

**PA COMPREHENSIVE MINE RECLAMATION STRATEGY**  
**-SLIPPERY ROCK CREEK WATERSHED PROJECT-**

**DESIGN PLAN**

**SR 85 & SR 86**

**-AS PART OF THE FERRIS TREATMENT COMPLEX-**

**-This design plan is based on the topographic maps used in the Operation Scarlift deep mine seal areas developed by GWIN, DOBSON, & FOREMAN, Consulting Engineers 1973.**

**-A grid layout and topographic survey site specific to the construction area is currently in process.**

**Roger D. Bowman, Mining Engineer  
Department of Environmental Protection  
Knox District Mining Office  
July 1996**

**Revised: October 1996**

**MINERAL RESOURCES MANAGEMENT  
BUREAU OF DISTRICT MINING OPERATIONS - KNOX  
PROJECT PLAN**

**DATE:** September 12, 1996

**AVAILABLE FUNDING:** \$ 60,000.00

**PROJECT SUBJECT:** Remediation of Operation Scarlift Discharges SR 85 and SR 86 via a comprehensive reclamation agreement with Kerry Coal Company for the Slippery Rock Creek Watershed Project.

**PROJECT OBJECTIVES/DESCRIPTION:**

To retain metals and boost alkalinity in two AMD discharges in State Game Lands 95 on the Slippery Rock Creek. The project will consist of collecting both discharges and treating them by constructing a vertical flow compost cell/retention basin/successive alkaline-producing system as part of the Slippery Rock Creek Rehabilitation Plan of the Comprehensive Mine Reclamation Strategy (CMRS).

**PROJECT START DATE:** October 1, 1996

**PROJECT LEADER (Include Tel. # & Office):** Roger Bowman, (814) 797-1191  
Knox District Mining Office

**PROJECT PARTICIPANTS (% Time Required):** \*estimated over life of project - 3 years (12/95 - 11/98)

TECH STAFF	COMPLIANCE STAFF	SUPERVISORY	KERRY COAL COMPANY
Roger Bowman 20%	Jim Plesakov 15%	Javed Mirza <1%	
Tim Gillen 10%		Lori Odenthal <1%	
Tom Kovalchuk 5%		Tim Vandyke 2%	
		Phill Newell <1%	

**SCOPE OF WORK:**

To construct passive treatment systems at SR 85 and SR 86 from Knox DMO design plans funded through a comprehensive reclamation agreement between Kerry coal Company and the PA Department of Environmental Protection, Knox District Mining Office.

**SCHEDULE; MILESTONES; DELIVERABLES:**

1. Develop design proposal for SR 85 and SR 86: 7/1/96
2. Grid layout/Topographic survey of construction areas/Final design: 6/96 - 6/97
3. Site construction of facilities: 10/96 - 11/96
7. Construct asbuilts of facilities: 10/97
8. Monitor success of systems and report: 11/98

**MEASURABLE OUTCOMES:**

	APPROVALS:	DATE:
1. Draft design proposal:	Javed I. Mirza	1/16/96
2. Final design:		7/08/96
3. Construction completion:		
4. Report:		

**STATUS (Include Date):**

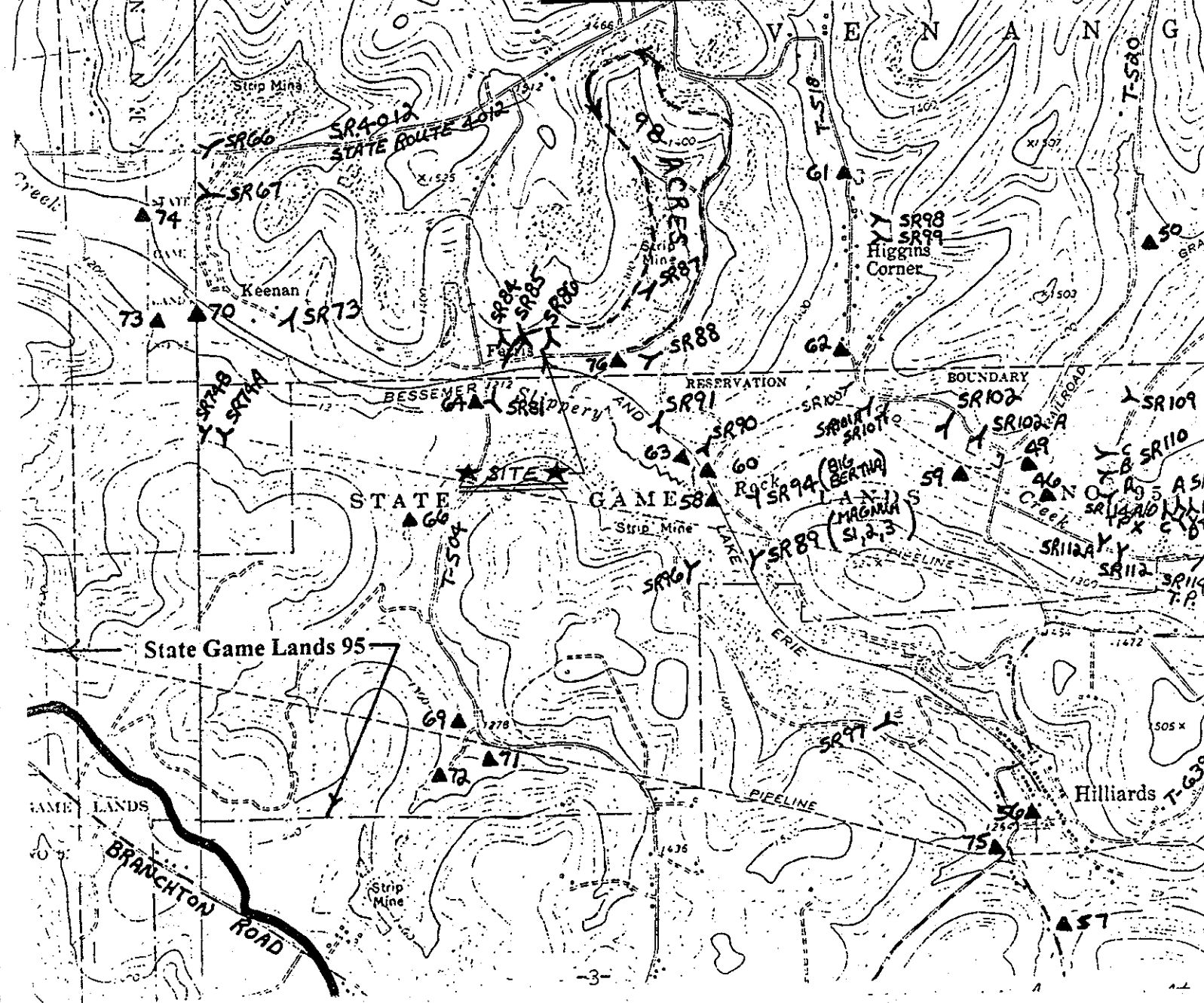
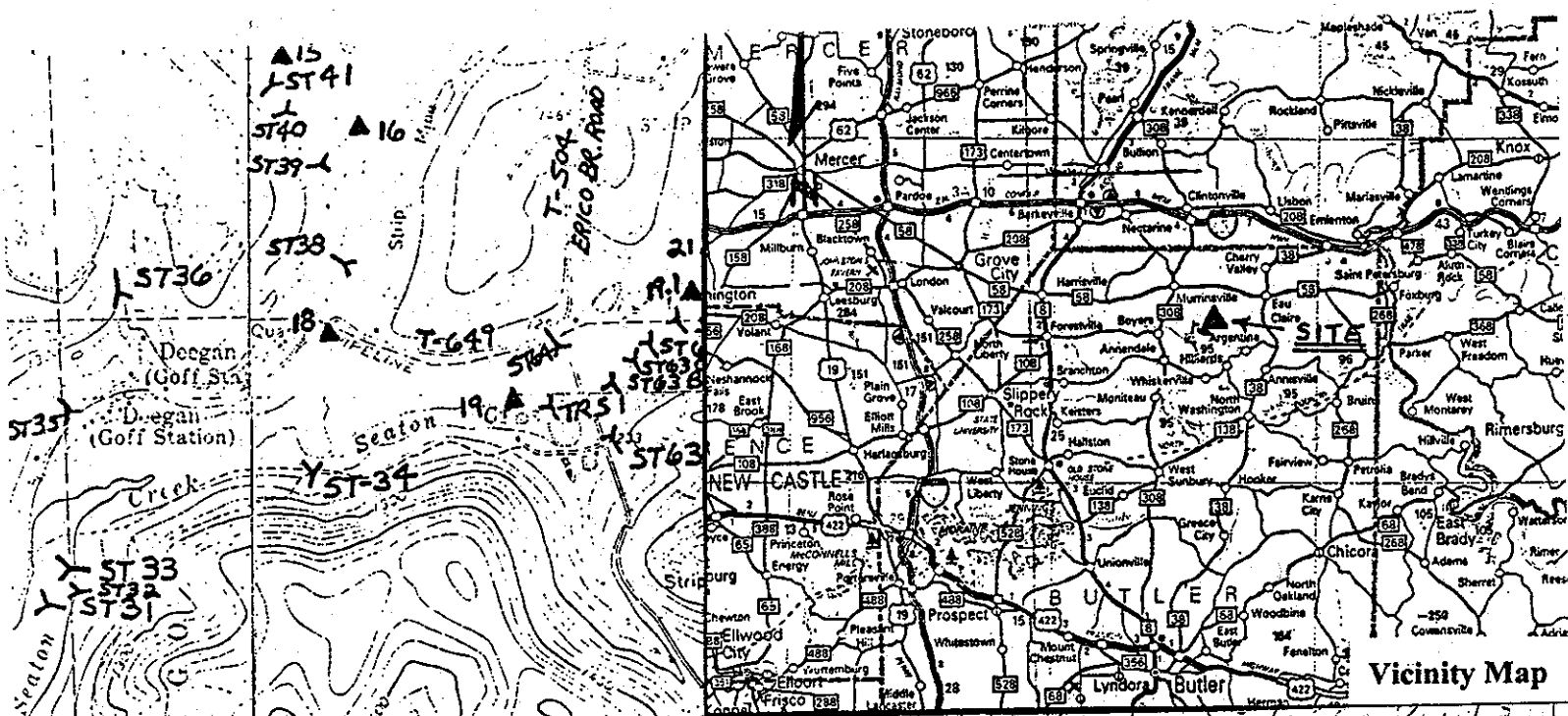
1. Completion of draft design proposal: 1/16/96
2. Completion of revised design proposal: 7/08/96

## Project Description:

The proposed plan to remediate Operation Scarlift discharges **SR 85** and **SR 86** is located in Venango township - Butler county, within PA State Game Lands No. 95. The project area is situated 1 mile south along T-504 from the S.R. 4012/T-504 intersection approximately 800 feet east of T-504 on the north side of the main branch of Slippery Rock Creek. The project area also can be located by measuring 14.92 in. West by 18.50 in. North from the southeast corner (i.e. 41-00-00 lat./79-45-00 long.) of the Hilliards 7.5 minute topographic map. Geographic position of the construction site appears to be approximately 41-06-08 north latitude by 79-51-28.5 west longitude.

Construction of the passive systems for **SR 85** and **SR 86** will be a portion of a combined remediation plan being referred to as the "**Ferris Treatment Complex**". Discharges existing in this area are associated with abandoned deep mining activity on the Clarion coal seam and corresponding strip contour cuts near the crop. The following table represents the water quality for **SR 85** and **SR 86** sampled by the Knox DMO from 12/28/94 through 4/16/96:

Sample	Date	gpm Flow	pH	-----mg/l-----				lbs/day	
				iron	mang.	Al	SO <sub>4</sub>	nt.acid	acid Id.
SR 85	12/28/94	12	3.10	16.40	2.48	24.30	549	244.0	35.11
SR 85	3/01/95	12	3.10	16.80	2.01	21.80	429	246.0	35.40
SR 85	3/30/95	10	3.00	13.30	1.96	19.90	571	248.0	29.74
SR 85	5/25/95	12	3.00	7.76	1.59	13.20	339	172.0	24.75
SR 85	7/27/95	3	2.90	9.03	1.64	11.50	459	192.0	6.91
SR 85	8/30/95	2	2.90	20.40	2.00	10.40	310	212.0	5.08
SR 85	9/21/95	1	2.90	17.30	2.17	12.20	413	206.0	2.47
SR 85	10/12/95	3	2.90	13.10	2.18	11.90	338	220.0	7.91
SR 85	11/02/95	3	3.00	8.18	2.26	10.70	433	174.0	6.26
SR 85	1/10/96	5	3.00	8.46	1.53	12.20	437	192.0	11.51
SR 85	2/22/96	12	3.00	7.93	1.88	16.60	505	202.0	29.07
SR 85	4/16/96	10	3.00	5.77	1.59	15.20	624	178.0	21.35
SR 86	12/28/94	100	3.30	6.63	2.07	7.91	429	102.0	122.32
SR 86	3/01/95	99	3.30	6.79	1.29	5.73	273	104.0	123.47
SR 86	3/30/95	114	3.30	7.81	1.35	5.99	346	106.0	144.91
SR 86	5/25/95	140	3.30	6.20	1.39	5.38	243	94.0	157.82
SR 86	7/27/95	122	3.20	5.01	1.04	4.31	258	92.0	134.60
SR 86	8/30/95	55	3.20	5.12	1.24	4.29	214	88.0	58.04
SR 86	9/21/95	55	3.30	5.86	1.65	5.63	325	108.0	71.23
SR 86	10/12/95	55	3.20	5.10	1.86	6.03	311	124.0	81.79
SR 86	11/02/95	55	3.20	4.35	1.95	6.65	438	106.0	69.91
SR 86	12/13/95	91	3.20	3.21	1.96	6.06	470	110.0	120.04
SR 86	1/10/96	72	3.20	2.65	1.85	5.87	451	102.0	88.07
SR 86	2/22/96	130	3.10	4.28	1.66	5.90	380	124.0	193.31
SR 86	4/16/96	130	3.20	3.20	1.09	4.22	318	100.0	155.90



The strategy behind passively treating Operation Scarlift discharges **SR 85** and **SR 86** has been divided into two phases of construction on State Game Lands No. 95 as follows:

- I. Construct the **retention area embankment** and **install outlet structures** at the location of the existing jeep trail.
- II. Construct the **vertical flow wetland** for discharges SR 85 and SR 86.

## **-DESIGN SPECIFICATIONS-**

### **Phase I: Retention Embankment**

- ◆ Construct embankment with a mixture of the borrow area fill material and/or REC-MIX or CFB Flyash. Embankment must have adequate compaction and stability for a permanent structure. *(i.e. 1 foot lifts)*

#### **A. Embankment Specifications**

1. Approximate Length:           **1300 FEET**
2. Top Width:                       **12 FEET**
3. Inside Slope:                   **2 : 1**
4. Outside Slope:                  **3 : 1**
5. Fill Estimate:                   **11500 cubic yards (approximately)**

◆ Install Outlet Structures.

A. Dewatering Device (1)

1. **6" Schedule 40 PVC**

2. Approximate Length: **70 FEET**

3. **6" Threaded Cap**

B. Principal Spillway (2)

1. **18" CPP**

2. Approximate Combined Length: **80 FEET**

3. **Anti-Seep Collars (2 per pipe)**

4. Outlet Protection: **R-7 (15" avg) Graded Rip-Rap**  
*(8.17 tons)*

C. Emergency Spillway

1. Drive thru channel at east end of embankment.

2. Freeboard Depth: **3 FEET**

3. Bottom Width: **40 FEET**

4. Side Slopes: **4 : 1**

5. Channel Lining: **40 tons #4 Stone on Level Section**  
*(174 tons of R-7, 15" avg., graded riprap  
to be installed by alternate source)*

Permit No FERRIS TREATMENT COMPLEX  
 Pond NED'S POND (PHASE I EMBANKMENT)  
 Township VENANGO  
 County BUTLER  
 Engineer/Land Surveyor \_\_\_\_\_  
 Date JULY 12, 1996

## POND CERTIFICATION INSTRUCTIONS

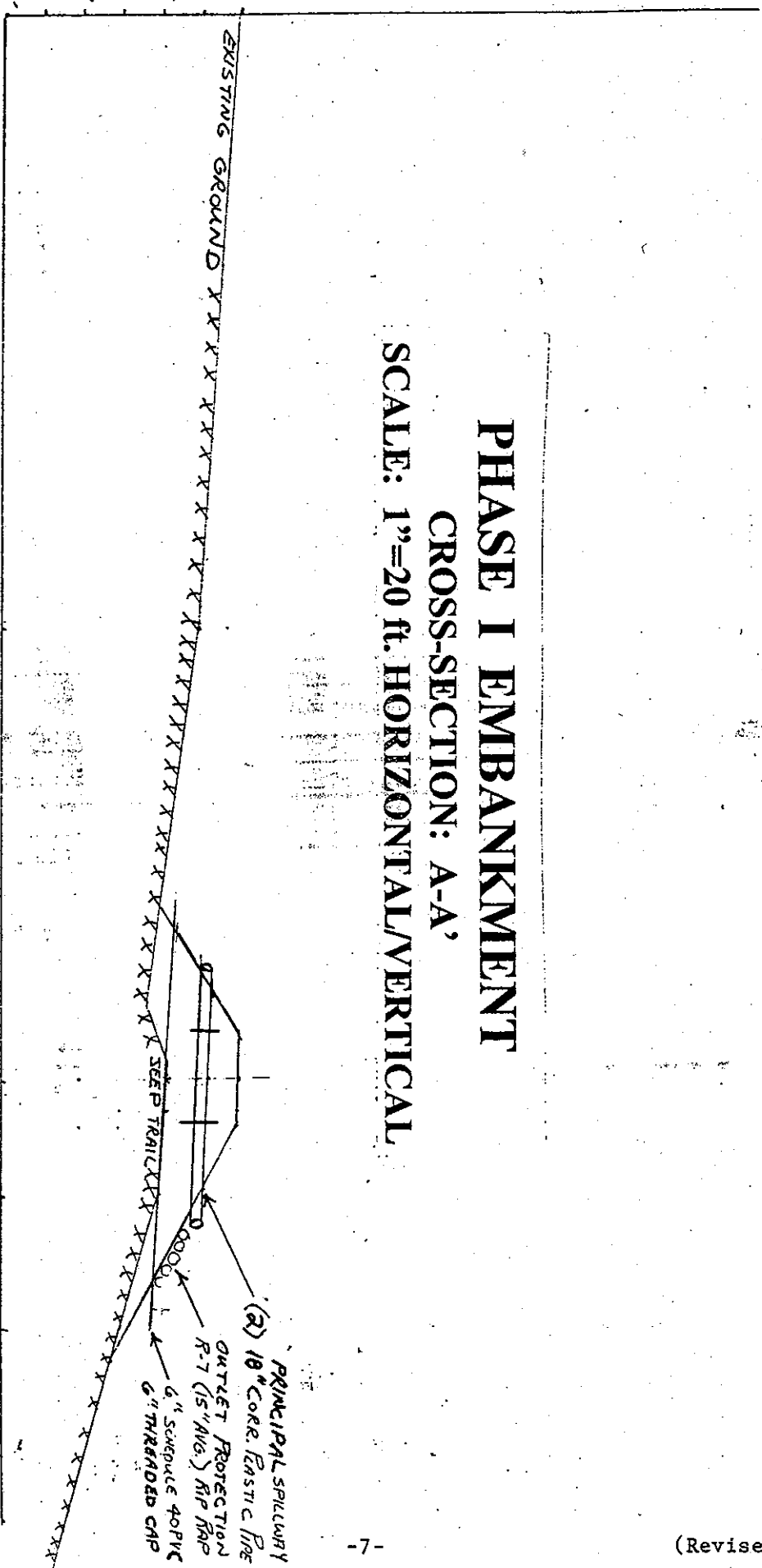
Complete first page and submit with permit application. Use both pages to certify completed impoundment.  
 Sedimentation ponds and other impoundments must be constructed in accordance with the approved permit before any disturbance of the area to be drained into the pond. Impoundment must be inspected during construction under the supervision of, and certified to the Department upon completion of construction by a registered professional engineer.  
 Any enlargement, reduction in size, reconstruction, or other modification, that may affect the stability or operation must be approved by the Department. Pond must be certified and approved prior to the start of any other mining activities.  
 Unless otherwise specified in your permit, use this form for the sedimentation pond and other impoundment certification. Submit 1 original and 2 copies to the appropriate District Mining Office. All information must be provided, otherwise it will be returned for completion.

U.S.G.S. Quadrangle: HILLIARDS Location (point of discharge): Latitude 41-06-06; Longitude 79-51-19  
 Location from Bottom Right corner of U.S.G.S. Quadrangle: HILLIARDS inches. North: 18.4" inches West: 17.5"  
 HYDROLOGY: Drainage Area 98 acres Design Storm \_\_\_\_\_ Average Watershed Slope STEEP  
 Land Use \_\_\_\_\_ Soil Type \_\_\_\_\_ Curve Number 75 Peak Discharge 2225 cfs

		Permit Application	As Constructed
Embankment	Top width (Minimum)	<u>12 FT.</u>	
	Outside Slope (Maximum) ( <u>3 H:</u> <u>1 V</u> )	<u>3 : 1</u>	
	Inside Slope (Maximum) ( <u>2 H:</u> <u>1 V</u> )	<u>2 : 1</u>	
	Top Elevation	<u>1220 FT.</u>	
	Bottom Elevation	<u>1210.5 FT.</u>	
	Upstream Toe Elevation	<u>1210.5 FT.</u>	
	Downstream Toe Elevation	<u>1205 FT.</u>	
	Amount Allowed for Settlement	<u>5%</u>	
	Type of Cover	<u>PRESCRIBED RECLAMATION</u>	
	Incised Slope (if any)	<u>MIXTURE</u>	
Inside Slope (Maximum) ( <u>   </u> H: <u>   </u> V)	<u>~</u>		
Top Elevation	<u>~</u>		
Bottom Elevation	<u>~</u>		
Principal Spillway	Type	<u>(2) CORR. PLASTIC PIPE</u>	
	Conduit Diameter (if barrel/riser give both) <u>TRICKLE TUBE</u>	<u>18" DIA. CAP (2)</u>	
	Inlet Elevation	<u>1215 FT.</u>	
	Outlet Protection	<u>R-7 (15" AVG) GRADED RIP-RAP</u>	
Spillway Capacity	<u>~ 12 C.F.S.</u>		
Dewatering Device	Type/Size	<u>6" SCHEDULE 40 PVC</u>	
	Inlet Elevation	<u>1212.5</u>	
	Discharge Regulation (ie. self draining or valved)	<u>VALVED</u>	
	Discharge Capacity (cubic feet/second)	<u>~</u>	
Time to Dewater Full Pond	<u>~</u>		
Emergency Spillway	Type	<u>DRIVE THRU TRAP CHANNEL</u>	
	Width	<u>40 FEET</u>	
	Depth (with 2 feet of freeboard)	<u>3 FEET</u>	
	Length	<u>~ 100 FEET</u>	
	Sideslopes	<u>4 : 1</u>	
	Crest Elevation	<u>1217.0 FT.</u>	
	Slope	<u>~</u>	
	Type of Lining/Protection	<u>R-7 (15" AVG) GRADED RIP RAP</u>	
Spillway Capacity (provide design calculations)	<u>7400 C.F.S.</u>		
Storage Capacity	@ Bottom : <u>AREA:</u>	<u>2178 sq. ft.</u>	
	Width @ Bottom	<u>~</u>	
	@ Crest of Principal Spillway <u>VOLUME:</u>	<u>200,528.5 cu. ft.</u>	
	@ Crest of Principal Spillway <u>AREA:</u>	<u>86,945.8 sq. ft.</u>	
	@ Crest of Emergency Spillway <u>AREA:</u>	<u>163,829.2 sq. ft.</u>	
	Width @ Crest of Emergency Spillway	<u>~</u>	
Volume @ Crest of Emergency Spillway	<u>539,523.3 cu. ft.</u>		

1190'  
1200'  
1210'  
1220'

A



# PHASE I EMBANKMENT

## CROSS-SECTION: A-A'

### SCALE: 1"=20 ft. HORIZONTAL/VERTICAL

(2) 10" Core Elastic Pipe  
 PRINCIPAL SPILLWAY  
 OUTLET PROTECTION  
 R-7 (15" AVG.) RIP RAP  
 6" SANDPILE 40 PVC  
 6" THREADED CAP

A'

42-381 30 SHEETS 3 SQUARE  
 42-382 30 SHEETS 3 SQUARE  
 42-383 100 SHEETS 3 SQUARE  
 NATIONAL



## Phase II: Vertical Flow Wetland

- ◆ Construct vertical flow wetland at proposed location for Operation Scarlift discharges SR 85 and SR 86.

### A. Excavation: **Cut/Fill** to design specifications.

1. Cut Estimate: **17,600 cubic yards** (approximately)
2. Fill Estimate: **5,400 cubic yards** (approximately)
3. Excess material: **12,200 cubic yards**  
(This excess could be used to construct the Phase I Embankment)

### B. Emergency Spillway: (2)

1. Freeboard Depth: **3 FEET**
2. Bottom Width: **10 FEET**
3. Side Slopes: **3 : 1**
4. Channel Lining: *(Cell 1)* **R-7 (15" avg) Graded Rip-Rap**  
*(Cell 2)* **Grass Lined**

### C. Graded Rip-Rap Inlet Protection to Cell 1: (2)

### D. Overflow Pipe

1. **8" Schedule 40 PVC**
2. Approximate Length: **25 FEET**

E. Plumbing Section

1. 6" Perforated Schedule 40 PVC:     **670 FEET**
2. 6" Schedule 40 PVC:                 **420 FEET**
3. 4" Valve plus Reducer:     Quantity                 **1**
4. 6" Threaded Caps   Quantity                 **8**
5. Joint connectors: T's, 4 ways, and angled as needed.
6. Install **Inline Water Level Control Structure** in Cell 2  
   **(6" dia., 15 ft.)**.

F. Seed plumbing section to **2 FOOT** depth in **CELL 1** with gravel.

1. Gravel:                                 **300 TONS (215 yd<sup>3</sup>)**

G. Place and Spread **Compost/#9 Stone** mixture to **3.5 FOOT** depth in **CELL 1**. (4 parts compost - 1 part #9 Stone)

1. #9 Stone                                 **145 TONS (111 yd<sup>3</sup>)**
2. Compost (spent mushroom)         **300 TONS (444 yd<sup>3</sup>)**

I. Place and spread **AASHTO NO. 1** Graded Limestone to **5 FOOT** depth in **CELL 2**.

1. AASHTO No. 1 - washed, graded limestone, 90% CaCO<sub>3</sub>
2. Volume:                                 **1650 TONS (1200yd<sup>3</sup>)**

J. Dimensions: **CELL 1 - CELL 2** Outside Slopes: **2 : 1**

1. **CELL 1:** Bottom: approximately **2900 ft<sup>2</sup>** as shown on plan  
Top: approximately **14,800 ft<sup>2</sup>** as shown on plan  
Inside Slopes: **2 : 1**
2. **CELL 2:** Bottom: **170' length x 20' width**  
Top: **260' length x 110' width**  
Inside Slopes: **3 : 1**

◆ **Erosion and Sedimentation Control Plan**

1. E&S plan will be prepared by Knox DMO and submitted to Butler County Conservation District for their approval.
2. 25 PA Code Chapter 105.12.(a)(16) waiver for restoration activities will be submitted by Knox DMO to Meadville D.E.P. for their approval.
3. E&S plan consists of:
  - a. *use of an existing drainage way identified as **diversion ditch DD1** to direct upslope runoff away from the construction area:*
  - b. installing **filter fence:**
    - 600 ft. of 24" wide fabric
    - 3 ft. wooden stakes, quantity 150

◆ **Revegetation Plan**

1. Seed and mulch affected area (i.e. approximately 4 acres) with **Mixture II** plan. This seed plan was approved by the Pa Game Commission for the SR 114 ALD's constructed by Hedin Environmental near Argentine.

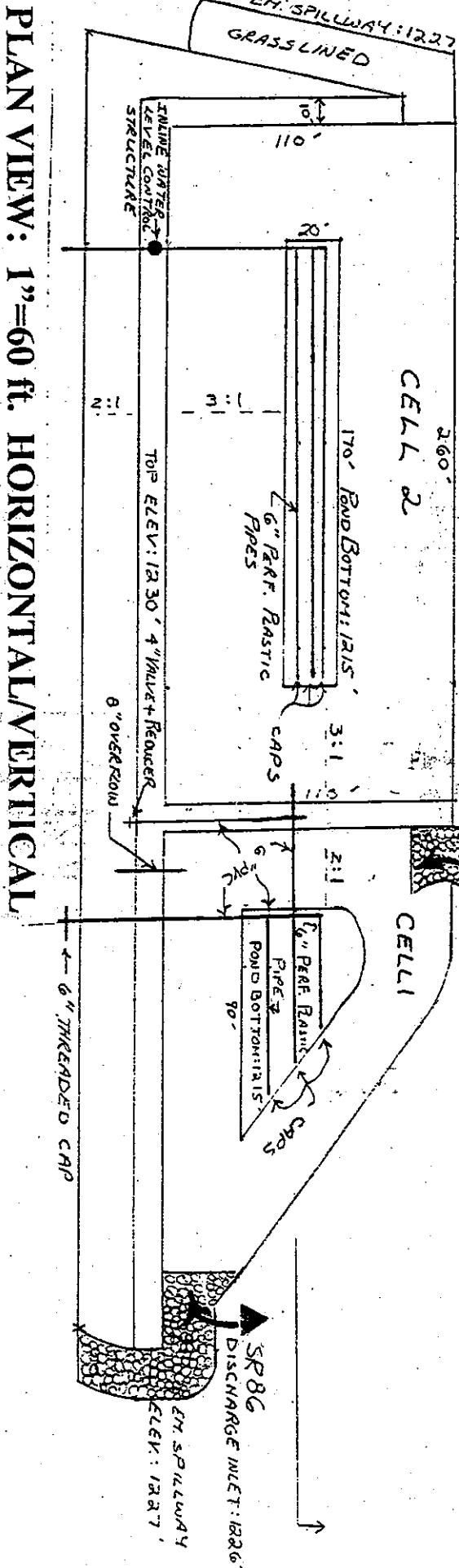
**MIXTURE II**

- |                                 |           |                        |              |
|---------------------------------|-----------|------------------------|--------------|
| a. bird's foot trefoil          | 10 lbs/ac | d. winter wheat cover  |              |
| ↓↑(double strength/innoculated) |           | e. ag lime             | 4 tons/ac    |
| b. white dutch clover           | 4 lbs/ac  | f. 10-20-20 fertilizer | 300lbs/ac    |
| c. kentucky bluegrass           | 10 lbs/ac | g. mulch (straw)       | 100 bales/ac |

PLAN VIEW

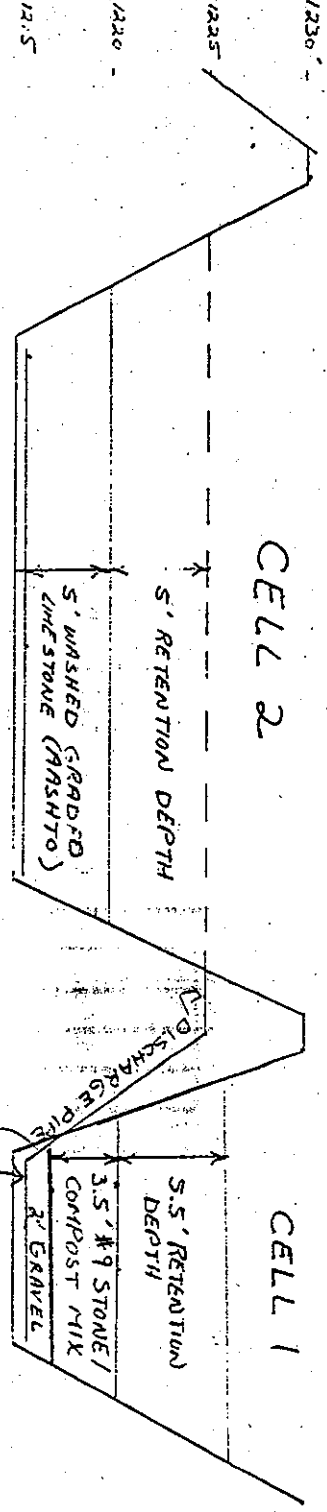
VERTICAL FLOW WETLAND

KROX DMO



**CROSS-SECTION: B-B'**  
**SCALE: 1"=60 FT. HORIZONTAL**  
**1"=10 FT. VERTICAL**

**VERTICAL FLOW WETLAND**



PROJECT: 111000000  
 SHEET: 111000000-11  
 DATE: 10/17/96

Anoxic Limestone Drain Sizing	
(calculations based on 15 hour retention time, expected effluent alkalinity, and flow rate)	
(equation from Hedin and Watzlaf, 1994)	
County:	Butler
Township:	Venango
Discharge ID:	SR85&86
Mass of Limestone necessary = mass required for 15 hour retention time + mass required for dissolutional losses over life of treatment	
$\text{Mass} = [\text{flow (l/min)} * (60 \text{ min/hr}) * \text{Bulk Density (1600 kg/m}^3) * (1 \text{ m}^3/1000 \text{ l}) * (1 \text{ mt}/1000 \text{ kg}) * 15 \text{ hr retention time}] / \text{bulk void volume (0.50)}$ $+ [ (\text{l/min}) * (60 \text{ min/hr}) * \text{effl. alk. conc. (mg/l)} * (1 \text{ mt}/10^9 \text{ mg}) * \text{ALD life (yrs.)} * (8766 \text{ hrs/1 yr}) / \text{CaCO}_3 \text{ content (dec.)}]$	
Flow Rate (gpm) =	110
Flow Rate (l/min) =	416
Expected effluent alk. (1-300) (mg/l) =	50
Expected Life (yrs) of ALD =	25
CaCO <sub>3</sub> Content =	90%
Volume of Limestone (m <sup>3</sup> ) =	939.62
Volume of Limestone (yds <sup>3</sup> ) =	1,228.98
Mass of Limestone (kg) =	1,503,395
Mass of Limestone for 15 hour retention (metric tons) =	1,199
Mass of Limestone for dissolution (metric tons) =	304
Total Mass of Limestone (metric tons) =	1,503
Total Mass of Limestone (short tons) =	1657
Cost of limestone (\$/ton) =	\$10.00
Total Cost of Limestone =	\$16,572.08

C:\+001\E&S.SSF  
A51: (F,2/C/P) @SUM(A43-A45-2)

	A	B	C	D	E	F
42	0.00	DRAINAGE AREA TO POND (ACRES)				
43	1230.00	T= TOP ELEVATION				
44	1217.00	I= UPSTREAM TOE ELEVATION				
45	1227.00	C= CREST ELEVATION				
46	1215.00	B= BOTTOM ELEVATION				
47	170.00	L= LENGTH @ BOTTOM (FT)				
48	20.00	W= WIDTH @ BOTTOM (FT)				
49	242.00	L2= LENGTH @ CREST OF EMERGENCY SPILLWAY (FT)				
50	92.00	W2= WIDTH @ CREST OF EMERGENCY SPILLWAY (FT)				
51	1.00	DEPTH OF EMERGENCY SPILLWAY				
52	13.0	EMBANKMENT HEIGHT IS OK				
53	12.0	D= DEPTH OF POND (FT)				
54	3.0	Z(1)= AVERAGE INSIDE SLOPE (LENGTH)				
55	3.0	Z(w)= AVERAGE INSIDE SLOPE (WIDTH)				
56	3400.0	A= L*W				
57	11536.0	B=(D*Z(1)+L)*(D*Z(w)+W)				
58	22264.0	C=(2*D*Z(1)+L)*(D*Z(w)+W)				
59	143616.0	VOLUME= VOLUME OF POND IN CUBIC FEET				
60		DOES THE POND HAVE ENOUGH CAPACITY ?				

YES Num J89

#1

Prot

	A	B	C	D	E	F
42	0.00	DRAINAGE AREA TO POND (ACRES)				
43	1222.00	T= TOP ELEVATION				
44	1217.00	I= UPSTREAM TOE ELEVATION				
45	1220.00	C= CREST ELEVATION				
46	1215.00	B= BOTTOM ELEVATION				
47	170.00	L= LENGTH @ BOTTOM (FT)				
48	20.00	W= WIDTH @ BOTTOM (FT)				
49	200.00	L2= LENGTH @ CREST OF EMERGENCY SPILLWAY (FT)				
50	50.00	W2= WIDTH @ CREST OF EMERGENCY SPILLWAY (FT)				
51	0.00	DEPTH OF EMERGENCY SPILLWAY				
52	5.0	EMBANKMENT HEIGHT IS			OK	
53	5.0	D= DEPTH OF POND (FT)				
54	3.0	Z(1)= AVERAGE INSIDE SLOPE (LENGTH)				
55	3.0	Z(w)= AVERAGE INSIDE SLOPE (WIDTH)				
56	3400.0	A= L*W				
57	6475.0	B=(D*Z(1)+L)*(D*Z(w)+W)				
58	10000.0	C=(2*D*Z(1)+L)*(D*Z(w)+W)				
59	32750.0	VOLUME= VOLUME OF POND IN CUBIC FEET				
60		DOES THE POND HAVE ENOUGH CAPACITY ?			YES	

Prot

Num J89

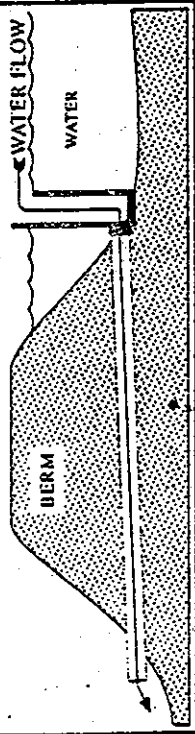
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Notes:

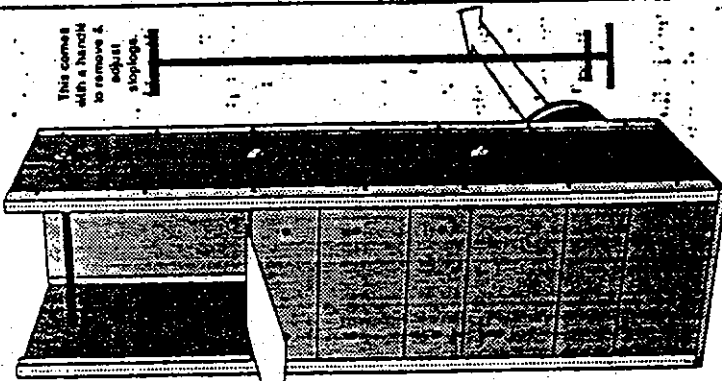
### INLET WATER LEVEL CONTROL STRUCTURE

- Rugged 1/2" PVC structure.
- Stainless steel screws and custom anodized aluminum corner extrusions are used for strength and durability.
- Soft rubber is attached to the stoplogs for a near perfect seal.
- 5" & 7" stoplogs for adjustability.
- Flexible couplers allow PVC, plastic pipe, or other materials to be easily attached. *(Please specify type of pipe when ordering)*
- Affordable for any project.
- Heavy steel handle included.

Inlet Control Structure



This comes with a handle to remove & adjust stoplogs.

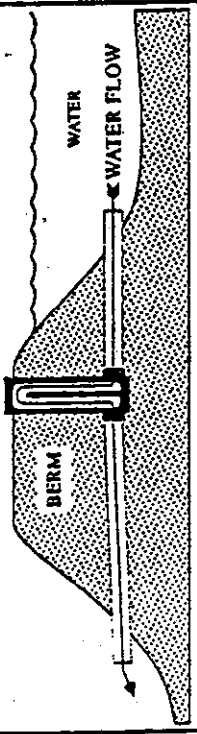


PIPE SIZE	HEIGHT												
	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'
4"	\$175	\$190	\$205	\$220	\$235	\$250	\$265	\$330	\$345	\$360	\$375	\$390	\$405
6"	180	195	210	225	240	255	270	335	350	365	380	395	410
8"	185	205	225	245	265	285	305	375	395	415	435	455	475
10"	190	215	235	255	275	295	315	385	405	425	445	465	485
12"	225	250	275	300	325	350	375	450	475	500	525	550	575
15"	245	275	305	335	365	395	425	505	535	565	595	625	655
18"	270	300	330	360	395	425	460	545	580	615	650	685	720

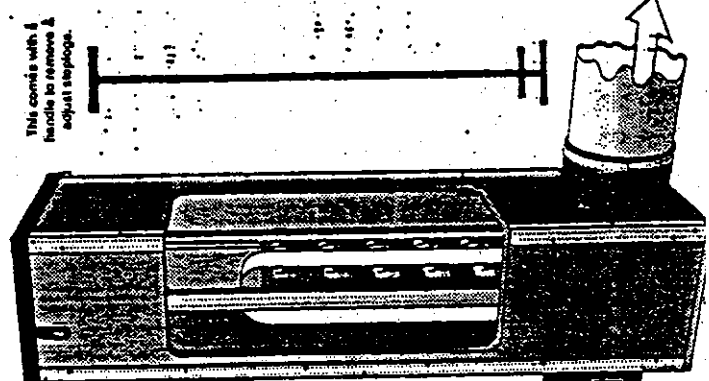
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- Rugged 1/2" PVC structure.
- Stainless steel screws and custom anodized aluminum corner extrusions are used for strength and durability.
- Soft rubber is attached to the stoplogs for a near perfect seal.
- 5" & 7" stoplogs for adjustability.
- Flexible couplers allow PVC, plastic pipe, or other materials to be easily attached. *(Please specify type of pipe when ordering)*
- Affordable for any project.
- Heavy steel lockable top and handle included.

Inline Control Structure



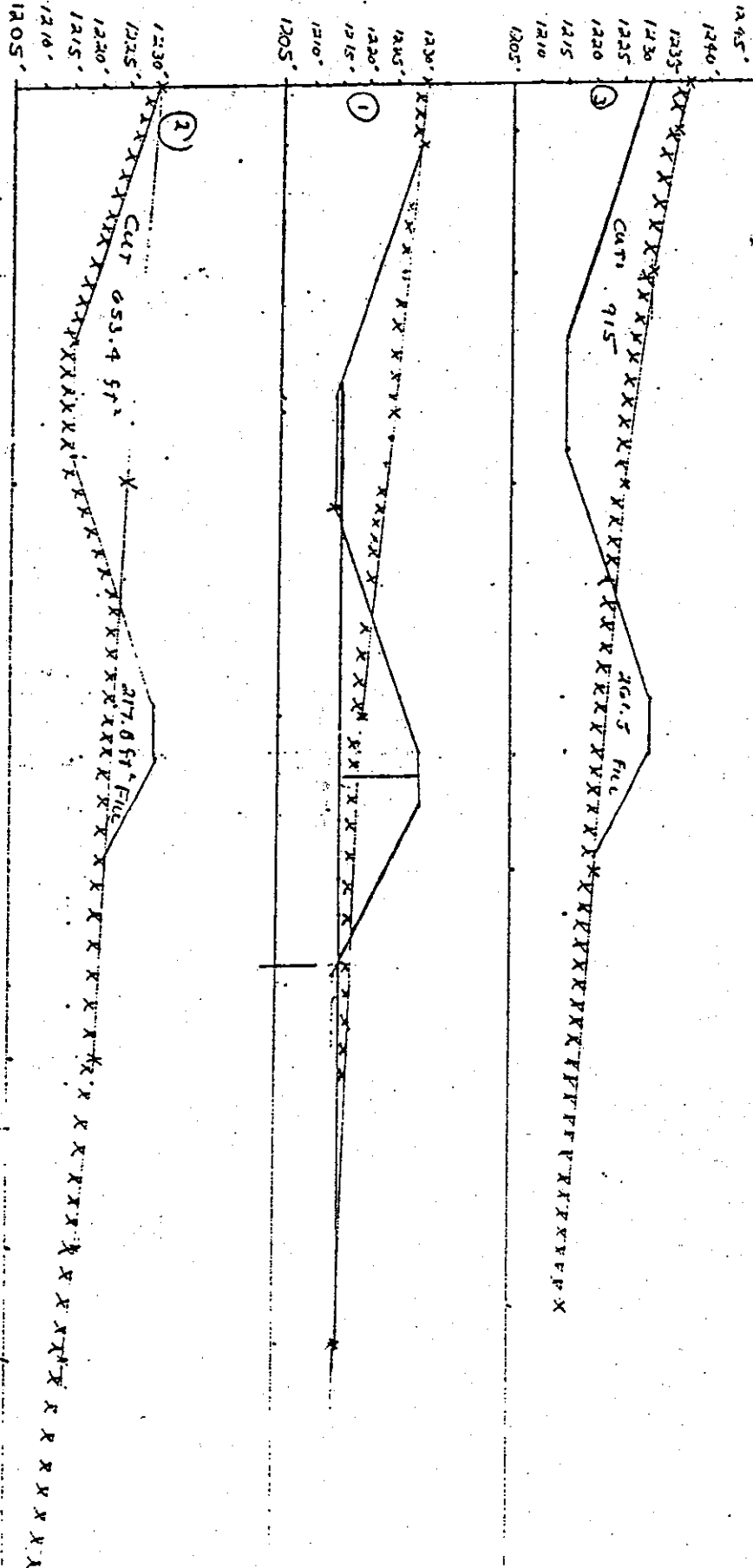
This comes with a handle to remove & adjust stoplogs.



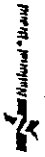
PIPE SIZE	HEIGHT												
	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'
4"	\$230	\$250	\$270	\$290	\$310	\$330	\$350	\$420	\$440	\$460	\$480	\$500	\$520
6"	235	255	275	295	315	335	355	425	445	465	485	505	525
8"	250	280	310	340	370	400	430	510	540	570	600	630	660
10"	270	300	330	360	390	420	450	530	560	590	620	650	680
12"	325	360	395	425	460	495	525	605	635	665	695	725	755
15"	350	395	425	460	495	525	560	645	680	715	750	785	820
18"	380	420	460	500	540	580	620	710	750	790	830	870	910

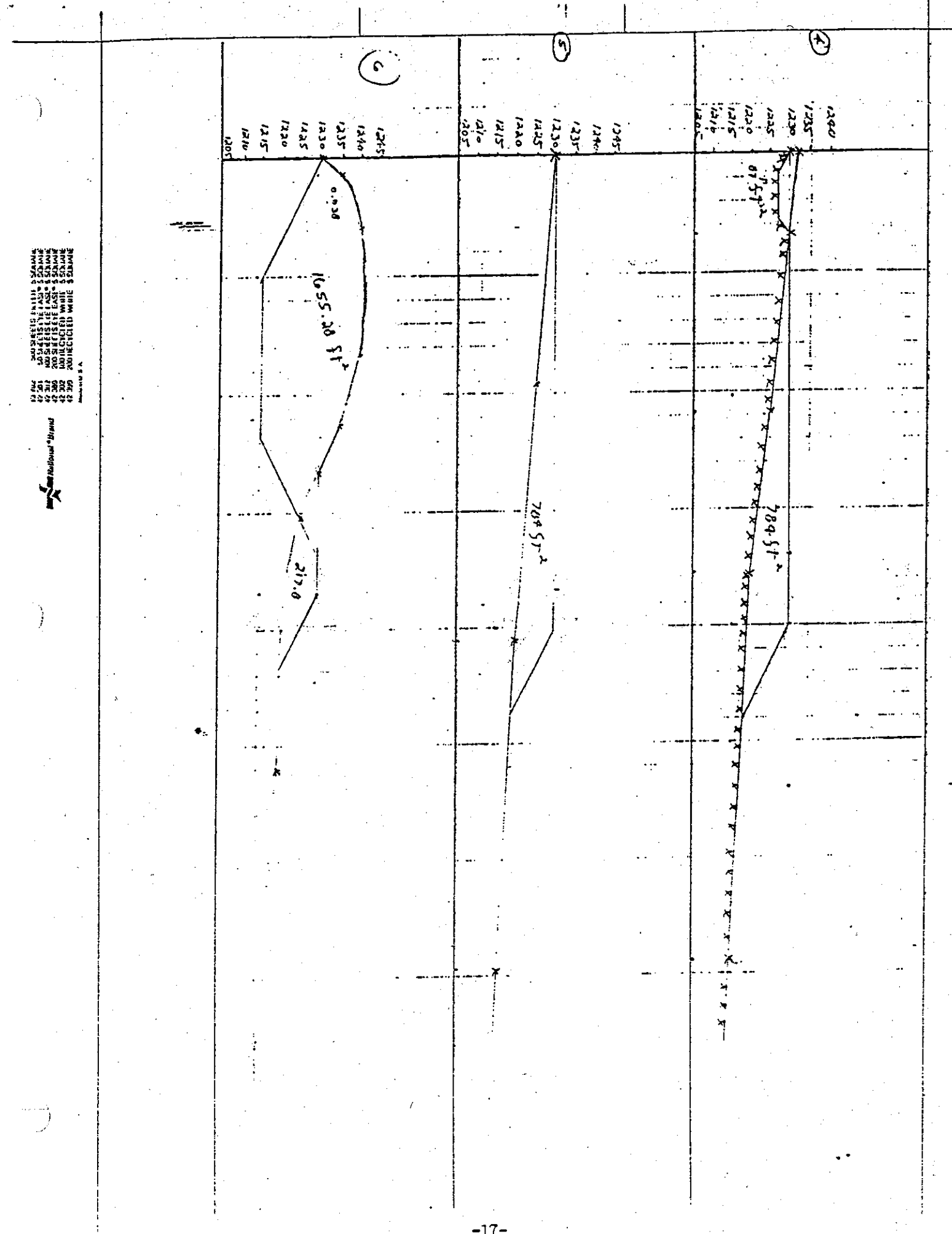
Call to request your free catalog of water management products





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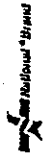
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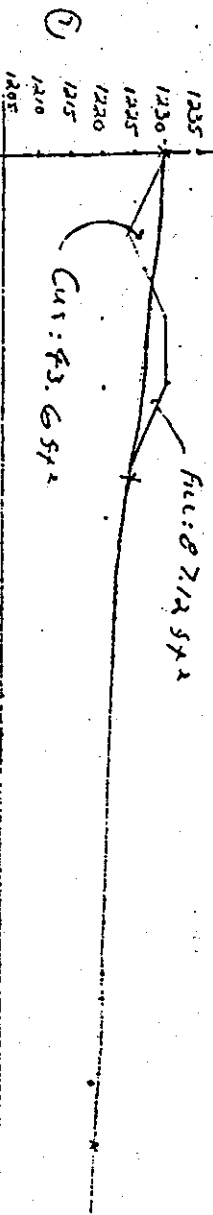
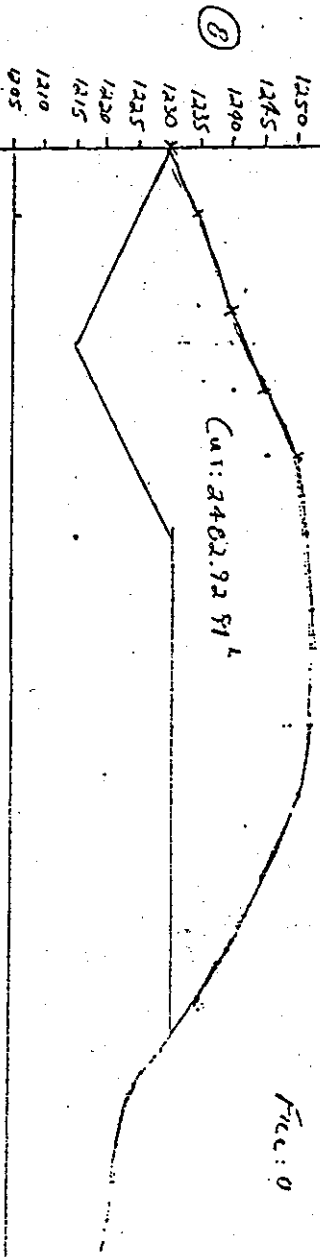
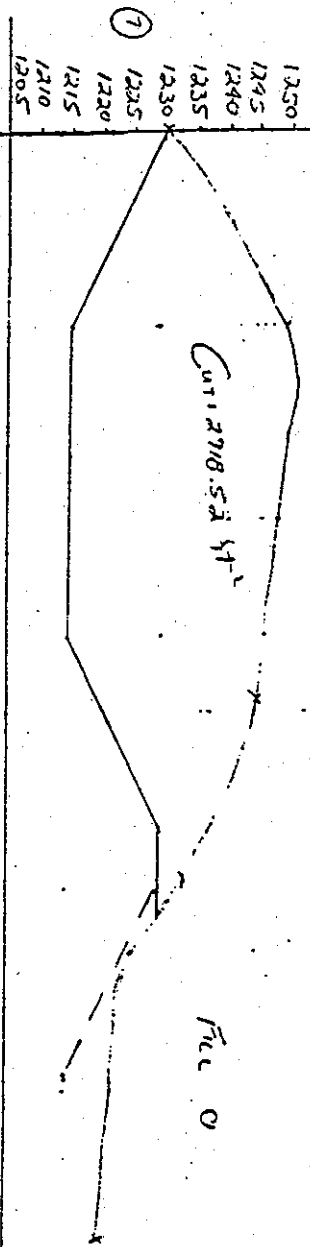
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**EMBANKMENT**

ITEM	UNITS	DESCRIPTION	UNIT COSTS	COST
MOBLILIZATION	1	EQUIP.	\$ 5,200.00	\$ 5,200.00
SITE PREP.	2	CLEARING & GRUBING	\$ 630.00	\$ 1,260.00
EMBANKMENT	11500	CU YD CONSTRUCTION	\$ 1.60	\$ 18,400.00
PIPES	70	FT 6" P.V.C.SCH 40	\$ 2.28	\$ 159.60
	3	CONNECTORS	\$ 6.42	\$ 19.26
	1	INSTALLATION	\$ 500.00	\$ 500.00
	80	FT 18" CPP.	\$ 7.95	\$ 636.00
	1	THREADED CAP	\$ 25.00	\$ 25.00
	2	CONNECTORS	\$ 10.00	\$ 20.00
	4	ANTI-SEEP	\$ 100.00	\$ 400.00
	1	INSTALLATION	\$ 500.00	\$ 500.00
RIP-RAP	8.1728	TONS PRINCIPAL SPILLWAY	\$ 10.00	\$ 81.73
	40	#4 STONE - LEVEL SECTION	\$ 8.80	\$ 352.00
	48.17	INSTALLATION	\$ 1.50	\$ 72.26

**TOTAL EMBANKMENT \$ 27,625.85**

**V.F. WETLAND**

EXCAVATION	6100	CU. YD. EMBANKMENT AND EXCESS	\$ 1.60	\$ 9,760.00
RIPRAP	88.84	TON EMERGENCY & CHANNEL	\$ 9.50	\$ 843.98
	88.84	PLACEMENT	\$ 1.50	\$ 133.26
PIPE	25	FT. 8" SCH. 40	\$ 3.71	\$ 92.75
	670	FT. 6" SCH 40 PERF.	\$ 3.28	\$ 2,197.60
	420	FT. 6" SCH 40 SOLID	\$ 2.28	\$ 957.60
	1	4" VALVE / REDUCER	\$ 160.00	\$ 160.00
	1	MISC./ FITTINGS/GLUE	\$ 250.00	\$ 250.00
WATER CONTROL	1	INLINE CONTROL	\$ 545.00	\$ 545.00
GRAVEL	300	TON	\$ 9.30	\$ 2,790.00
	300	PLACEMENT	\$ 1.50	\$ 450.00
COMPOST	300	TON MUSHROOM	\$ 17.91	\$ 5,373.00
LIMESTONE	145	TON #9	\$ 8.00	\$ 1,160.00
	445	MIXING AND PLACEMENT	\$ 1.50	\$ 667.50
AASHTO#1	1650	TONS	\$ 11.50	\$ 18,975.00
FILTER	600	FILTER FENCE	\$ 2.73	\$ 1,638.00
	600	PLACEMENT	\$ 0.50	\$ 300.00
REVEGETATION	4	ACRES	\$ 450.00	\$ 1,800.00

**SUB-TOTAL WETLAND \$ 48,093.69**

**SUB-TOTAL EMBANKMENT & WETLAND \$ 75,719.54**

QUALITY AGGREGATES \$ 9,145.00

FINES \$ 5,155.00

TOTAL \$ 14,300.00

**TOTAL \$ 61,419.54**

WHOLESALE  
AND  
RETAIL

# KERRY COAL COMPANY

PRODUCERS OF QUALITY COAL

P. O. Box 19 1129 Perry Highway  
PORTERSVILLE, PENNSYLVANIA 16051

35-1311  
Phone: 412-368-8871  
FAX: 412-368-8491

412-679-8663

November 4, 1996


Department of Environmental Protection  
White Memorial Building  
P.O. Box 569  
Knox, PA 16232  
Attention: Bill Allen

Dear Bill,

We would like to inform the Department that we will accept the proposal for completion of tasks at the Ferris Reclamation site per your correspondence of 10/21/96. We understand the cost to be in line with the Consent Order and Agreement. The plans are understood and are satisfactory to us, however, we would like to go on record that while we understand and will fulfill our obligation to the conclusion of this project we have reservations as to the ultimate success. We would like to reserve the right to hold discussions with the Department concerning such during the time we are involved doing the work.

The schedule for completion of this work would be to complete Phase I - the Retention Embankment during the month of November 1996. Due to the limited work that can be done through the winter we would like to reserve all other work to the spring of 1997. During the winter months we will collect all necessary materials in order to start Phase II- Vertical Flow Wetland, as soon as reasonable, next year. If there are any questions, please call.

Sincerely,

  
V. Y. Kerry  
President