

ARMSTRONG CONSERVATION DISTRICT

Sent 3/6/2019

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March 6, 2019

Mr. David Leiford
DEP
286 Industrial Road
Ebensburg, PA 15931

RE: Final Report
Aluminaide AMD Treatment Project
DEP Doc # 4100070595

Dear Mr. Leiford:

Please find enclosed the following documents to be reviewed for the **Final Report** for the Aluminaide AMD Treatment Project, DEP Doc # 4100070595.

1. Project Summary
2. Project Final Report
3. Goals and Accomplishments Worksheets
4. Project Photographs

If you have questions, please feel free to contact me at 724-545-3642.

Sincerely,

David R Rupert
*District Manager for the
Armstrong Conservation District*

Enclosures

CR140083 - Aluminaide AMD Treatment Project Grant-Armstrong Conservation District

PROJECT DESCRIPTION: This project collected AMD from an abandoned deep mine discharge and installed a passive wetland treatment system on state game Lands 105 to reduce AMD to the UNT to Huling Run. The UNT is on the 303(d) list of impaired waters. Huling run is a trout stocked fishery and has the potential to become a self-sustaining cold water fishery. Coupled with this construction was a pre and post-construction stream monitoring system to document improvement in the chemical analysis of the water samples.

PROJECT GOALS: The goal of the project was to collect the AMD discharge and install a passive wetland treatment system on the site in the Huling Run Watershed.

PROJECT RESULTS:

As a result of the Aluminaide AMD treatment Project Grant, the UNT to Huling Run shows a significant increase in water quality downstream of the point of discharge from the treatment facility. Water Quality will continue to be monitored over the next year to determine overall project effectiveness.

PROJECT COSTS: Growing Greener Grant Amount: \$151,565 Total Spent: \$215,148.46

LESSONS LEARNED: Financial support and technical assistance by the Arrowhead Chapter of Trout Unlimited and Szalankiewicz Engineering proved invaluable to the successful completion of this project. The cooperation of the Pa. Game Commission was essential as they harvested timber resources from the affected area and cleared the site for the construction of the treatment facility. The post construction stream monitoring over the upcoming year to document improvements in the chemical analysis for the water samples will more accurately represented the long term improvements to the UNT to Huling Run.

PARTNERS: Landowner: Pa. Game Commission

Support: Szalankiewicz Engineering, PC and Arrowhead Chapter of Trout Unlimited

CONTACT INFORMATION: Armstrong Conservation District-David R. Rupert, drupert@co.armstrong.pa.us

CR140083- Aluminaide AMD Treatment Project Grant

1. Narrative Description of Project

a. What was the project supposed to accomplish?

This project was intended to collect AMD from an abandoned deep mine discharge and install a passive wetland treatment facility to improve water quality in the UNT to Huling Run. The Armstrong Conservation District (ACD) and Szalankiewicz, PC worked with the Pa. Game Commission to install the collection and treatment system on State Game Lands 105. Coupled with this construction was a pre and post-construction stream monitoring system to document improvement in the environment of the UNT. It was also our goal to have the UNT removed from the 303(d) list.

b. What you actually did and how it differs from your plan?

The installed collection and treatment system was constructed as per the original grant application. Additional collection of AMD was also accomplished when the contractor encountered additional AMD seeps upslope of the treatment system. We were not able to capture all of the AMD seeps affecting the UNT to Huling Run and the current water quality samples indicate that we will not be able to have the UNT removed from the 303(d) list as we had hoped. The Armstrong Conservation District was able to secure funding and volunteer services from the Arrowhead Chapter of Trout Unlimited.

What were your successes and reasons for your success?

As a result of the Aluminaide AMD Treatment Project, the Armstrong Conservation District was able to complete the designed facilities within acceptable budget parameters. Szalankiewicz Engineering, PC donated a substantial portion of their professional services to ensure project success. The Pa. Game Commission staff clearing the land by harvesting timber from the area reduced our cost of development.

c. What problems were encountered and how you dealt with them?

Site conditions in 2018 (intermittent rain) made it very difficult to perform construction. The Armstrong Conservation District had to extend the contract time due to these weather conditions.

The Armstrong Conservation District also had to work around the Pa. Game Commission hunting seasons and could not perform work during certain big game seasons. The Armstrong Conservation District worked

closely with the Washington Township supervisors to keep the road open and improved during our construction timeframe.

d. How your work contributed to solution of original problems?

The installation of a collection and treatment system for AMD as designed by Szalankiewicz Engineering, PC permitted the Armstrong Conservation District to address the AMD problems affecting the UNT to Huling Run.

e. What else needs to be done and what additional efforts are underway or planned?

The Arrowhead Chapter of Trout Unlimited has agreed to perform the O&M on the treatment system. They will also need to follow the Operation and Maintenance Plan developed by Szalankiewicz Engineering. The District will continue to investigate the possibility of monitoring and collecting any additional AMD seeps from this area that are or may be affecting the UNT to Huling Run. In the future, we may conduct water sampling efforts in an effort to prepare designs to hopefully capture any additional AMD seeps affecting the UNT. One of our original goals was to restore 3 miles of Huling Run as a cold water fishery. The construction of the treatment system may not have accomplished this goal. The District will work with our local Trout Unlimited chapter and the Pa. Fish commission to monitor and hopefully perform biological assessments in the future to determine the effectiveness of our treatment system on improving the water quality and biological health of the lower 3 miles of Huling Run.

f. What are your plans for disseminating results of your work?

The Armstrong Conservation District holds a Fall Conservation Tour annually to showcase projects completed by the staff. The Armstrong Conservation District plans to tour this project site in the future to showcase our AMD treatment efforts. Future educational tours of this project by ACD will include a stop to show high school and college students how AMD may be treated. The Armstrong Conservation District created a GeoTrail ACD W.A.T.E.R Project in 2017, which stands for Watersheds, Agriculture, Trail, Erosion, and Roads. The ACD W.A.T.E.R Geo Trail is an educational project to highlight conservation work done in Armstrong County. A geocache may be placed there in the future with the consent of the Pa. Game Commission. Each geocache has a written description of the conservation project.

g. How well did your spending align with your budget request?

The Armstrong Conservation District was able to work with the Pa. Game Commission, szalankiewicz Engineering and the Arrowhead Chapter of Trout Unlimited to secure funding and volunteer services for the Aluminaide AMD Treatment project.

2. Goals and Accomplishments Worksheet (see attached)

3. Photographs (see attached)

4. Detailed Technical Reports where applicable.

All designs for the collection and Treatment systems were performed by a registered professional engineer (PE) licensed in the state of Pa. with extensive expertise in AMD treatment issues. The registered PE oversaw the construction of the entire project

5. Pollutant Load Reductions that can be attributed to the implementation of the project.

There were pre and post construction water samples completed with this project. These water samples measured Total Acidity, Alkalinity, Al, FE, MG, PH, and TSS. The post construction water samples show significant improvement in all parameters as measured downstream of the treatment facility. The post construction stream monitoring documents improvements to the chemical analysis of the water samples. This should result in a healthier biological community in Huling Run and great angler opportunities within the Huling Run Watershed.

6. Operation, Maintenance, and Repair Plans:

The collection and treatment system installed in this grant were designed by Szalankiewicz Engineering,PC. The design has an operation and maintenance plan attached to it. Copies of the design are located at the Armstrong Conservation District.



Growing Greener Watershed Protection and AMD Set-Aside Goals and Accomplishments Worksheets

Project Name Aluminaide AMD Treatment Project Grant

Project Number CR140083 County Armstrong

This Report is *(choose one):*

- Project Goals
- Project Accomplishments *(to be submitted with final report)*

Project Type *(check all that apply)*

- Organization of a Watershed Group *(fill out Sheet A*)*
- Watershed Assessments and Development of Restoration and/or Protection Plan
(check all that apply and fill out sheet B)*

- AML/AMD
- Non-Point Source
- Assessment
- Development of Restoration Plan
- Development of Protection Plan

Implementation of Watershed Restoration and/or Protection Project
(check all that apply and fill out Sheets C, D, E, F, and G)*

- AML/AMD
- Oil and Gas
- Non-Point Source
- Restoration
- Protection

- Demonstration *(fill out Sheet H*)*
- Education/Outreach *(fill out Sheet I*)*

*Please fill out all the appropriate information on the sheets corresponding to your project type. Leave blank any sheets or information on the sheets that do not apply to your specific project. If you have any questions call the Grants Center at 717-705-5400.

Organization of a Watershed Group

Name of Group _____

Watershed Area _____ Acres

Membership _____ Number

Meetings Held _____ Number Held
_____ Attendance

Mission Defined Yes No

Incorporation Yes _____ Date
 Applied _____ Date
 No

Non-Profit Status Yes _____ Date
 Applied _____ Date
 No

Officers Elected Yes No

Strategic Plan Developed Yes No _____ Date

Newsletter _____ Number Printed

Brochures _____ Number Printed

Webpage _____ Web Address

Other Outreach Describe in Narrative

Describe Activities to date for your organization:

Watershed Assessments and Development of

Watershed Restoration and/or Protection Plans

Area Assessed _____ acres

Stream Reach _____ feet

Data Gathered _____ briefly describe

Monitoring Measurements _____ type

Maps Developed _____ number/type

Surveys Completed _____ type

Fish Identified _____ species

Macroinvertebrates Identified _____ species

Riparian Buffers Restored _____ feet planned

Riparian Buffers Protected _____ feet planned

Stations Monitored: Chemistry _____ #/frequency

Biology _____ #/frequency

Problems Identified: AMD Trash Point Source Pollutants

Erosion & Sedimentation Stormwater Temperature

303D Listed: Yes No

Chapter 93 designation _____

Nutrient Assessed _____ list below

Frequency of Monitoring _____ describe

Stream Corridors Restored _____ feet planned

Stream Corridors Protected _____ feet planned

Education/Outreach _____ describe

TMDL Completed _____ describe

Public Input _____ describe

Describe your project activities to date:

Receiving Stream UNT to Huling Run name/location

Receiving Stream Benefits

Upstream Quality		Downstream Quality	
Before	After	Before	After
Iron 5.6	2.678 mg/L	Iron 4.3	less than .3 mg/L
pH 3.0	3.6 S.U.	pH 3.5	7.9 S.U.
Acid 142	33.6 mg/L as CaCO ₃	Acid 40	-116.2 mg/L as CaCO ₃
Alk 0	0 mg/L as CaCO ₃	Alk 0	135.2 mg/L as CaCO ₃
Al 10.1	1.459 mg/L	Al 2.8	less than .5 mg/L
Mn 1.2	.539 mg/L	Mn .944	less than .6 Mg/L

AMD Treatment

Anoxic Limestone Drain _____ tons Limestone(LS)

Successive Alkalinity Producing System (SAP) _____ tons organic matter

Wetlands _____ tons (LS) _____ tons aerobic matter
 _____ anaerobic acres

Diversion Wells _____ #

Setting Ponds _____ # total LS capacity _____ capacity (gpm)

Limestone Channel _____ ft. OLC _____ ft. MOLC

Limestone Dosing/Dumping _____ tons LS

Reverse Alkalinity Producing Systems _____ #

Bactericide Remediation _____ lbs/acre

Beneficial Use of Dredged Material _____ tons

Manganese Oxidizing Bacteria Systems _____ #

AML

Openings Closed _____ #

High Walls Removed _____ Feet

Land Remined _____ Acres

Wildlife Habitat Improved _____ Acres

Trees Planted _____ #

Sealing Mine Portals _____ #

Revegetation _____ wet or dry seal
 _____ acres

Grout Injection _____ tons

Mine Capping _____ acres

Oil and Gas

Wells Plugged _____ #

Total Flow Before _____ gpm

Total Flow After _____ gpm

Contaminants Removed/Prevented

Iron _____ (ppd) pounds per day

Acidity _____ (ppd)

Alkalinity _____ (ppd)

Wildlife Habitat Created _____ acres

Describe Activities to Date:

Total Treated Flow Rate _____

15.5 gpm average _____ 24.0 gpm high

Predicted lifespan of system _____ 10 years

Sludge Capacity _____ 5 years

Contaminants removed/Contained by system (average)

Iron _____ 10.4 ppd Al _____ 18.6 ppd

Mn _____ 1.17 ppd Acid _____ 50.7 ppd

Excess Alkalinity added _____ 26.5 ppd

pH change _____ 3.13 influent _____ 7.33 effluent

Name of Project: _____

Non-Point Agricultural

Farmstead/Barnyard

Upland

Streams/Wetlands

Measures on Separate pages

Manure Storages:

	Number	Cubic Feet	AEUs
Dairy	_____	_____	_____
Beef	_____	_____	_____
Swine	_____	_____	_____
Poultry	_____	_____	_____
Latitude	_____	Longitude _____	_____
Barnyard runoff controls:	_____		
Built with manure storage	_____	_____	number _____
Built without manure storage	_____	_____	number _____
Curbing	_____	feet _____	_____
Roof Gutters	_____	feet _____	_____
Buffer Strips	_____	feet _____	_____
Other (Describe)	_____		

Soil Conservation Plans Developed	_____	acres
On conventional cropland	_____	acres
On hayland	_____	acres
On pasture	_____	acres
Grazing land	_____	acres protected
No till	_____	acres implemented
Cover crops planted	_____	acres planted
Nutrient management plans	_____	acres
Waterways	_____	feet
Diversions/Terraces	_____	feet
Pesticide management	_____	acres
Wildlife land improved	_____	acres
Woodland improved	_____	acres
Stream Fencing	_____	feet
Stabilized Crossings	_____	# _____
Vegetated Buffer	_____	acres
Forest Buffer	_____	acres
Latitude	_____	Longitude _____

Describe your implementation activities to date:

Name of Project: _____

Non-Point Other

Stormwater

Other BMP

Streams/Wetlands

Measures on separate pages

	Latitude	Longitude	drainage area	Sediment Ponds	Streams/Wetlands
Extended dry detention basin	number	number	drainage area	Septic Pumping	number
Wet detention pond	number	number	drainage area	Home Septic	number
Conversion of dry retention to wet	number	number	drainage area	Denitrification installed	number
Pond-wetland system	number	number	drainage area	Septic systems connected to WWTP POTW	number
Stormwater wetland	number	number	drainage area	Nutrient Management	acres
Sand Filter	number	number	drainage area	Dirt/Gravel Road Maintenance	feet
Infiltration Swale	number	number	drainage area	Road Bank Stabilized	ft ²
Porous Pavement	number	number	drainage area		
Rain garden	number	number	volume addressed		
Roof Water Management	number	number	feet		
Operation & Maintenance (describe below)					
Other (describe below)					

Describe your implementation activities to date: (Advise if your improvements are new construction, replacements, or changes to existing systems)

Streams

Name of Project: _____ 303D Listed Yes No

Riparian buffers installed _____ length (ft) _____ type (trees, shrubs, grasses)

(Report both sides of stream if appropriate)

Latitude _____ Longitude _____

Prior land use where established _____ type _____

Filter Strips installed _____ length (ft) _____ avg width (ft)

Land use where established _____ type _____

Stream bank protection with fencing _____ length (ft) _____ avg. width (FT)

Stream bank protection without fencing _____ length (ft) _____ avg. width (FT)

Off stream watering systems _____ number _____

Barerooted plantings _____ type/species (trees, shrubs, grasses)

Container grown plants _____ type/species (trees, shrubs, grasses)

Protected root stock _____ type/species (trees, shrubs, grasses)

Weed control _____ type/species (trees, shrubs, grasses)

Invasive species removed _____ type/species (trees, shrubs, grasses)

Dams removed _____ number _____ length (ft) _____ height (ft)

Fluvial Geomorphology (FGM) _____ (ft)

Stream channel restoration _____ length (ft)

Fish structures _____ number _____ type

Rootwads _____ length

J-hook vanes _____ number

Other _____ units

Trash removed _____ tons _____ number of sites

Protection Measures Implemented (describe below)

Please describe activities to date: (include sources of technical assistance)

Chapter 93 Designation
 WWF CWF TSF
 HQ EV

Sheet

Wetlands

Existing Site Conditions

Are wetlands present on the site? Yes No

If present, what are the types and acreages:

Type: Size:

PEM (palustrine emergent) _____

PSS (palustrine scrub/shrub) _____

PFO (palustrine forested) _____

POW (palustrine open water) _____

Total Size: _____

Are prior Converted Wetlands Areas Present? Yes No

Wetland Protection/Restoration/Creation Projects

Hydrogeomorphic Classification of Wetland
(stream areas are considered riverine):

Existing Wetland Acreage Impacted (0.0):	Acreage Restored or created (0.0):
Type _____ Size _____	Type _____ Size _____
<input type="checkbox"/> PEM	<input type="checkbox"/> PEM
<input type="checkbox"/> PSS	<input type="checkbox"/> PSS
<input type="checkbox"/> PFO	<input type="checkbox"/> PFO
<input type="checkbox"/> POW	<input type="checkbox"/> POW

Latitude _____ Longitude _____ Latitude _____ Longitude _____

Please describe activities to date:

Are any water course(s) affected by the project? Yes No

If affected, what are the Ch. 93 Classification(s):

WWF (Warm Water Fishery) CWF (Cold Water Fishery) TSF (Trout Stocks) HQ (High Quality) EV (Exceptional Value)

What is the contributing drainage area to the wetland project (in acres)? _____ acres

What is the predominant land use in the contributing drainage area?

Enhancement/Functional Gain Projects

Hydrogeomorphic Classification of Wetland
(stream areas are considered riverine):

Enhancement Activity Type	Size of area affected (0.0)
<input type="checkbox"/> Streambank Fencing	_____
<input type="checkbox"/> Wetland Fencing	_____
<input type="checkbox"/> Exotic/Invasive Sp. Cont	_____
<input type="checkbox"/> Hydrologic Manipulation	_____
<input type="checkbox"/> Other	_____
Other Desc.:	_____

Latitude _____ Longitude _____

Demonstration Project

Name of project: _____

Type of project _____

Mining Related Yes No

Non-point Related Yes No

Demonstrations Held _____ Number

_____ Attendance

Publicity _____ Number

Newspapers _____ Number

Radio Spots _____ Number

TV Spots _____ Number

Internet _____ Number

Magazine Articles _____ Number

Other _____ Number

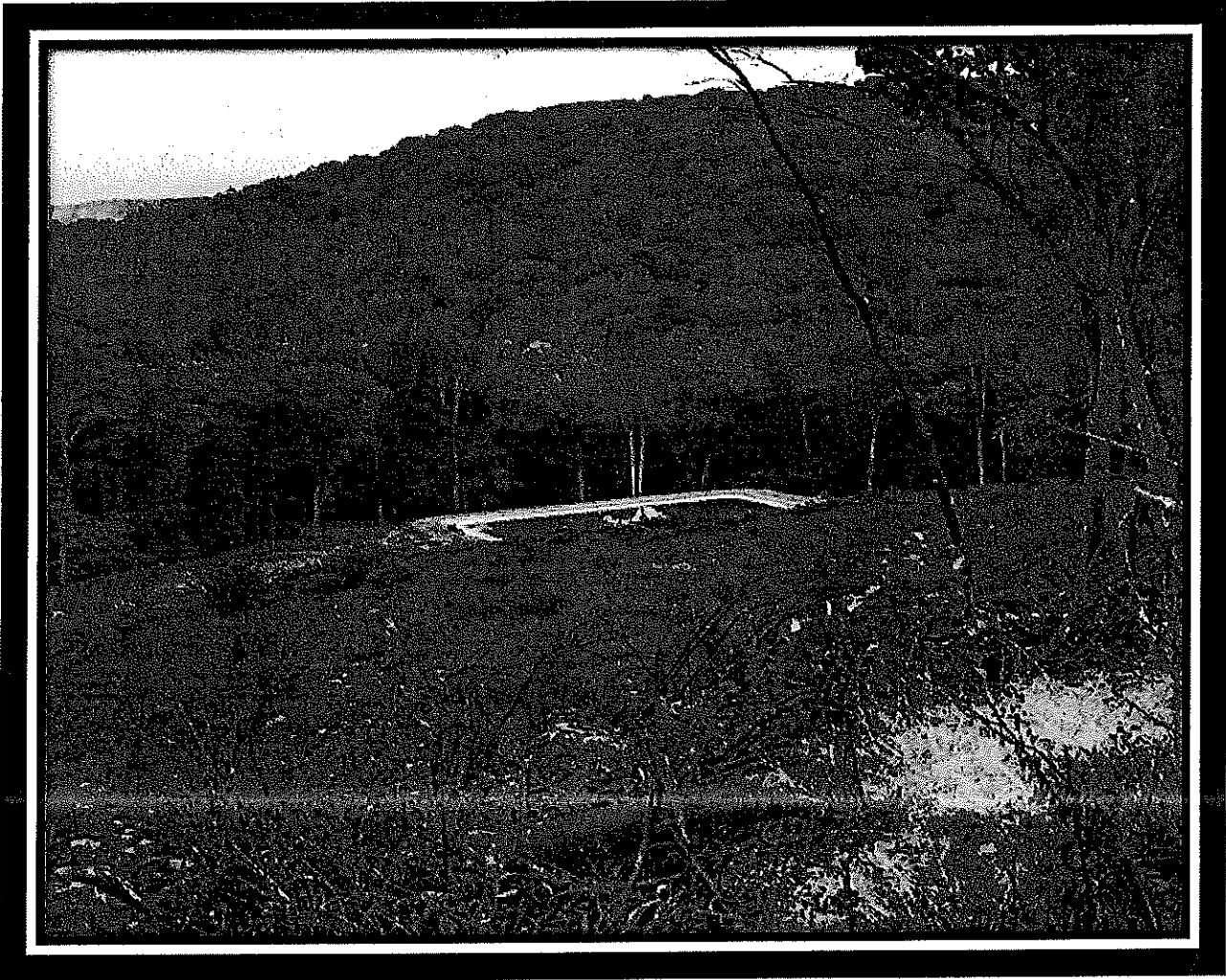
Describe activities and technologies developed to date for your demonstration project:

Education Project/Outreach

Schools reached	_____	number
Children reached	_____	number
Adults reached	_____	number
Brochures distributed	_____	number
Newspaper articles	_____	number
Radio/TV spots	_____	number
Magazines	_____	number
Web site hits	_____	number
Training sessions held	_____	number
	_____	attendance
Workshops held	_____	number
	_____	attendance

Describe your efforts to date:

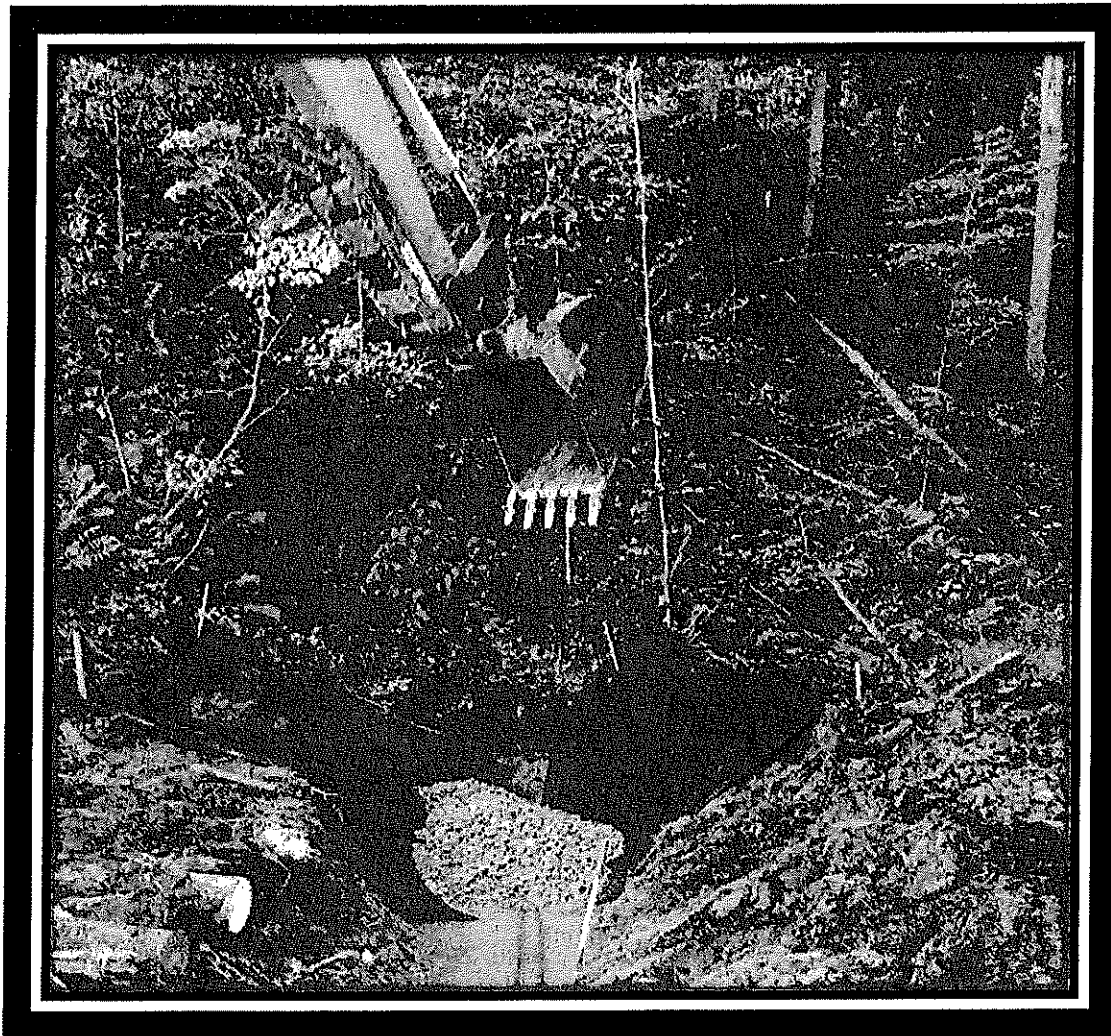
Aluminaide AMD Treatment Project- CR 140083



ALUMINAIDE TREATMENT WETLAND



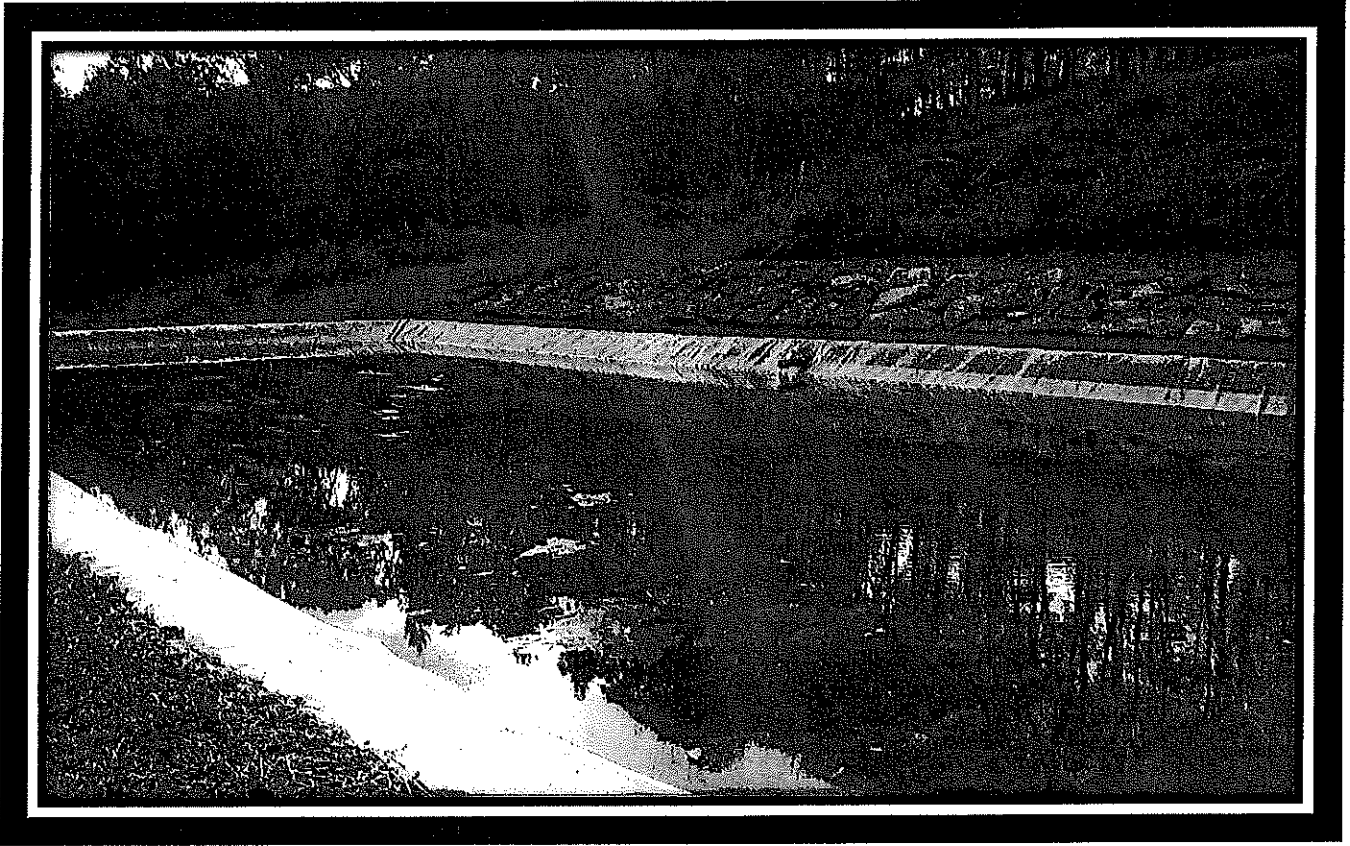
COLLECTION PIPELINE FROM DEEP MINE



STONE BACKFILL AT DEEP MINE ENTRY



DEEP MINE COLLECTION SYSTEM COVERING



ALUMINAIDE PASSIVE WETLAND TREATMENT SYSYTEM POND
