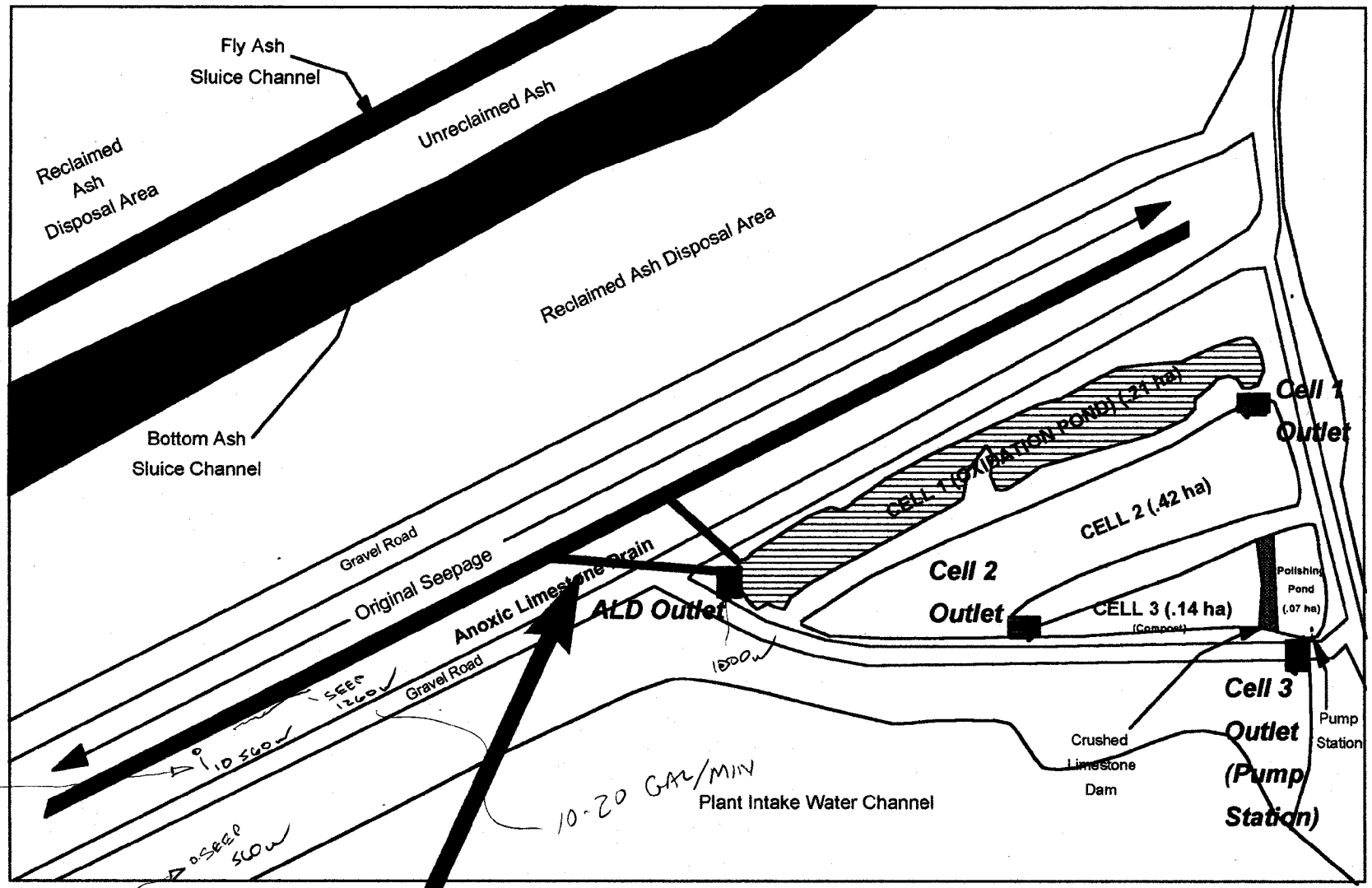


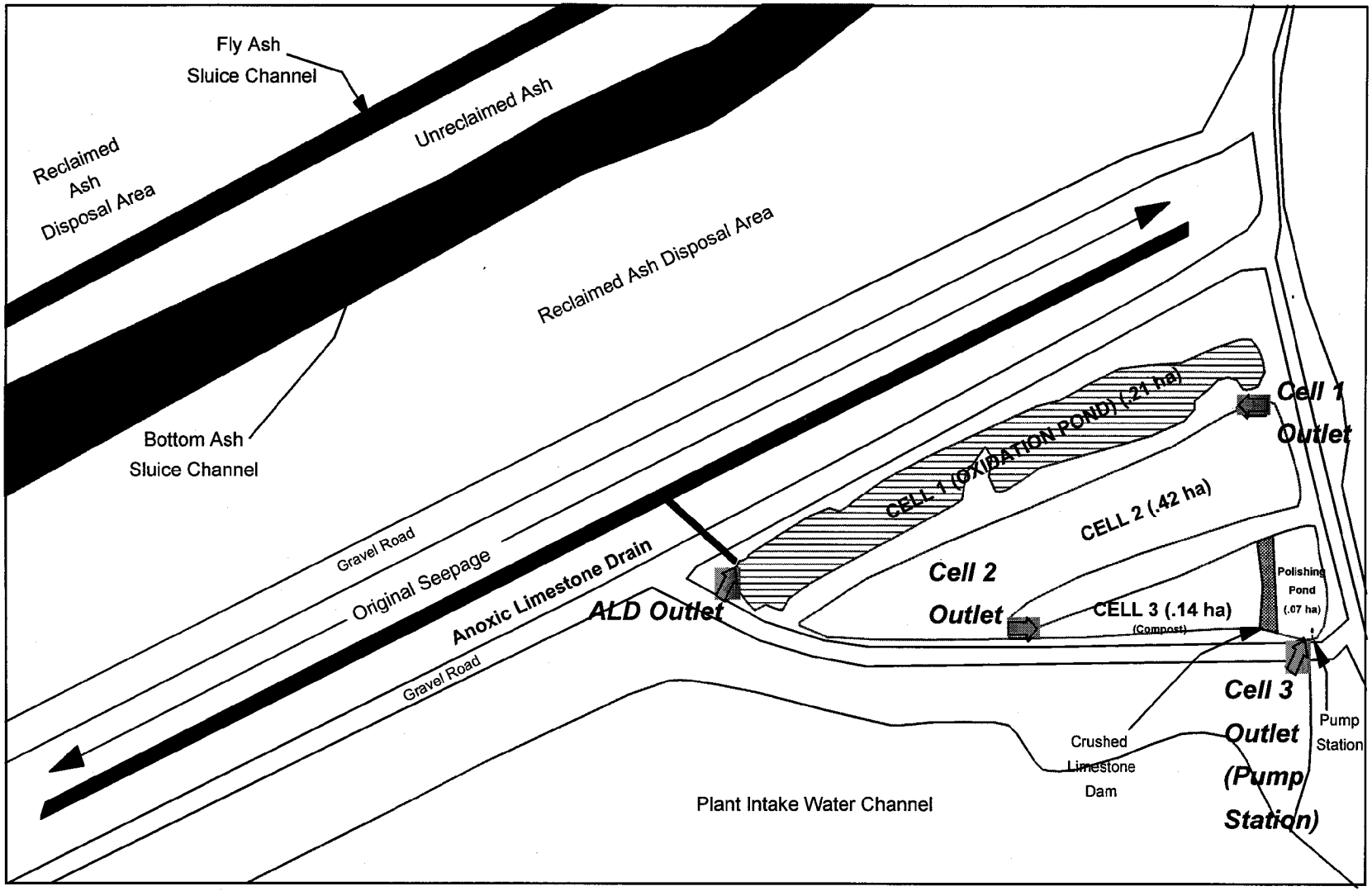
ALD Location

WELL #10 - ARTESIAN FLOW < 1 gal/min
1/7/98

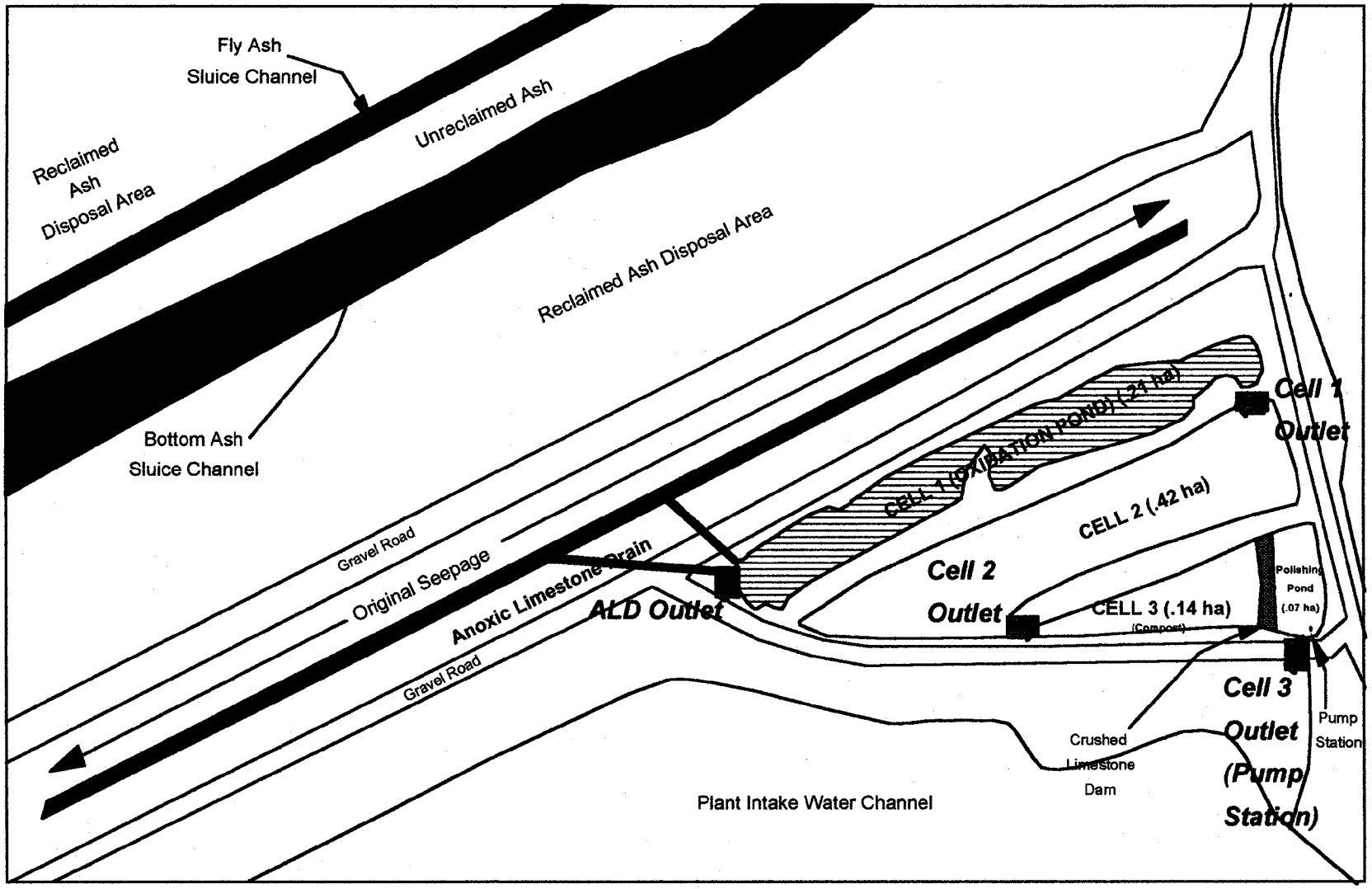
5-10
GAL/MIN

NOTE:
SECOND DRAIN OUTLET
FOR ALD SYSTEM ADDED
IN 1994 PER R.L. POPE.

H2 PETTY



ALD Location



ALD Location

(423) 751-6704
Fax (423) 751-7094
e-mail hlpetty@tva.gov

ALD.ppt

Petty, Harold L.

From: Petty, Harold L.
Sent: Wednesday, October 15, 1997 1:59 PM
To: Morris, Benton C.
Cc: Burnett, Kenneth W.; Garrett, Donal J.; Smith, H. Michael; Pope, Ralph L.
Subject: Kingston Fossil Plant - ALD repair

Clark:

We need to bring an issue to your attention regarding the Anoxic Limestone Drain (ALD). The ALD is located near the intake channel and along the southeast dike of the reclaimed ash pond.. In essence it is giant French drain that collects redwater seepage from the reclaimed ash disposal area and pre-treats that seepage by lowering the pH before it drains into the engineered wetlands. R. L. Pope and Dave Robinson identified some repair work that needed to be done to the ALD system. Basically this work consisted of capping an area of leakage with clay and re-seeding and mulching. The idea being that a small repair now would avoid a much larger problem later. This issue came up while HED was performing the earthwork associated with the parallel track. Lee Star was HED's foreman on the job. Lee had previously worked with Dave Robinson on this type work; HED had the right equipment, and a good clay seam was available at the parallel track. The work was estimated to take approximately 1/2 day and cost less than $2000. At that time and with plant concurrence we agreed to fund this work from the parallel track project account and letting HED do the repair.

It was my understanding that HED was told to do the work, however; the work remains to be done. (Communications breakdown)

HED has demobilized from the site. They will be back next week to finish up some punchlist items (Pipe guard post, gate, and reseeding work) but it is doubtful they will bring the right equipment for the ALD work. I believe for the ALD work they would need to bring a dump truck from a nearby job at Cookeville. The work is not complicated and could be performed by your yard personnel as well, provided a clay source is available.

A scope of the work for the repair needs to be defined. I would suggest Dave Robinson be involved in this as he was responsible for the original design. There is some opinion that a more extensive repair be made than was originally thought. (Dave thinks not) A decision needs to be made on who to do the work and a source of funding be found.

My involvement to this point has been minimal since the major thrust was the parallel railroad track. Our section has a strong interest in environmental/ash pond projects. If you desire engineering support please let me know.

Attached below is a PowerPoint map locating the ALD

Thanks,

H. L. Petty

ATTACHED AS A REMINDER FOR 1998 ASH POND INSPECTION

B65 970411 260

Master File

April 14, 1997

R. M. Cole, Kingston Fossil Plant

KINGSTON FOSSIL PLANT (KIF) - ANNUAL INSPECTION OF WASTE DISPOSAL AREAS

Attached is a report from C. M. Minghini dated April 14, 1997, concerning the inspection of KIF's ash disposal areas.

This report includes recommendations for corrective work. I concur with these recommendations.

Ralph G. Johnson
Manager, Fossil Engineering
LP 2G-C

KWB:CMM:SRH
Attachment
cc (Attachment):
J. S. Baugh, LP 5H-C
W. D. Hall, LP 1H-C
RIMS, WR 4Q-C (w/o drawings)

j:\fossil\site\kifcov.doc

TENNESSEE VALLEY AUTHORITY
KINGSTON FOSSIL PLANT

ANNUAL INSPECTION OF WASTE DISPOSAL AREAS

Prepared By: Cherie Minghini
Date: April 10, 1997

KINGSTON FOSSIL PLANT
NPDES PERMIT NO. TN0005452
ANNUAL ASH POND DIKE INSPECTION
1997

INTRODUCTION

An annual inspection of the ash pond dikes and toe areas at KIF to ensure structural stability was conducted March 25, 1997. The inspection was conducted by Cherie Minghini of Fossil Engineering, Jim Edgar of Fossil Fuels, and Bill Foster of Kingston Fossil Plant.

ACTIVE ASH DISPOSAL AREA AND DREDGE CELLS

Active Ash Disposal Area

There has been no change in operation of the active ash pond since last inspection. Bottom ash is sluiced into a channel at the southwest end of the pond where it falls out and is removed by dragline. Fly ash is sluiced into a trench that is parallel and to the west of the bottom ash channel. The bottom ash and fly ash waters flow through the ash pond and through two plant constructed spillway/skimmers to the stilling pool. The plant constructed spillways/skimmers were discharging at the time of inspection and appear to be in good condition. Skimmer discharge flows to the intake channel through five of six standard spillways and skimmers. At the time of the inspection, five outlet pipes were discharging; the spillway on the west end has been raised and is not discharging. There was no visible loss of ash to the intake channel during the annual inspection.

The riprap at the spillway outlets appeared to be in good condition with no signs of erosion. The dikes appear to be stable and did not exhibit any notable changes in the exterior dikes since the last inspection. A good vegetative cover was present on all exterior slopes. There is a good crushed stone surface on the dike roads. The 25' long minor surface slough on the south dike of the active ash pond identified in a previous ash pond inspection does not appear to be a threat to the stability of the dike. There are several areas of standing water along Dike "C" where the ditch is not draining. There is erosion present around a dike storm drain on the north end of the ash disposal area. The vegetative growth around the outlet of the drain needs to be cleaned out to allow a smooth flow. There was also some seepage observed on the south end of Dike "C". This area stays wet but there are no visible signs of any movement of material.

Seepage persists along the exterior slope of the southeast dike. The seepage is collected in an interceptor ditch and routed to an engineered wetland. The water is then pumped to the ash pond. Cattails and other aquatic growth continue to increase in the wetland.

KINGSTON FOSSIL PLANT
NPDES PERMIT NO. TN0005452
ANNUAL ASH POND DIKE INSPECTION
1997

Dredge Cells

Dredge Cell No. 1 (southern cell) and Dredge Cell No. 3 (center cell) are partially full and inactive. The dike elevations are at 795. Ash from the active ash disposal area is currently being dredged into Cell No. 2 (northern cell). The dikes of Cell No. 2(northern cell) have been raised to elevation 783 (first lift) in accordance with closure plans and design drawings. The field-constructed return spillways for the dredge cells are located in the southeastern end of each cell.

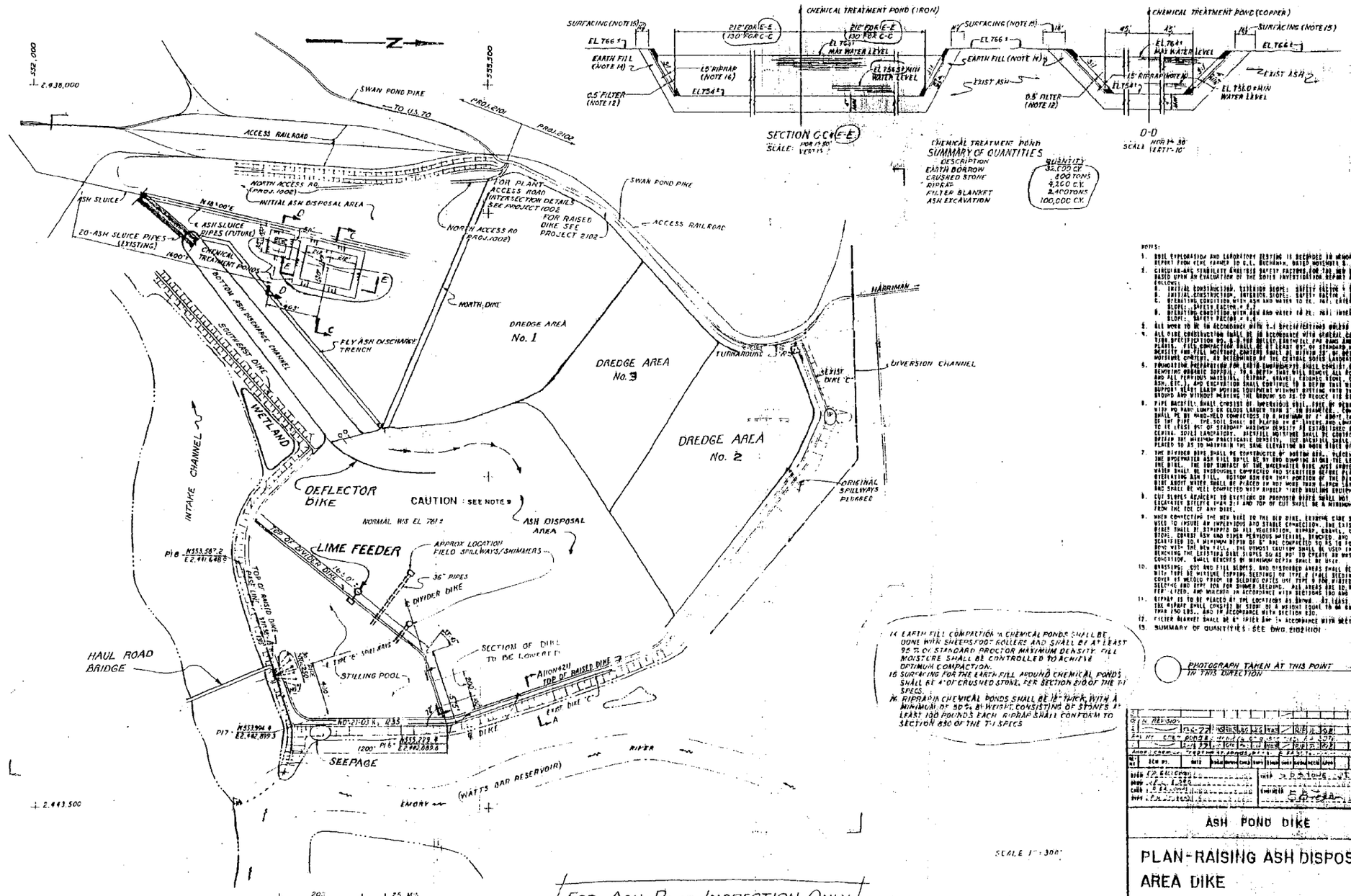
The dikes appear to be stable and. a good vegetative cover is present on the dike slopes. There is a good crushed stone surface on the dike roads. Runoff water from the top of Dredge Cell No. 1 dike has formed erosion gullies down to the eastern end of the north dike drainage ditch. Riprap has been placed in this eroded area; additional riprap may be necessary to prevent continued erosion. The dike adjacent to Swan Pond Road has a few areas of ponded water, primarily at the northernmost end of the dike. The 50' slough identified in previous ash pond inspections located on the west end of Dike "C" about 150 feet from Swan Pond Road was still present, but does not appear to be worsening and does not appear to be a stability problem. There is an area of rutting and standing water on the west end of Dike "C". The seep identified in the center of Dike "C" off Dredge Cell No. 2 in previous ash pond inspections was observed and does not appear to be worsening. There is no evidence of any movement of material.

The toe of the Stage A lift adjacent to Dike "C" has a few areas of standing water where earthen material is lacking and is poorly graded. A good vegetative cover has been established on the slopes of the Stage A lift; however, the area should continue to be overseeded and fertilized so that a lush cover is established on this dike.

KINGSTON FOSSIL PLANT
NPDES PERMIT NO. TN0005452
ANNUAL ASH POND DIKE /QUARTERLY RED WATER INSPECTION REPORT
1997

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein; and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. See 18 U.S.C. Section 1001 and 33 U.S.C. Section 1319. (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years.)

_____
SIGNATURE OF PRINCIPAL/EXECUTIVE OFFICER OR AGENT



NOTES:

1. SOIL EXPLORATION AND LABORATORY TESTING IS RECORDED IN MEMORANDUM REPORT FROM KERR FARMER TO G.L. BUCHANAN, DATED NOVEMBER 8, 1972.
2. CIRCULAR-ARC STABILITY ANALYSIS SAFETY FACTORS FOR THE NEW DIKES BASED UPON AN EVALUATION OF THE SOILS INVESTIGATION REPORT ARE AS FOLLOWS:
   A. INITIAL CONSTRUCTION, EXTERIOR SLOPE: SAFETY FACTOR = 1.5
   B. INITIAL CONSTRUCTION, INTERIOR SLOPE: SAFETY FACTOR = 1.3
   C. OPERATING CONDITION WITH ASH AND WATER TO EL. 781, EXTERIOR SLOPES: SAFETY FACTOR = 1.5
   D. OPERATING CONDITION WITH ASH AND WATER TO EL. 781, INTERIOR SLOPES: SAFETY FACTOR = 1.5
3. ALL WORK TO BE IN ACCORDANCE WITH T.V.A. SPECIFICATIONS UNLESS NOTED.
4. ALL DIKE CONSTRUCTION SHALL BE IN ACCORDANCE WITH SPECIAL CONDITIONS FOR SECTION 99, 2.1 AND 2.2 OF THE LATEST EDITION OF "EARTH DAMS AND POWER PLANTS". FILL COMPACTION SHALL BE AT LEAST 95% OF STANDARD MAXIMUM DENSITY FOR FILL MATERIAL CONTENT SHALL BE WITHIN 2% OF OPTIMUM MOISTURE CONTENT, AS DETERMINED BY THE KERMIL SOILS LABORATORY.
5. FOUNDATION PREPARATION FOR EARTH EMBANKMENTS SHALL CONSIST OF REMOVING ORGANIC TOPSOIL TO A DEPTH THAT WILL REMOVE ALL ROOTS, AND ALL PREVIOUS MATERIAL (RIPRAP, GRAVEL, CRUSHED STONE, COARSE ASH, ETC. AND EXCAVATION SHALL CONTINUE TO A DEPTH THAT WILL SUPPORT HEAVY EARTH MOVING EQUIPMENT WITHOUT RUTTING INTO THE GROUND AND WITHOUT MIXING THE GROUND SO AS TO REDUCE ITS STABILITY.
6. PIPE BACKFILL SHALL CONSIST OF IMPERVIOUS SOIL, FREE OF DEBRIS, WITH NO HARD LUMPS OR CLODS LARGER THAN 6" IN DIAMETER. COMPACTION SHALL BE BY HAND-HELD COMPACTORS TO A MINIMUM OF 1' ABOVE THE TOP OF THE PIPE. THE SOIL SHALL BE PLACED IN 6" LAYERS, AND COMPACTED TO AT LEAST 95% OF STANDARD MAXIMUM DENSITY ESTABLISHED BY THE KERMIL SOILS LABORATORY. BACKFILL MOISTURE SHALL BE CONTROLLED TO KEEP THE MOISTURE PRACTICABLE DENSITY. TOP BACKFILL SHALL BE PLACED SO AS TO MAINTAIN THE SAME ELEVATION OR MORE ABOVE OF THE PIPE.
7. THE DIVIDER DIKE SHALL BE CONSTRUCTED OF BOTTOM ASH. PLACEMENT OF THE IMPERVIOUS ASH FILL SHALL BE BY END DUMPING ALONG THE LENGTH OF THE DIKE. THE TOP SURFACE OF THE IMPERVIOUS CORE JUST ABOVE THE WATER SHALL BE SMOOTHLY COMPACTED AND STABILIZED BEFORE PLACING THE OPERATING ASH FILL. BOTTOM ASH FOR THE REMAINDER OF THE DIVIDER DIKE ABOVE WATER SHALL BE PLACED IN NOT MORE THAN 2 LAYERS, AND SHALL BE WELL COMPACTED WITH RUBBER TIRED DOZER AND EQUIPMENT.
8. CUT SLOPES ADJACENT TO EXISTING OR PROPOSED DIKES SHALL NOT BE EXCAVATED STEEPER THAN 2:1 AND TOP OF CUT SHALL BE A MINIMUM OF 30' FROM THE TOE OF ANY DIKE.
9. WHEN CONNECTING THE NEW DIKE TO THE OLD DIKE, EXISTING SLOPE SHALL BE USED TO INSURE AN IMPERVIOUS AND STABLE CONNECTION. THE EXISTING RIPRAP SHALL BE STRIPPED OF ALL VEGETATION, RIPRAP, GRAVEL, CRUSHED STONE, COARSE ASH AND OTHER PERVIOUS MATERIAL DISCARDED, AND SCARIFIED TO A MINIMUM DEPTH OF 6" AND COMPACTED SO AS TO FORM A BOND WITH THE NEW FILL. THE EXISTING EARTH SLOPE SHALL BE USED IN BENCHING THE EXISTING DIKE SLOPES SO AS NOT TO CREATE AN UNSTABLE CONDITION. SMALL BENCHES OF MINIMUM DEPTH SHALL BE USED.
10. GRASSING: CUT AND FILL SLOPES, AND DISTURBED AREAS SHALL BE SEEDED WITH TYPE 'B' MIXTURE (SPRING SEEDING) OR TYPE 'A' (FALL SEEDING). IF COVER IS NEEDED PRIOR TO SEEDING DATES USE TYPE 'B' FOR WINTER SEEDING AND TYPE 'A' FOR SUMMER SEEDING. ALL AREAS TO BE SEEDED, FERTILIZED, AND MULCHED IN ACCORDANCE WITH SECTIONS 190 AND 192.
11. RIPRAP IS TO BE PLACED AT THE LOCATIONS AS SHOWN. AT LEAST 50% OF THE RIPRAP SHALL CONSIST OF STONE OF A WEIGHT EQUAL TO OR GREATER THAN 150 LBS., AND IN ACCORDANCE WITH SECTION 830.
12. FILTER BLANKET SHALL BE 6" THICK AND IN ACCORDANCE WITH SECTION 830.
13. SUMMARY OF QUANTITIES : SEE DWG. 2102E1101

14 EARTH FILL COMPACTION IN CHEMICAL PONDS SHALL BE DONE WITH SHEEPSFOOT ROLLERS AND SHALL BE AT LEAST 95 % OF STANDARD PROCTOR MAXIMUM DENSITY. FILL MOISTURE SHALL BE CONTROLLED TO ACHIEVE OPTIMUM COMPACTION.

15 SURFACING FOR THE EARTH FILL AROUND CHEMICAL PONDS SHALL BE 4" OF CRUSHED STONE, PER SECTION 210 OF THE T-I SPECS.

16 RIPRAP IN CHEMICAL PONDS SHALL BE 18" THICK WITH A MINIMUM OF 50% BY WEIGHT CONSISTING OF STONES AT LEAST 100 POUNDS EACH. RIPRAP SHALL CONFORM TO SECTION 830 OF THE T-I SPECS.

PHOTOGRAPH TAKEN AT THIS POINT IN THIS DIRECTION

SCALE 1" = 300'

FOR ASH POND INSPECTION ONLY
NOT FOR CONSTRUCTION

COMPANION DRAWING: 10N21, N422, N431
HWY PROJECT 210...

INSPECTED AND APPROVED FOR ISSUE

NO.	REVISION	DES	DRN	CHK	APP	DATE
1	ADD CHEM. POND E-E, MODIFY CHEM. POND C-C, ADD SECTIONS E-E & D-D, ADD QUANTITIES	RJB	JLS	WAS	RJB	11-30-76
2	ADD PHOTO LOCATION	RJB	JLS	WAS	RJB	12-21-76

DESIGN: F.P. ELLIOTT
DRAWN: J.L.S.
CHECKED: W.A.S.
SUBMITTED: R.J. Buchanan
RECOMMENDED: F.P. Elliott
APPROVED: W.A. Scott
KNOXVILLE 5-20-76

ASH POND DIKE

PLAN - RAISING ASH DISPOSAL AREA DIKE

KINGSTON STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

36 C | 10N420 R2

W.A. Scott 6-11-76

FOR PLANT USE ONLY (INTERIOR DIKES), ACTIONS ON PREVIOUS RECOMMENDATIONS / CURRENT RECOMMENDATIONS AND PHOTOGRAPHS

ACTIVE ASH DISPOSAL AREA/DREDGE CELS

The concrete around the monitoring wells 5B and 5C along Dike "C" is cracked and in poor condition. The divider dike at the stilling pool appears to be stable; however, there is some erosion which persists on the dike due to wave action evident primarily on the north side of the stilling pond.

The fly ash continues to be sluiced into a rubber-lined ditch. Repairs to the lining have been made by placing earth fill and riprap on the slopes for approximately 150 feet of the ash sluice ditch after cleaning it out. The flow does not appear to be restricted to the ash pond.

The dikes of Cell No. 2 (northern cell) have been raised to elevation 783 (first lift) in accordance with closure plans and design drawings. Bottom ash, which is removed from the discharge channel, was used to construct the dikes. The raised dike along the north side of the cell is located approximately 200 feet from Dike "C" for stability safety. The next lift will bring the dikes level with the Dredge Cell No. 1 and No. 3 dikes at elevation 795.

CHEMICAL TREATMENT PONDS

The chemical treatment ponds (iron and copper) are located between North Access Road and the fly ash discharge trench. The chemical ponds are excavated below grade and there are no exterior dikes. Both chemical pond internal dikes are covered with riprap. They appear to be in good condition.

The copper and iron pond water is discharged periodically by pumping to the bottom ash discharge channel which flows into the active ash disposal area. The iron pond and copper pond were pumped down at the time of the inspection and will be pumped out again at a later date.

FOR PLANT USE ONLY (INTERIOR DIKES), ACTIONS ON PREVIOUS RECOMMENDATIONS / CURRENT RECOMMENDATIONS AND PHOTOGRAPHS

COAL YARD DRAINAGE BASIN

The coal yard drainage basin is located at the southwest corner of the coal pile. This basin was excavated below grade; therefore, there are no exterior dikes. All discharge from this basin is pumped into the fly ash discharge ditch which flows to the active ash disposal area. At the time of inspection, water in the pond was pumped down. New pumps, located on a floating platform, have been installed to allow a greater pumping capacity and to help ensure that the basin does not overflow.

ACTIONS ON RECOMMENDATIONS OF LAST INSPECTION

Plant personnel have continued to periodically mow grass and remove small trees and brush from all dike slopes.

Plant personnel have continued to repair ruts and monitor the exterior dike slopes for seepage, soft wet spots, animal burrowing, etc. and report any changes to Fossil Engineering.

Plant personnel have monitored the sloughs on Dike "C" and the south dike for any movement and reported any changes to Fossil Engineering.

Riprap has been placed in areas where wave erosion has undercut the inside of the ash pond dike and stilling pond dike; however, plant personnel should continue to monitor for wave erosion and add riprap if necessary.

Plant personnel have not repaired the concrete around the monitoring wells.

Plant personnel have cleaned out the pipe on the south dike allowing water to drain from the toe ditch.

Plant personnel have repaired the erosion on the divider dike; however the divider dike continues to erode.

FOR PLANT USE ONLY (INTERIOR DIKES), ACTIONS ON PREVIOUS RECOMMENDATIONS / CURRENT RECOMMENDATIONS AND PHOTOGRAPHS

Plant personnel have placed some riprap in the erosion gullies of the north dike. Plant personnel have placed earthfill along the north dike drainage ditch in eroded areas. The north dike drainage ditch has established vegetation which will aid in preventing additional erosion.

Plant personnel have replaced the first 150' of the fly ash discharge ditch with earth liner and riprap.

Plant personnel have continued to periodically skim floating ash out of the stilling pond.

Plant personnel have monitored riprap at the outlet end of the existing dike storm drains.

Plant personnel have not regraded the drainage ditches in areas with standing water.

Plant personnel have established a good vegetative cover in areas to prevent erosion.

RECOMMENDATIONS

Plant personnel should continue to periodically mow grass and remove small trees and brush from all dike slopes.

Plant personnel should repair any ruts and continue to monitor the exterior dike slopes for seepage, soft wet spots, animal burrowing, etc. and report any change to Fossil Engineering.

Plant personnel should monitor the sloughs identified on Dike "C" and the south dike for any movement and report any changes to Fossil Engineering.

Plant personnel should continue to monitor the seeps along Dike "C" and notify Fossil Engineering immediately of any increased adverse conditions, such as greatly increased seepage, dive movement, etc.

Plant personnel should repair the concrete around the monitoring wells.

Plant personnel should repair the erosion on the divider dike by placing bottom ash or earthfill in eroded areas. If earthfill is placed in eroded areas, personnel should seed and mulch to establish vegetative cover.

FOR PLANT USE ONLY (INTERIOR DIKES), ACTIONS ON PREVIOUS RECOMMENDATIONS & CURRENT RECOMMENDATIONS, PHOTOGRAPHS

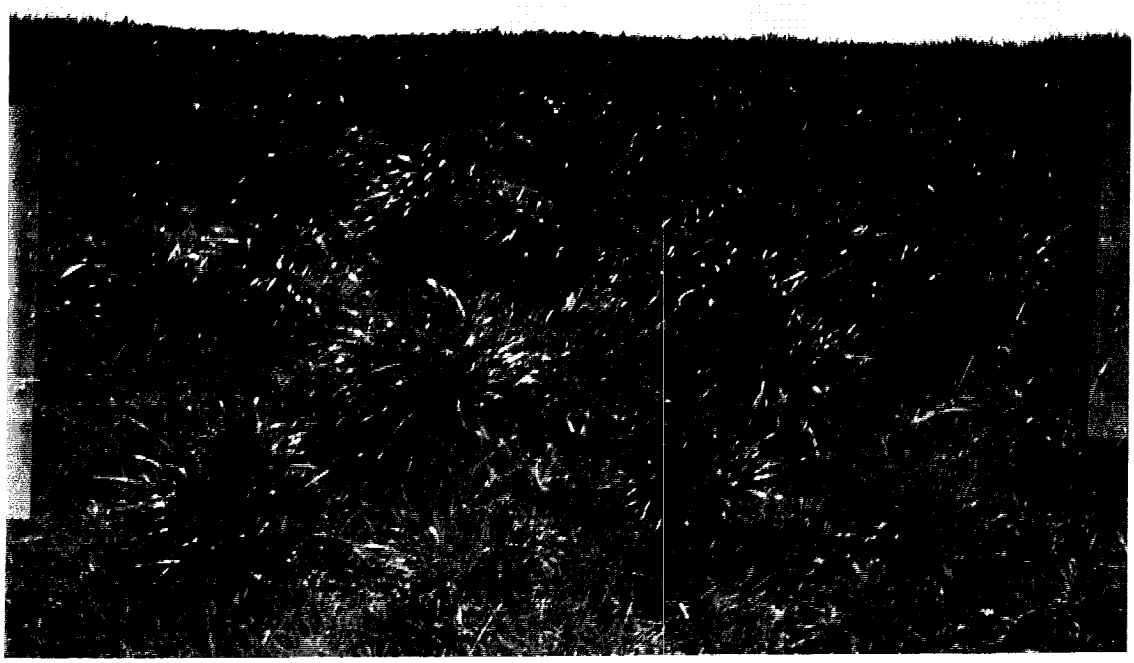
Plant personnel should place riprap in the erosion gully along the north dike if erosion persists in this area.

Plant personnel should periodically skim floating ash out of the stilling pond.

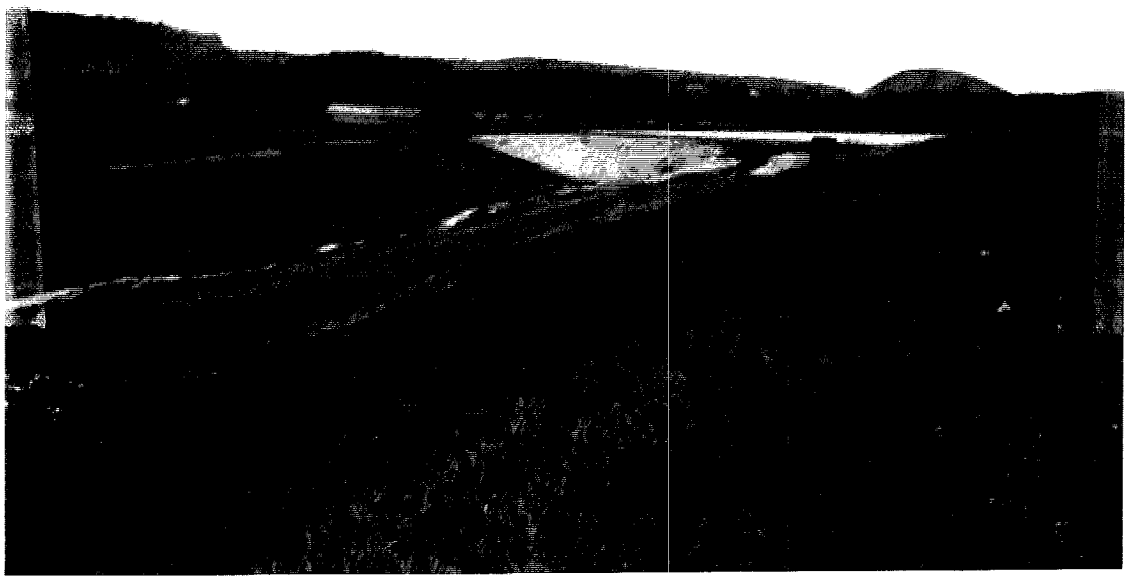
Plant personnel should continue to add and monitor riprap at the outlet end of the existing dike storm drains. Plant personnel should repair the erosion around the dike storm drain on the north end of the ash disposal area by filling with earth, compacting, and establishing vegetation or placing riprap in the area to prevent any additional erosion. Plant personnel should clean out the vegetation around the outlet so that flow does not become inhibited.

Plant personnel should clean out and regrade the drainage ditches in areas with standing water and establish vegetation in any disturbed areas.

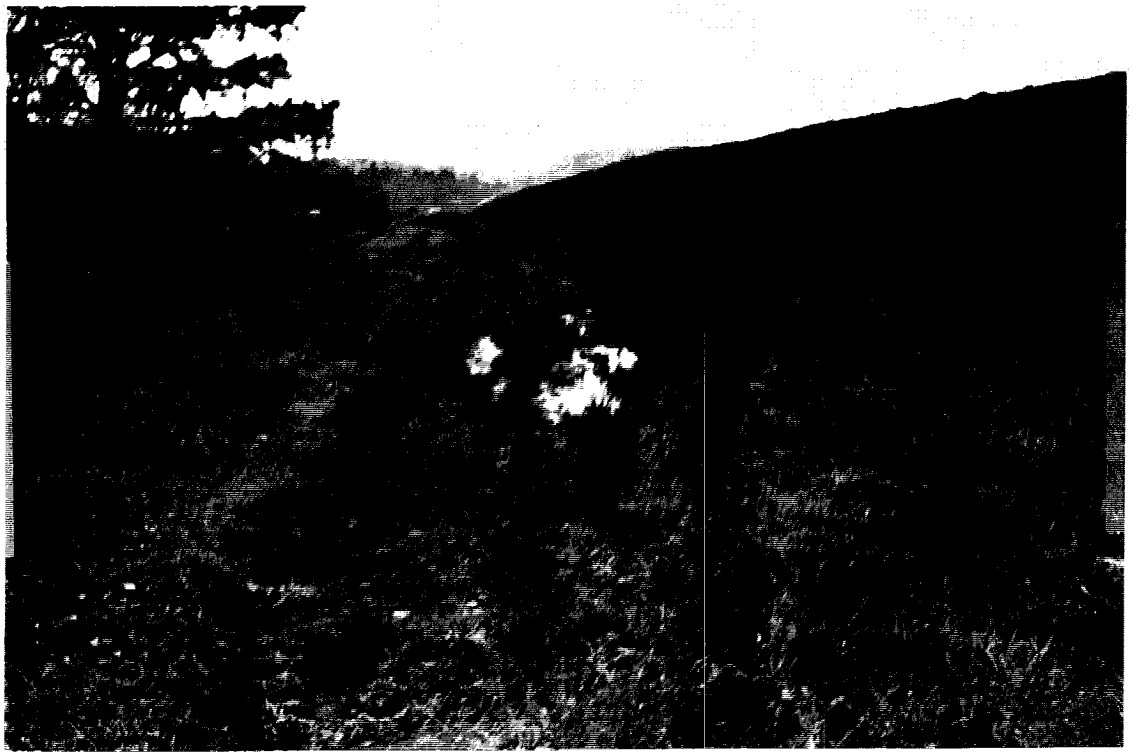
Plant personnel should overseed and fertilize the slopes of the Stage A lift of Dredge Cell No.2 to establish a lush vegetative cover.



SLOUGH - DIKE "C"



FIRST LIFT OF DREDGE CELL NO. 2 OFF DIKE "C"



SEEP - LOCATED MIDWAY ON DIKE "C" OFF DREDGE CELL NO. 2

RUTTED AREAS - WEST END OF DIKE "C"