

**INDIANA COUNTY
BLACKLEGGS CREEK WATERSHED ASSOCIATION**

**BIG RUN #2
TREATMENT FACILITY**



Prepared for:

**Commonwealth of Pennsylvania
Department of Environmental Protection**

Prepared by:

Blackleggs Creek Watershed Association

In Association with:

**SKELLY AND LOY, INC.
ENGINEERS-CONSULTANTS**

MARCH 2004

**INDIANA COUNTY
BLACKLEGGS CREEK WATERSHED ASSOCIATION**

**BIG RUN #2
TREATMENT FACILITY**

PREPARED FOR

**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

PREPARED BY

BLACKLEGGS CREEK WATERSHED ASSOCIATION

MARCH 22, 2004

TABLE OF CONTENTS

	PAGE
I. PROJECT DESCRIPTION	1
A. PROJECT BACKGROUND AND SUMMARY	1
B. BIG RUN #2 DISCHARGE PASSIVE TREATMENT DESIGN	1
II. PROJECT RESULTS	3
A. ENVIRONMENTAL IMPROVEMENTS	3
B. PUBLIC OUTREACH AND COMMUNITY INVOLVEMENT	4

APPENDICES

APPENDIX A - PROJECT LOCATION MAP
APPENDIX B - PHOTOGRAPHS
APPENDIX C - AS-BUILT DESIGN PLANS

LIST OF TABLES

NO.	DESCRIPTION	PAGE
1	FLOW AT FINAL SYSTEM EFFLUENT	3
2	INFLUENT WATER QUALITY	3
3	LIMESTONE POND EFFLUENT WATER QUALITY	4
4	FINAL SYSTEM EFFLUENT WATER QUALITY	4

I. PROJECT DESCRIPTION

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A. PROJECT BACKGROUND AND SUMMARY

The Big Run #2 discharge emanates from a deep mine drainage heading along Big Run in Conemaugh Township, Indiana County. While the discharge chemistry is not severe, the high average flow rate of 1,250 gallons per minute (gpm) translates to 245 tons of acidity and 8.5 tons of aluminum entering Big Run and its receiving stream, Blacklegs Creek, annually. Its significant pollutant loading combined with its upstream location made treatment of the Big Run #2 discharge a priority in the "Blacklegs Creek AMD Remediation Plan." Working toward the goals set forth in the plan, the Blackleggs Creek Watershed Association (BCWA) submitted for and received funding through the Pennsylvania Department of Environmental Protection's (PA DEP) Growing Greener grants program for construction of the Big Run #2 passive treatment system in 2001.

Upon receiving construction funds, BCWA contracted Skelly and Loy, Inc. to complete the engineering design and permitting and Grguric Excavating to construct the treatment system. System construction was completed in Winter of 2003/2004. Inclement weather delayed the completion from its originally proposed date of Fall 2002.

B. BIG RUN #2 DISCHARGE PASSIVE TREATMENT DESIGN

1. Proposed Design

Design considerations outlined in the original grant application entailed piping the discharge 900 feet to the treatment location. The general concept employed is to contact the seepage water with limestone material to add alkalinity to the water. The net alkaline water is then routed through pond/wetland cells for precipitation of metals. The passive treatment system includes the following components: a piping network to direct the discharge to the treatment location; one limestone-filled basin; and pond/wetland cells. The system also includes an in-line water control structure to adjust wetland water elevations.

The limestone pond contains 3,400 tons of limestone and is designed to be easily "recharged" as limestone is consumed. The addition of limestone will be a simple process of adding additional stone to the top of the bed.

II. PROJECT RESULTS

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A. ENVIRONMENTAL IMPROVEMENTS

The Big Run #2 discharge, as already described, is a net acid discharge that contributes significant metals and acidity loads to Big Run, a tributary of Blacklegs Creek. Iron concentrations are low, but aluminum is found in concentrations lethal to aquatic life (3.1 mg/L average). Annually, it is estimated that 8.5 tons of aluminum enter Big Run from this discharge.

Water quality data from influent and effluent samples show that the system is discharging near neutral to net alkaline water having a pH suitable for metals precipitation. However, the samples showed that aluminum is present in the effluent. It appears that the pond/wetland was being short-circuited and not providing sufficient retention time to allow for the retention of metals in the pond. Establishment of baffles and vegetation in the wetland portion should improve this retention capacity. Sizing of the pond/wetland fully utilized the space available. The in-line water level control structures allow for adjustment of the water elevation within both the limestone pond and the pond/wetland. Water elevation management is currently being investigated as a means of improving metals retention. A summary of treatment system influent and effluent water quality and flow rate follows.

**TABLE 1
FLOW AT FINAL SYSTEM EFFLUENT**

Date	Flow
January 2004	1,314 GPM
February 2004	1,792 GPM

**TABLE 2
INFLUENT WATER QUALITY**

Sample ID	Date	pH SU	Alkalinity mg/L	Acidity mg/L	Iron mg/L	Manganese mg/L	Aluminum mg/L
BR-4	1/04	4.1	2	115	6.31	2.41	17.00
BR-4	2/04	4.7	8	32	1.16	2.40	7.76

**TABLE 3
LIMESTONE POND EFFLUENT WATER QUALITY**

Sample ID	Date	pH SU	Alkalinity mg/L	Acidity mg/L	Iron mg/L	Manganese mg/L	Aluminum mg/L
ST-1	1/04	5.6	18	16	1.11	2.41	7.01
ST-1	2/04	6.5	71	0	0.49	2.17	3.24

**TABLE 4
FINAL SYSTEM EFFLUENT WATER QUALITY**

Sample ID	Date	pH SU	Alkalinity mg/L	Acidity mg/L	Iron mg/L	Manganese mg/L	Aluminum mg/L
ST-0	1/04	5.4	13	24	1.08	2.48	6.56
ST-0	2/04	6.4	51	0	1.30	2.26	5.07

Based on loading calculations, the treatment system is removing aluminum at a rate of 21 tons per year. Acidity loading is being reduced by 190 tons per year and 101 tons per year of alkalinity are being added to Big Run. These improvements in water quality combined with the relocation of the discharge downstream will produce improvement to Big Run.

B. PUBLIC OUTREACH AND COMMUNITY INVOLVEMENT

A wealth of information concerning the activities of the BCWA as well as the Big Run #2 passive treatment system is available on the Web at www.blackleggs.org. On this site, visitors can read background information, view construction photographs, and even watch a video of construction activities. With this site, anyone can learn more about the BCWA and how they can get involved.

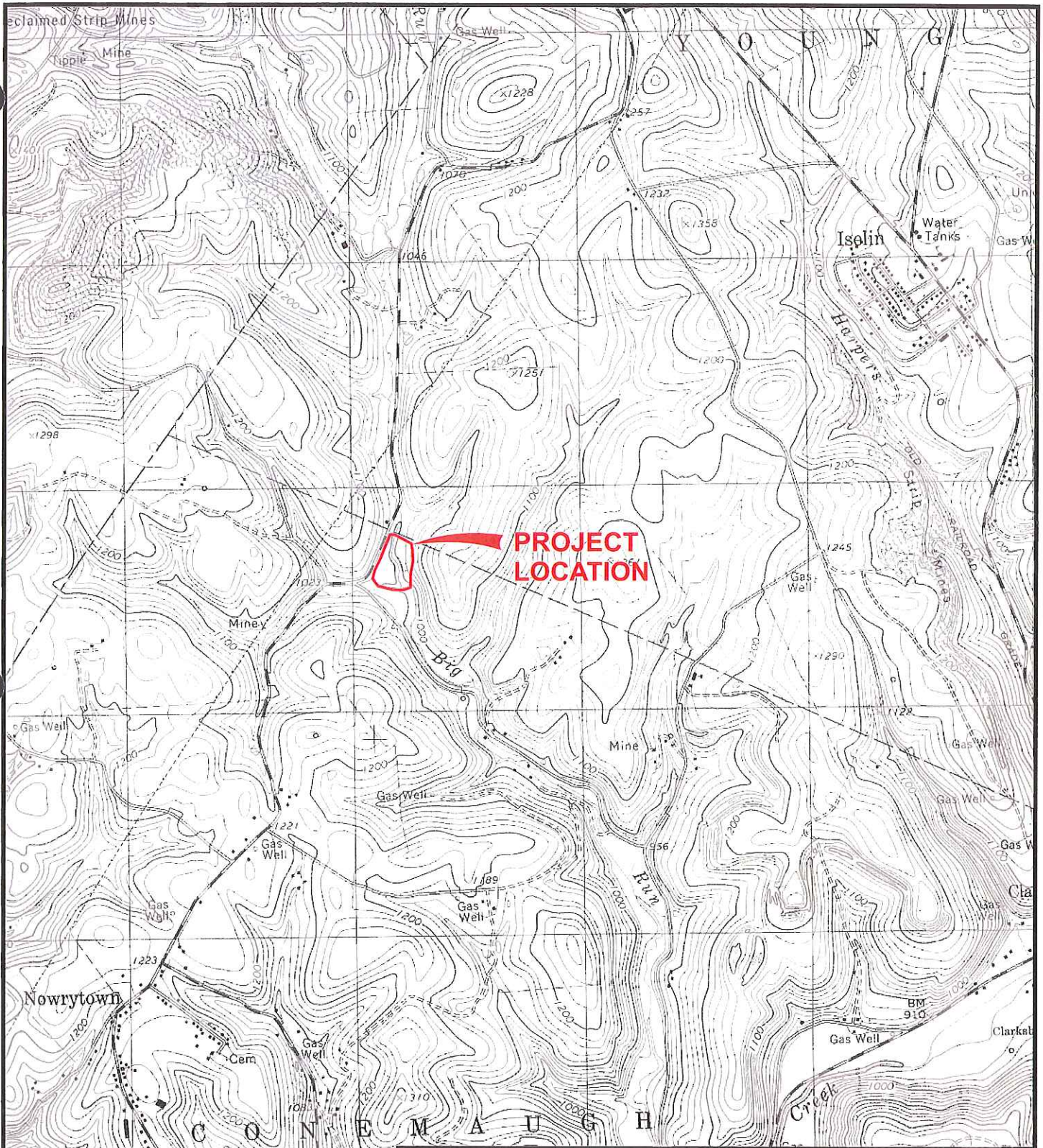
BCWA maintained correspondence with Skelly and Loy throughout the project. Also assisting with the oversight process was the Indiana County Conservation District and Western Pennsylvania Coalition for Abandoned Mine Drainage (WPCAMR). Additionally, our organization utilized a project technical committee to coordinate project activities.

Our organization conducts regular meetings where information regarding our projects through the Growing Greener program is discussed. Because of the notoriety of the Blacklegs

Trout Nursery, obtaining community support has not been difficult. Our organization continuously strives to involve the public in our efforts. This is evidenced by the several community days and open house programs coordinated in the past. Information regarding this project will continue to be conveyed at our regularly scheduled events. We feel that our organization and the Blacklegs Creek watershed could serve as a model for other watersheds groups with regard to AMD treatment in several different capacities. We have also partnered with several agencies, organizations, and even the Consol Coal Company in order to reach our ultimate goals.

APPENDICES

**APPENDIX A -
PROJECT LOCATION MAP**



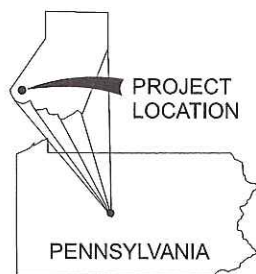
BLACKLEGGS CREEK WATERSHED ASSN.

SPORANZA #2 AMD
 REMEDIATION PROJECT
 CONEMAUGH TOWNSHIP INDIANA COUNTY

PROJECT LOCATION

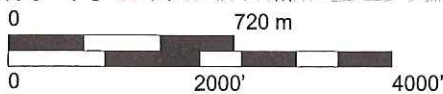
FIGURE - 1

SKELLY and LOY Inc.
 CONSULTANTS IN
 ENVIRONMENT - ENERGY
 ENGINEERING - PLANNING



PROJECT
 LOCATION

PENNSYLVANIA



**APPENDIX B -
PHOTOGRAPHS**



Excavated drainage heading.



Closeup view of exposed drainage heading.



Pipe being fitted to storm water control structure.



Installing pipe between storm water control structure (upper left) and valve box (lower right).



Pipe route to treatment system.



Overview of emergency overflow pipe and valve box (inset) after back filling.



Pond construction.



Limestone Pond prior to limestone placement. Flushing network is visible.

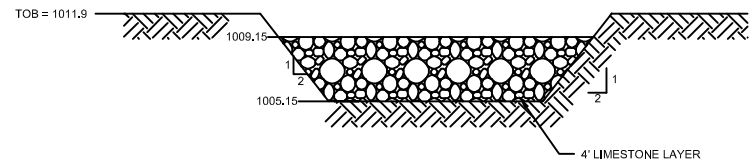


View of flushing network in Limestone Pond prior to limestone placement. Note bedrock exposed on left pond berm.

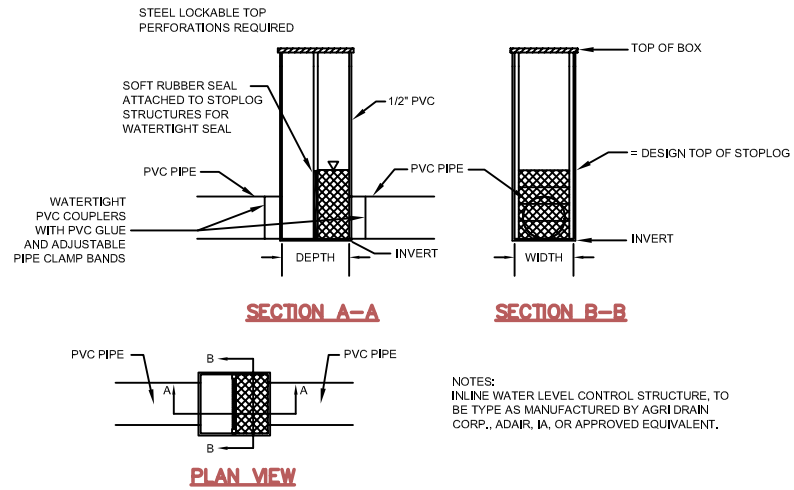


Pond/wetland construction. Inline water level control structures for the Limestone Pond are visible in the foreground.

**APPENDIX C -
AS-BUILT DESIGN PLANS**



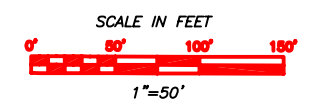
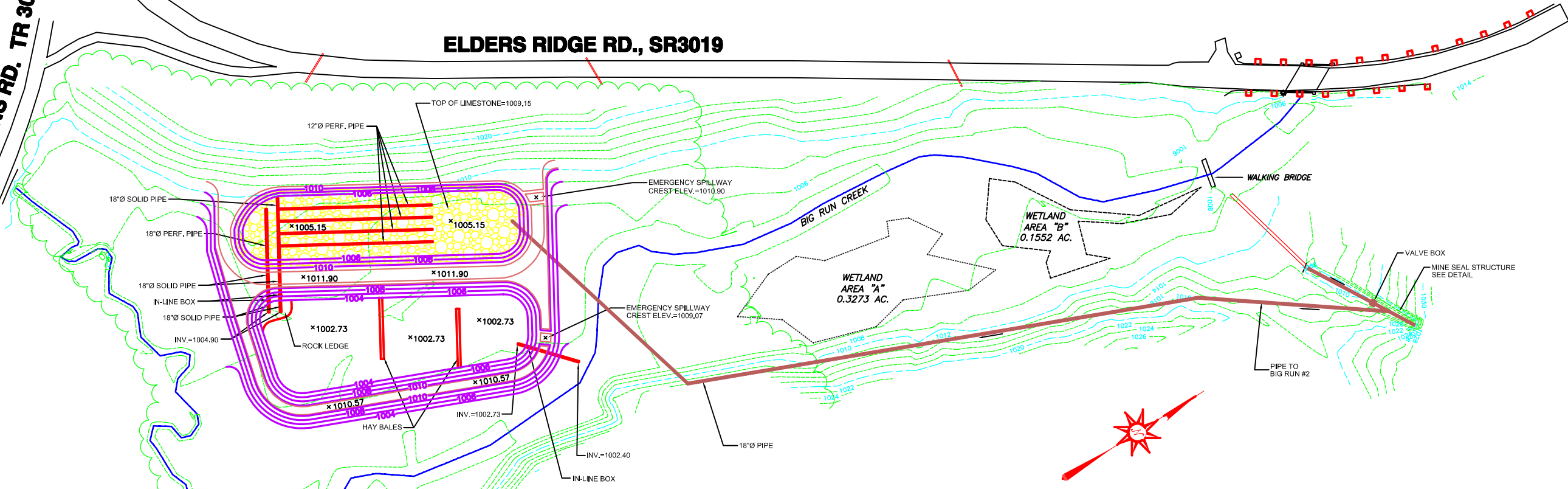
LIMESTONE POND CROSS SECTION
NO SCALE



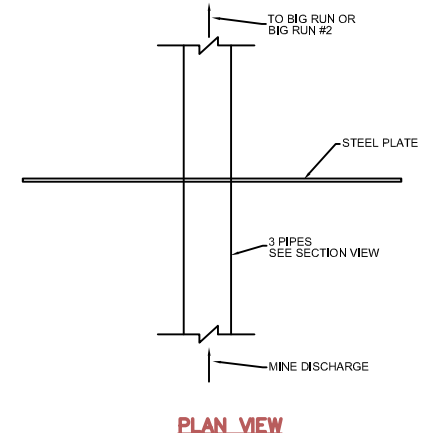
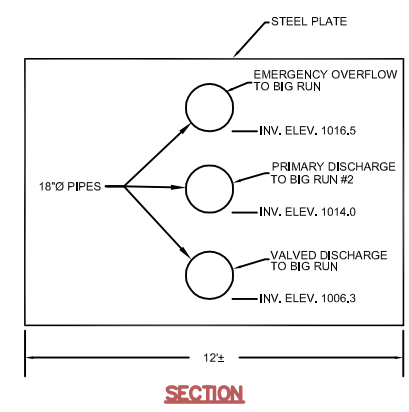
PVC INLINE WATER LEVEL CONTROL STRUCTURE WITH ATTACHMENTS
NO SCALE

SPORTSMANS RD. TR 304

ELDERS RIDGE RD., SR3019



- LEGEND**
- GUIDE RAIL
 - REBAR AND CAP
 - PENNDOT DISC
 - UTILITY POLE
 - ROAD SIGN
 - FILTER FABRIC FENCE
 - PROPOSED CONTOUR LINES
 - EXISTING CONTOUR LINE
 - EXISTING CONTOUR LINE (10 FT INTERVAL)
 - STREAM



MINE SEAL STRUCTURE
NO SCALE

DRAWING NO. C-1	SHEET 1 OF 1
SPERANZA BLACKLOGG CREEK WATERFED ASSOCIATION CONEMAUGH TOWNSHIP CLARKEBURG, PA. INDIANA COUNTY, PA.	
ENGINEERS-CONSULTANTS	
DATE 3/17/02	DATE 3/17/02
DESIGN TWS	DESIGN BAS
CHKD TWS	CHKD TWS
APPV	APPV
SCALE 1" = 50'	
DATE 3/19/04	DATE 3/19/04
AS-BUILT PLAN	DESCRIPTION
REV	BY
REV	BY
SKELLY AND LOY, INC.	
ENGINEERS-CONSULTANTS	
2601 NORTH FRONT STREET HARRISBURG, PENNSYLVANIA	
(800)892-6532 FAX (717)232-1799	
(717)232-0593	
JOB NUMBER 1601045	DATE MARCH 7 2002