Flow (cfs)	Flow E/M	Lab Number
		ORBI	Raw Influent						
		ORBSAP1	DSG SAP #1						
		ORBPOND2	DSG Pond #2						
		ORBUS	Oven Run Upstream						
		ORBSAP2	DSG SAP #2						
		ORBO	Final DSG						
		ORBDS	Oven Run 300 ft downstream						

Weather Conditions:

Comments:

Collector Name (Please Print): Rich Beam Signature:

* For non-established monitoring points, include latitude/longitude. Indicate datum and method in comments.

SIS SAMPLING POINT INVENTORY FORM

SIS
MONITORING POINTS INVENTORY CREATE

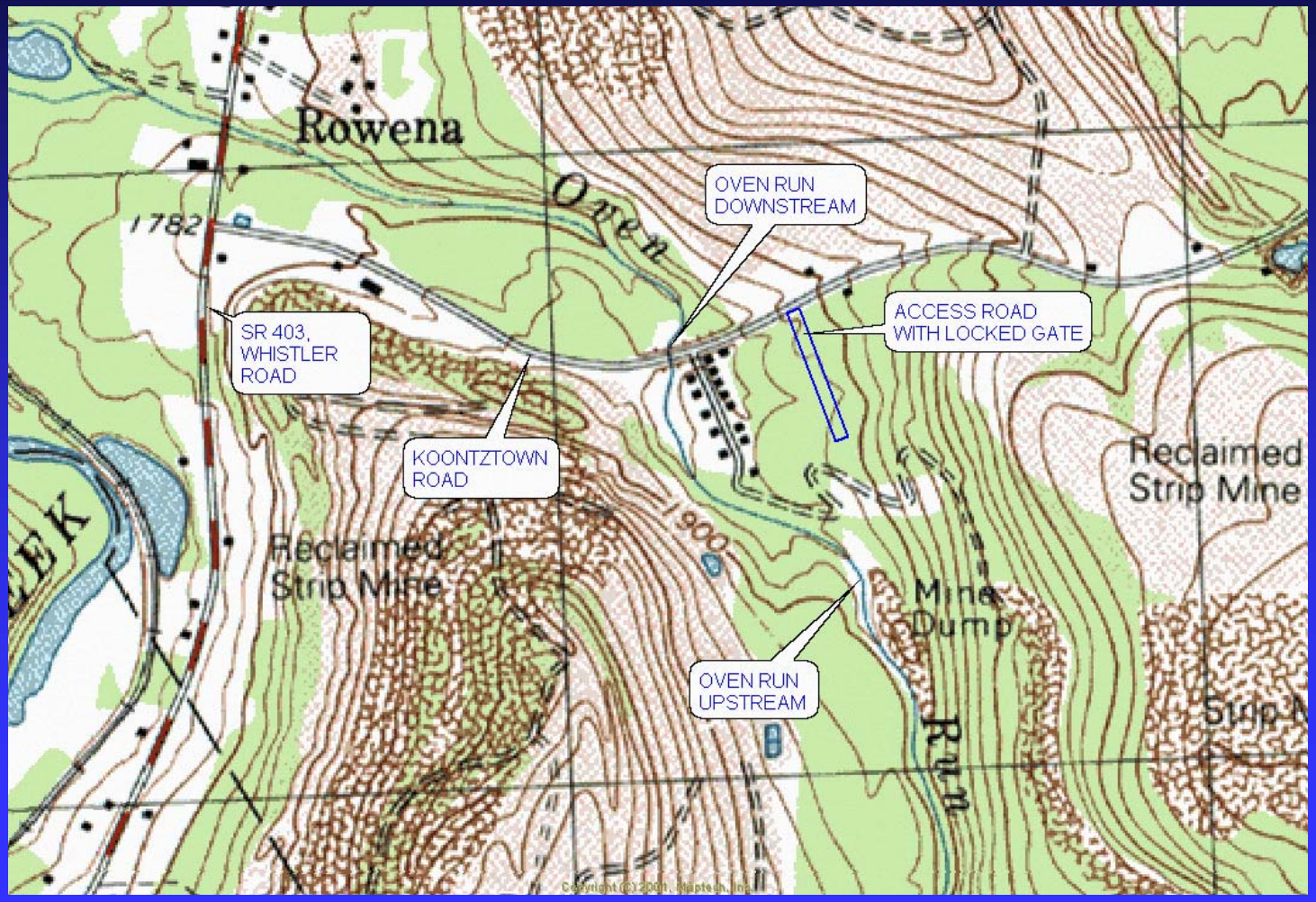
Project ID # Oven Run Project Name Oven Run Watershed Project Primary Township Shade Primary County Somerset Multi Township/County* _____
*If multi township/county you will need to indicate appropriate township and/or county for each MP.

LOCATION METHOD Map ELEVATION ACCURACY 10 feet MEASUREMENT METHOD Map

MP # ALIAS	TYPE	LOCATION DESCRIPTION	LATTITUDE	LONGITUDE	SURFACE ELEVATION	QUAD
ORBI	MDSEP	Oven Run Site B Raw Discharge (Influent)	40-06-44	078-54-42	2120	Stoystown
ORBSAP1	MPTRM	Oven Run Site B Sap #1 Effluent	40-06-41	078-54-41	1980	Stoystown
ORBPOND2	MPTRM	Oven Run Site B Pond #2 Effluent	40-06-39	078-54-44	1935	Stoystown
ORBUS	STRM	Site B Oven Run Upstream	40-06-43	078-54-48	1870	Stoystown
ORBSAP2	MPTRM	Oven Run Site B Sap #2 Effluent	40-06-42	078-54-46	1930	Stoystown
ORBO	MPTRM	Oven Run Site B Effluent from Treatment system	40-06-44	078-54-47	1860	Stoystown
ORBCN	MPTRM	Oven Run Site B Effluent from Treatment system at outlet	40-06-46	078-54-48	1820	Stoystown
ORBSAP1FP1	MPTRM	Oven Run Site B Sap #1 #1 Flush Pipe	40-06-46	078-54-46	2000	Stoystown
ORBSAP1FP2	MPTRM	Oven Run Site B SAP #1 Flush Pipe #2	40-06-46	078-54-45	2000	Stoystown
ORBSAP1FP3	MPTRM	Oven Run Site B SAP #1 Flush Pipe #3	40-06-46	078-54-46	2000	Stoystown
ORBDS	STRM	Site B Oven Run 300 ft Downstream	40-06-46	078-54-51	1860	Stoystown

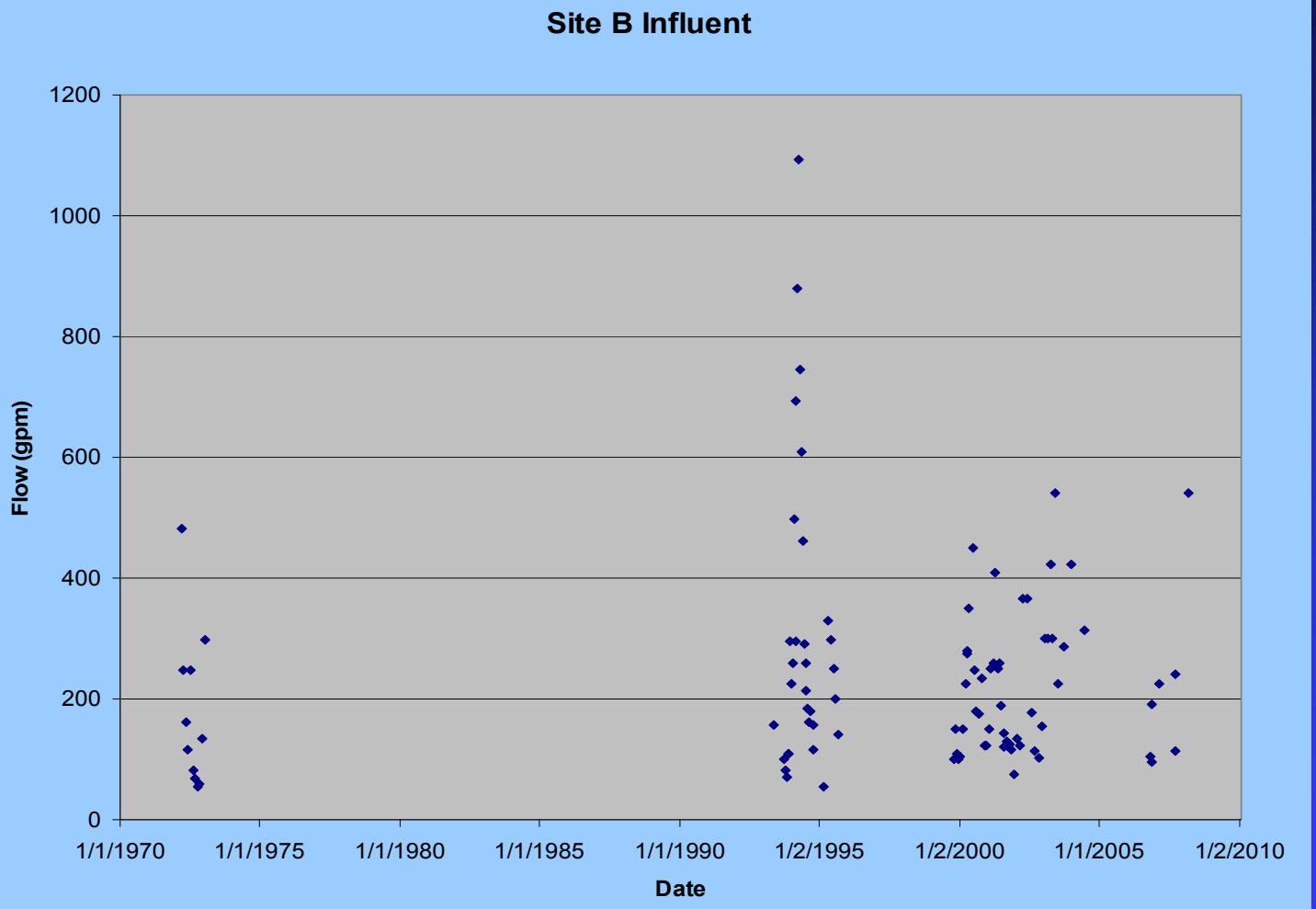
COMMENTS:

OVEN RUN SAMPLING LOCATIONS UPSTREAM AND DOWNSTREAM OF SITE "B"

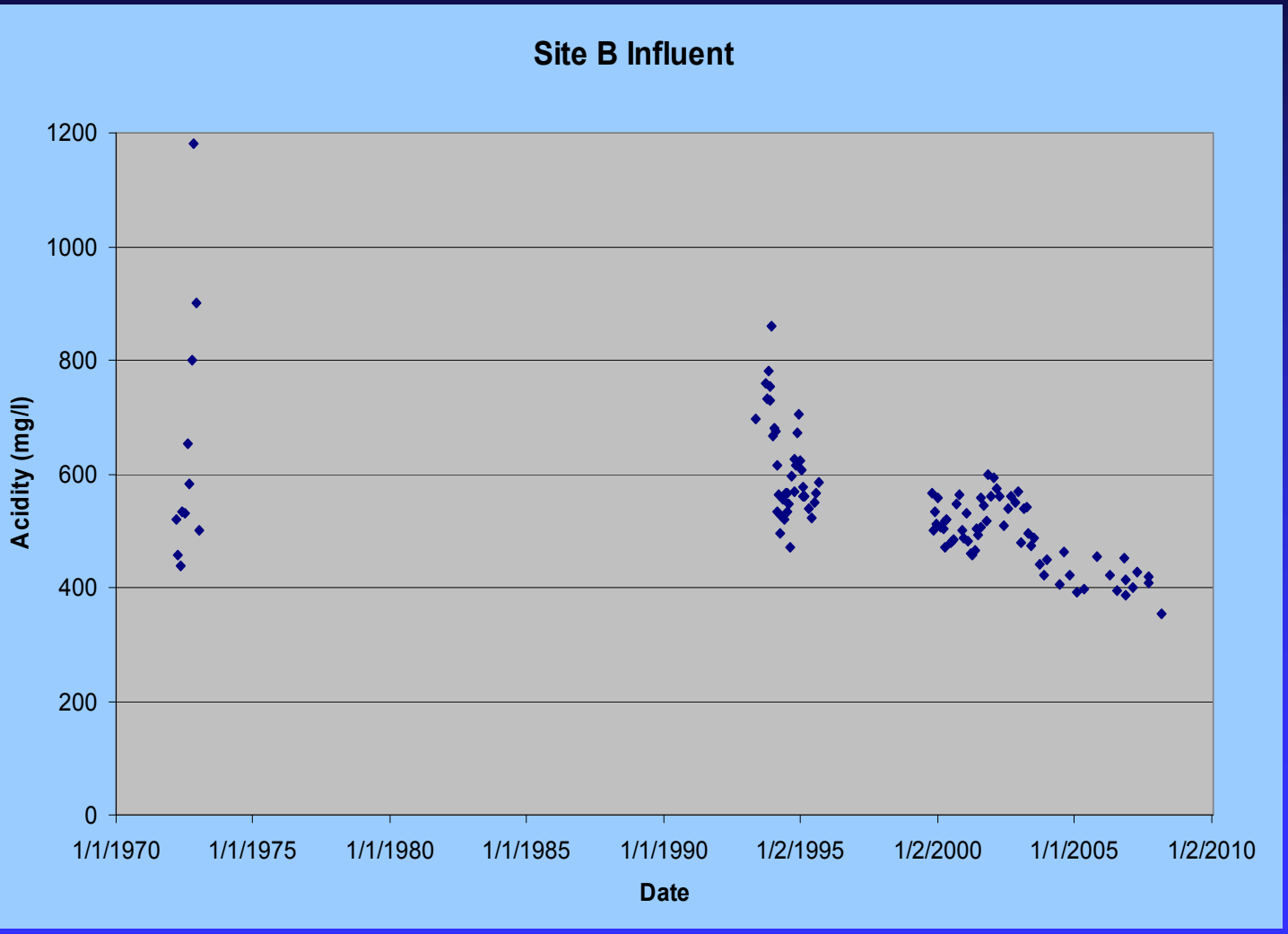



Oven Run Location Map
Hooversville 7.5' U.S.G.S. Map
Stoystown 7.5' U.S.G.S. Map
F
E
D
B
C
A
STONYCREEK
RIVER
Rowena
Wilbur
Stoystown
Kantner
S H A D E
I N G
Reclaimed Strip Mine
Strip Mine
Mine Dump

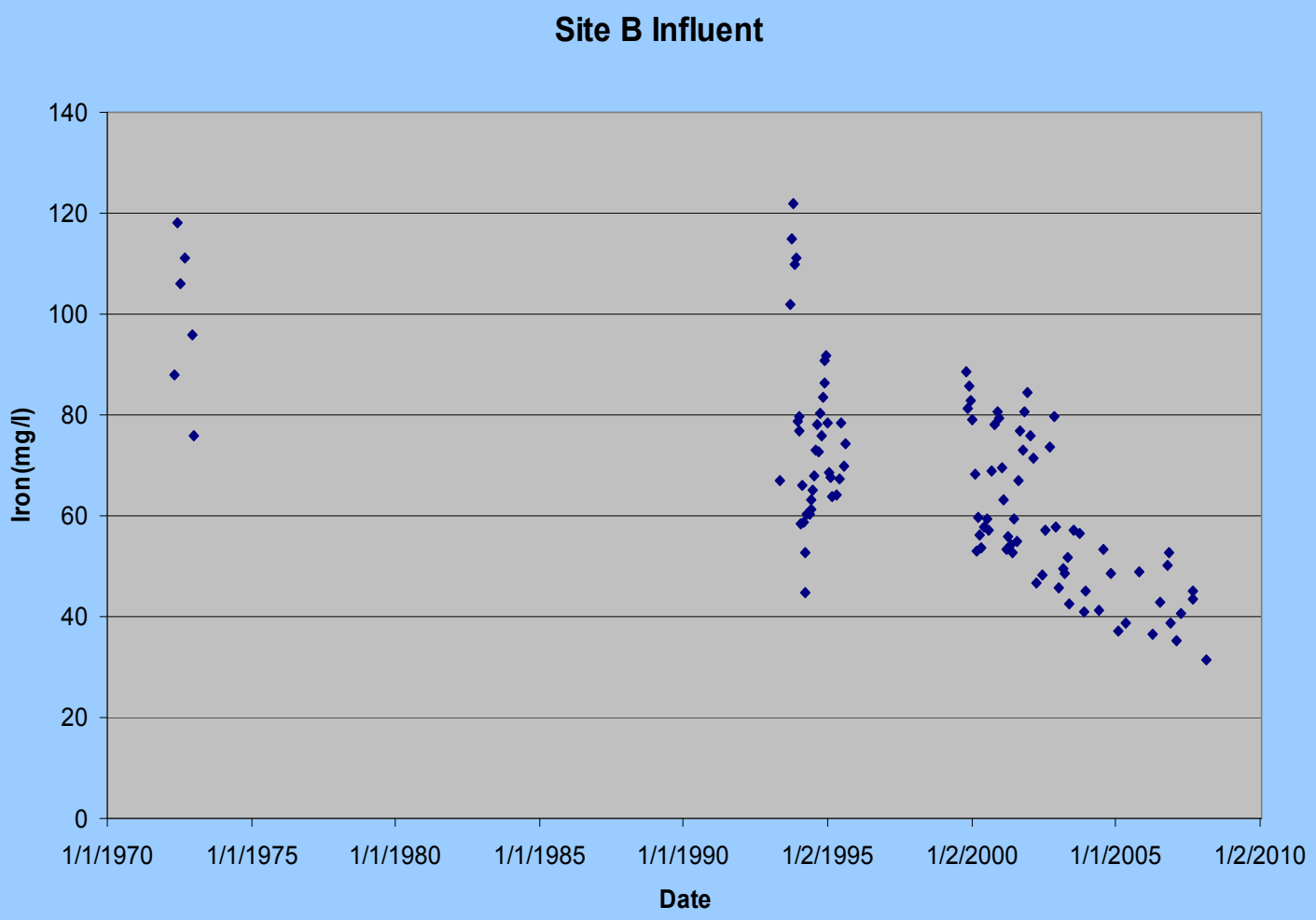
INFLUENT FLOW TO SYSTEM



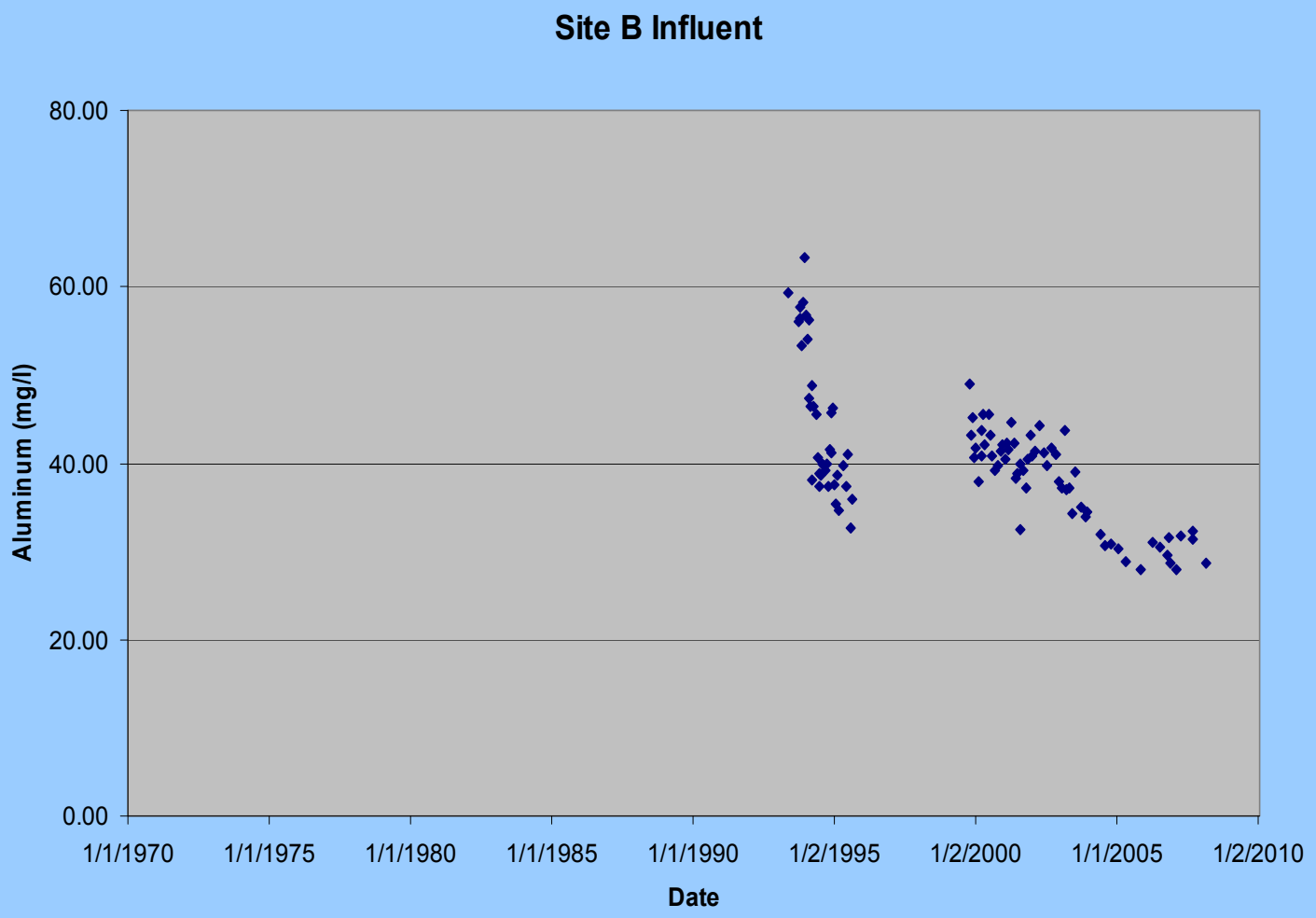
INFLUENT ACIDITY



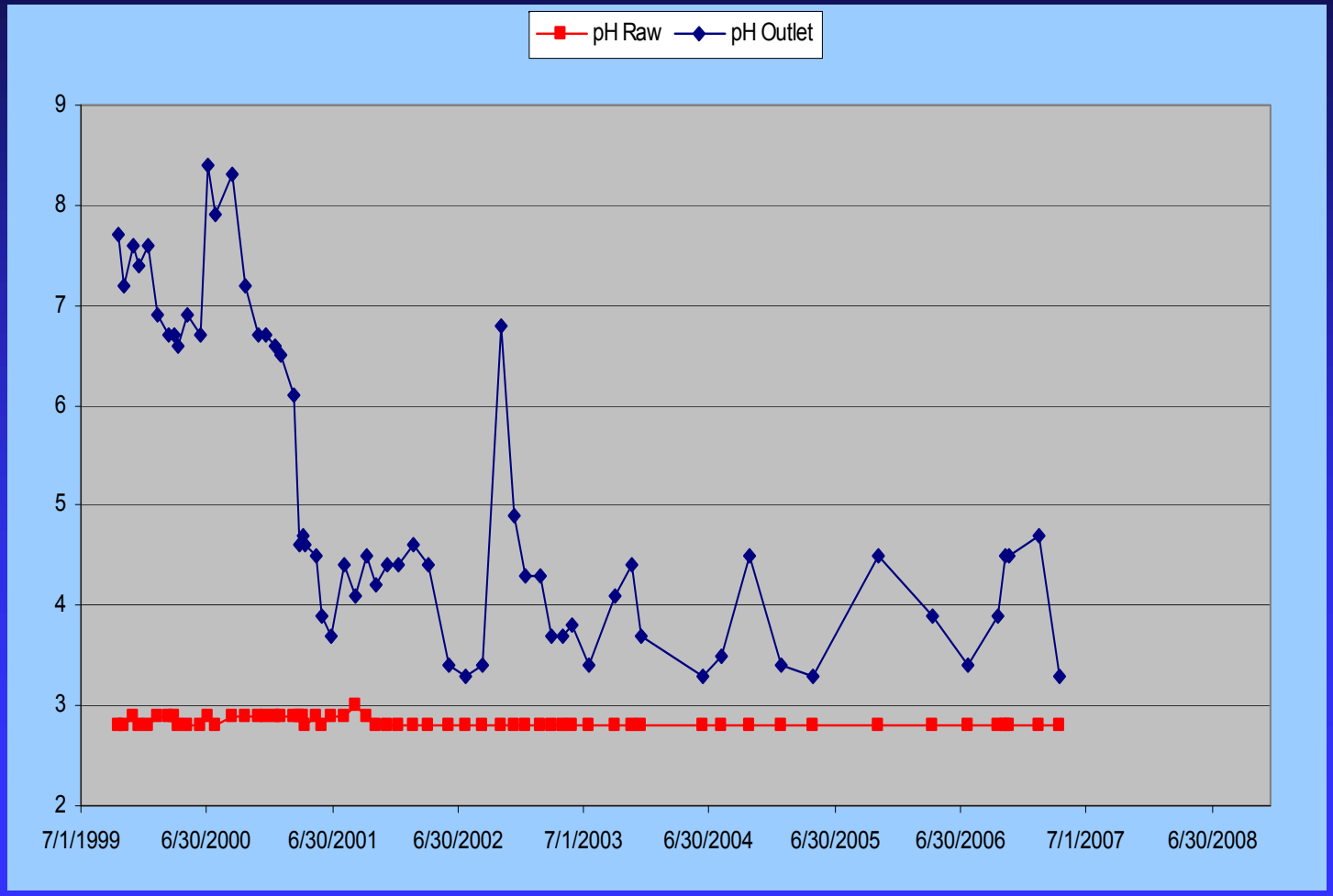
INFLUENT IRON CONCENTRATIONS



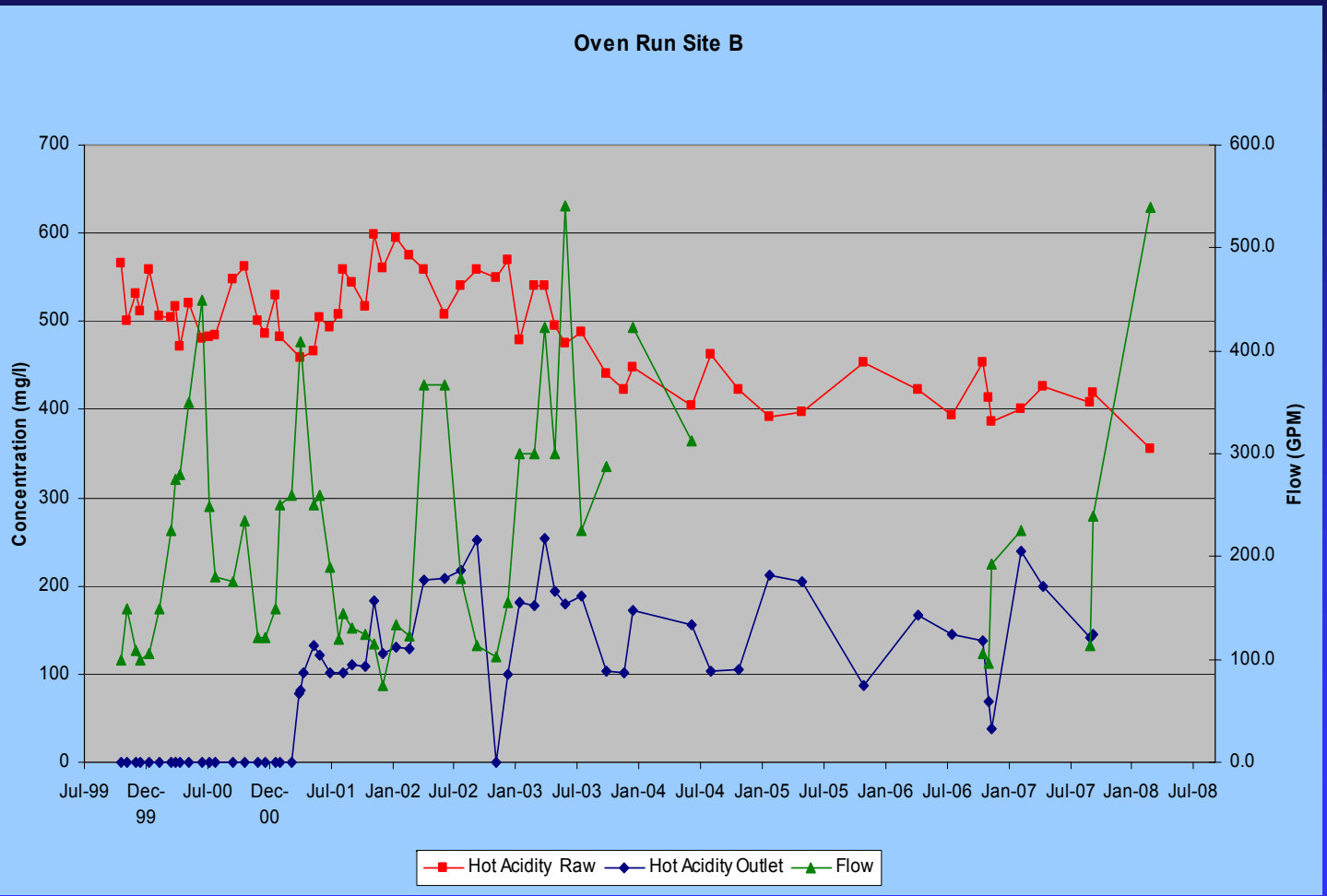
INFLUENT AL CONCENTRATIONS



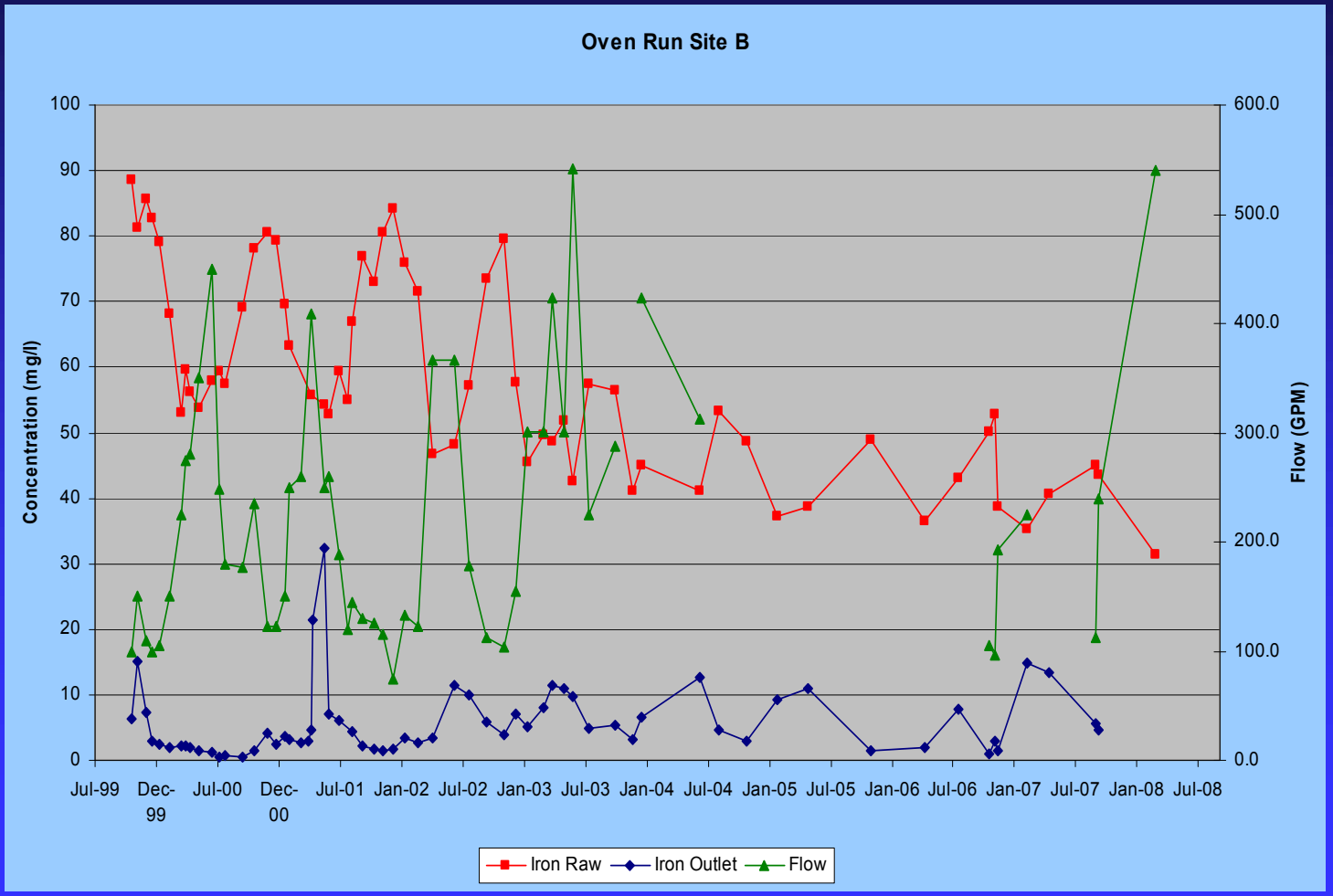
INFLUENT PH VS. EFFLUENT PH



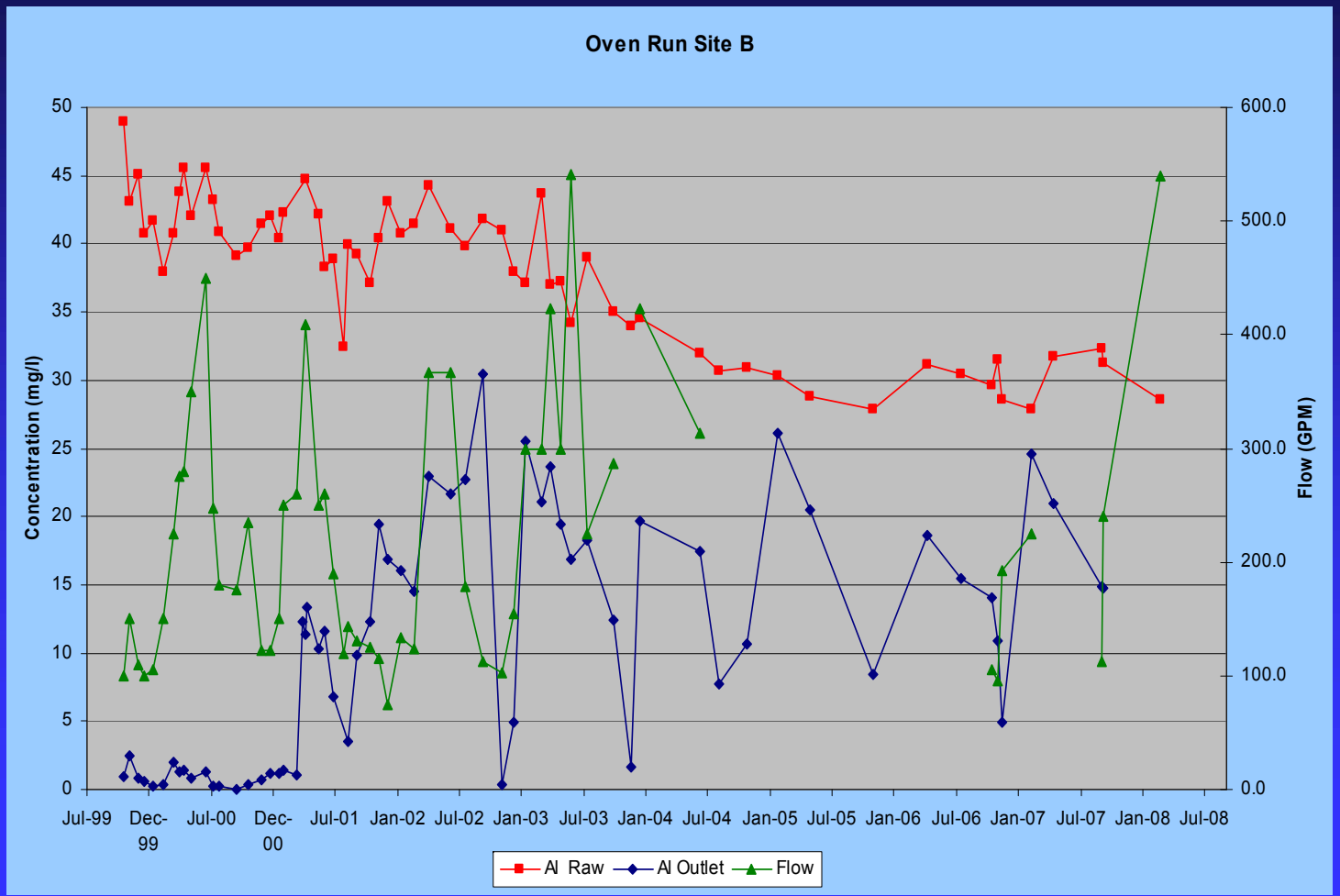
INFLUENT ACIDITY VS. EFFLUENT ACIDITY



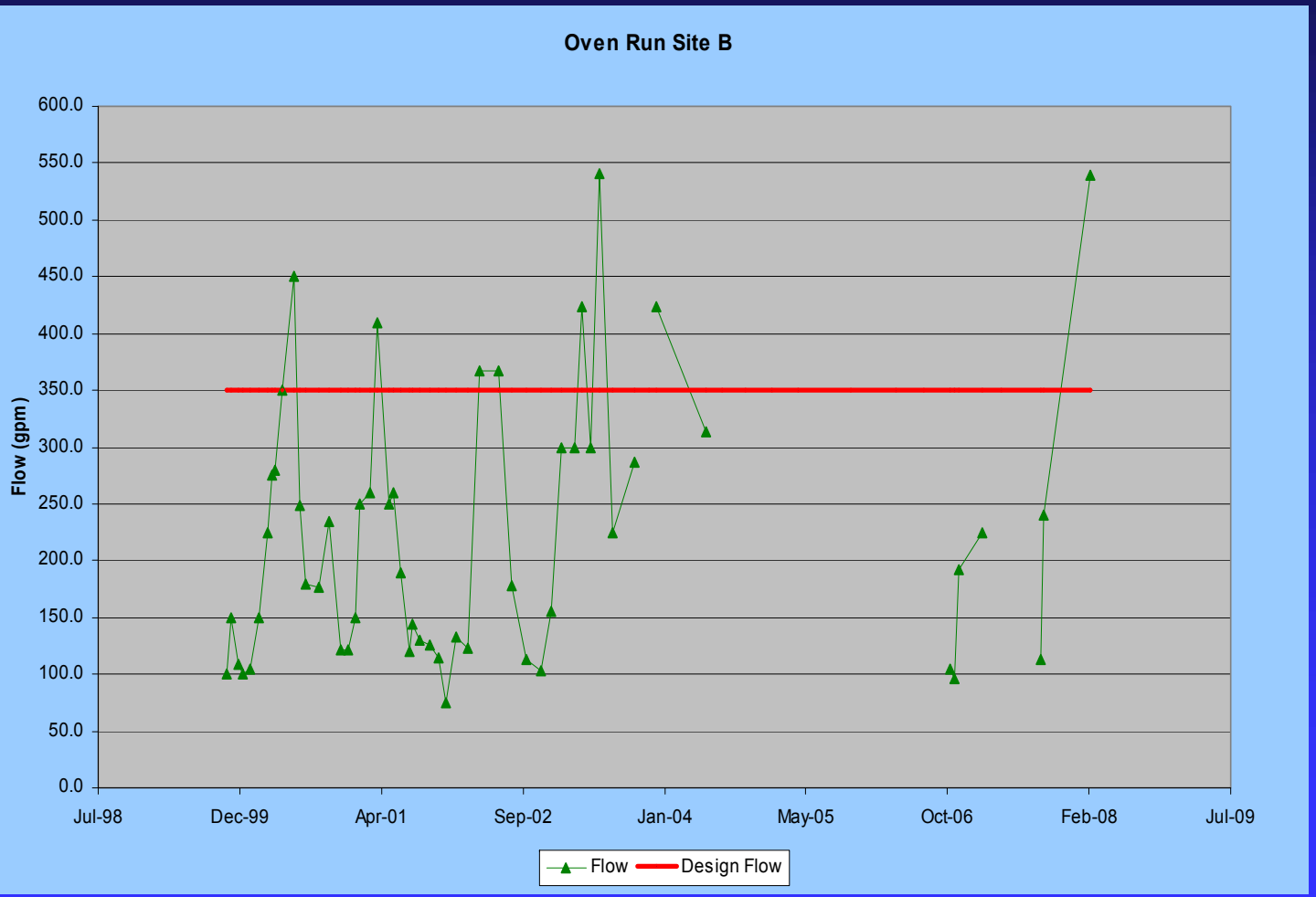
INFLUENT IRON VS. EFFLUENT IRON



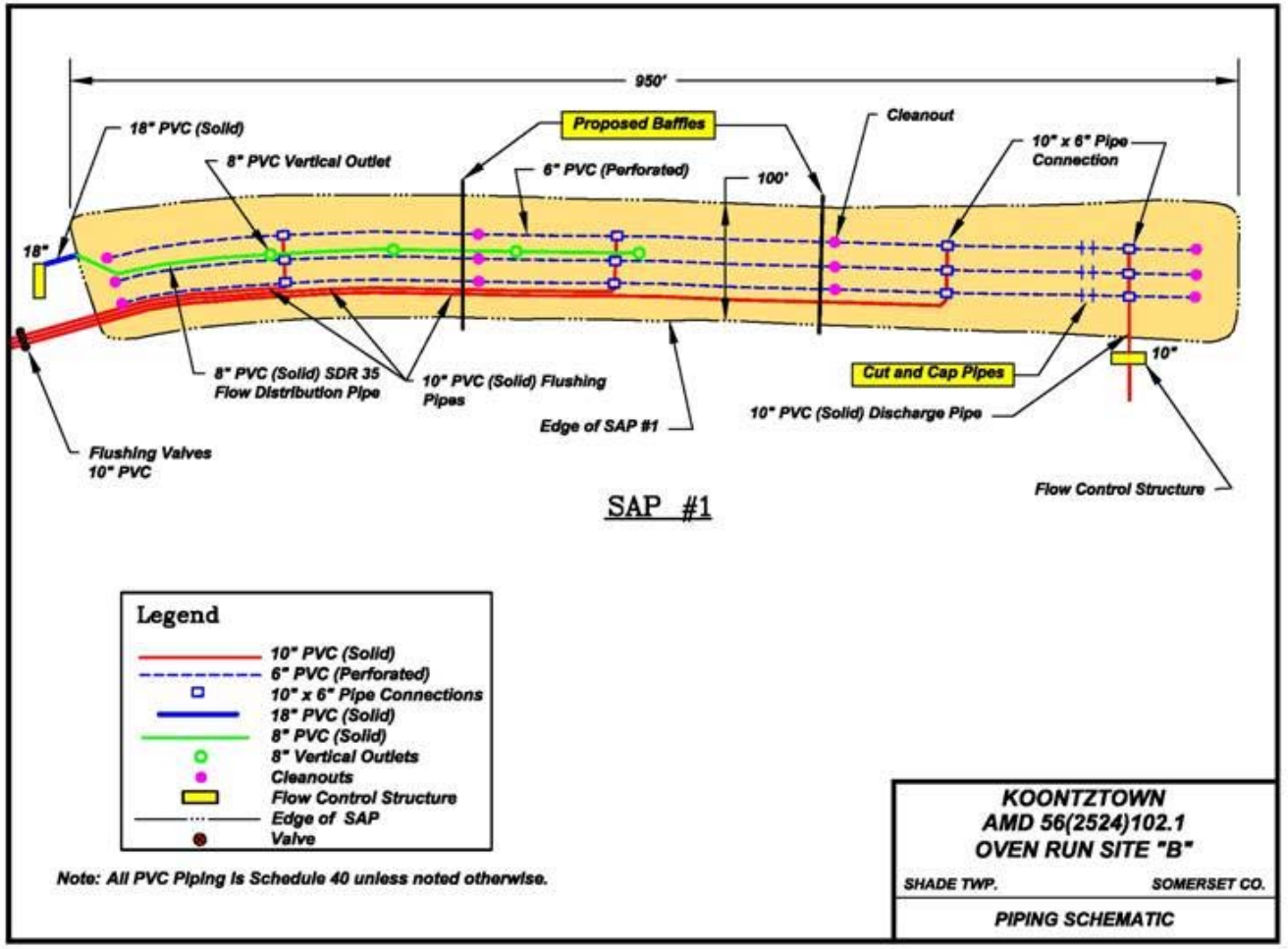
INFLUENT AL VS. EFFLUENT AL



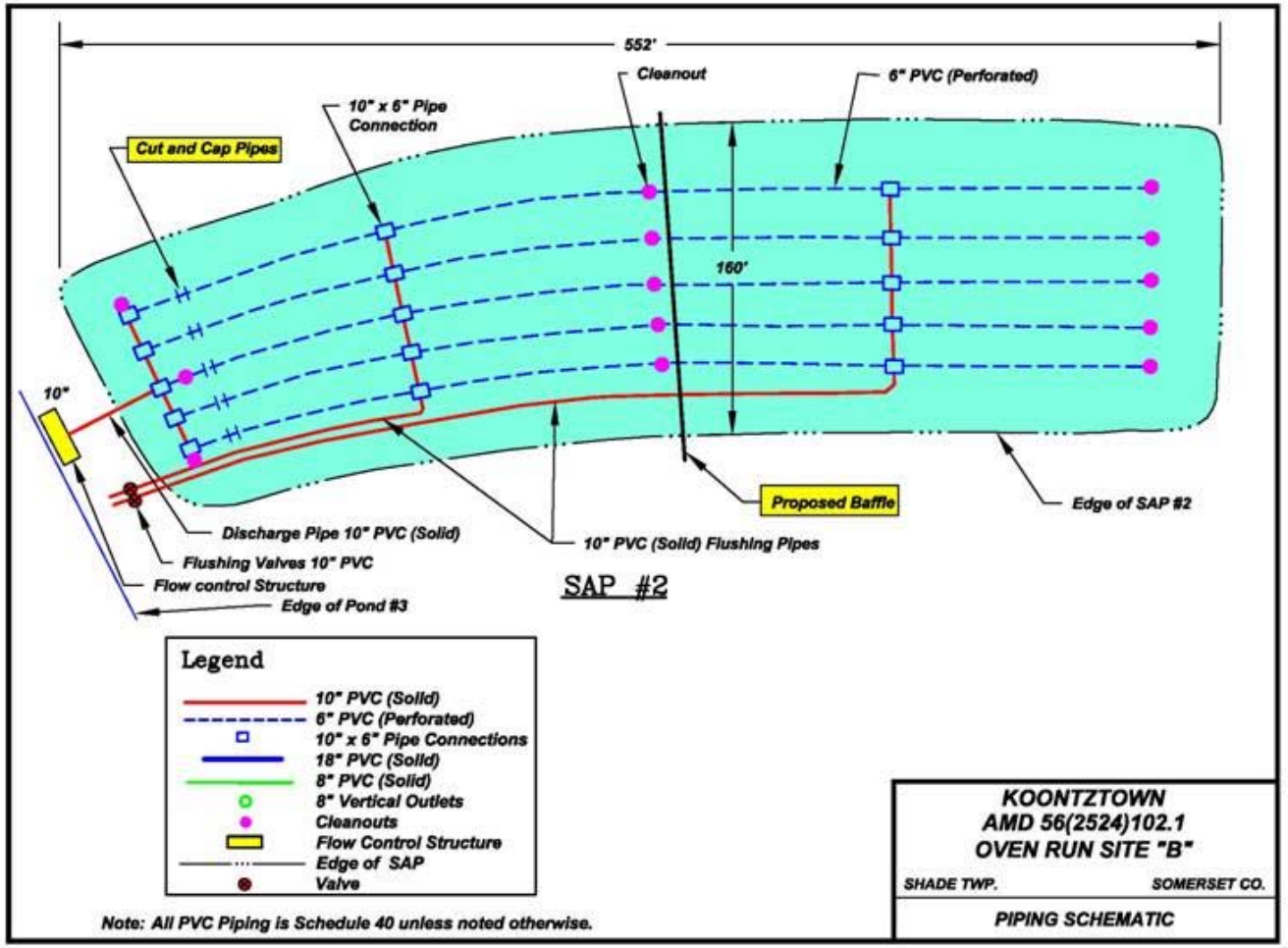
SYSTEM FLOW RATES VS DESIGN FLOW RATE



PROPOSED BAFFLE LOCATIONS AND HEADER PIPE SEPARATION SAP #1



PROPOSED BAFFLE LOCATION AND HEADER PIPE SEPARATION SAP #2



ESTIMATED LIST OF MATERIALS FOR BD PROJECT FOR OVEN RUN SITE "B"

- One 10" Schedule 40 PVC Gate Valve
- Twenty-two (22) 6" Schedule 40 PVC cleanout adapters with female threaded ends (re-use existing threaded caps)
- Four (4) 10" Schedule 40 PVC cleanout adapters with female threaded ends (re-use existing threaded caps)
- Sixteen (16) 6" Schedule 40 PVC end caps
- PVC cement
- Forty-five (45) 4' x 8' sheets of ¾" pressure treated plywood for three (3) baffles
- Forty-seven (47) 4" x 4" x 12' pressure treated posts (cut to 6' lengths)
- Pressure treated posts to rebuild access ramp
- Stainless steel screws for fastening plywood
- 400 l.f. x 5 ft. wide rubber roofing to seal plywood bottom edge, joints and ends
- Rubber roofing wrap cement and bonding adhesive
- Twenty (20) tons of AASHTO #57 sandstone to support ends of plywood baffles and to rebuild access ramp on Pond #3
- Caustic soda drip system or soda ash briquettes

DIRECTIONS TO THE PROJECT SITE

Directions from Ebensburg to Oven Run Site "B"

- Take U.S. Route 219 south to Davidsville/Hollsopple exit
- Take State Route 403 south to Hooversville
- After passing through Hooversville, continue south on S.R. 403 (Whistler Road) to Koontztown Road on the left
- Go approximately 0.6 mile on Koontztown Road to the project entrance road on the right.