

2018 Annual Dam and Dike Inspection Report

Primary Ash Dam

Flint Creek Plant

Southwestern Electric Power Company

Gentry, Arkansas

August 2018



Prepared by: American Electric Power Service Corporation

1 Riverside Plaza
Columbus, OH 43215



Document ID: GERS-18-032

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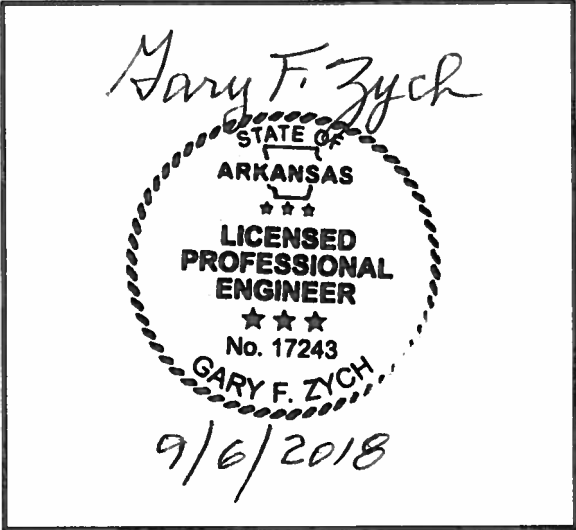
Primary Ash Dam

Document Number: GERS-18-032

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I certify to the best of my knowledge, information and belief the information contained in this report meets the requirements of 40 CFR § 257.83(b).

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1.0 INTRODUCTION

AEPSC (American Electric Power Service Corporation) Civil Engineering administers the Dam Inspection and Maintenance Program (DIMP) at AEP facilities. As part of the DIMP, staff from the geotechnical engineering section conducts dam and dike inspections on a periodic basis. Gary Zych, P.E. and Adam L. Winebrenner performed the inspection of the primary ash pond dam at the Flint Creek Power Plant. This report was prepared by AEP- Geotechnical Engineering Services (GES) section, in part, to fulfill requirements of 40 CFR 257.83 and to provide the Flint Creek Plant an evaluation of the facility.

Mr. Scott Carney was the plant contact for the inspection. The inspection was performed on August 8, 2018. Weather conditions were overcast and temperatures were in the range of 85--90°F. Rainfall for the 7 days preceding the inspection was 0.24 inches, all recorded on the day before the inspection per the plant records.

2.0 DESCRIPTION OF IMPOUNDMENTS

Figure 1 provides a plan view of the primary ash pond. The primary ash pond dam is an 820-foot long cross-valley dam on an unnamed tributary to Little Flint Creek. The primary ash pond is used for the settling and storage of bottom ash, and is considered a CCR surface impoundment. Periodically, the bottom ash is excavated/dredged for beneficial use. Flow from the reservoir discharges into the secondary pond.

GENERAL INFORMATION

Dam or Reservoir:	Primary Ash Pond
Owner:	Southwestern Electric Power Co.
Type of Dam:	Earth-Fill Structure
Date of Construction:	1978
D/S Hazard:	Low

LOCATION

County:	Benton County
General Location:	Approximately 4.5 miles north of Siloam Springs, AR
Stream and Basin:	Unnamed tributary to Little Flint Creek; Flint Creek Basin

SIZE – PRIMARY DAM

Dam Crest Elevation:	1,155 feet
Current Water Elev/depth:	1,145.7/25.7 feet
Dam Height: ¹	45 feet
Water Surface Area:	24 acres (current at el. 1145)
Reservoir Volume:	485 ac-ft (el. 1145)

3.0 REVIEW OF AVAILABLE INFORMATION (257.83(b)(1)(i))

A review of available information regarding the status and condition of the Primary Ash Dam which include files available in the operating record, such as design and construction information, previous periodic structural stability assessments, previous 7 day inspection reports, and previous annual inspections has been conducted. Based on the review of the data there were no signs of actual or potential structural weakness or adverse conditions noted.

4.0 INSPECTION (257.83(b)(1)(ii))

4.1 CHANGES IN GEOMETRY SINCE LAST INSPECTION (257.83(b)(2)(i))

No modifications have been made to the geometry of the Primary Ash Dam since the last annual inspection (November 8, 2017).

4.2 INSTRUMENTATION (257.83(b)(2)(ii))

There are four piezometers located along the crest of the dam. These are the only instrumentation related to this facility. A review of readings since the last inspection and historical readings indicate the levels are consistent and respond to the fluctuation of the cooling lake level. There were no unusual measurements since the last inspection. The table below lists the maximum piezometer reading since the last annual inspection. Table 1 at the end of this report is a summary of the monthly readings since October 2017.

INSTRUMENTATION DATA			
Primary Ash Dam			
Instrument	Type	Maximum Reading since last annual inspection	Date of reading
A1	Piezometer	1137.40	5/8/2018
A2	Piezometer	1137.51	5/8/2018
A3	Piezometer	1138.78	6/5/2018
A4	Piezometer	1142.01	7/30/2018

4.3 IMPOUNDMENT CHARACTERISTICS (257.83(b)(2)(iii, iv, v))

Table 2 is a summary of the minimum, maximum, and present depth and elevation of the impounded water & CCR since the previous annual inspection; the storage capacity of the impounding structure at the time of the inspection; and the approximate volume of the impounded water and CCR at the time of the inspection. (The data below is based on the original topography and 2004 hydrographic survey. The lowest elevation of CCR/sediment is 1130 ft msl; original was 1120; ash pipe discharge 1150.) The water level in the primary ash pond does not vary much during normal operations. Based on the normal operations the volume of ash and water remain fairly constant, as material is annually removed or temporarily stockpiled within the footprint of the pond.

Table 2

IMPOUNDMENT CHARACTERISTICS	
Primary Ash Dam	
Approximate Minimum depth (elevation) of impounded water since last annual inspection	15.3 ft (1145.30 ft msl)
Approximate Maximum depth	16.05 ft. (1146.05 ft msl)

(elevation) of impounded water since last annual inspection	
Approximate Present depth of impounded water at the time of the inspection	15.7 ft. (1145.7 ft msl)
Approximate Minimum depth (elevation) of CCR since last annual inspection	30 ft. (1150 ft msl)
Approximate Maximum depth (elevation) of CCR since last annual inspection	30 ft.(1150 ft msl)
Approximate Present depth (elevation) of CCR at the time of the inspection	30 ft. (1150ft msl)
Approximate Storage Capacity of impounding structure at the time of the inspection	771 ac-ft (at crest elevation)
Approximate volume of impounded water at the time of the inspection	138 ac-ft.
Approximate volume of CCR at the time of the inspection	347 ac-ft

4.4 DEFINITIONS OF VISUAL OBSERVATIONS AND DEFICIENCIES

This summary of the visual observations uses terms to describe the general appearance or condition of an observed item, activity or structure. The meaning of these terms is as follows:

- Good:** A condition or activity that is generally better or slightly better than what is minimally expected or anticipated from a design or maintenance point of view.
- Fair/Satisfactory:** A condition or activity that generally meets what is minimally expected or anticipated from a design or maintenance point of view.
- Poor:** A condition or activity that is generally below what is minimally expected or anticipated from a design or maintenance point of view.
- Minor:** A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is below what is normal or desired, but which is not currently causing concern from a structure safety or stability point of view.
- Significant:** A reference to an observed item (e.g. erosion, seepage, vegetation, etc.) where the current maintenance program has neglected to improve the condition. Usually conditions that have been identified in the previous inspections, but have not been corrected.
- Excessive:** A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is above or worse than what is normal or desired, and which may have affected the ability of the observer to properly evaluate the

structure or particular area being observed or which may be a concern from a structure safety or stability point of view.

This document also uses the definition of a “deficiency” as referenced in the CCR rule section §257.83(b)(5) Inspection Requirements for CCR Surface Impoundments. This definition has been assembled using the CCR rule preamble as well as guidance from MSHA, “Qualifications for Impoundment Inspection” CI-31, 2004. These guidance documents further elaborate on the definition of deficiency. Items not defined by deficiency are considered maintenance or items to be monitored.

A “deficiency” is some evidence that a dam has developed a problem that could impact the structural integrity of the dam. There are four general categories of deficiencies. These four categories are described below:

1. Uncontrolled Seepage

Uncontrolled seepage is seepage that is not behaving as the design engineer has intended. An example of uncontrolled seepage is seepage that comes through or around the embankment and is not picked up and safely carried off by a drain. Seepage that is collected by a drain can still be uncontrolled if it is not safely collected and transported. Seepage that is not clear and is turbid would also be considered as uncontrolled. Seepage that is unable to be measured and/or observe it is considered uncontrolled seepage. Note: Wet or soft areas are not considered as uncontrolled seepage, but can lead to this type of deficiency. These areas should be monitored more frequently.

2. Displacement of the Embankment

Displacement of the embankment is large scale movement of part of the dam. Common signs of displacement are cracks, scraps, bulges, depressions, sinkholes and slides.

3. Blockage of Control Features

Blockage of Control Features is the restriction of flow at spillways, decant or pipe spillways, or drains.

4. Erosion

Erosion is the gradual movement of surface material by water, wind or ice. Erosion is considered a deficiency when it is more than a minor routine maintenance item.

4.5 VISUAL INSPECTION (257.83(b)(2)(i))

A visual inspection of the Primary Ash Dam was conducted to identify any signs of distress or malfunction of the impoundment and appurtenant structures. Specific items inspected included all structural elements of the dam such as inboard and outboard slopes, crest, and toe; as well as appurtenances.

Overall the facility is in good condition. The impoundment is functioning as intended with no signs of potential structural weakness or conditions which are disrupting the safe operation of the impoundment. Inspection photos are included in Attachment A.

Changes in Geometry – there have been no changes to the geometry of the dam since the last annual inspection.

Spillway Structures

The principal spillway at the primary impoundment is a concrete drop-inlet structure with stop logs used to control the pool elevation. The spillway was in generally fair condition. Flow through the principal spillway was unobstructed.

The emergency spillway at the primary impoundment is an incised channel in natural ground with a concrete weir control section, 1 ft. in height, across the channel width. The spillway was in generally fair condition at the time of inspection (photo 3). The spillway appeared to be generally stable.

Vegetation control in this natural ground area is fair except for two trees that are located at the water's edge to the secondary pond.

Upstream Slope

The upstream slope of the primary dam was observed to be in satisfactory condition from the visual riprap up to the crest. Since the pond is used for settling of solids, there is an accumulation of bottom ash over the upstream slope. Therefore, approximately 6-8 feet of the embankment slope can be seen. The accumulated bottom ash has naturally revegetated but is not mowed.

There were no signs of sloughing or movement of the upstream slope. No rodent holes or erosion were observed during the inspection.

Crest

The crest surface of the primary dam is composed of hard-packed earth topped with bottom ash. Vehicular traffic is maintained across the crest for access for monitoring. The crest is in generally satisfactory condition with no evidence of misalignment, settlement, or cracking.

Downstream Slope

The downstream slope of the primary dam was in satisfactory condition (photos 1 & 2). Most of the slope is covered with riprap except for the top 3-5 feet which is grassed. Woody vegetation within the riprap is being controlled. There was no observed displacement or movement of the riprap. There was no seepage observed along the face of the slope.

About half of the downstream slope is inundated by the normal pool of the Little Flint Creek dam cooling lake.

There were no rodent holes that were observed in the upper slope that is grassed.

No erosion was observed in either of the groin ditches.

4.6 CHANGES THAT AFFECT STABILITY OR OPERATION (257.83(b)(2)(vii))

Based on interviews with plant personnel and field observations there were no changes to the Primary Ash Dam since the last annual inspection that would affect the stability of the impounding structure.

5.0 SUMMARY OF FINDINGS

5.1 GENERAL OBSERVATIONS

Based on the visual inspection and review of the instrumentation information available, it is concluded that the primary ash pond dam is generally in good condition at the time of inspection.

There were no signs of distress that would indicate possible instability, excessive settlement, misalignment, sloughing, or cracking of the dam.

Control of vegetation on the slopes is well maintained and is adequate for inspection

There were no deficiencies noted during the inspection or any of the 7-day inspections.

5.2 MAINTENANCE ITEMS

The following maintenance items were identified during the visual inspection, see inspection map for locations. Contact Geotechnical Engineering for specific recommendations regarding repairs:

- Continue the vegetation control plan of mowing and spraying.
- Remove woody vegetation in the natural ground below the emergency spillway from the Primary Bottom Ash Pond.

5.3 ITEMS TO MONITOR

None

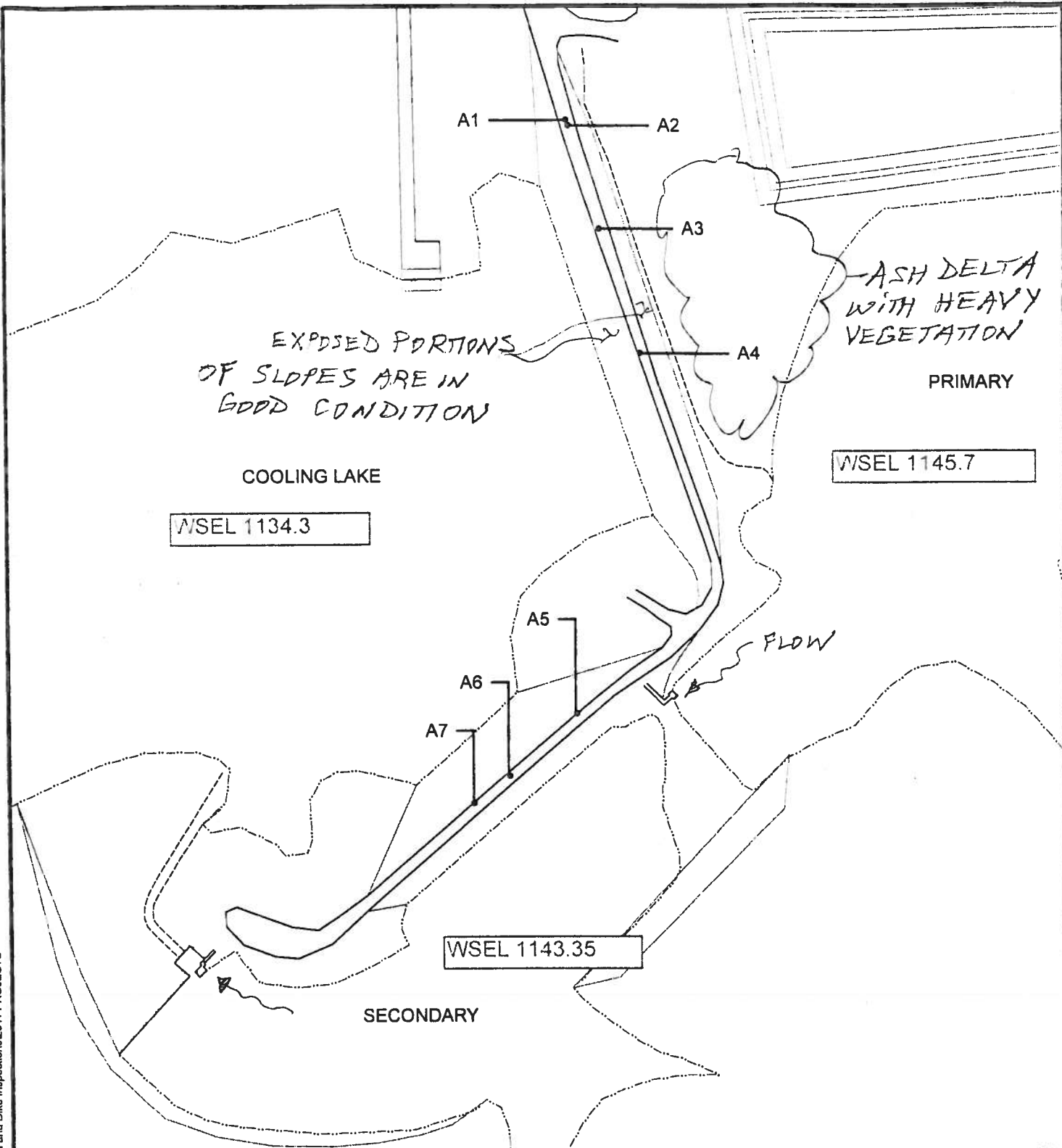
5.4 DEFICIENCIES (257.83(b)(2)(vi))

The Primary Ash Dam exhibited no signs of structural weakness or disruptive conditions during the inspection that would require additional investigation or remedial action. There were no deficiencies noted during this inspection or during any of the periodic 7-day inspections. A deficiency is defined as either 1) uncontrolled seepage, 2) displacement of the embankment, 3) blockage of control features, or 4) erosion, more than minor maintenance. If any of these conditions occur before the next annual inspection contact AEP Geotechnical Engineering immediately.

If you have any questions with regard to this report, please contact Gary Zych at 614-716-2917 (Audinet: 200-2917)

Table 1. Piezometer Elevations and Reservoir Pool Elevations - Flint Creek Plant Primary and Secondary Ash Dams												
Date	Piezometer Elevations						Reservoir Pool Elevations			Flint Creek Plant Primary and Secondary Ash Dams		
	A1	A2	A3	A4	A5	A6	A7	Primary Pool	Secondary Pool	Little Flint Ck. Pool		
10/5/2017	1132.74	1133.16	1137.03	1141.36				1145.15				1133.00
11/29/2017	1129.60	1129.60	1136.43	1140.20				1145.50	0.00			1131.30
12/19/2017	1130.60	1131.00	1136.26	1140.01	1132.00	1131.27	1132.77	1145.30	1143.15			1130.70
1/17/2018	1129.71	1130.11	1136.29	1139.06	1131.81	1130.44	1131.74	1145.35	1143.20			1129.90
2/15/2018	1128.96	1129.17	1135.98	1139.00				1145.55	1143.25			1128.95
3/14/2018	1132.82	1134.02	1136.21	1139.56				1145.60	0.00			1134.30
4/11/2018	1136.60	1136.58	1136.98	1140.10	1137.01	1136.75	1136.81	1146.05	1142.85			1137.20
5/8/2018	1137.40	1137.51	1138.38	1140.69				1145.50	0.00			1137.80
6/5/2018	1136.65	1136.92	1138.78	1141.52				1145.40	0.00			1137.20
7/2/2018	1135.20	1133.30	1138.26	1141.49				1145.05	0.00			1135.45
7/30/2018	1134.16	1134.26	1137.75	1142.01	1135.17	1134.90	1135.99	1145.25	1143.00			1134.50

Q:\GIS\American Electric Power\09390068 Dam and Dike Inspections\2011 PROJECTS



EXPOSED PORTIONS OF SLOPES ARE IN GOOD CONDITION

ASH DELTA WITH HEAVY VEGETATION

WSEL 1134.3

WSEL 1145.7

WSEL 1143.35

PROJECT
**AMERICAN ELECTRIC POWER
 LITTLE FLINT CREEK GENERATING STATION**

TITLE
**PRIMARY ASH POND DAM
 LOCATION OF PIEZOMETERS**

PROJECT No		09390068.11	FILE No	LFC FIG
DESIGN	AXX	XXX	SCALE	1:2,400
GIS	MTC	11/03/2011	REV	0
CHECK	R/O	12/05/2011	1	
REVIEW	R/O	2/05/2011		



INSPECTION DATE: AUG 8, 2018, BY AEP
 PLACEMENT OF DAM COMPONENTS AND IDENTIFIED DEFICIENCIES IS APPROXIMATE

ATTACHMENT A

Observation Photos



Photo #1 – d/s slope from right abutment



Photo #2 – d/s slope from left abutment

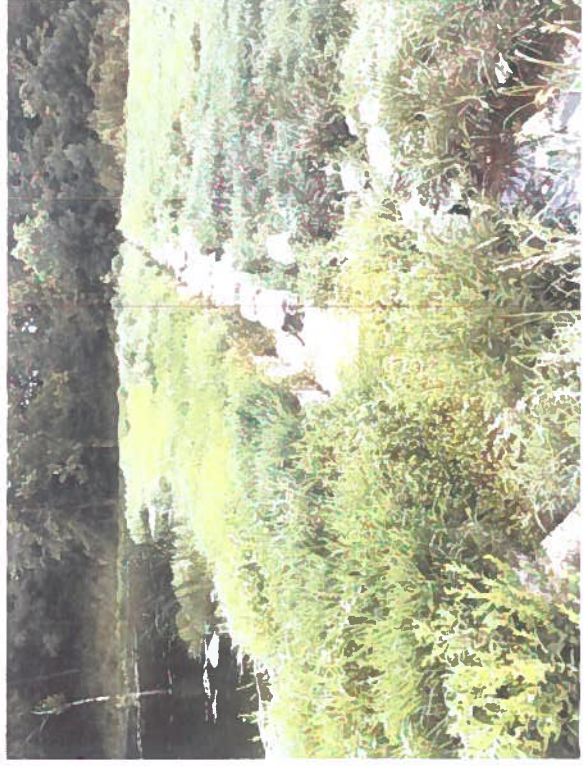


Photo #3 – emergency spillway weir area