REPORT OF THE DEPARTMENT OF CONSERVATION AND RECREATION

STUDY OF DAMS OWNED BY SOIL AND WATER CONSERVATION DISTRICTS

TO THE GOVERNOR AND THE GENERAL ASSEMBLY OF VIRGINIA



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COMMONWEALTH OF VIRGINIA RICHMOND 1998

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December 30, 1997

The Honorable George Allen, Governor Commonwealth of Virginia Capital Square Richmond, VA 23219 Members of the 1998 General Assembly Commonwealth of Virginia General Assembly Bldg., Capital Square Richmond. VA 23219

Dear Governor Allen and Members of the General Assembly,

Enclosed for your review is the report of the 1997 House Joint Resolution 446; Study of Dams Owned by Soil and Water Conservation Districts prepared by the Department of Conservation and Recreation. We appreciate the assistance of the legislative oversight committee chaired by Senator Emmett W. Hanger.

Sincerely,

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Kathleen W. Lawrence Director



STUDY OF DAMS OWNED BY SOIL AND WATER CONSERVATION DISTRICTS

Prepared by:

Virginia Department of Conservation and Recreation 12/4/97

STUDY OF DAMS OWNED BY SOIL AND WATER CONSERVATION DISTRICTS

EXECUTIVE SUMMARY

Dams owned by soil and water conservations districts are a form of infrastructure in the Commonwealth that were built for the purpose of flood control as long as 60 years ago. These dams were built using sound engineering procedures but, to serve their intended function in a safe manner well into the future requires proper care and maintenance by the owners of the dams.

This report details the overall status of these structures and outlines some of their needs. It responds to a request made by Virginia General Assembly to provide an overall assessment of dams owned by soil and water conservation districts which are political subdivisions of the Commonwealth. See Appendix 4.

The Department of Conservation and Recreation contracted with Gannett Fleming, Inc. to perform detailed engineering studies and analyses of selected dams during the summer and fall of 1997 as outlined in the legislative language. This study was done in three phases consisting of a preliminary reconnaissance phase of the 22 dams which meet the criteria specified by the General Assembly stipulations of Class 1 or Class 2 and built prior to 1969. After the preliminary reconnaissance of all 22 dams, detailed inspections were made of major structural features of 16 dams. The study was concluded with a report prepared by the consultant that provided analyses of findings, detailed recommendations, alternative approaches, and cost estimates. See Appendices 5, 8, and 10 for additional details. The detailed study results provided by the consultant were supplemented by other data available to the Division of Dam Safety to prepare this overall assessment of district owned dams.

Detailed review of the 22 dams in this study did not reveal any conditions that warrant immediate emergency action. Some needs identified, however, do warrant priority attention to assure continued safe beneficial usage. Corrective actions can be phased in over a period of years. The Department of Conservation and Recreation recommends the following to address the identified needs of the district dams:

- 1- Establish a maintenance and repair program with set objectives within a specified time frame. The initial efforts should be directed on a priority basis to sites with immediate needs.
- 2- Continue systematic study to look at remaining dams on a priority basis.
- Continue operation and maintenance funding to the Soil and Water
 Conservation Districts. (NOTE: The total need has been identified as over \$100,000 per year, it is recommended that there be a 50%-50% cost share

between the state and the locality. \$50,000 was provided to the soil and water districts during FY98 by the Acts of the 1997 General Assembly.)

- 4- Identify beneficiaries of dams to determine more appropriate allocation of cost for periodic rehabilitation needs (deteriorating concrete, metal features, etc.) including a contingency fund in case damage occurs during operation of water control gates. The needs for concrete rehabilitation, particularly at dams with open, leaking joints, should not be deferred.
- 5- Develop legislative initiative to investigate funding sources for dams identified as needing major upgrades on a priority basis.

STUDY OF DAMS OWNED BY SOIL AND WATER CONSERVATION DISTRICTS

STUDY OF DAMS OWNED BY SOIL AND WATER CONSERVATION DISTRICTS

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STUDY OF DAMS OWNED BY SOIL AND WATER CONSERVATION DISTRICTS

AUTHORITY

This study was initiated in response to HJR No. 446 language which reads as follows: "... That the Department of Conservation and Recreation be requested to study the structural condition and the costs of maintaining dams owned by soil and water conservation districts. In conducting its study, the Department shall evaluate (i) the integrity of these structures and the risk to health, safety, and welfare of the public; (ii) the infrastructure needs and maintenance and repair costs of the dams; (iii) the need for integrated flow and observation warning systems (IFLOWS); and (iv) the design of each of these dams to determine whether they are adequate to meet the changing land use patterns of the watershed...

"The Department of Conservation and Recreation shall complete its work in time to submit its findings and recommendations to the Governor and the 1998 Session of the General Assembly as provided in the Division of Legislative Automated Systems for the processing of legislative documents."

Funding to perform detailed analyses of selected dams was provided in the FY1998 appropriations.

INTRODUCTION

This study is being made to address the status and needs of the 104 dams owned by Soil and Water Conservation Districts in Virginia. This study and analysis of the designated dams responds to the following:

the current status and integrity of the dams; the maintenance and repair needs and costs;

the necessity and use of IFLOWS; and

the adequacy of the dams in meeting changes in land use.

Although designs and construction methods may have been similar for many of the district-owned dams, there are also many dissimilarities among them due to varying site conditions, geologic conditions, different contractors, different materials sources, different construction seasons, etc. In other words, each dam has its own unique character. Dams are not manufactured in a factory under controlled conditions and care must be exercised in making extrapolations from one dam to another.

CURRENT STATUS OF DISTRICT-OWNED DAMS

Summary information on each of the 104 district dams is contained in Appendix 1. The following provides a brief overview.

One of the first considerations given to the safety evaluation of any district dam or any other dam under the Virginia Dam Safety Act, is its classification, sometimes referred to as "hazard classification." The Virginia Dam Safety Regulations specify that each dam be classified based on potential loss of human life or property damage if it were to fail. The classes range in the order of decreasing hazard potential from Class 1 to Class 4 with Class 1 having the greatest potential for adverse downstream impacts in event of failure. This classification is not related to the physical condition of the dam nor the probability of its failure. The classification of any dam depends upon the downstream consequences if it were to fail and has nothing to do with the physical condition of the dam. See Appendix 3 which shows the classification criteria as contained in the Dam Safety Regulations.

Standards are established for each dam and are related to the dam's classification. Virginia's standards are not unlike those of our neighboring states and are in line with similar standards throughout the country. Safety standards become increasingly more stringent as the potential for adverse impact increases. For example, a Class 1 dam -- that is, one whose failure would result in probable loss of human life -- is required to meet higher standards than a dam whose failure would not be as likely to result in such severe adverse consequences.

Under the Virginia Dam Safety Act, the owners of all dams, including soil and water conservation districts, are issued certificates and permits based upon regulations promulgated by the Virginia Soil and Water Conservation Board. If a dam meets all requirements of the regulations, a certificate is issued by the Board for a period of six years. If deficiencies of a nonimminent danger category exist, a Conditional Certificate can be issued for a period not to exceed two years.

The following charts provide an overview of the number of Soil and Water Conservation District dams by classification, by certificate type, and by age.





<u># Dams</u>
1
91
12
104

*Of the 12 Conditional Certificates, 2 are Class 1 dams that have significant emergency spillway erosion but both are under an Alteration Permit for repair. 7 are Class 1 dams with insufficient emergency spillway capacity. 3 are Class 2 dams with insufficient emergency spillway capacity.



<u>Year Built</u> :	No. Of Dams
prior to 1960	14
1960-1969	51
1970-1979	22
1980-1989	12
after 1989	5
Total	104

BACKGROUND

With the exception of the Woodstock Dam, all district-owned dams have been built through assistance of the US Department of Agriculture under the small watershed program, PL 83-566 and PL 78-534. The dams have been built throughout the Commonwealth starting in 1954. Of the 146 dams that have been built in Virginia under the watershed program, 43 are the responsibility of cities, towns, local special purpose districts, or counties. The remaining 103 are the responsibility of soil and water conservation districts. The Woodstock Dam, brings the number of dams owned by soil and water conservation districts to a total 104 dams including one that is currently under a construction permit.

For each dam, agreements have been executed between the US Department of Agriculture and the city, town, county, or district. These agreements, in general, specify that the USDA will provide the engineering and financial services for building the dam and that operation of the dam is the responsibility of the local governmental entity (county, district, etc.) throughout the life of the dam. USDA refers to these local entities as "sponsors." See Appendix 7 for a copy of a sample agreement.

The Virginia Dam Safety Act defines the owner of a dam as follows:

"Owner" means the owner of the land on which a dam is situated, the holder of an easement permitting the construction of a dam and any person or entity agreeing to maintain a dam.

From this perspective, a District, in addition to being a "sponsor" of a federal project, is a dam owner.

To provide access and authority for operation and maintenance of the dams, each district has executed an easement with the landowner in lieu of fee simple title. See Appendix 6 for a copy of a sample easement. Since the landowner maintains title to the land upon which the dam is located, he/she is also considered the "owner," of the dam as defined in the Act. In reality, it is the district that is usually called upon to provide the maintenance and operation of the dam although many landowners -- but unfortunately, not all -- take great pride in "their" dam and do an outstanding job of mowing, trash removal and general care of the dam. However, responsibility for major maintenance features such as gate operation, replacements to structural features, and major repairs falls upon the districts as noted in the previously mentioned agreements.

METHODOLOGY

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The Department of Conservation and Recreation contracted with Gannett-Fleming, Inc. to perform detailed engineering studies and analyses of selected dams during the summer and fall of 1997 as outlined in the legislative language. The study was done in three phases consisting of a preliminary reconnaissance phase of the 22 dams which meet the criteria specified by the General Assembly stipulations of Class 1 or Class 2 and built prior to 1969. For details, refer to Appendix 10.

After the preliminary reconnaissance of all 22 dams, detailed inspections were made of major structural features of 16 dams. These 16 dams were selected on a priority basis taking into account the location of the dams, their accessibility, size, and age. Two dams were not considered for the detailed study because one (Hone Quarry, L N River #83, #16503) is being planned for major repair due to damage suffered during recent floods and the other (Marrowbone #1, #08908) is being redesigned for a major upgrade to bring it into compliance with the Dam Safety Act. The respective districts and local land owners were extremely helpful in gaining access to each dam. The study was concluded with a report prepared by the consultant which provided analyses of findings, detailed recommendations, alternative approaches, and cost estimates. See Appendix 5 and refer to the Final Study Report (Appendix 10) for additional details.

Meetings were held with interested parties during the course of the study as follows:

May 5, 1997 in Charlottesville with the Virginia Association of Soil and Water Conservation Districts and the 12 districts which own dams July 15, 1997 with the Joint Select Committee in Richmond

- July 30, 1997 in Verona with the 4 districts which owned dams targeted for special detailed study
- September 23, 1997 with the Joint Select Committee in Verona and included a field trip to two district dams

This report also provides details regarding all dams owned by soil and water conservation districts and draws heavily upon a 1991 task force report on Dam Maintenance and Safety Study on district dams prepared by the Virginia Association of Soil and Water Conservation Districts in cooperation with the Virginia Department of Conservation and Recreation, the US Department of Agriculture, the Virginia Association of Counties, the Virginia Municipal League, and the Virginia Soil and Water Conservation Board. This "task force report" contained a detailed analysis of district-owned dam needs and has provided a framework for addressing the needs of the district dams. It has been used as a basis for setting priorities on modification needs and is still today a valuable tool for an overall analysis of these dams.

Limitations

During the course of the study, a question arose pertaining to the districts' authority to enforce easements and their liability. A request was made to the Attorney General's office for assistance in clarifying the districts' authority. See Appendix 4. Because of the liability question, the districts were reluctant to lower the reservoirs. The inspection was therefore limited to what was observable from inside the risers and no attempt was made to inspect the exterior of the concrete by underwater means.

In response to DCR's request, the Office of the Attorney General indicated that the Commonwealth would be liable for claims resulting from a "negligent or wrongful act or omission of a state employee acting within the scope of his employment."

The landowner would not be liable unless he caused the damage.

When the Federal Energy Regulatory Commission inspects dams, they often require the owner to operate the gates to avoid Federal liability. The consultant, Gannett Fleming, Inc., indicated to DCR that if they were to accept the contingent liability of operating the gates, they would have to add that factor into the cost of the study.

Use was made of "As-Built" plans where available to help in analyses of the dams. In the case of Tom's Branch dam, however, the plans did not agree with observed conditions. The cause of this discrepancy could not be determined.

DISCUSSION

Spillway design flood requirements

As part of this overall assessment, ten district dams have been identified as needing major modification or upgrade because they do not meet the criteria for spillway design flood requirements. Nine of these dams were also included in the 1991 task force report. Marrowbone Dam #1 was not included in the 1991 task force report because at that time consideration was being given to transfer of the dam to the City of Martinsville and adding significant storage for water supply. The modifications, however, were never implemented and thus it is still a district-owned dam. The ten dams are discussed under the section Major Modification or Upgrade later in this report.

The 1991 task force report devoted a major emphasis on the need to meet the spillway capacity requirements. At that time, 19 dams had conditional Operation and Maintenance Certificates. Of these, it was estimated that eight would need major upgrades to meet the spillway requirements. The remaining eleven were expected to be brought into compliance with the regulations through further engineering studies. The following is the status of the 19 district dams listed in the 1991 task force report as having conditional certificates and as summarized in Table A.

2 dams have been modified to bring them into compliance with the Act: South River #4 Leatherwood #2A

8 have been brought into co	mpliance with additional	engineering studies
Leatherwood #4	Johns Crk # 2	Johns Crk # 3
Johns Crk # 4	Willis River # 6	South River # 7
Upper Blackwater # 6	6 Horse Pasture # 2	

9 dams remain from the 1991 list that still have Conditional Certificates:

Leatherwood # 3	Leatherwood # 5	Leatherwood # 6
Johns Creek # 1	South River # 6	South River # 23
South River # 25	South River # 26	Upper Blackwater # 4

TABLE A. DAMS NEEDING UPGRADE OR STUDY PER 1991 TASK FORCE REPORT.

Inv.#	Name	Remarks	Est. Cost	Est. Const	Current Needs	Spw. Cap.	Class	Current	Comments
		1991	1991	Cost 1994	Est Cost			Cert	
08095	Leatherwood 2A	Mod. Require	39,900	119,317		50%PMF	11	MR	Dam modified
08904	Leatherwood 3	Mod. Require	227,000	170,000	340,000	30%PMF		MC	Req. Mod.
08906	Leatherwood 4	Try Reclass.				100 YR		MR	Cert w/ detailed study
08902	Leatherwood 5	Mod. Require	128,000	120,000	240,000	30%PMF	11	MC	Reg. Mod.
08907	Leatherwood 6	Mod. Require	33,000	130,000	260,000	30%PMF	11	MC	Req. Mod.
04502	John's Creek 1	Try Sec. 3.4		1,000,000	1,800,000	32%PMF	1	MC	Sec. 3.4.tried, not successful
04501	John's Creek 2	Try Sec. 3.4				45%PMF	1	MR	Cert. Sec 3.4
04503	John's Creek 3	Try Sec. 3.4				30%PMF	1	MR	Cert. Sec 3.4
04504	John's Creek 4	Try Sec. 3.4				45%PMF	1	MR	Cert. Sec 3.4
02907	Willis River 6	Try Reclass.		_		50%PMF	11	MR	Cert. w/ detailed study
01511	South River 4	Mod. Require	120,000	301,858		PMF	1	MR	Dam modified
01509	South River 6	Mod. Require	187,000	210,000	420,000	80%PMF	1	MC	Req. Mod.
01522	South River 7	Mod. Require	82,000			90%PMF	1	MR	Cert w/ detailed study
01508	South River 23	Try Reclass.		150,000	300,000	55%PMF	1	MC	Reduce class tried, unsuccessful
01502	South River 25	Mod. Require	162,000	330,000	660,000	60%PMF	1	MC	Sect.3.4 tried, not successful
01501	South River 26	Try Sec. 3.4		130,000	260,000	50%PMF	1	MC	Sect.3.4 tried, not successful
06702	Upper Blackwater 4	Try Sec. 3.4		270,000	540,000	20%PMF	1	MC	Needs detailed study for 3.4
06701	Upper Blackwater 6	Try Reclass.			· · · · · · · · · · · · · · · · · · ·	50%PMF	11	MR	Cert. w/ detailed study
08909	Horse Pasture 2	Try Sec. 3.4			1	50%PMF	11	MR	Cert. w/ detailed study
08908	Marrowbone 1			610,000	610,000	32%PMF	1	MC	Des Mod Underway
					1		·		
								1	
	Т	OTAL EST COS	ST		5,430,000			1	1
	1							1	
1. The tota	l cost includes funding of \$430,000) which has already been	spent to bring Le	atherwood 2A and S	50. River #4 up to standa	rds.			1
2: Marrowb	one #1 was not included in 1991 st	udy. It is included here as	s an impending D	istrict need.					
3. MR means O&M Certificate									
MC me	ans Conditional O&M Certificate	<u> </u>	1						

Water Control Gates and Valves

A particular problem which has been noted for many years, but which has come to light especially during this detailed study, has been the operation of gates on the dams. Typically, the dams had "drawdown" or "low level water release" gates installed when they were built. The purpose of these gates is to enable the owner to readily lower the reservoir to be able to make needed repairs to the inlet structure and to provide a ready means for inspection of features that may otherwise normally be covered with water. These gates, which are made of metal, usually have a life expectancy of 25 or so years - much less than the expected life of the dam. Therefore gate replacement should be expected as a periodic maintenance need every few decades.

In order to make detailed engineering inspections it is desirable to have the reservoirs drawn down as far as possible. This makes the intake tower (riser) -- both inside and outside -- readily available for inspection. Drawdown also minimizes the flow going through the principal spillway and thus enables better visibility and access for inspection.

The first preference is to open the gate and provide drawdown through the principal spillway. For gates that have historically been periodically operated, this should not be a problem. Of course, there is always a chance that the gate, once opened, would not close completely. This is a risk that, as usual, must be borne by the owner. If the gate cannot be closed, it could result in a loss of the reservoir or permanent pool. Loss of the reservoir, from the dam safety standpoint, is not a problem; however in many or most cases it would be the loss of a valuable local resource.

A possibility would be that the gate, once opened, could get blocked with sediment or debris or otherwise not seal properly upon closing and therefore leak continually even to the point that the desired reservoir level cannot be maintained. Sediment build up near the riser should generally be fined grained and tend to flush itself out. The biggest hazard would probably be old sunken tree limbs or other debris. Each case would need to be handled individually. Alternatives for unblocking gates could include: 1) allowing a complete drawdown and remove the obstruction after the reservoir is down to gate level; or 2) sending down a diver to remove the obstruction (NOTE: THIS CAN BE AN EXTREMELY RISKY OPERATION AND SHOULD ONLY BE ATTEMPTED UNDER SPECIAL, CONTROLLED CONDITIONS. MANY OF THESE GATES OPERATE UNDER A LARGE HYDRAULIC HEAD AND WHEN AN OBSTRUCTION IS SUDDENLY REMOVED, EXTREMELY DANGEROUS FLOW CURRENTS AND PRESSURES CAN OCCUR.)

It is normally recommended that mechanical equipment such as a water control gate be operated regularly (every few months). Otherwise, the mechanism has a chance of getting corroded and "frozen" in place which would render the gate inoperable when needed. Troublesome gates should not be unanticipated and measures, including a contingency fund, should be included in the maintenance program to address gate problems as they develop. Repair or even a complete replacement is certainly within the realm of funding normally expected in operation of the dam.

Districts should operate these water control gates on a regular basis. It would have been desirable to operate the gates for the detailed inspections conducted as part of this study. However, due to the risk of possible damage, neither the districts nor the local land owners wanted to open or attempt to move the gates without a determination of liability or the financial resources to make any necessary repairs replacements. See discussion below on the detailed inspections. See Appendix 4 for question of liability.

Detailed Inspections

The initial thrust of the detailed inspections was to have provided a reservoir drawdown so that underwater surfaces and the interior of the principal spillways could be readily inspected. Because of the reluctance of the districts to operate the gates as discussed above, it is obvious that the first deficiency is that the water level control gates need to be operated and, if they cannot be operated, they should be made operable. Judging from the appearance of the gates from inside the risers (non-water side) they appeared to be in fairly good condition and it is possible that they could be operated with a minimum of problems. However, there is no way to determine this until they are actually operated.

The detailed inspections made by Gannett-Fleming as part of this study revealed several other deficiencies that cannot otherwise be discovered during regular visual inspections. The major deficiencies involved deteriorating concrete beyond what was normally observable. This was discovered by cutting off the flow of water through the dam's principal spillway and having a person enter the riser for further examination. The conduits and outlet pipe of the drains were inspected by means of a remote video camera.

Due to the inconclusiveness of the status of the drainage systems of several of the dams, consideration needs to be given to the installation of monitoring wells or piezometers at the dams with priority given to those dams with a possible problem. Such monitoring would provide a means to determine the location of the phreatic line in the embankment and thus enable an assessment of the operation of the drainage system. This problem was most apparent at Tom's Branch #01502 which is listed as a Priority 2 Periodic Rehabilitation need. Further investigation and installation of piezometers for Tom's Branch is expected to be in the range of \$30,000 to \$40,000.

Integrated Flood Observing and Warning System -- IFLOWS

Detailed information of the IFLOWS system is contained in Appendix 2. IFLOWS gages have been installed on 5 district owned dams. These gages are valuable for determining critical situations during flood events. They can, when properly calibrated,

provide information on rainfall quantities at the site and reservoir stage data. This data is especially important for sites which cannot be readily accessible for on-site monitoring during floods.

IFLOWS installations can be a very important asset to monitoring capabilities. It would be helpful to have an operational IFLOWS system on every Class 1 and 2 dam in the state. However, an IFLOWS installation is NOT a substitute for having adequate spillway capacity. Several reasons can be cited for this. For one, an IFLOWS installation does nothing to prevent a dam failure and the dam is still as susceptible to failure as before. Any kind of remote monitoring depends on several specific actions to be effective. The systems are not fool-proof. Although the technology can be made very reliable, the effectiveness still will also depend upon human response-- that is, it depends mainly upon people to make the proper notification to other people who must then be depended upon to take the correct action during an emergency. Perhaps though the most important fact is that most of the dams are on very small drainage areas, steep and mountainous terrain, very remote areas, and subject to very fast, flash flooding. There often is simply insufficient time to react. Most engineers who deal with dams on a regular basis support the conclusions of the fallacy of substituting warning for upgrading the spillway.

NEEDS AND FUNDING TO BE CONSIDERED

When given proper care, earth fill embankment dams have proven to be very effective almost indefinitely. A good operation and maintenance program will help protect the dam against deterioration and prolong its life, resulting in protection not only to the owner but to the general public as well.

Although a dam itself may be designed for a one hundred year life span, it is normally expected that operating gates and other metal features have an expected life span of 25 years and would therefore need replacement several times during the life of the dam. Occasionally, some dams may need major rehabilitation due to some unusual circumstance such as a major flood event. For discussion purposes, the total funding needs for the dams are grouped into three general categories. The three groups are discussed below:

- 1) regular annual maintenance;
- 2) periodic rehabilitation; and
- 3) major modification or upgrade.

Pegular Annual Maintenance

ese measures are needed on a regular basis, normally on a frequency of at least once each year. Typical activities which should be included in a good maintenance program include:

- mow dam semi-annually
- grazing, if allowed on an embankment, needs to be controlled
- operate drawdown gate twice annually and lubricate annually or as recommended by the manufacturer.
- monitor dam during and immediately following significant rainfall events
- repair fences as needed
- eliminate woody growth and other undesirable vegetation on embankment, along wave berm, stilling basin, outlet channel, AND within 25 feet of all contacts of embankment with natural ground
- clean up debris on embankment and appurtenances as needed.
- inspect at least annually

One item that is common to many dams is a perceived inability to mow embankments. It must be emphasized that regular mowing accomplishes two very important items. For one, it reduces the likelihood of unwanted woody vegetation and helps to maintain a desirable cover of close-growing grasses. For another, it keeps the vegetation low enough to enable an inspector to traverse the embankment to detect potential problem areas that may not otherwise be seen. The steepness of the embankments is usually

A as the reason because normal mowing equipment is difficult to use. It should be ded that several manufacturers now have available equipment that is designed especially for mowing steep embankments. While the equipment may be expensive for any one district to purchase for their own use, consideration could be given to a "joint venture" whereby several districts could pool their funding to enable them to do the necessary mowing. Consideration could also be given to the districts contracting with private contractors who also do mowing on steep slopes for VDOT.

The General Assembly appropriated \$50,000 for maintenance work for district-owned dams for FY1998. The funding was allocated through the Department of Conservation and Recreation to each of the 12 districts that own dams based on the number of dams owned by each district. Table B indicates the allocation made to the districts and the proposed use of the funds. The activities are still ongoing and Table B is intended to indicate the typical use being made of the funding based on the highest priorities. DCR is tracking progress. The districts appear to be making good use of this funding and are targeting it to provide some of the much needed maintenance on a priority basis. Maintenance with a lower priority still needs attention and it is recommended that, because these dams are a local asset, that local funding options be investigated to provide the balance of the needs.

The 1991 task force report estimated a normal annual maintenance need to be from \$1,000 to \$2,000 per dam which represents an estimated need of \$104,000 to \$208,000 for all 104 dams. Based upon the experience of districts which have provided good maintenance and with the limited experience to date with the use made of the maintenance fund for dams, this still appears to be a valid estimate of the needs. Some districts have funding available to supplement the amount appropriated through DCR but other districts have very limited funds and are unable to meet their maintenance needs. Of the estimated maintenance needs of about \$100,000 per year, it is expected that approximately \$50,000 would be provided through funding by the General Assembly and the balanced financed locally through the districts.

TABLE B. DISTRICT MAINTENANCE ACTIVITIES USING MAINTENANCE FUND

DISTRICT/ NO. OF DAMS	AMOUNT RECEIVED	ACTIVITY**
BLUE RIDGE10	\$ 4,854	Highest priority is tree removal from 2 dams at an estimated cost of about \$1,000. The remaining funding will be used for other maintenance on a priority basis.
CULPEPER11	5,340	Bush hog, remove trees and fill ground hog holes on dams.
HANOVER-CAROLINE1	485	Mowing and liming.
HEADWATERS11	5,340	Liming and fertilizing of additional dams.
LORD FAIRFAX3	1,456	Mowing of the two earth dams.
MOUNTAIN CASTLE4	1,942	Spraying to kill unwanted vegetation
PETER FRANCISCO17	8,252	Bush hogging completed or underway on 11 of the 17 structures based on the highest priorities.
PIEDMONT13*	6,311	Mowing completed for 9 dams.
ROBERT E. LEE6	2,913	Mowed 4 of the 6 dams and had alders removed from one.
SHENANDOAH VALLEY-7	3,398	Bids to be advertised in December for the hand removal of woody growth.
SOUTHSIDE12	5,825	Repairing damage caused by traffic across the crest of four to five dams.
THOMAS JEFFERSON8	3,884	Bids out for the mowing of six dams with greatest need.
TOTAL 103*	\$ 50,000	

NOTES: * Dam #14741 was not included because it is under a Construction Permit. **The activities are still ongoing and this list is intended to indicate the typical use being made of the funding based on the highest priorities. DCR is tracking progress.

Periodic Rehabilitation

Periodic rehabilitation is expected to be needed on a more or less irregular and infrequent basis and is required to repair, restore or improve the dams to conditions appropriate for their intended use and ensure long term safety. Some of these types of periodic needs were the subject of the detail inspection provided by the consultant during this study. For a summary and conclusions refer to Appendix 5. Typically, activities which need to be addressed in a good maintenance program include:

- periodic detailed inspection using remote video or other means to inspect areas not normally accessible
- repair deteriorating concrete
- repair or replace deteriorating trash racks, ladders, and railings
- replace corrugated metal pipes before they completely deteriorate
- periodically flush and monitor performance of embankment drains
- repair or install needed structural monitoring devices such as staff gages, monuments, or observation wells
- major revegetation restoration*
- removal of unwanted woody vegetation*
- repair or replace drawdown gates
- replacement or installation of riprap

* NOTE: These items should not be needed IF proper regular annual maintenance has been performed.

Based upon the detailed inspection of the 22 dams selected for study, recommendations for repairs are grouped in priority order are as follows:

Priority 1 -- repair leaks in concrete

#01507 Upper North River #77 (Hearthstone) #16502 Lower North River #78 (Briery Branch) #04502 John's Creek 1

Priority 2 -- deteriorating concrete in riser or monitor embankment

#01501 South River #26(Inch Branch)

#01502 South River #25 Toms Branch

#01508 South River #23 (Robinson Hollow)

#01511 South River #4 Lofton)

#01509 South River #6 (Senger Mountain)

Priority 3 -- minor repairs

#08902 Leatherwood Cr #5

#01514 South River #19 Waynesboro Nursery

#04501 Johns Creek #2

It is expected that the rehabilitation needed to address the concrete deficiencies noted would consist primarily of epoxy or cementitious grouts to fill voids or reduce seepage or leakage and the application of coatings/sealers to restore surfaces. Some of this work will probably require partial or complete drawdown of the reservoirs. Naturally, if this cannot be accomplished by opening of the reservoir drainage gate, the first action would be to make the necessary repairs or replacement of these gates. Based upon experience with work normally needed for the concrete repairs expected to be needed, an estimated cost is expected to be in the \$20,000 to \$30,000 price range. Gate replacement, if needed, could add another \$10,000 to \$20,000 per site. Assuming an effort to renovate about five dams per year on a priority basis, the periodic need for these infrequent rehabilitations is thus estimated at about \$150,000 per year.

A recommended maintenance program for all 104 district dams would be based upon a rehabilitation need on an average frequency of about 20 to 30 years. This would translate to about 4 or 5 dams per year which could be accomplished for about \$150,000 per year with preference given to the highest priorities listed above. In order to establish priorities for these needed rehabilitations, extension of the detailed study is recommended at an estimated cost of about \$125,000 per year. The additional detailed inspections may reveal some needs more critical than those identified as priority 3 above.

Major Modification or Upgrade

This category of need refers to dams that need major upgrades because they do not meet current recognized dam safety criteria or standards. It is a type of upgrade that is normally not anticipated but occurs because the dam has had a change in hazard class.

The classification of a dam is not static. Downstream conditions, including land use, can and often do change. Although a dam itself may remain relatively stable, it is subject to reclassification if a change occurs in the downstream inundation zone. For example, if new homes are built in the downstream potential inundation zone of a Class 2, 3 or 4 dam, the dam could be reclassified to Class 1.

Most of the district-owned dams met the federal engineering standards at the time they were built. However, subsequent downstream development has necessitated a change in classification. A change in classification can create a dilemma because when a dam is reclassified, it usually does not meet the higher standards of the new classification. To meet the required higher standards, the owner of the dam is often required to make expensive modifications. Several district-owned dams were built as Class 2 or 3 and are currently designated as a higher potential hazard. Because of the spillway capacity requirements for the higher classification, most of these dams do not now meet the Dam Safety Act and Regulations and are therefore deficient. Currently, 12 District-owned dams have conditional certificates. See following list.

Inventory No	Name of Dam	Class
01501	South River #26	1
01502	South River #25	1
01508	South River #23	1
01509	South River #6	1
04502	Johns Creek #1	1
06702	Upper Blackwater River #4	1
08908	Marrowbone Creek #1	1
16503	Lower North R. #83	1
16507	Lower North R. #82	1
08902	Leatherwood Creek #5	2
08904	Leatherwood Cr. #3	2
08907	Leatherwood Creek #6	2

Of the twelve district dams having Conditional Certificates, two dams #16503 and #16507 carry conditional certificates because they have had significant flood damage. Both are in the process of being repaired through assistance of the USDA Natural Resources Conservation Service at a total cost of about \$500,000. As soon as the repair work is completed, it is expected that both of these dams can receive regular certificates.

The remaining ten dams have Conditional Certificates because they do not meet the required spillway design flood requirements. These ten dams will require major modification or upgrade and are listed in Table C in the order of their proposed priority. It is estimated that the funding required to upgrade these ten dams is about 5.4 million dollars. This estimated total cost is based upon updated construction cost estimates made in 1994 and updated to current total cost as part of this study. As long as no other changes occur in the classification of district dams, this should be considered as a one time need to bring these dams into conformance with the dam safety act and regulations.

It should be noted that 79 district dams are Class 2 or Class 3. If downstream areas develop, some of these dams could be subject to reclassification. To avoid the need for expensive modifications of these dams in the future, all affected parties should recognize the impact that downstream development can have on the required standards for a dam. Before downstream development occurs, its potential impact on the owner of a dam should be recognized as a part of local land use planning. Educating land use planners of this relationship is the most efficient way to prevent the problem rather than to ignore the issue and attempt to meet the increased safety requirements later.

TABLE C. ESTIMATED COST and PRIORITIES FOR MAJOR MODIFICATION OR UPGRADE

Inv. No.	Name	Current Needs Est.	Spw. Cap.	Class	Priority
#08908	Marrowbone 1	610,000	32% PMF	1	1
#06702	Upr Blackwater 4	540,000	20% PMF	1	2
#04502 *	John's Creek 1	1,800,000	32% PMF	1	3
#01501 **	South River 26	260,000	50% PMF	1	4
#01508 **	South River 23	300,000	55% PMF	1	5
#08902 ***	Leatherwood 5	240,000	30% PMF	2	6
#08907	Leatherwood 6	260,000	260,000 30% PMF		7
#08904	Leatherwood 3	340,000	30% PMF	2	8
#01502 **	South River 25	660,000	60% PMF	1	9
#01509 **	South River 6	420,000 80% PM		1	10
TOTAL		5,430,000			

- Note: These dams are also identified as needing periodic rehabilitation based on the detailed inspections conducted as part of this study:
 - * Priority 1
 - ** Priority 2
 - *** Priority 3

CONCLUSIONS

Dams owned by soil and water conservations districts have served the citizens of the Commonwealth well for many years but can continue to do so only if they are properly maintained. Although these dams were built using sound engineering procedures they cannot continue to serve their intended function in a safe manner without proper care and maintenance.

In general their needs are broken down into three main categories:

 Regular annual operation and maintenance. The districts and local land owners can usually handle this by themselves but some districts need to be more diligent about controlling vegetation on and adjacent to the embankments. Districts also need to operate water level control gates on a regular and systematic basis and anticipate periodic problems that will need to be addressed.

- 2) Periodic rehabilitation. This needs to be anticipated every few decades as some of the structural features begin to deteriorate. Periodic repair and/or replacement of water level control gates needs to be anticipated.
- 3) Major upgrades. Since 1991, the number of district dams that do not meet the requirements of the Virginia Dam Safety Act and regulations has been reduced from 19 to 10. Major upgrades are still needed at those 10 dams and it is recommended that effort be devoted to removing these deficiencies on the basis of their listed priority. A reasonable approach would be an effort to upgrade one dam every year or so based on their priority. An effort is currently underway to upgrade the Marrowbone Creek dam. The Natural Resources Conservation Service is providing the design services and some funding for the upgrade has been appropriated through the General Assembly.

Continuing funding needs for the district owned dams can be summarized as follows:

Annual needs for regular operation and maintenance \$ 100,000 per year Periodic needs for infrequent rehabilitation Major modification or upgrade for 10 dams

Continue study of all SWCD dams

- \$ 150,000 per year
- \$5,430,000 one time effort for the ten dams spread over ten vears
- \$ 125,000 per year for 2 yrs.

APPENDICES

APPENDIX 1

SUMMARY OF DISTRICT DAMS

I_NO	NAME_DAM	OWNER_NAME	CLASS	CERT_TYPE	CERT_DATE	PMT_TYPE	PMT_DATE	TOT_HT	TOT_CAP	YR_COMP	COUNTY
06701	Upper Blackwater River Dam #6	Blue Ridge SWCD	2	MR	05/18/95			50	672	1972	FRANKLIN
06702	Upper Blackwater River Dam #4	Blue Ridge SWCD	1	MC	03/20/97			59	338	1974	FRANKLIN
08902	Leatherwood Creek Dam #5	Blue Ridge SWCD	2	MC	07/18/96			57	2997	1963	HENRY
08904	Leatherwood Cr. Dam #3	Blue Ridge SWCD	2	MC	07/18/96			41	2400	1964	HENRY
08905	Leatherwood Creek Dam #2A	Blue Ridge SWCD	2	MR	09/19/96			52	1750	1964	HENRY
08906	Leatherwood Creek Dam #4	Blue Ridge SWCD	3	MR	05/19/93			42	432	1964	HENRY
08907	Leatherwood Creek Dam #6	Blue Ridge SWCD	2	MC	07/18/96			32	500	1964	HENRY
08908	Marrowbone Creek Dam #1	Blue Ridge SWCD	1	MC	07/18/96			46	2343	1960	HENRY
08909	Horse Pasture Creek Dam #2	Blue Ridge SWCD	2	MR	07/15/93			38	459	1972	HENRY
08912	Horse Pasture Creek Dam #1C	Blue Ridge SWCD	3	MR	09/18/97			53	985	1973	HENRY
04701	Mountain Run Dam #8A	Culpeper SWCD	3	MR	05/15/97			34	1870	1959	CULPEPER
04705	Mountain Run Dam #13	Culpeper SWCD	3	MR	05/15/97			30	1140	1960	CULPEPER
04706	Mountain Run Dam #18	Culpeper SWCD	1	MR	07/18/96			43	2290	1973	CULPEPER
11302	Beautiful Run Dam #2A	Culpeper SWCD	3	MR	09/21/95			39	688	1965	MADISON
11303	Beautiful Run Dam #4	Culpeper SWCD	3	MR	09/21/95			29	86	1967	MADISON
11304	Beautiful Run Dam #5	Culpeper SWCD	3	MR	09/18/97			27	77	1967	MADISON
11305	Beautiful Run Dam #6	Culpeper SWCD	3	MR	09/21/95			29	195	1968	MADISON
11306	Beautiful Run Dam #7	Culpeper SWCD	3	MR	09/21/95	L		26	133	1969	MADISON
11307	Beautiful Run Dam #10	Culpeper SWCD	3	MR	09/21/95			28	89	1969	MADISON
11308	Beautiful Run Dam #11	Culpeper SWCD	3	MR	09/18/97			30	309	1968	MADISON
11309	Beautiful Run Dam #1B	Culpeper SWCD	3	MR	12/05/95			35	452	1977	MADISON
08502	South Anna #52 B	Hanover-Caroline SWC	3	MR	01/16/92			33	2019	1973	HANOVER
01522	South River Dam #7	Headwater SWCD	1	MR	03/18/93			46	690	1957	AUGUSTA
01501	South River Dam #26	Headwaters SWCD	1	MC	07/10/97			57	868	1956	AUGUSTA
01502	South River Dam #25	Headwaters SWCD	1	MC	07/10/97			62	1281	1957	AUGUSTA
01505	Upper North River Dam #10	Headwaters SWCD	3	MR	09/17/92			68	865	1963	AUGUSTA
01507	Upper North R. #77	Headwaters SWCD	1	<u></u>	07/20/95			110	3680	1966	AUGUSTA
01508	South River Dam #23	Headwaters SWCD	1	MC	07/10/97			_49	919	1956	AUGUSTA
01509	South River Dam #6	Headwaters SWCD	1	MC	07/10/97			56	1283	1959	AUGUSTA
01511	South River Dam #4	Headwaters SWCD	1	MR	11/10/94			56	890	1959	AUGUSTA
01512	South River Dam #11	Headwaters SWCD	1	MR	07/20/95	L		27	292	1957	AUGUSTA
01513	South River Dam #24	Headwaters SWCD	2	MR	09/17/92			35	330	1954	AUGUSTA
01514	South River Dam #19	Headwaters SWCD	2	MR	09/17/92			35	1034	1957	AUGUSTA
17101	Stony Creek Dam #9	Lord Fairfax SWCD	1	MR	01/18/96			73	3260	1971	SHENANDOAH
17102	Stony Creek Dam #10	Lord Fairfax SWCD	1	MR	01/16/97			71	1910	1971	SHENANDOAH
17104	Woodstock Dam	Lord Fairfax SWCD	1	MR	05/18/95	ļ		44	102	1957	SHENANDOAH
04501	Johns Creek Dam #2	Mountain Castles SWC	1	MR	03/17/94		L	51	1334	1967	CRAIG
04502	Johns Creek Dam #1	Mountain Castles SWC	1	MC	03/21/96			62	3759	1967	CRAIG
04503	Johns Creek Dam #3	Mountain Castles SWC	1	MR	03/19/92			50	292	1968	CRAIG
04504	Johns Creek Dam #4	Mountain Castles SWC	1	MR	03/17/94		<u> </u>	95	1022	1966	CRAIG

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02901	Willis River Dam #1A	Peter Francisco SWCD	3	MR	09/19/96			42	3183	1975	BUCKINGHAM
02902	Willis River Dam #1B	Peter Francisco SWCD	3	MR	09/19/96			44	1204	1975	BUCKINGHAM
02903	Willis River Dam #3	Peter Francisco SWCD	3	MR	05/16/96			44	871	1974	BUCKINGHAM
02904	Willis River Dam #4	Peter Francisco SWCD	3	MR	05/16/96			44	1102	1974	BUCKINGHAM
02905	Willis River Dam #5E	Peter Francisco SWCD	3	MR	05/16/96			42	1448	1972	BUCKINGHAM
02906	Willis River Dam #5F	Peter Francisco SWCD	3	MR	05/16/96			43	1178	1972	BUCKINGHAM
02907	Willis River Dam #6	Peter Francisco SWCD	2	MR	05/16/96			47	4922	1972	BUCKINGHAM
02908	Willis River Dam #6A	Peter Francisco SWCD	3	MR	05/16/96			33	1036	1973	BUCKINGHAM
02909	Willis River Dam #7	Peter Francisco SWCD	3	MR	09/19/96			38	3251	1969	BUCKINGHAM
02910	Willis River Dam #9	Peter Francisco SWCD	3	MR	05/16/96			36	590	1969	BUCKINGHAM
02911	Muddy Creek Dam #1	Peter Francisco SWCD	3	MR	09/18/97			39	997	1962	BUCKINGHAM
02912	Muddy Creek Dam #2	Peter Francisco SWCD	3	MR	09/18/97			33	495	1962	BUCKINGHAM
02919	Willis River Dam #2	Peter Francisco SWCD	3	MR	09/19/96			46	2730	1975	BUCKINGHAM
02933	Slate River Dam #14	Peter Francisco SWCD	3	MR	09/18/97			40	1814	1982	BUCKINGHAM
02934	Slate River Dam #13	Peter Francisco SWCD	3	MR	09/18/97			35	1318	1983	BUCKINGHAM
02935	Slate River Dam #8	Peter Francisco SWCD	3	MR	09/18/97			50	2919	1984	BUCKINGHAM
02936	Slate River Dam #7	Peter Francisco SWCD	2	MR	06/18/92			50	2670	1991	BUCKINGHAM
14701	Buffalo Creek Dam #1	Piedmont SWCD	3	MR	09/19/96			35	2537	1966	PRINCE EDWAR
14702	Buffalo Creek Dam #3	Piedmont SWCD	3	MR	09/19/96			51	2018	1966	PRINCE EDWAR
14703	Buffalo Creek Dam #4	Piedmont SWCD	3	MR	09/19/96			46	5064	1967	PRINCE EDWAR
14706	Buffalo Creek Dam #2	Piedmont SWCD	3	MR	09/19/96			35	1537	1963	PRINCE EDWAR
14707	Buffalo Creek Dam #5	Piedmont SWCD	3	MR	09/19/96			37	1350	1965	PRINCE EDWAR
14708	Buffalo Creek Dam #6	Piedmont SWCD	3	MR	09/19/96			38	1373	1965	PRINCE EDWAR
14709	Buffalo Creek Dam #7	Piedmont SWCD	3	MR	09/19/96			36	623	1965	PRINCE EDWAR
14710	Buffalo Creek Dam #8	Piedmont SWCD	3	MR	09/19/96			38	619	1965	PRINCE EDWAR
14711	Buffalo Creek Dam #9	Piedmont SWCD	3	MR	09/19/96			41	608	1968	PRINCE EDWAR
14734	Bush River Dam #2	Piedmont SWCD	2	MR	09/19/96			49	2245	1985	PRINCE EDWAR
14736	Bush River Dam #7	Piedmont SWCD	3	MR	09/19/96			44	3570	1990	PRINCE EDWAR
14739	Bush River Dam #5	Piedmont SWCD	3	MR	03/16/95			39	1010	1994	PRINCE EDWAR
14740	Bush River #6	Piedmont SWCD	3	MR	05/16/96			37	1810	1995	PRINCE EDWAR
14741	Bush River Dam #4B	Piedmont SWCD	3			co	07/10/97	48	7277	·	PRINCE EDWAR
01102	East Fork Falling River #7	Robert E. Lee SWCD	3	MR	07/18/96			47	1442	1958	APPOMATTOX
01103	East Fork Falling River #15	Robert E. Lee SWCD	3	MR	07/18/96			38	907	1956	APPOMATTOX
01104	East Fork Falling River #21	Robert E. Lee SWCD	3	MR	07/18/96			36	414	1956	APPOMATTOX
03101	Little Falling River Dam #1	Robert E. Lee SWCD	3	MR	07/18/96	1		44	3132	1967	CAMPBELL
03103	Little Falling River Dam #2	Robert E. Lee SWCD	3	MR	07/18/96			42	584	1968	CAMPBELL
03104	Little Falling River Dam #3	Robert E. Lee SWCD	3	MR	07/18/96			34	578	1966	CAMPBELL
16501	Lower North R. #80	Shenandoah Valley SW	1	MR	05/15/97			87	1345	1967	ROCKINGHAM
16502	Lower North R. #78	Shenandoah Valley SW	1	MR	05/15/97			89	2550	1968	ROCKINGHAM
16503	Lowe ^r R. #83	Shenandoah Valley SW	1	MC	7 ۲	AL	09/18/97	93	2167	1968	ROCKINGHAM
16507	Lowe, R. #82	Shenandoah Valley SW	1	MC	ι /	AL	09/18/97	120	5780	1980	ROCKINGHA

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Shoemaker River Dam #1A Sheamadeah Valley SW 1 MR 06/15/97 52 545 1980 ROCKINGHAM 16510 Sheamadeah Valley SW 1 MR 06/15/97 86 2159 1984 ROCKINGHAM 16510 Sheamadeah Valley SW 1 MR 06/15/97 74 72 1986 ROCKINGHAM 03702 Reanoke Creek Dam # 35A Southside SWCD 3 MR 09/18/97 45 900 1990 CHARLOTTE 03708 Reanoke Creek Dam #3A Southside SWCD 3 MR 09/18/97 36 1919 1962 CHARLOTTE 03707 Reanoke Creek Dam #6A Southside SWCD 3 MR 09/18/97 36 1919 1962 CHARLOTTE 03708 Reanoke Creek Dam #6A Southside SWCD 3 MR 09/18/97 34 2130 1963 CHARLOTTE 03708 Reanoke Creek Dam #51 Southside SWCD 3 MR 09/18/97 36 741 1962 <t< th=""><th>······</th><th>· · · · · · · · · · · · · · · · · · ·</th><th></th><th></th><th></th><th></th><th></th><th> </th><th></th><th></th><th></th></t<>	······	· · · · · · · · · · · · · · · · · · ·						 			
G510 Shoemaker River Dam #4C Sheanadoeh Valley SW 1 MR 05/15/97 66 2150 1984 ROCKINGHAM 15511 Shoemaker River Dam #3B Sheanadoeh Valley SW 1 MR 06/15/97 74 792 1996 ROCKINGHAM 10510 Roanoke Creek Dam #5A Southside SV/CD 3 MR 06/16/97 32 1575 1991 CHARLOTTE 03706 Reanoke Creek Dam #6A Southside SV/CD 3 MR 09/16/97 34 1379 1992 CHARLOTTE 03706 Reanoke Creek Dam #6A Southside SV/CD 3 MR 09/16/97 34 1303 1964 CHARLOTTE 03706 Reanoke Creek Dam #6A Southside SV/CD 3 MR 09/16/97 34 2130 1963 CHARLOTTE 03706 Reanoke Creek Dam #6A Southside SV/CD 3 MR 09/16/97 36 473 1962 CHARLOTTE 03706 Reanoke Creek Dam #61A Southside SV/CD 3 MR <td>16509</td> <td>Shoemaker River Dam #1A</td> <td>Shenandoah Valley SW</td> <td>1</td> <td>MR</td> <td>05/15/97</td> <td></td> <td>52</td> <td>545</td> <td>1980</td> <td>ROCKINGHAM</td>	16509	Shoemaker River Dam #1A	Shenandoah Valley SW	1	MR	05/15/97		52	545	1980	ROCKINGHAM
Shoemaker River Dam #3B Sheanodah Valley SW 1 MR 09/18/97 74 722 1986 ROCKINGHAM 03703 Roanoka Creek Dam # 68 Southside SWCD 3 MR 09/18/97 45 900 CHARLOTTE 03704 Reanoke Creek Dam # 68 Southside SWCD 3 MR 09/18/97 34 1379 1962 CHARLOTTE 03706 Reanoke Creek Dam #5A Southside SWCD 3 MR 09/18/97 34 1379 1962 CHARLOTTE 03706 Reanoke Creek Dam #5A Southside SWCD 3 MR 09/18/97 34 2130 1963 CHARLOTTE 03707 Reanoke Creek Dam #62 Southside SWCD 3 MR 09/18/97 32 1470 1960 CHARLOTTE 03708 Reanoke Creek Dam #67 Southside SWCD 3 MR 09/18/97 32 1470 1960 CHARLOTTE 03710 Reanoke Creek Dam #61A Southside SWCD 3 MR 09/18/97 36 <	16510	Shoemaker River Dam #4C	Shenandoah Valley SW	1	MR	05/15/97		86	2159	1984	ROCKINGHAM
03703 Roanoke Creek Dam # 35A Southside SWCD 3 MR 09/18/97 45 900 1960 CHARLOTTE 03704 Roanoke Creek Dam # 68 Southside SWCD 3 MR 09/18/97 32 1575 1961 CHARLOTTE 03706 Roanoke Creek Dam #59 Southside SWCD 3 MR 09/18/97 34 1376 1962 CHARLOTTE 03706 Roanoke Creek Dam #49A Southside SWCD 3 MR 09/18/97 34 2130 1983 CHARLOTTE 03707 Roanoke Creek Dam #49A Southside SWCD 3 MR 09/18/97 34 2130 1983 CHARLOTTE 03708 Roanoke Creek Dam #42A Southside SWCD 3 MR 09/18/97 36 474 1962 CHARLOTTE 03710 Roanoke Creek Dam #4A Southside SWCD 3 MR 09/18/97 30 1716 1962 CHARLOTTE 03711 Roanoke Creek Dam #318 Southside SWCD 3 MR 09	16511	Shoemaker River Dam #3B	Shenandoah Valley SW	1	MR	05/15/97		74	792	1986	ROCKINGHAM
03704 Roanoke Creek Dam #59 Southside SWCD 3 MR 09/18/97 32 1575 1961 CHARLOTTE 03705 Roanoke Creek Dam #59 Southside SWCD 3 MR 09/18/97 34 1375 1962 CHARLOTTE 03706 Roanoke Creek Dam #6A Southside SWCD 3 MR 09/18/97 36 1815 1962 CHARLOTTE 03707 Roanoke Creek Dam #49A Southside SWCD 3 MR 09/18/97 34 2130 1963 CHARLOTTE 03708 Roanoke Creek Dam #4A Southside SWCD 3 MR 09/18/97 32 1470 1964 CHARLOTTE 03710 Roanoke Creek Dam #4A Southside SWCD 3 MR 09/18/97 36 473 1962 CHARLOTTE 03711 Roanoke Creek Dam #51 Southside SWCD 3 MR 09/18/97 30 1716 1963 CHARLOTTE 03713 Roanoke Creek Dam #51 Southside SWCD 3 MR 09/18/9	03703	Roanoke Creek Dam # 35A	Southside SWCD	3	MR	09/18/97		45	900	1960	CHARLOTTE
Brancke Creek Dam #5B Southside SWCD 3 MR 09/18/97 34 1370 1982 CHARLOTTE 03706 Roanoke Creek Dam #6A Southside SWCD 3 MR 09/18/97 36 1819 1962 CHARLOTTE 03707 Roanoke Creek Dam # 49A Southside SWCD 3 MR 09/18/97 34 2130 1963 CHARLOTTE 03708 Roanoke Creek Dam # 62 Southside SWCD 3 MR 09/18/97 32 1470 1960 CHARLOTTE 03708 Roanoke Creek Dam # 62 Southside SWCD 3 MR 09/18/97 32 1470 1960 CHARLOTTE 03710 Roanoke Creek Dam # 4A Southside SWCD 3 MR 09/18/97 36 173 1962 CHARLOTTE 03711 Roanoke Creek Dam # 318 Southside SWCD 3 MR 09/18/97 30 1718 1967 CHARLOTTE 03713 Roanoke Creek Dam # 318 Southside SWCD 3 MR 09/18/97	03704	Roanoke Creek Dam # 68	Southside SWCD	3	MR	09/18/97		32	1575	1961	CHARLOTTE
03706 Roanoke Creek Dam #5A Southside SWCD 3 MR 09/18/97 36 1819 1952 CHARLOTTE 03707 Roanoke Creek Dam # 49A Southside SWCD 3 MR 09/18/97 34 2130 1963 CHARLOTTE 03708 Roanoke Creek Dam # 67 Southside SWCD 3 MR 09/18/97 32 1470 1960 CHARLOTTE 03708 Roanoke Creek Dam # 67 Southside SWCD 3 MR 09/18/97 36 473 1962 CHARLOTTE 03710 Roanoke Creek Dam # 61A Southside SWCD 3 MR 09/18/97 36 473 1962 CHARLOTTE 03711 Roanoke Creek Dam # 31B Southside SWCD 3 MR 09/18/97 30 1718 1965 CHARLOTTE 03713 Roanoke Creek Dam # 43A Southside SWCD 3 MR 09/18/97 31 2219 1975 CHARLOTTE 03715 Roanoke Creek Dam # 43A Southside SWCD 3 MR <	03705	Roanoke Creek Dam #5B	Southside SWCD	3	MR	09/18/97		 34	1379	1962	CHARLOTTE
03707 Roanoke Creek Dam # 49A Southside SWCD 3 MR 09/18/97 34 2130 1953 CHARLOTTE 03708 Roanoke Creek Dam # 62 Southside SWCD 3 MR 09/18/97 44 3373 1964 CHARLOTTE 03709 Roanoke Creek Dam # 67 Southside SWCD 3 MR 09/18/97 36 473 1962 CHARLOTTE 03710 Roanoke Creek Dam # 61A Southside SWCD 3 MR 09/18/97 36 473 1962 CHARLOTTE 03711 Roanoke Creek Dam # 41A Southside SWCD 3 MR 09/18/97 36 794 1963 CHARLOTTE 03713 Roanoke Creek Dam # 43A Southside SWCD 3 MR 09/18/97 30 178 Calonoke Creek Dam # 43A Southside SWCD 3 MR 09/18/97 31 2219 1975 CHARLOTTE 03715 Roanoke Creek Dam # 43A Southside SWCD 3 MR 09/18/97 31 1405 1973 <	03706	Roanoke Creek Dam #6A	Southside SWCD	3	MR	09/18/97		36	1819	1962	CHARLOTTE
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APPENDIX 2

INTEGRATED FLOOD OBSERVING AND WARNING SYSTEM

IFLOWS

APPENDIX 2

INTEGRATED FLOOD OBSERVING AND WARNING SYSTEM -- IFLOWS

IFLOWS became operational for the first time in 1981, in a pilot program involving twelve counties in Kentucky, Virginia, and West Virginia. Over the past ten years, IFLOWS has grown considerably, both in size and in capability. It is now operational at approximately 200 locations in twelve eastern states, including Pennsylvania, Connecticut, New York, New Jersey, North Carolina, Tennessee, Maryland, and Ohio. Its complement of 1,600 plus automated rainfall and stream stage sensors makes it one of the largest surface weather observing networks in the world.

The Virginia network includes 38 participating local jurisdictions, the state Emergency Operations Center, and four National Weather Service (NWS) offices. The network is currently monitoring 243 rain gages and 46 stream gages. Virginia is also interfaced with the Kentucky, West Virginia, and Tennessee networks. The data from more than 600 sensors is available from a single site.

IFLOWS was conceived by the NWS in 1979. Its primary objective is to collect, disseminate, and analyze real-time rainfall and stream stage information to help local and state emergency management personnel predict and react to the threat of flooding. Unlike locality-based systems, IFLOWS operates over large geographic areas, and supports information sharing among localities as a keystone of its design. Moreover, all information gathered by IFLOWS is supplied to the National Weather Service for incorporation into its forecast procedures.

IFLOWS is unique in another way. It is a cooperative venture involving the NWS as well as state and local governments. The NWS provides overall program management and most capital equipment. State and local governments provide day-to-day operational support and maintenance. Horizon Data Systems of Richmond, Virginia, provides design, development, and system support services under contract funding provided by the NWS.

Each participating IFLOWS locality has a small computer system located in a central dispatch area, and several automated rainfall and/or stream stage gages, usually in headwater areas, that report observations to the computer by radio. The data is analyzed comparing reported values against pre-determined thresholds, and the system can sound alarms when these threshold levels are exceeded. IFLOWS can provide real-time data in a variety of formats, and allows users to modify alarm thresholds. In addition, users can exchange messages with all other IFLOWS network locations, including NWS offices. In some cases, voice communication among IFLOWS sites is provided as well.

At the same time, each computer exchanges its information with nearby systems using combinations of radio, microwave, telephone lines, and, in Pennsylvania, satellite. In

this way, each locality (and state personnel) can observe and respond to events with as much warning as possible. IFLOWS even exchanges real-time information among independent state systems, providing the maximum possible geographic coverage.

An important IFLOWS feature recently added to the system is its ability to create and maintain, in real-time, an external file of current observations and the relative threat posed by each, determined by user-defined thresholds. Programs outside IFLOWS can access this file, analyze its contents, and respond accordingly. It is precisely this mechanism that EIS uses to obtain the current rainfall data that drives the Proactive Flood Monitoring.

APPENDIX 3

TABLE 1 from VIRGINIA DAM SAFETY REGULATIONS

TABLE I

Class of Dam	Hazard Potential	SIZE CLASSIFICATION		Spillway Design
	Structure Fails	Maximum Capacity(Ac-Ft)*	Height (Ft) [#]	Flood(SDF)b
t	Probable Loss of	Large > 50,000	> 100	₽MF°
	Life:Excessive	Medium > 1,000 & < 50,000	> 40 & < 100	PMF
	Economic Loss	Small > 50 & < 1,000	> 25 & < 40	1/2 PMF to PMF
11	Possible Loss of	Large > 50.000	> 100	PMF
	Life; Appreciable	Medium > 1.000 & < 50.000	> 40 & < 100	1/2 PMF to PMF
	Economic Loss	Small > 50 & < 1,000	> 25 & < 40	100-YR to 1/2 PMF
	No Loss of Life	Large > 50.000	> 100	1/2 PMF to PMF
	Expected: Minimal	Medium > 1,000 & < 50,000	> 40 & < 100	100-YR to 1/2 PMF
	Economic Loss	Small > 50 & < 1,000	> 25 & < 40	50-YR ^d to 100-YR ^e
IV	No Loss of Life Expected; No	> 50 (non-agricultural)	> 25 (both)	50-YR to 100-YR
	Economic Loss to Others	> 100 (agricultural)		

a. The factor determining the largest size classification shall govern.

b. The spillway design flood (SDF) represents the largest flood that need be considered in the evaluation of the performance for a given project. The impounding structure shall perform so as to safely pass the appropriate SDF. Where a range of SDF is indicated, the magnitude that most closely relates to the involved risk should be selected. The establishment in this regulation of rigid design flood criteria or standards is not intended. Safety must be evaluated in the light of peculiarities and local conditions for each impounding structure and in recognition of the many factors involved, some of which may not be precisely known. Such can only be done by competent, experienced engineering judgement, which the values in Table 1 are intended to supplement, not supplant.

c. PMF: Probable Maximum Flood. This means the flood that might be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible in the region. The PMF is derived from the current probable maximum precipitation (PMP) available from the National Weather Service, NOAA. In some cases local topography or meteorological conditions will cause changes from the generalized PMP values; therefore, it is advisable to contact local, state or federal agencies to obtain the prevailing practice in specific cases.

d. 50-Yr: 50-Year Flood. This means the flood magnitude expected to be equaled or exceeded on the average of once in 50 years. It may also be expressed as an exceedence probability with a 2 percent chance of being equaled or exceeded in any given year.

e. 100-Yr: 100-Year Flood. This means the flood magnitude expected to be equaled or exceeded on the average of once in 100 years. It may also be expressed as an exceedence probability with a 1 percent chance of being equaled or exceeded in any given year.
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LETTERS TO ATTORNEY GENERAL dated May 12, 1997 and July 29, 1997

Genere Allen Governor

Becky Norton Duniop Secretary of Natural Resources



Kathleen W. Lawrence Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

(804) 786-6124

203 Governor Street, Suite 302

TDD (804) 786-2121 Rich

Richmond, Virginia 23219-2010

FAX (804) 7866141

MEMORANDUM

To:	Fred Fisher
From:	Sandy Liddy Bourne
Subject:	SWCD Watershed Dam Easements
Date:	May 12, 1997

Enclosed is a request from Headwaters Soil and Water Conservation District that relates to the legal authority soil and water conservation districts have in enforcing easements to the watershed dams owned by the districts as they attempt to maintain and repair the dams. There is some potential concern that a few landowners may not provide access to the dams. We are preparing to study the structural integrity of the dams under HJR 446 and answers to the questions posed in the letter will provide us with useful information in this regard.

Thank you for your timely assistance in this matter.

cc Kathleen W. Lawrence Charles Horn Joe Haugh Jack Frye



May 9, 1997

Alexandra Liddy Bourne Department of Conservation and Recreation 203 Governor Street, Suite 302 Richmond, VA 23219

Dear Ms. Bourne:

I want to thank you for your willingness to have DCR help us obtain a decision from the Attorney General's office on the easement questions I raised at the meeting on May 5th. I feel it would be better to know for sure the extent of our authority to study and make repairs in case a gate valve does not close and a lake is drained. This is of special concern at South River #6 where the original landowner developed a campground that has been sold and developed into timeshare camp sites.

Enclosed are examples from South River Dam #25 (Toms Branch) of easements, deeds, and Operation and Maintenance Agreement between the Soil Conservation Service and the District. Also I included two easements from South River #6 (Stoney Creek). The easements are virtually the same. Because of this I did not include easements for all the dams. If this is necessary contact me and I will make copies and forward to you.

I need to note that the easements are granted to the Shenandoah Valley Soil Conservation District. The Headwaters Soil and Water Conservation District was formed from the Shenandoah Valley District in 1975 and takes in the 13 South River and 3 North River watershed structures.

The questions that I need answered are:

1. Does the fact that the Headwaters District is not the original easement holder create any problems.

2. If the landowners around a lake formed by the flood control dam are uncooperative, can we still proceed with lowering water levels to investigate and make repairs to the risers.

3. If the gate valve does not close and the lake is drained dry, is the District obligated to make immediate repairs (since you know money is seldom available) or is a lake even obligated under the easement.

You have already warned me that an answer from the Attorney General's office is usually slow in coming. Yet I am sure you realize how important this investigative study is and how excited our District is to finally have some appropriated money to do so. I hope you can relay this to the Attorney General's office to speed the process.

Sincerely,

l. Haylor

John Kaylor, Conservation Technician

Enc.

CC: Charles E. Horn, Chairman, HSWCD Richard P. Coon, Chairman Dam Safety and Main. HSWCD Ralph Denney, Associate Director, HSWCD Joseph S. Haugh, Director, Division of Dam Safety, DCR Gerald L. Jones, District Dam Safety Consultant, DCR Charles W. Wade, Field Operations Manager, DCR A. Lee Ervin, Augusta Co. Commonwealth Attorney Plunkett & Woodworth, PC, Attorneys, Co. of Augusta

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George Allen Governor

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Resources	



Kathleen W. Lawrence Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

203 Governor Street, Suite 302

TDD (804) 786-2121 (804) 786-6124 FAX (804) 7866141 Richmond, Virginia 23219-2010

MEMORANDUM

То:	Frederick S. Fisher, Assistant Attorney General
From:	Alexandra Liddy Bourne, Chief Deputy Director
Subject:	HJR 446 Study of SWCD Owned Dams
Date:	July 29, 1997

The 1997 General Assembly passed HJR 446 requiring the study of Soil and Water Conservation District Dams; Chapter 356 establishing a Soil and Water Conservation District Dam Maintenance and Repair Fund; and appropriated \$125,000 to the Department of Conservation and Recreation for the study of the repair and maintenance costs of Soil and Water Conservation District Dams. Twelve Districts own 103 dams. DCR has completed the initial reconnaissance phase of the study and is preparing to go forward with the field review of the structural integrity of thirteen dams

'ected as top priority flood control structures .

There is a concern about liability for the next phase of the study. It is necessary to draw down the water level for all the dams to gather further data. Several of the dams have not had their gates open for years. There is a possibility that opening the gates or attempting to open the gates for the study could damage the structures including the possibility that they will not be able to close the gates, thus risking total drainage of the body of water. None of the 13 dams have significant downstream development. The flood control structures are for a single purpose, ie., they are not used for recreational purposes or for water supply to a locality.

The Districts hold conservation easements for access to the structures and were appropriated \$50,000 for small repair and maintenance. Private landowners own the property around the flood control structures. Should damage occur, who is liable; DCR, the Districts, the General Assembly, all of the above, or the landowner? The Districts basically want to know who will bear the brunt of the cost if damage occurs beyond what exists during the time of the study?

I have brought this matter to the attention of Legislative Services, specifically Marty Farber, who suggested that I confer with you.

cc Kathleen W. Lawrence Sen. Emmett W. Hanger, Jr Joseph S. Haugh lartin G. Farber

DAMS STUDIED IN DETAIL

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Dams studied in detail

The following 22 dams were the subject of the detailed study by Gannett Fleming, Inc. during the Summer and Fall of 1997. All 22 dams were given a preliminary reconnaissance during the week of June 23-27, 1997 and 16 of the 22 were selected for detailed study. Two sites, #08908 and #16503, were deleted from further investigation because plans are being made to make rather major modifications to both in the near future.

I_NO	NAME_DAM	TV Insp	Comments
08902	Leatherwood Cr#5	Yes	Roots noted in drain. Some concrete deterioration. Repair needed. *
08904	Leatherwood Cr#3	No	Gap between pipe and headwall needs repair *
08905	Leatherwood Cr#2A	No	n/a
08907	Leatherwood Cr#6	Yes	Crack in riser slab *
08908	Marrowbone Cr #1	No	Major rehab planned - inadequate spwy.*
01522	South River #7	Yes	n/a
01501	South River #26	Yes	Concrete pitted and in poor condition. Needs major repair. Gate stem needs replacement. *
01502	South River #25	Yes	Exp. aggregate. Minor repair needed. Riser was replaced about 1987. Embankment drain absent. Stability evaluation recommended. *
01507	Upper North R #77	Yes	Conc. deficiencies in riser need repair.
01508	South River #23	Yes	Concrete is poor and pitting. Repair needed. *
01509	South River #6	Yes	Poor concrete condition. Needs repair. *
01511	South River #4	Yes	Riser is pitting. Some exposed steel. Needs minor repair.
01512	South River #11	Yes	n/a

I_NO	NAME_DAM	TV Insp	Comments
01513	South River #24	Yes	Riser was replaced in 1984.
01514	South River #19	Yes	Aggregate exposed. Minor repair needed.
04501	Johns Creek #2	Yes	Minor deterioration of concrete. Minor repair needed. Drain filled with sand.
04502	Johns Creek #1	No	Concrete deficiencies in riser need repair. *
04503	Johns Creek #3	No	n/a
04504	Johns Creek #4	Yes	Exp. aggregate. Minor repair needed.
16501	Lower North R. #80	Yes	n/a
16502	Lower North R. #78	Yes	Conc. deficiencies in riser need repair.
16503	Lower North R. #83	No	Major spillway repair underway.

* NOTE: These dams are also noted as having deficient emergency spillway capacity and are listed as needing major modification or upgrade. See Table C in main body of the report.

General conclusions of the detailed inspections were as follows: More detail is included in the final report prepared by the consultant.

- 1. Severe concrete deficiencies have been discovered at three dams listed below as Priority 1 (Hearthstone, John's Creek 1 and Briery Branch). Although not considered an emergency situation at present, the condition is sufficiently severe to warrant repair as soon as practicable. The dams listed as Priority 2 should be repaired as funds are available.
- 2. Conduits appear to be in good condition with no evidence of joint separation resulting from settlement of the embankments. Some minor stress cracks were observed but are not considered significant. Of the dams which were not inspected during this study, there are several (about six) that were built with corrugated pipe. Such pipe is normally expected to have a life span of 30 to 50 years and these pipes should be given a detailed inspection prior to reaching that age.
- 3. The embankment drains appear to be in good condition. Although corrosion has been noted at the exit end, there is no evidence of deterioration internal to the embankment. Most of the pipe coating appears to be in good condition. Some deposits were evident in some of the drains. The source/cause of deposits and

their overall effect of potential drain failures on slope stability need to be further investigated.

- 4. The limited sampling of structures did not reveal trends which would correlate structural deficiencies to geographic location. In general, the most serious deficiencies in the riser seem related to construction procedures on the more massive structures constructed after 1960. Various degrees of concrete pitting were observed, most notably on structures constructed prior to 1960. The major deficiencies discovered could not have been detected without internal inspection methods. The detailed inspections should be continued with top priority given to the 65 dams built prior to 1969.
- 5. The entire detailed inspection process could be enhanced by a lowering of the reservoir level using the water level control gates. Due to the reluctance of the districts to take on the responsibility and liability associated with gate operation, the gates were not operated. It is recommended that the districts be required to regularly operate these gates to provide access for inspection and repair and that they have some funding mechanism to be able to provide any needed gate repairs or replacements should they develop.

Rehabilitation needed to address the concrete deficiencies noted during this study is expected to consist of epoxy or cementitious grouts to fill voids or reduce seepage or eakage and application of coatings/sealers to restore surfaces. Some of this work will probably require partial or complete drawdown of the reservoirs. Naturally, if this cannot be accomplished by opening of the reservoir drain, the first action would be to make the necessary repairs or replacement of these drainage gates. Based upon experience with work normally needed for the concrete repairs expected to be needed, an estimated cost is expected to be in the \$20,000 to \$30,000 price range. Gate replacement, if needed, could add another \$10,000 to \$20,000 per site. Assuming an effort to renovate about five dams per year on a priority basis, the periodic need for these infrequent rehabilitations is thus estimated at about \$150,000 per year.

Recommendations for repairs grouped in priority order are as follows:

Priority 1 -- repair leaks in concrete #01507 Upper North River #77 (Hearthstone) #16502 Lower North River #78 (Briery Branch) #04502 John's Creek 1

Priority 2 --repair or replace deteriorating concrete in risers #01501 South River #26(Inch Branch) #01508 South River #23 (Robinson Hollow) #01511 South River #4 Lofton) #01509 South River #6 (Senger Mountain) Priority 3 -- more minor repairs

#08902 Leatherwood Cr #5 #01502 South River #25 Toms Branch #01514 South River #19 Waynesboro Nursery #04501 Johns Creek #2

The dams listed as priority 1 and priority 2, while not in a state of imminent failure, should be repaired as soon as practicable. If left unrepaired, they will continue to deteriorate and at some time could lead to failure of the principal spillway to operate and lead to other serious problems at the dam. Dams listed as priority 3 as well as the other dams studied should be continued to be monitored for signs of further deterioration and repaired as funds are available.

SAMPLE EASEMENT between District and Landowner

41762

THIS INDENTURE, mede this /sr day of ______, 1958 by Lena W. Vines, single - Lillian V. Davis, widow - Flore V. Wiseman, widow and Carrie L. Vines, single, hereinafter referred to as the Landowners, and the Shemandosh Valley Soil Conservation District, hereinafter referred to as the Local Organization,

WITNESSETH THAT:

WHEREAS, The Secretary of Agriculture, United States Department of Agriculture, is authorized by the Watershed Frotection and Flood Frevention Act to carry out a program of assistance to Local Organizations in planning and installing works of improvement for flood prevention or agricultural phases of the conservation, development, utilization and disposal of water, and

WHEPPENS, the Local Organization is cooperating in said program for the purpose of installing a project in the South River watershed a subwatershed of the Potomac River watershed, State of Virginia, in connection with which it desires to secure certain rights in, over and upon the hereinafter described land of the Landowner,

THERFORE, for and in consideration of One Dollar (\$1.00) and the benefits accruing to the Landowner from the installation of said project, and other good and valuable considerations, the receipt whereof is hereby acknowledged, the Landowners do hareby grant, barrein, sell, convey and release unto the Local Organization an easement in, over and upon the following described land situated in the County of Augusta, State of Virginia, to-wit:

A portion of a tract of land located in Fivershead District adjoining the National Forest Land and the Felmer Estate, now owned by H. A. and Mary C. Senger. The location of the tract is as shown on the attached plat. The easement boundary will be the maximum flood pool line as drawn on the plat not to exceed one acre in area.

1. The Local Organization shall have the right, privilege and authority to use said land for the temporary storage of flood waters that may be impounded by any dam or other reservoir structure described below:

An earth fill flood water retarding structure located on the He A. Senger, land approximately 400 feet downstream.

2. The Local Organization shall be responsible for operating, maintaining, and keeping in good repair the works of improvement herein described.

3. The Landowners reserve the right to use said land or any part thereof st any time and for any purpose, provided such use does not interfere with the full enjoyment by the Local Organization of the easement herein conveyed.

4. The easement herein conveyed shall be subject to any essements, rightsof-way, or mineral reservations or rights now outstanding in third persons.

5. In the event (a) the works of improvement herein described are not installed on said lend within sixty (60) months from the date hereof, or (b) the casement described herein is abandoned, the rights, privileges, and authority granted hereunder to the Local Organization shell be terminated.

IN WITNESS WHENDE, the Landowners have executed this instrument on the day and year first above written.

mes Carrie L. Vincs - sing Likence U. A. areas Lillian V. Devis - vidow

Flora V. Wisenen, - widow

41762

Recorded in the Cierk's Office of the Linnak Court for the County of ACM. P.M. NETL - 1. 50 Part of Doed Book No. 432 Pare 4 The states and • . . Transfer Tune: T

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County of Reguta State of Virginia

I Derrolum fr., a notary public in and for the State and County aforesaid whose commission erpires on the 15 day of <u>1967</u>; do hereby certify that Lena W. Vines, whose name is signed to the foreroing writting beering date on the <u>1 day of 1970</u>, 1958 personally appeared before mg in my County aforesaid and acknowledged the same this <u>1</u> day of <u>1970</u>, 1958.

omelu Notary Public

County of the State of Vir

I <u>Correction</u>, a notary public in and for the State and County aforesaid whose commission e pires on the <u>Conday</u> of <u>1965</u>, do hereby certify that Carrie E. Vines, whose name is signed to the foregoing writing bearing date on the <u>Corder</u> of <u>Mary</u>, 1958 personally appeared before me in my County aforesaid and acknowledged the same this <u>So</u> day of <u>Mary</u>. 1958.

Notery Public

County of Ougusto State of Virginia

I constant of a notary public in and for the State and County aforesaid whose commission expires on the 15% day of forming 1964, do hereby certify that Lillion V. Davis, whose name is signed to the foregoing writing bearing date on the 15 day of Tray, 1958 personally appeared before me in my County aforesaid and acknowledged the same this for day of Tray. 1958.

Notary Fublic

County of Congueta State of Virginia

I <u>6 0-27 6.1.</u>, a notery public in and for the State and County aforesaid whose commission expires on the <u>15</u> day of <u>1961</u>, do hereby certify that Flora V. Wiseman, whose name is signed to the foregoing writing bearing date on the <u>1</u> day of <u>7.27 and</u>, 1958 personally appeared thefore me in my County aforesaid and acknowledged the same this <u>1</u> day of <u>2000</u>, 1958.

677 reduce Notary Public

SAMPLE AGREEMENT between District and USDA

10

OPERATION AND MAINTENANCE AGREEMENT

THIS and here tion and	AGRI MINT, made and entered into the <u>b</u> day of <u>October</u> , 1958, by between the Soil Conservation Service, United States Department of Agriculture, inafter referred to as the "Service," and the Shemandoah Valley Soil Conserva- District, hereinafter referred to as the "District" relates to the operation maintenance of the following described Works of Improvement:
rg1 of (nive 01510	Flood Retarding Structure No. 3, located on Poor Creek near Greenville, Va
01509	Flood Retarding Structure No. 6, located on Cold Springs Creek near Green- ville, Virginia.
01512	Flood Retarding Structure No. 11, located on Canada Run, near Eherando, Va
01514	Flood Retarding Structure No. 19, located near Lyndhurst, Virginia.
01508	Flood Retarding Structure No. 25, located in Robinsons Hollow near Lyndhurst, Virginia.
11513	Flood Retarding Structure No. 24, located near Lyndhurst, Virginia.
01502	Flood Retarding Structure No. 25, Located on Tome Branch near Sherando, Va
01501	Flood Retarding Structure No. 26, located on Inch Branch near Lyndhurst, Va
	All Structures are in Augusta County, Virginia and are a part of the South

River Flood Control Project, Potomae River Watershed. The estimated annual cost for operating and maintaining the works of improvement

herein described is \$50.00/based on present construction costs. per structure

I. OPERATION

The parties hereto agree as follows to the operation of the works of improvement:

- A. The Service will provide such technical services as are available for assistance in the proper operation of the works of improvement.
- B. The District will:
 - 1. Be responsible for operation of the works of improvement simultaneously with the receipt of a written notice from the Service that the works of improvement have been accepted from the contractor.
 - 2. Prohibit the installation of gates or other obstructions of any kind being placed in any portion of the principal or emergency spillway(s).
 - 5. Frohibit any works to raise any portion of the spillways above the planned elevation or to deflect or decrease the planned flow through the spillways in any manner.
 - 4. Prohibit the installation of Nikes or other structures which may deoresse the capacity of the flood channel or deflect the flow from the constructed channel bottom.
 - 5. Take all other necessary steps to insure that the works of improvement are permitted to function in the manner for which they were designed, and are operated in accordance with any applicable state law.

. II. MAINTENANCE

The parties hereto agree as follows to the maintenance of the works of improvement:

- A. The Service Will:
 - 1. Inspect the works of improvement at least annually.

- 2. Prepare and furnish to the District a report of inspection finding including recommendations for maintenance work needed and when such work should be completed.
- 3. Provide such technical services as are needed and available for proparing plans, designs and specifications for needed maintenance of the works of improvement.
- B. The District will:
 - 1. Be responsible for maintenance of the works of improvement simultanecusly with the receipt of a written notice from the Service that the works of improvement have been accepted from the contradtor.
 - Inspect the works of improvement at least annually and after every major storm or the cocurpence of any other unusual condition that might adversely affect the works of improvement to insure proper functioning and to check for possible damage or deterioration. Items to be checked
 At time of inspection may indude, but not be limited to, the following:
 - a. Principal spillways.
 - (1) Damage or obstructions.
 - (2) Condition of outlet and riser.
 - (a) Signs of seepage.
 - (b) Separation of joints.
 - (o) Cracks or breaks.
 - (d) Differential settlement.
 - (3) Sediment level in relation to top of riser.
 - b. Emergency spillways drainage ways.
 - (1) Erosion
 - (2) Sedimentation
 - (3) Weeds, logs and other obstructions or accumulations reducing
 - channel capacity.
 - (4) Conformity with original design (deposition or sloughing).
 - o. Reservoir area.
 - (1) Undesirable vegetative growth.
 - (2) Cut or fallen trees.
 - (3) Slash and other debris.
 - d. Embankments.
 - (1) Settlement or oracking.
 - (2) Erosion
 - (3) Loskage
 - (4) Rodent, wildlife or livestock damage.
 - (5) Condition of vegetative cover.
 - e. Fences and Gates.
 - (1) General Condition Repairs needed.
 - (a) Loose or damaged posts.
 - (b) Loose or broken wires.
 - (o) Accumulated debris.
 - (d) Open gates.
- 3. Perform all maintenance needs indicated by inspections and reports thereof within the time limits specified, if any, in such manner as not to damage the works of improvement in any way and in accordance with any applicable state laws. Maintenance may include, but not be limited to, the following:
 - a. Remove and burn debris.
 - b. Refill, smooth and vegetate rilling on embankments, spillways, and drainage ways.
 - o. Realign disposal channel where needed.
 - d. Repair damaged riprap or other works.
 - e. Repair fonces and gates where needed.
 - f. Other maintenance work as indicated in Service inspection reports.
- 4. Frepare a report for each inspection performed and furnish one copy to the Service. Maintain a record of all maintenance work performed and make such records available for review by the Service.
- 5. Perform operation and maintenance by Lonal Contract

6. Obtain operation and maintenance funds by Operation and Maintenance Agreement entered into between the District and the Commonwealth of Virginia, Department of Welfare and Institutions for Flood Retarding Site No. 3.

An agreement between the District and the City of Waynesboro, whereby the city of Waynesboro will provide funds for maintenance of the balance of the structures.

- III. IT IS MUTUALLY AGREED THAT:
 - A. Government representatives shall have the right of free access to inspect the works of improvement any any time.
 - B. Whenever possible the parties to this agreement w'l make their annual inspections jointly. It is desirable that the annual inspections be made during the months of February, March, or April. Any supplemental inspections then determined necessary will be scheduled and agreed to at that time.
 - C. The District will secure prior Service approval of any agreement(s) to be mitered into with other parties for any operation or maintenance of these works of improvement and furnish the Service with 2 copies of such agreements. The District also will notify in writing the party assuming operation or maintenance responsibilities under the agreement and provide the Service with 2 copies of such notification.

No Member of or Delegate to Congress, or Resident Commissioner shall be admitted to any share or part of this agreement or to any benefit to arise therefrom. This provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.

The signing of this agreement Was Authorized by a resolution of the governing body of the Shemandoah Valley Soil Conservation District, Harrisonburg, Virginia adopted at a meeting held on July 24 , 1958.

SHENANDOAH VALLEY SOIL CONSERVATION DISTRIC

Bys Chairman of Board Dates Jacky 24 , 1968

Soil Conservation Service

United States Dept. of Agriculture By: Act State Conservationist tate Conservationist

Dates Oct 6 , 1958

COOPEPATIVE AGREEMENT

FOR

MAINTENANCE OF FLOODWATER FETARDING STPUCTURES

South River Sub-Matershed

This erroment for the maintenance of a floodwater retarding structure, designated as Dam No. 3, South Hiver Watershed, is ontered into by the Shenandoah Valley Soil Conservation District, referred to hereafter as the District, and the Commonwealth of "irginia, Department of Welfare and Institutions, Flohmond, Virginia, hereinafter referred to as the Farmer, and is in addition to the provisions agreed to in the Farmer-District Cooperative Agreement No.<u>A. 96.9-A.F.C. Aff</u>and the terms of the Watershed Frotoction Issonent for Dam No. 3, South Hiver Watershed.

The District agrees to:

1. Provide regular inspection of the structure and technical advice on proper maintenance.

The Farmer Agrees tor

- 1. To protect the structure and adjoining improvements from harmful grasing.
- 2. To furnish and apply fortilizer and seed as needed to maintain an adequate sod on structure, spillway and adjoining improvements.
- To now or otherwise control weeds and other objectionable growth as may be necessary to maintain adequate sod on said structure, spillway and improvements.
- 4. To generally use and protect said structure and improvements in such manner that the continuing function thereof will in no wise be impaired.
- 5. To remove all debris that may lodge in and impair function of mechanical spillway.
- 6. To repair demage to structure or spillway caused by rilling, washing and ebc.

(Signed) E. W. Armstrong E. W. Armstrong, Chairman Board of Supervisors Ehemandoah Valley SCD

(Signed) Richard W. Coveland Commonwealth of Virginia Dopt. of Welfare & Institutions

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Interim Memorandum



September 22, 1997

GANNETT FLEMING, INC. P.O. Box 67100 Harrisburg, PA 17106-7100 Location: 207 Senate Avenue Camp Hill, PA 17011 Fax: (717) 763-1808 Office: (717) 763-7211

Joseph S. Haugh, P.E. Chief of Dam Safety 203 Governor Street, Suite 206 Richmond, VA 23219

RE: SWCD Dam Inspection Interim Memorandum

Dear Mr. Haugh:

At this time, we are at about the mid-point of the inspection program for damsites you have identified in the Blue Ridge, Headwaters, Mountain Castle and Shenandoah Districts. The purpose of this study is to inspect specified structural features -- namely, the risers, conduits and embankment drains -- which are not accessible for viewing without employing confined space entry procedures and/or video equipment mounted on a remote operating vehicle.

The following is a preliminary summary of findings based upon our limited visual reconnaissance of all 22 listed sites and a more detailed inspection of risers, conduits and embankment drains at the first six selected sites. We are currently preparing to initiate the final phase of inspections, which will be followed by a more comprehensive report.

The 22 reconnaissance visits were performed during the week of June 23 to June 27, 1997, primarily to assess access and dewatering requirements for inspection of the risers, conduits and embankment drains. The findings of the cursory visual inspections were used to develop a matrix of site conditions for prioritizing the order of detailed inspections. The matrix, along with other supporting documentation from the reconnaissance visits, was compiled in a memorandum, dated July 15, 1997, and our conclusions from the site visits were summarized verbally during a July 16, 1997 meeting with the Division of Dam Safety. At that time, we indicated there was no compelling evidence of structural deficiencies at any of the visited sites which would influence the priorities for detailed inspections. On that basis, 20 of the 22 sites were jointly categorized into three levels of priority, attempting to assure that the more detailed inspections will include a balanced sampling of sites within the available limits of funding. Consideration for establishing priorities included the comparative age of the structures, the comparative height of embankments, the physiographic setting, along with access and dewatering requirements necessary to complete the more detailed inspections. Two of the sites, Marrowbone and Hone Quarry, were deleted from further consideration for inspection at this time, because of pending maintenance/repair contracts for rehabilitating or enlarging the emergency spillways. The prioritized listing is enclosed for reference.

A Tradition of Excellence Since 1915

Gannett Fleming

Mr. Haugh September 22, 1997 Page 2

The first phase of the more detailed inspections was performed on six selected sites during the week of August 11 through August 15, 1997. In order to minimize travel and maximize the number of first phase inspections, all of the sites for the first phase of inspection were grouped in the Shenandoah and Headwaters Districts. Three of these sites (Wilda, Waynesboro Nursury and Sengers Mountain Lake) were the only ones among the 22 listed dams which had no discharge through the principal spillway. The remaining three dams (Hearthstone, Union Springs and Briery Branch) have two stage risers, with actively flowing low-level cold water intake pipes. These intakes were temporarily blocked off for inspection using inflatable packers. The camera was advanced through the conduit at each site, using a pan-and-tilt mechanism to provide head-on viewing of each conduit joint, except at Sengers Mountain Lake, where the televising was straight through the conduit. The embankment drain outlets were flushed as necessary to clear siltation prior to televising. All four walls of the riser structure were televised for full depth. Concrete deficiencies are referenced with respect to the top of structure. For reference, all four sides of the riser exterior were also video taped above the water line for record. Four of the six sites had embankment drains with outlets consisting of 6- to 10-inch-diameter corrugated-metal pipe.

Video tapes and field logs of the first six inspected sites were provided to the Division of Dam Safety during a meeting on August 21, 1997. General conclusions of the first inspections were as follows:

- 1. Conduits, all of which are concrete, appear to be in good condition with no evidence of joint separation resulting from settlement of the embankment. Some minor stress cracks were observed in the pipe crown which are not considered significant.
- 2. Concrete deficiencies (primarily leaks and spalls at the apparent location of cold joints) were revealed in two of the six riser structures (Hearthstone and Briery Branch). Neither of these conditions are considered to constitute an emergency at present, however, the leakage is severe at Briery Branch, which may inhibit maintenance of normal pool level. The risers at both sites warrant repair to prevent further deterioration of the concrete and reinforcing steel.
- 3. The embankment drains appear to be in good condition. Although corrosion has been observed at the exit end, there is generally no evidence of deterioration internal to the embankment. Most of the pipe coating appears to be in good condition. However, friable black fragments of what appears to be bituminous coating were flushed out of the drains at Union Springs when water was jetted into the drains with a power washer to remove silt. Deposits were evident in the drain outlets at one site. The source/cause of deposits and the overall effect of potential drain failures on slope stability need to be further investigated.

Gannett Fleming

Mr. Haugh September 22, 1997 Page 3

- 4. The limited sampling of structures did not reveal trends which would correlate structural concrete deficiencies to the age of the structure or the site location. In general, the most serious deficiencies in the riser seem to be related to construction procedures. Various degrees of concrete pitting were also observed, but the major deficiencies were not readily detectable without inspection from the interior.
- 5. The limited sampling of structures did not reveal trends which would correlate embankment drain clogging to the age of the structure or the site location. Conclusive evidence of silt migration (piping) through the filter or drain pipe joints has not been revealed by the inspection to date. The next phase of inspection will be composed entirely of dams with embankment drains to further investigate drain condition and occurrence of deposits.

The proposed final phase of inspection was devised to complete inspections on all the priority 1 and 2 dams. The dams with embankment drains (but without impact basins) were given preference for inspection among the priority 3 sites which were selected to complete the inspection schedule. The proposed dam sites, and proposed optional sites which will be inspected if time allows, are shown by the attached table. The final phase of inspections will broaden the sampling base by covering a wider geographic area. As a result of this wider geographic sampling, the findings may be affected by the different material sources available for construction and/or potentially more compressible foundation conditions beneath the embankments.

During the final phase of this study, we will also evaluate options for repair of concrete structures. These options are expected to include injection of epoxy or cementitious grouts to fill voids and eliminate or reduce seepage/leakage, and application of coatings/sealers to restore surfaces. Some of this work may require partial or complete impoundment drawdown which may provide the opportunity to assess reservoir drain operability. Based on our experience with work of this nature, costs for concrete repair, exclusive of drawdown, staging and mobilization, can be expected to range form \$20,000 to \$30,000 per site.

Other recommendations for repairs which may result from further inspection are related to the source of deposits located in the drain outlets, and to potential failure of embankment drains and procedures for rehabilitation. Piezometers to evaluate phreatic levels within the embankment may be warranted to compete stability analyses to assess dependence on drain performance. Costs for design and repair work to rehabilitate drain systems, if necessary, are site specific and have not been developed for this interim report.

Gannett Fleming

Mr. Haugh September 22, 1997 Page 4

We trust sufficient general information is provided with this interim report and the video documentation that has been previously made available, and we appreciate the opportunity to continue to assist the Division of Dam Safety with this study.

Very truly yours,

GANNETT FLEMING, INC. Water Resources and Geotechnical Division

WILLIAM B. BINGHAM, P.E. Vice President Manager, Dam and Flood Control Section

WBB/cb

JLS1060, WPD

Dam		Year	Height		Priorities of	
No.	Name	Const.	(Feet)	Embankment Drains	7/16/97	Televised Inspections
08908	Marrowbone Creek No. 1	1960	46	1	Deleted	
08902	Leatherwood Creek No. 5	1963	57	2 - Silted ?	1	Proposed
08904	Leatherwood Creek No. 3	1964	41	2 - In impact Basin	3	
08905	Leatherwood Creek No. 2	1964	32	2 - In impact Basin	3	Proposed
08907	Leatherwood Creek No. 6	1964	32	2 - Clogged	2	Proposed
04504	Johns Creek No. 4	1966	95	2 - In impact Basin	1	Proposed
04501	Johns Creek No. 2	1967	51	2 - Clean	2	Proposed
04502	Johns Creek No. 1	1967	62	2 - Rt. Clogged	3	Proposed Optional
04503	Johns Creek No. 3	1968	50	N/A	3	
16501	Union Springs - Lower North River No. 80	1967	87	2 - Silted ?	1	8/11/97
16502	Briery Branch - Lower North River No. 78	1968	89	N/A	1	8/12/97
16503	Hone Quarry - Lower North River No. 83	1968	93	N/A	Deleted	
01513	Happy Hollow - South River No. 24	1954	35	1 - Clean	2	Proposed
01501	Inch Branch - South River No. 26	1956	57	1 - Silted ?	3	Proposed
01508	Robinson Hollow - South River No. 23	1956	49	1	3	Proposed Optional
01502	Toms Branch - South River No. 25	1957	62	1 - Damaged End	2	Proposed
01522	Wilda - South River No. 7	1957	46	1	1	8/14/97
01512	Canada Run - South River No. 11	1957	27	1 - Silted ?	3	Proposed
01514	Waynesboro Nurs South River No. 19	1957	35	1 - Clean	1	8/14/97
01509	Sengers Mnt. Lake - South River No. 8 [:	1959	56	1	3	8/15/97
01511	Lofton - South River No. 4	1959	56	N/A	3	
01507	Hearthstone - Upper North River No. 77	1966	66	N/A	1	8/13/97

Virginia's Program for Safe Dams testimony presented at meeting of Joint Select Committee

on

July 15, 1997

by

Joseph S. Haugh, Director, Division of Dam Safety

VIRGINIA'S PROGRAM FOR SAFE DAMS by Joseph S. Haugh, P.E¹

INTRODUCTION

I appreciate the opportunity to appear before you today to discuss the Virginia Dam Safety program and especially on the relationship with dams owned by the several Soil and Water Conservation Districts.

I would like to begin by providing just a brief background and where dam safety has gone over the past couple of decades. Some of you may recall that back in the 1970s' that there was a considerable amount of interest, effort, debate, and activity about responsibility for dams. To no one's surprise, the responsibility issue came around to the point that it was the owner who is responsible for the safety of his or her dam. There was also pretty much unanimous agreement that no one wanted the federal government to come in and apply federal standards to privately owned dams. This is where the states come in. The Association of State Dam Safety Officials has done a super job at coordinating these efforts throughout the country.

VIRGINIA AND DAM SAFETY

Virginia is no different from many other states in that we have many dams out there that no one is paying much attention to. Most people are not surprised to learn that Virginia has more than 1,500 lakes. People are generally aware of the lakes and drive by them or otherwise notice them on a daily basis. However people do not generally realize that only two of these lakes occur naturally. The remainder are created by dams. Of these 1,500 or so dams, 477 are under jurisdiction of the state dam safety program.

Since 1986, the number of dams in full compliance with the Virginia dam safety program has gone from about 28 dams to 425 dams. However, it takes continual vigilance to make sure that owners know how to take care of their dams.

Owners do not want their dams to fail. While that may sound like a very trite statement and although it should be obvious, the truth is that <u>many owners do not have any</u> <u>earthly idea about how to take care of a dam.</u>, Maybe they've never been told, perhaps they forgot, or it may be a new owner. When I see a dam with its upstream slope neatly

¹Director, Division of Dam Safety, Virginia Department of Conservation and Recreation. Remarks prepared for discussion at meeting of the Joint Select Committee Studying Dams, Richmond, VA, July 15, 1997.

mowed and in good shape, then turn around and see the downstream slope grown up in a jungle of large trees, it brings me back to the reality that not all owners are aware of the needs to care for their dams. One of the primary roles of our staff is education of the owners who must respond and take care of their dams.

RESPONSIBILITY AND PARTNERSHIP

Virginia's dam safety program is tailored on the fundamental precept that responsibility for the safety of each dam rests with its owner and that the Component conwealth is responsible for the safety of its citizens. Virginia's dam safety program relies on a partnership involving: the owner who is ultimately responsible for the safety of each dam; the private sector which provides the needed engineering assistance; and the Virginia Soil and Water Conservation Board which ensures that the public interest is served and makes the program viable. Virginia's program contrasts sharply with that of many other states in that we rely heavily upon the use of private consultants to provide the engineering inspections of dams.

DIVERSITY OF DAMS

The dams covered under the program are quite diverse. Most are earth embankments but there are also several other types including concrete gravity, arch, and now we are beginning to see a few roller compacted concrete dams. Ownership includes local municipalities, home owner associations, local water authorities, companies, private citizens, and the State. Private owners make up about half of the dams we regulate.

SPILLWAY REQUIREMENTS

Some have questioned the design requirements for high hazard dams. As you may be aware, the design criteria for dams where failure would result in a probable loss of human life, requires that the spillway be capable of passing an extremely large flood up to the probable maximum flood (PMF). Admittedly, this size flood is very extreme. Some owners of dams contend that the criteria is too extreme because their dam has been in place for many years and has never experienced such a large flood. My answer to them is that have been very lucky. We also have to recognize that we humans often have a very limited perspective and short term time frame. In defense of such extreme criteria, I would cite a couple of recent examples.

Can a PMF happen? Ask the folks in Nelson County who went through Hurricane Camille in 1969. I have heard reports of 31 inches in five hours ... or ask the folks in Madison County where, according to at least one report, a rainfall of about 24 inches occurred in June 1995.

On June 22, 1995, the Timber Lake Dam near Lynchburg failed. That was a terrible tragedy but, considering the fact that the rainfall was much more intense than the dam was expected to handle, it was certainly not unexpected. The dam was simply not capable of withstanding a flood of that intensity. Virginia continued to experience major flooding for several more days and several dams in the Commonwealth received significant damage. Floods the following winter and then followed by Hurricane Fran in September 1996 continued to devastate much of the state. Many owners are still trying to catch up with making repairs to some of the dams that were damaged by these floods.

The point is that in any specific area, we can go for several decades without having a very large storm and then get "dumped on" with one of these huge floods.

CHANGING CLASSIFICATION

A problem that we deal with continually relates to classification of dams and how it can change with time. Dams are classified based on their potential to cause damage if they were to fail. This obviously means that a dam's class depends on what happens to be downstream. Usually the owner of the dam has no control over future land use in the downstream area. If land use intensifies, the owner may be left with a dam that does not meet the appropriate standards for the now higher class dam. In other words, a dam's classification can change with time through actions by others and over which the dam's owner has no control. The responsibility for meeting these higher standards is on the owner even though he or she may have done nothing to cause the change. These are not trivial matters. It is very expensive to upgrade a dam to the higher standard. There may be a better way to keep these uncontrolled changes from occurring but obviously we start getting into the very sensitive issue of land owners' rights. It may take a little imaginative thinking to deal with this problem before it occurs when the solution may be much less expensive. We obviously need to do a better job in dealing with this reclassification problem. We cannot hide our head in the sand and pretend that the problem does not exist.

STUDY OF DAMS OWNED BY SOIL AND WATER CONSERVATION DISTRICTS

Over the next several months, DCR will be making a study of dams owned by Soil and Water Conservation Districts. We had a meeting in Charlottesville on June 5 with District leaders to initiate some dialog about the study. I would like to touch on a couple of items that may be of interest to this committee.

One of the items will be to look at is the adequacy of any dam to meet changing land use needs. As noted earlier, a dam's classification and its resulting requirements for spillway capacity depends on the what happens to be downstream. Any dam that does not currently have a spillway capacity meeting the Probable Maximum Flood requirements could be vulnerable if downstream land use changes to require a reclassification of the dam. Only 14 of the 104 District owned dams have a spillway capable of passing a full PMF. Although we do not expect land use below many of the other 90 dams to change, nevertheless, as we all know, any attempt to predict future land use changes is fraught with uncertainty and such changes could happen unless there is some commitment or requirement by local land use planners and decision-makers to bite the bullet and provide some positive assurance to keep the downstream land use in line with the hazard classification of each dam. We do have to recognize that if the land use changes do occur, it could require a reclassification of the dam. The resultant spillway capacity requirements can present a very significant financial burden on the owner.

Part of the study will consist of a detailed assessment of Class 1 and 2 District-owned dams built prior to 1969. Specifically, that comes to 23 dams. We have hired a consultant and are in the initial reconnaissance phase. This phase consists of a field reconnaissance of 22 of these dams to assess their general condition and to provide a basis for setting priorities for further, more detailed studies. We anticipate that these more detailed studies will consist of inspections of the interior of pipes and other structural features which are not normally inspected by more routine inspections. These inspections will utilize modern technology such as remote operated video cameras and/or divers to inspect non-accessible areas. These assessments should provide us with a better idea of the long term outlook for these dams and enable the Districts to plan for their future needs. We do not expect to be able to perform this detailed assessment for all 23 dams. However, we should be able to provide a pretty good indication of their overall integrity and their risk to life, health, safety, and welfare of the public as well as the long-term infrastructure needs and the maintenance and repair costs of the dams. Hopefully, it will also provide us with more insight as to what to anticipate on the overall long-term condition of many other dams which are not owned by Districts.

USE OF IFLOWS

Integrated Flow and Observation Warning Systems (IFLOWS) have been suggested by some as a substitute for providing spillway capacity. First, let me explain briefly what IFLOWS is. I understand that Stan Campbell, from the Department of Emergency Services, is here and will explain how this works in more detail and, I'm sure more succinctly. Basically, an IFLOWS installation on a dam is a device to record, in real itime, the level of the reservoir and the rainfall that falls at the dam. The information is

4

transmitted to another location, usually a county emergency operations center, which can interpret this data using a set of parameters for the particular dam and be able to provide an emergency response in event of an impending emergency situation. Virginia's Dam Safety Act was amended in 1993 to permit the installation of IFLOWS on SWCD dams while awaiting funds to correct emergency spillway deficiencies.

Let me say, very emphatically, that I fully support IFLOWS installations. I wish that we had them on every Class I and 2 dam in the state. They are almost essential at any site that cannot be readily reached overland due to inclement weather. However, and again I will say this very emphatically, an IFLOWS installation is NOT a substitute for having an adequate spillway. I can cite several reasons for this. For one, an IFLOWS installation does nothing to prevent a failure and the dam is still as susceptible to a failure as before. Any kind of remote monitoring depends on several specific actions to be effective. They are not fool-proof. Although the technology can be made very reliable, the effectiveness still will depend upon human response- that is, it depends mainly upon people to make the proper notification to other people who must then be depended upon to take the correct action during an emergency. Perhaps though the most important fact is that most of these sites are on very small drainage areas, very steep, mountainous terrain, very remote areas, and subject to very fast, flash flooding. There often is simply insufficient time to react. I don't think that I'm out there by myself on this subject. I think that almost all engineers who deal with dams on a daily basis will support my conclusions on the fallacy of substituting warning for fixing the spillway. I will readily admit that the IFLOWS installations are cheaper than increasing capacity of a spillway. Somehow or other though, we have to admit that it is expensive to modify any spillway. Just as with many other items in our infrastructure, there are no cheap fixes

CLOSING

No amount of regulation can replace the need for a sound engineering approach when it comes to evaluating dams. Dams are getting older. They are an integral part of our state's and our Nation's infrastructure every bit as much as roads, highways, water supplies, sewerage systems, buildings, power supplies, etc. With proper care, an earth dam can last a very long time.

I want to do all that I can to encourage the partnership approach involving the dam owner, the owner's engineer, and our staff, as we work toward our common goal of public safety. Thank you for the opportunity to meet with you here today. I appreciate your interest and look forward to our continuing dialog.





VIRGINIA DAM SAFETY ACT APPLICABILITY

2

STATUS OF REGULATED DAMS July 10, 1997

CLASS 1 (H	igh Hazard Potential)				
Total	100				
	Regular O&M Certificates -	72			
	Conditional O&M Certificates -	25			
	Construction Permit -	1			
	No O&M Certificate -	2*			
	* Blue Ridge Estates Dam, Botetou Big Cherry Dam, Wise County	irt County			
CLASS 2 (Si Total	gnificant Hazard Potential) 112				
	Regular O&M Certificates -	97			
	Conditional O&M Certificates -	10			
	Construction Permit -	5			
	No O&M Certificate	0			
		Ŭ			
CLASS 3 (Low Hazard Potential) Total 244					
	Regular O&M Certificates -	220			
	Conditional O&M Certificates -	12			
	Construction Permit -	9			
	No O&M Certificate -	3*			
*Stump Dump Landfill Dam, Fairfax County Darr Pond, King George County Fye Dam, Halifax County					
CLASS 4 (La Total	ow Hazard Potential) 21				
	Regular MF authorization -	20			
	Construction Permit -	1			
	0				
SUMMARY	Construction Permits Regular Certificates or a Conditional Certificates Not in Compliance	uthorized			
TOTAL REG	GULATED DAMS	477			



Department of Conservation & Recreation Dam Safety Program (7/93)

Regulated Dams Constructed in Virginia


Regulated Dams Constructed in Virginia (Showing NRCS (SCS) Assisted*)



* SCS started assisting in 1955 ** in 5 year intervals

CLASSIFICATION AND SPILLWAY REQUIREMENTS

CLASS POTENTIAL HAZARD

2

3

4

SIZE

SPILLWAY DESIGN FLOOD

PMF

PMF

 $\frac{1}{2}$ PMF to PMF

1 Probable Loss of life or excessive economic loss

Large Medium Small

Large

Small

Medium

Possible Loss of Life or appreciable economic loss

> No Loss of Life expected; minimal economic loss

Large Medium Small PMF ¹/₂ PMF to PMF 100-yr to ¹/₂ PMF

¹/₂ PMF to PMF 100-yr to ¹/₂ PMF 50-yr to 100-yr

No Loss of Life all 50-yr to 100-yr expected; no economic loss to others

VIRGINIA DAM SAFETY PROGRAM jsh 9/96









DISTRICT-OWNED DAMS Type of Certificate/Permit

CLASS	REGULAR	CONDITIONAL	CONSTRUCTION	TOTAL		
1	16	9	0	25		
2	10	3	0	13		
3	63	2	. 1	66		
TOTAL_						
	89	14	1	104		

DISTRICT OWNED DAMS

£

Spillway Capacity (% PMF)

CLASS	20-49	50-74	75-99	100%	Total
1. REGULAR	3	2	1	10	16
CONDITIONAL	3	3	1	2	9
2. REGULAR	1	8	0	1	10
CONDITIONAL	3	0	0	0	3
3. REGULAR	52	10	0	1	63
CONDITIONAL	2	0	0	0	2
CONSTRUCTION_	1	0	0	0	
	65	23	2	14	104





APPENDIX 10

FINAL REPORT

on

STUDY OF SELECTED DAMS OWNED BY SOIL AND WATER CONSERVATION DISTRICTS IN VIRGINIA

prepared by Gannett Fleming, Inc.

November 1997

Study of 22 SWCD Dams FINAL REPORT

presented to:

Commonwealth of Virginia Department of Conservation and Recreation Richmond, Virginia



November 1997



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November 20, 1997

Joseph S. Haugh, P.E. Director, Division of Dam Safety Commonwealth of Virginia Department of Conservation & Recreation 203 Governor Street Richmond, VA 23219

> RE: SWCD Dam Inspections Final Report

Dear Mr. Haugh:

We have completed inspections of dam sites identified in the Blue Ridge, Headwaters, Mountain Castle and Shennadoah Districts and are pleased to submit our SWCD Dam Inspections Final Report. A total of 22 dam sites were visited during this study, 20 of which were placed into a prioritized listing for inspection of the risers, conduits and embankment drains. Based on the available funding, 16 of the 20 prioritized sites were re-visited to perform televised inspections, the results of which are reported herein, along with our comments and recommendations. The 14 video tapes and field logs for each of the 16 dam sites were provided under separate cover.

We have enjoyed the opportunity to provide our services to the Commonwealth of Virginia on this project and remain available to address any questions you may have regarding the findings of our investigation and our recommendations.

Very truly yours,

GANNETT FLEMING, INC. Water Resources & Geotechnical Division

Zacure W. O'comme

William B. Bingham, P.E. Vice President Manager, Dam and Flood Control Section

[t:\31246.308\M3288]

A Tradition of Excellence Since 1915

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SWCD DAM INSPECTIONS DIVISION OF DAM SAFETY COMMONWEALTH OF VIRGINIA

1.0 EXECUTIVE SUMMARY

The 22 flood control structures included within the scope of this study were constructed by the former Soil Conservation Service [SCS], now the Natural Resources Conservation Service [NRCS], during the period from 1954 to 1968. The primary purpose of this study was to inspect and assess the internal condition of the risers, outfall conduits, and embankment drains which are not accessible for viewing without employing confined space entry procedures and/or video equipment mounted on a remote operating vehicle. Deficiencies revealed by inspection will be reviewed by the Division of Dam Safety to develop budgetary priorities in conjunction with overall dam safety requirements which have not been addressed by this study.

The findings of the study did not reveal any conditions of obvious imminent danger which would warrant emergency action. However, several maintenance needs were identified which should be prioritized and budgeted for repair. Primary among the maintenance needs, most of the reservoir drain control valves reportedly have not been operated in many years, and we suspect that at least some of the valves are no longer operable. Having the ability to lower the impoundment in a controlled manner is important for emergency response to various situations where embankment performance may be threatened, i.e., excessive seepage, slides, sloughs, etc. Our recommendation for addressing this issue is to develop a short-range plan which would coordinate scheduled impoundment drawdowns for riser repairs with the evaluation and rehabilitation of the operator and drain control valves. Implementation of the short-range plan would provide information to refine a long-range [5 to 10 year] plan to inspect, repair and/or replace operator and drain control valves at sites with less immediate needs for rehabilitation of the riser.

Risers which were constructed in the 1950's, and have not already been replaced, appear to be serviceable, although four of seven of the remaining original risers contain severely deteriorated concrete surfaces below the normal water level. The service life of these structures can be extended by rehabilitation of the concrete surfaces, which can be phased over several years. Among the 1950's era risers, exposures of reinforcing steel were not observed, except at the Lofton site.

A more urgent priority for repair should be established for those risers with leaks or open joints. These features are subject to freeze thaw action, and/or cavitation below the water line. The open joints may also be exposing reinforcing steel to corrosion which cannot be directly observed. The risers at Briery Branch, Hearthstone and Johns Creek No. 1 were all observed to have open joints. All three of these structures are two stage risers constructed in the period from 1966 to 1968

and the deficiencies are believed to be related to construction procedures rather than the age of the structures.

It is our opinion that deferral of riser repairs where leaks and open joints were encountered could diminish the value of the state's investment in flood control facilities, resulting in higher expenditures for repair or replacement at a later date. Also, we estimate that rehabilitation of the oldest risers from the 1950's can be accomplished for about 75 to 80% of the replacement cost, but rehabilitation will only remain an option as long as the basic integrity of the structure is maintained.

Outfall conduits range from 24 to 48 inch diameter concrete pipe. With the exception of some minor cracks, the conduits are typically in good condition, even at sites where the riser concrete is severely pitted and/or otherwise deteriorated. Soil staining presumably from a past pipe joint leak was observed at Johns Creek No. 2, but no active leaks or joint separations provide evidence of embankment settlement damage to conduits within the study group. Regrouting of the interior joints is a means to reduce risks of soil migration into the conduits, but this effort does not appear to be warranted by the overall inspection results.

Embankment drains range from 6 to 10 inch diameter corrugated metal pipe. Some of the bituminous coatings used for corrosion protection have cracked and deteriorated, typically near the outlet end of the drains, but otherwise the pipes appear to be in good condition, with little evidence of corrosion, except at the outlet.

The embankment drains were partially clogged with silt or combinations of silt and sand at over half of the sites where televised internal inspections were conducted. These materials are believed to be migrating into the drains from the filter trench, but may be only doing so during brief periods of high water level in the impoundment. The embankment designs depend upon the drains for slope stability and/or control of seepage pressures and piping. Accordingly, it is essential that the drains be maintained free to flow. We suspect that at least some of the sources of material migration into the drains are related to construction. However, this cannot be verified without excavating into the embankment, which we do not recommend at this time. Even though the drains which are flowing are partially clogged, the water appears to be clear and free of suspended sediment. Constant drain flows may, however, be piping silt at rates which are visually imperceptible. To assess the risks associated with long term migration of material through the drains, we recommend a comparison of turbidity tests on samples obtained from the drain outlets during various different impoundment water level conditions. This would provide data to allow calculation of estimated quantities of materials that may have migrated over the life of the structures.

Maintaining the embankment drains in a free flowing condition is essential to preserving the integrity of the original design, many of the specifics of which are no longer available. At Toms Branch, the original design included embankment drains which apparently were not constructed. Owing to the absence of as-built plans and slope stability analysis for this site, we recommended verification of existing conditions by performing a slope stability analysis.

The scope of this study did not focus on items normally addressed by the routine periodic inspections required by law. Some general observations typical of periodic inspections, such as erosion, vegetation, missing hardware or debris clogging on orifice trashracks, were noted in the Reconnaissance Phase memorandum of July 1997, but are not considered all inclusive. In overview, the absence of railings and ladder cages on risers does not conform with current OSHA standards, which may need to be addressed in consideration of future funding for rehabilitation or replacement of risers. Also, all the sites in this study group revealed a lack of maintenance with respect to embankment cover, except at sites where public use is prevalent. Notable areas that appear inadequately maintained are adjacent to the principal discharge conduit outlet structures which are overgrown to the extent that visual inspection is impaired and discouraged. Included in the vicinity of these structures are the embankment drain outlets which, as indicated above, need to be monitored to provide insight to embankment performance. Fine root mass was removed from the embankment drains during flushing operations at several sites, including Union Springs, Leatherwood No. 5 and Robinson Hollow. This may suggest that the roots from vegetation at the embankment toe are contributing to clogging of the drains.

2.0 PROJECT SCOPE

The subject project was divided into three phases conducted over a period of about 6 months. The work was subdivided into an initial Reconnaissance Phase for prioritizing, a second phase consisting of televised inspections at sites within relatively close proximity of each other, and a third and final phase consisting of televised inspections over a broad geographic area, including interim and final reporting. Work scopes for each phase were conducted as follows:

2.1 <u>Phase I:</u>

Conducted a reconnaissance of all 22 listed sites during the week of June 23 to June 27, 1997, primarily to assess access and dewatering requirements for inspection of the risers, conduits, and embankment drains. Notes were assembled on the principal discharge conduit, embankment drains and the intake structures and appurtenances such as the operators, trashracks and ladders. The findings of the reconnaissance inspection were used to develop a matrix of site conditions for prioritizing the order of detailed inspections. The matrix, along with other supporting documentation from the reconnaissance visits was compiled in a Memorandum dated July 15, 1997, and our conclusions from the site visits were summarized verbally during a July 16, 1997 meeting with the Division of Dam Safety. At that time, we indicated there was no compelling evidence of structural deficiencies at any of the visited sites which would influence the priorities for detailed inspections. On that basis, 20 of the 22 sites were jointly categorized into three levels of priority, attempting to assure that the more detailed inspections would include a balanced sampling of sites within the available limits of funding. Consideration for establishing priorities included the comparative age of the structures, the comparative height of embankments, the physiographic setting, along with access and dewatering requirements necessary to complete the more detailed Two of the sites, Marrowbone and Hone Quarry, were deleted from further inspections. consideration for inspection at this time, because of pending maintenance/repair contracts for rehabilitating or enlarging their emergency spillways.

2.2 Phase II:

More detailed inspections were performed on six selected sites during the week of August 11 through August 15, 1997. In order to minimize travel and maximize the number of first phase detailed inspections, all the sites for the inspections were grouped in the Shennadoah and Headwaters districts. A pan and tilt camera was used for televised inspections of the outfall conduit in order to provide head-on viewing of each conduit joint. The embankment drain outlets were flushed as necessary to clear siltation prior to televising. All four interior walls of the riser structure were televised for full depth. Concrete deficiencies are referenced with respect to depth from the top of the structure. For reference, all four sides of the riser exterior were also video taped above the water line. Exterior concrete surfaces normally under water were not inspected during this program, and the operability of the reservoir drain control valve was not verified. Video tapes and field logs of the first six inspected sites included in Phase II were provided to the Division of Dam Safety during a meeting on August 21, 1997.

2.3 Phase III:

The third phase of study included interim reporting of project status and findings, additional detailed inspections of ten sites and preparation of the final report. The proposed final phase of inspection was devised to complete inspections on all the dams classified in Phase I as Priority I and II dams. The dams with embankment drains [but without impact basins] were given preference for inspection among the Priority III sites which were selected to complete the inspection schedule. The field work for the third phase of inspection was conducted during the period from September 22 through October 2, 1997. Video tapes and field logs of the ten Phase III inspections were forwarded to the Division of Dam Safety by letter of October 9, 1997.

3.0 BACKGROUND

All of the dams included within this study were designed as flood control projects and include the most simple operative mode requiring little or no regulation from human resources for the intended purpose. Because of this, intake structures at a number of the dams are constructed without direct access to discourage trespassing and unauthorized personnel. This arrangement also limits and hinders efficient access to features for inspection and maintenance.

Intake structures at the inspected dams are either single or double stage. Single stage structures are constructed as uncontrolled overflow weirs designed to accommodate pressure flow conditions at advanced impoundment stages. Each of these includes an integral crest slab located over the weir opening to preclude entry of oversize debris or unauthorized personnel. Access to the operating stem for the reservoir drain is also available from the crest slab. Reservoir drain diameter is consistent with conduit diameter and ranges from 24 to 42 inches. Control for reservoir drains appear to be sluice gates designed for seating head operation.

Double stage intake structures are also constructed as uncontrolled overflow weirs with an integral crest slab and include one or more openings typically located a significant distance below the weir crest. These openings are rectangular shaped orifices approximately 24 inches wide by 18 inches high. Openings to pipes, approximately 12 to 14 inches in diameter and located through the intake walls are also included at a number of the sites. The pipes are continued external to the intake structure and extended to the reservoir bottom for the purpose of introducing colder water to normal releases. The positions of the orifices and pipe openings, in close proximity, establish a normal pool stage. Trash rack structures are positioned at the weir and orifice openings.

Reservoir drain operators are located on the crest slab. Reservoir drain diameter for double stage risers is consistent with conduit diameter and range from 24 to 48 inches. Control for reservoir drains also appear to be sluice gates designed for seating head operation.

Conduits for controlled releases through the embankment are reinforced concrete pipe constructed integral with the intake structure. The intake structure is transitioned at the base to provide efficient conveyance of flow from the intake into the conduit.

Two outlet arrangements were common for the 20 dams included with this inspection program. One arrangement is a concrete structure consisting of a head wall, sidewalls and stilling basin with sill. Outlets for embankment drains if included with the design are located in the sidewalls.

The second arrangement consists of a projecting conduit, located through riprap protection. The riprap protection is extended into an excavated stilling basin area. Outlets for embankment drains if included with the design, are also located through the riprap.

4.0 DISCUSSION OF FINDINGS

The following, Sections 4.1 through 4.4, present an overview of the study findings with respect to the condition of the risers, drain control valves, conduits and embankment drains. All supporting information consisting of inspection narratives, overview photographs and video logs are included in the appendices to this report. Narratives for each of the sixteen Phase II and III inspections are included in Appendix A, along with an abbreviated Summary Table of some of the significant findings at each site. Unless otherwise noted, the narratives refer to interior inspected surfaces. General overview photographs of each of the 20 prioritized sites are included in Appendix B, following photographs of specific features from the video inspections as referenced in the narratives. The July 15, 1997 Reconnaissance Phase Memorandum contains additional overview photographs of all 22 original sites. The operator's video logs are included in Appendix C for direct reference to other specific features.

4.1 <u>Risers:</u>

The general condition of the risers is judged to be satisfactory with respect to serviceability, but deficient in some areas of maintenance. Concrete surfaces for the intake structures above the normal water level externally, and internally for the full height of the structure, generally appear to be without significant deterioration. Exposed aggregate faces on exterior surfaces over the normal range of water fluctuation and pitting on interior surfaces are evident at most of the intake structures. Minor spalling is probably caused by freeze-thaw action, and, in some cases, spalls may be associated with methods of concrete placement and form removal. Exposed aggregate and pitting, are probably caused by cavitation. Neither spalling or exposed aggregate are considered to be a serious concern with regard to structural integrity at this time.

Deterioration of concrete surfaces suggests the need for maintenance at several sites which have been divided into categories as follows:

Surface deterioration without exposed reinforcing steel

South River No. 26	-	Inch Branch
South River No. 23	-	Robinson Hollow
South River No. 6	-	Sengers Mountain Lake

Surface deterioration with exposed reinforcing steel

South River No.	4	-	Lofton
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Construction Joint Deterioration

Lower North River No. 78	-	Briery Branch
Upper North River No. 77	-	Hearthstone
Johns Creek No. 1	-	McDaniels Lake

4.1.1. <u>Concrete Surface Deterioration:</u>

Nine of the twenty inspected structures were originally constructed during the 1950's. Within that group, we understand that the risers were replaced at the 1957 Toms Branch site and at the 1954 Happy Hollow site. Concrete surface deterioration appears to be more advanced in four of the seven remaining 1950's era risers, as listed above. This deterioration is possibly related to freeze-thaw activity, but could also be a result of cement aggregate reaction. Recovery of concrete cores for testing is a means to check for the presence of alkali-silica compounds prior to final selection of an option to either replace or restore the existing riser and may establish trends relative to deterioration of aging structures. Should testing confirm the presence of alkali-silica compounds, measures to seal the concrete surfaces from water intrusion should, as a minimum, be considered.

All the listed structures with deteriorated concrete surfaces are considered serviceable at this time. With the exception of the Lofton riser, reinforcing steel exposures were not observed and as such, the useful service life may extend several years into the future without taking action. Reinforcing steel exposure will, however, accelerate the corrosion process and eventually eliminate options to cost effectively rehabilitate concrete to extend the service life of the structure. Photographs depicting surface deterioration of concrete are shown by Plates 11 and 12 in Appendix B.

4.1.2 Construction Joint Deterioration:

Eleven of the twenty inspected structures were constructed after 1960. Compared with the 1954 to 1959 risers which are 8 to 18 feet high, the inspected risers constructed between 1963 and 1968 are typically 20 to 53 feet high. Concrete for the walls of these taller and more massive structures would have been placed in stages. In addition, scheduling for continuous placement of concrete for each stage may have been made more difficult by the remote site locations, which may account for the open joint conditions observed at three of the eleven sites constructed in the post 1960 era, as listed above.

The riser interior was not televised at Johns Creek No. 1, nevertheless, the Phase I reconnaissance of all 22 original sites revealed a weathered joint on the exterior face of this riser, about 2 feet above the water line. The open joint appears to be weathering completely around the structure and is probably a planned construction joint location. This feature is shown in the general site overview photograph contained in Appendix B.

Leaking joints below the water line were revealed within the interior of the risers at Briery Branch and Hearthstone. These features are generally irregular with respect to location and deviation from horizontal, which leads to the belief that there may have been time gaps between concrete truck deliveries or segregation of the concrete matrix where the material was not completely vibrated into the forms. Photographs depicting interior joint leaks are shown by Plates 3 and 4 in Appendix B. It is our opinion that the structures with open joints should be repaired to arrest further deterioration due to freeze thaw action, cavitation and exposure of reinforcing steel to corrosion. Deferral of these repairs could diminish the value of these structures, resulting in higher costs for repair or replacement at a later date.

4.2 <u>Operator and Drain Control Valves:</u>

No attempts were made to operate the drain control valves as a part of this study. Sluice gates generally appear to be seated without evidence of leakage, however, at the Wilda site (South River No. 7), a sock was noted in the sluice gate, which the owner indicated was sealing a leak.

Operation of the reservoir drain control valve can be verified by testing, which is recommended annually and will be discussed further in this report. Proper testing requires that prior arrangements be made with all pertinent agencies and/or parties to accommodate a range of circumstances that might occur as a result of drain operation. Probably the most serious circumstance that could occur would be the inability to completely close the valve. For such a situation, provisions including a source of funding should be made to replace the valve and operator as required.

Typically sluice gates properly installed and maintained have a service life of about 30 to 50 years. With the apparent lack of operator maintenance, it is reasonable to assume that some of the control valves are inoperable and may require major rehabilitation or replacement.

4.3 <u>Conduits and Outlet Structures:</u>

The general condition of the conduits is judged to be good. Outfall conduits range from 24 to 48 inch diameter concrete pipe. Some minor cracks were observed in the pipes, none of which appear to be significant with respect to structural integrity. Pipe joints generally appear to be tight, but not consistently grouted at all sites. Even though some of the cracks appear to be moist, no active leaks or joint separations provide evidence of embankment settlement damage to conduits. At Johns Creek No. 2, staining which is probably the result of past pipe joint leakage was observed at one location, but the joint does not appear to be actively leaking, despite its position which is probably below the phreatic line. Photographs of this joint are shown by Plates 5 and 6 in Appendix B, however, the discoloration is considerably more visible in the video.

Three of the original 22 dam sites -- Leatherwood Dam Nos. 2 and 3, and Johns Creek No. 4 -- were constructed with reinforced concrete impact basins at the outlet. All of these structures appear to be in good condition. At Leatherwood 3, the joint between the conduit and the headwall of the outlet structure needs to be sealed. A photograph of this feature is shown in the Phase I Report.

4.4 Embankment Drains:

Seventeen of the original 22 dams in the study were constructed with embankment drains. One of the 17 dams with embankment drains -- Marrowbone -- was deleted from the prioritized list of dams to be inspected. In addition, three of the dams with drains have outlets extending through the sidewalls of impact basins. Televising of the drains was attempted at one of these sites, however, owing to acute pipe bends beyond the basin walls, televising was not possible with the available equipment. The drains were televised at all but one of the remaining 13 sites with embankment drains. At that location, Johns Creek No. 1, at least one of the two drains is clogged at the outlet end, as shown by the photograph in the Phase I Report.

All of the drains were constructed with corrugated metal pipe (CMP) ranging from 6 to 10 inches in diameter, except at Toms Branch. The 1956 design plans for Toms Branch indicate the dam should have been constructed with a 10 inch diameter CMP drain. There is a 2 inch diameter iron pipe protruding into the riprapped plung pool, left of the outfall conduit. The iron pipe was televised for its full length and was found to be capped at 17 feet from the outlet end with no apparent perforations in the side walls. A photograph of the drain interior at Toms Creek is shown by Plate 8 in Appendix B.

Among the eleven remaining sites where embankment drains were televised, seven of the sites were found to have drains 20 percent or more clogged with silt or combinations of silt and sand. As indicated by the Phase I reconnaissance memorandum, many of the drains are not actively flowing when the impoundment is at normal pool level. Where flows were observed, the water at least visually appears to be clear, even at locations where the outlet is partially clogged. At two of the sites where the embankment drains had the greatest volume of flow, Union Springs and Robinson Hollow, the drains were clogged with silt or silt and sand by as much as 90%.

Some of the bituminous coatings used for corrosion protection have cracked and deteriorated. Cracks in the coating can be observed in the video for Johns Creek No. 2. Fragments of the bituminous coating were recovered from the flush water tailings at Union Springs and Robinson Hollow. Deterioration of the bituminous coating appears to be predominately near the outlet end of the drains. As evidence of this, even at the Union Springs and Robinson Hollow sites where fragments of the coating were recovered in the flush water, the coating appears to be intact further within the drains. The relatively good condition is possibly due to more modest temperature variation and reduced oxygen at locations embedded further within the embankment. Evidence of possible corrosion can be observed at some of the pipe perforations (refer to Plates 1 and 2 in Appendix B), but corrosion does not appear to be effecting drain performance. In no case were the drains found to be seriously corroded beyond the protruding outlet end. By comparison, the ungalvanized animal guards on the drain outlets at some sites have been completely destroyed by corrosion.

Sources of material migration into the drains may vary. Moreover, piping, i.e. seepage transport of embankment soil, may be on-going or periodically occurring, despite the visual

appearance of clear flow under normal pool seepage conditions. Photographs of various conditions of drain clogging are shown by Plates 1, 2, 7, 9 and 10 in Appendix B. Soil deposition within the drains can be broadly categorized as backflow (tailwater) siltation, filter sand migration, or silt migration through the filter or pipe joints. There is evidence of all of these mechanisms, even within drains on the same site. Our opinions regarding suspected sources of drain clogging at each of the seven effected sites are as follows:

Johns Creek No. 2

Suspect that concrete sand was used for filter without an aggregate interface at the drain perforations. Sand migration into drains through the perforations has nearly filled the drain in some locations, as shown by Plate 7 in Appendix B. No deposits of sand were found below the drain outlets, which may suggest that drain flows are insufficient to transport sand out of the drain.

Union Springs

Suspect that silt is migrating into the drain from the filter trench on the left side of the dam (reference Plate 2 in Appendix B), similar to the migration through pipe perforations shown by Plate 1 in Appendix B. Design gradations of the filter material appear to be appropriate, but the 8 inch thickness of coarse and fine filter material surrounding the drain may have been difficult to construct within specified tolerances, possibly resulting in insufficient filtering in some locations. A blind trench which extends up the relatively steep right abutment likely creates relative high hydrostatic head above the right drain, which contains silt as well as sand from the filter. A stick located over 100 feet up within one of the drains may indicate that tail water also occasionally deposits silt and debris into the drains at this site.

Inch Branch

Suspect that silt is migrating into the drain pipe through joints (reference Plate 9 in Appendix B), but could not view full length of drain owing to a joint obstruction.

Robinson Hollow

No apparent source of soil migration into drains and as-built construction drawings are not available for comparison. The soil clogging the drain is predominately silt, containing no filter sand. Fragments of wood within the flush water tailings may suggest deposition by tailwater, which the 1979 Phase I Inspection Report indicates has submerged the drain outlets in the past. Conditions about 100 feet into the drain are shown by Plate 10.

<u>Canada Run</u>

Within the drain, dry silt with surface riffles may be an indication of tailwater deposition. No indication of other potential sources of soil migration was observed throughout the full 62 foot length of non-perforated drain.

Leatherwood 5 and 6

No indications were observed of the source of siltation within the drains. Relatively flat, 0.75%, drain slopes may not positively drain the pipe, particularly if influenced by settlement and/or fine root mass growth within the drain. Deposition may be related to tailwater submergence of the drains.

The design intent accompanying the use of embankment drains can not be fully understood with certainty on the basis of available records. It is evident that slope stability calculations relied upon the use of embankment drains to control the phreatic line during the flood stage. In addition, the drains are also relied upon to prevent piping in deep boulder areas (John's Creek No. 4), to relieve seepage pressures (Leatherwood No. 5) and to reduce the hazard of piping in sandy material in the downstream section around the conduit (Johns Creek No. 1). Accordingly, it is essential that the drains be maintained.

To preserve the original intent of design, the embankment drains must be maintained free to flow. At Toms Branch, embankment drains were shown on the design plans in the 1978 Phase I Inspection Report, but could not be found in the field. The Phase I Report also indicates that no asbuilt plans or slope stability analysis are available for this dam. As such, the constructed conditions may not meet the intent of design. Slope stability and seepage analysis to verify the adequacy of existing conditions are beyond the scope of this study. While it is important to investigate as-built conditions which appear to deviate from the design, it should be recognized that the analysis of slope stability at many of these sites, with or without drains, could reveal deficiencies which require correction to meet current standards.

5.0 <u>COMMENTS AND RECOMMENDATIONS</u>

Based on a review of the completed inspections and intended long-term serviceability of the subject dams, it is recommended that the owners and operators prepare and complete a systematic maintenance/repair program to insure the reliability of the projects for future flood protection. Identified needs are maintenance related rather than emergencies. Accordingly, the work effort can be phased over a period of years. To protect the Commonwealth's investment in flood control structures, we suggest that long range plans be established to accomplish set objectives within a specified time frame, probably 5 to 10 years. The initial 1 to 2 years of effort may only include 3 to 5 dams per year, concentrating on sites possessing the most immediate needs for riser maintenance, as identified in this report. Impoundment dewatering to rehabilitate risers at these sites will provide information to refine probable long range costs for rehabilitating the operator and drain control valves.

As a minimum, drain operability should be verified at each of the sites. Recommended steps and probable estimated costs are outlined below. We expect that as the needs for structural maintenance/repair are reduced by the initial phases of work, the later phases of a long range plan may include more structures within comparable limits of funding.

The needs for concrete rehabilitation, particularly at sites with open joints, should not be deferred. A program of continuing inspections and identification of needs can be on-going concurrent with contracts for rehabilitation. The work effort should be phased to best accommodate available funding and mesh with the Department's overall requirements for dam safety. Towards that goal, we offer the following itemized listing with estimated associated costs for budgeting and planning purposes. The costs shown are per site.

5.1 <u>Diving Prior to Dewatering Impoundment:</u>

Preliminarily assess condition of drain control value by diver, with primary objective to remove accumulated debris from drain opening prior to operation. Diver can also check condition of submerged hardware and assess debris surrounding the drain which may be pulled into the drain by high velocity flow when the gate is opened.

Estimated diver cost, assuming 2 days for inspection and debris removal:

\$6,000

5.2 Impoundment Dewatering:

Dewater the impoundments in accordance with predetermined dewatering rates and monitor embankment performance throughout the drawdown. Coordinate this activity with appropriate regulatory agencies, e.g., Game and Inland Fisheries, and downstream communities. Allowable drawdown rates typically vary from 6 to 12 inches per day. Based upon the variable, and in some instances unknown characteristics of embankment soils, we recommend maintaining drawdown rates near the lower end of that range. Beyond the cost of an underwater inspection and debris clearing by a diver, the costs for dewatering ideally could be relatively low, assuming an operable valve and the availability of owner personnel to operate the valve and observe the embankment during drawdown. Assuming that a repair contractor is responsibile for dewatering, labor costs over a drawdown period of 2 to 6 weeks will add to construction costs. Labor costs for dewatering could be a significant percentage of total construction cost if full time personnel are required to monitor pumping. For instance, at Canada Run, the valve stem is damaged to a degree that operation may not be possible. Also, at Inch Branch, the valve stem is missing. A number of other valves may also be inoperable, in which case accomplishing drawdown by pumping through the riser may be required.

Estimated cost to dewater by pumping, including labor and equipment:

\$7,000/month

5.3 <u>Riser Rehabilitation/Replacement:</u>

Inspect and repair the concrete intake structure as required. Repairs are expected to include removal of deteriorated concrete, filling/patching of voids, and sealing/coating of concrete surfaces. Briery Branch, Hearthstone and Johns Creek No. 1, all have open joints or voids which should be given priority for repairs.

Estimated costs based upon various conditions of repair that may be required are as follows:

a. <u>Rehabilitation of single stage riser, assuming 200 SF cost basis</u> -- includes sandblasting, gunite resurfacing, new gate and operator, 15% engineering and inspection:

\$34,000

b. <u>Replace single stage riser in kind</u> -- assuming size comparable to above includes new control gate and operator, 15% engineering and inspection:

\$44,000

c. <u>Concrete joint repairs, assuming repairs are made in the dry</u> -- includes scaffolding, joint preparation and joint filler. Estimate does not include diver and dewatering costs, nor engineering and inspection which should be added to total:

\$4,000

5.4 Operator and Drain Control Valve Replacement Contingency:

Inspect and repair/replace the operator and drain control value as required. Estimated cost to replace the sluice gate and operator, assuming installation in the dry, are as follows:

- a. 24" diameter \$10,000.
- b. 36" diameter \$12,000.
- c. 48" diameter \$16,000.

5.5 Embankment Drain Maintenance and Monitoring:

Periodically clean embankment drains as necessary to maintain flow. To assess performance of the drains, obtain turbidity tests of embankment drain discharge from drain outlets during various different water level conditions within the impoundment. Robinson Hollow and Union Springs are sites with partially clogged drains and a steady discharge under normal pool seepage conditions. If piping of fines from the embankment is a slow, on-going process, these sites should provide a good source of data which can be compared with turbidity test results from sites with periodically flowing drains which were indicated to be relatively clean (refer to table in Appendix A).

Estimated cost of turbidity testing is as follows, assuming 20 to 30 tested specimens per year, with on-site sampling by district personnel. Estimate includes sample vials, shipping and laboratory testing. Cost of drain cleaning should be evaluated on a case by case basis and is not included.

\$500/year

5.6 <u>Slope Stability Analysis:</u>

Slope stability analysis of the Toms Branch site should be performed to evaluate the apparent as-built deviation from the design plans which included 10 inch diameter embankment drains. We recommend that the analysis include a geotechnical investigation along with the installation of piezometers to permit periodic monitoring of the phreatic surface.

Estimated cost for field sampling, instrumentation, laboratory testing and related analysis (excluding long term monitoring of piezometers):

\$40,000

APPENDI

Dam	Nama	Year	Height	Priorities of	Televised	Inspections		Embankment Drains			Conduits		Risers	
No.	ji j	Const.	(Feel)	//10/9/	Tape No.	Date	No.	Size	Condition	Size	Len.*	Condition	Hgt.*	Condition
08905	Marrowbone Creek No. 1	1960	46	Deleted		[1	6-		42-		1		
08902	Leatherwood Creek No. 5	1963	57	1	7	9/23/97	2	6"	Pipes sag - poss. settled	36-	332	Satisfactory	36'	i minor speli
08904	Leatherwood Creek No. 3	1964	4]	3			2	6"	In impact basin	42"		Minor Gap at Pipe/Headwall Joint		
08905	Leatherwood Creek No. 2	1964	32	3			2	6"	In impact basin	36"				
08907	Leatherwood Creek No. 6	1964	32	2	6	9/22/97	2	6"	Pipes sag - silt clogging; poss. settled	24-	210	Satisfactory	20'	Satisfactory; Crack in Slab
04504	Johns Creck No. 4	1966	95	l	8	9/24/97	2	6"	In impact basin	30-	278'	Cracks & repairs	39'	Exposed aggregate
04501	Johns Creek No. 2	1967	51	2	9	9/25/97	2	6*	Up to 100% clogged - silt & sand	30-	289'	l cracked segment; l dry joint stain	32'	Exposed aggregate m pitting & spalls
04502	Johns Creek No. 1	1967	62	3			2	8"	Lt. dry; Rt. weeping & clogged	42*				Weathered joint gap exterior
04503	Johns Creek No. 3	1968	50	3			0			24"				
16501	Union Springs - Lower North River No. 80	1967	87	1	1	8/11/97	2	8"	Up to 90% clogged - silt & sand	30*	473'	1 minor crack	53'	Satisfactory
¥502	Briery Branch - Lower North River No. 78	1968	89	1	2	8/12/97	0			36"	470	3 minor cracks	47	Leaking
16503	Hone Quarry - Lower North River No. 83	1968	93	Deleted			0			36"				
01513	Happy Hollow - South River No. 24	1954	35	2	10	9/29/97	1	6"	Replaced 1984; satisfactory	24"	185'	Replaced 1984; satisfactory	14'	Replaced 1984; satisfactory
01501	Inch Branch - South River No. 26	1956	57	3	11	9/30/97	1	8"	Up to 90% clogged - silt; dry joint stain	24"	309'	Satisfactory	15'	Poor; Pitted
01508	Robinson Hollow - South River No. 23	1956	49	3	12	9/30- 10/2/97	2	8-	Over 50% clogged - silt	74"	306'	Satisfactory	16'	Poor; Pined
01502	Toms Branch – South River No. 25	1957	62	2	10	9/29/97	1	_2*	Non-functional; design deviation	24"	371'	Exposed aggregate; 1 crack	17	Replaced 1985-87; m pitting; surface sealed
01522	Wilds - South River No. 7	1957	46	1	4	8/14/97	1	6-	Satisfactory	24*	253	Satisfactory	13'	Satisfactory; surface sealed
01512	Canada Run - South River No. 11	1957	27	3	14	10/2/97	1	8-	Silt in bottom 20%	24*	179'	Satisfactory	9	Satisfactory
01514	Waynesboro Nurs South River No. 19	1957	35	ł	4	8/14/97	1	10*	Satisfactory	24"	194'	Satisfactory	8'	Aggregate exposur
01509	Sengers Mnt. Lake - South River No. 6	1959	56	3	5	8/15/97	1	6"	Satisfactory	24"	343'	Satisfactory	11	Poor; Pitted
ı الأراد	Lofton - South River No. 4 -	1959	56	3	13	10/1/97	0			24*	316'	Satisfactory	18'	Poor; Pitted and Exposed Steel
01507	Hearthstone - Upper North River No. 77	1966	66	1	- 3	8/13/97	0			48-	570'	Minor cracks	49'	Leaking

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* Based on field measurements, which may vary slightly from design dat

Video Tape No. 1 Dam No. 16501 Lower North River No. 80 Union Springs

Conditions at Time of Inspection

Pool level about 12 inches below upstream orifice at time of inspection. Cold water intake pipe flow was temporarily cut off for the duration of riser and outfall conduit inspections.

<u>Riser</u> - Approximate height 53 feet.

Concrete condition generally appears to be satisfactory, with minor pitting of interior surfaces at depths in excess of 30 feet below the top. The location of pitted concrete corresponds with the normally wetted surfaces below the orifice (normal pool) level. The sluice gate does not appear to be leaking.

Outfall Conduit - 30 inch diameter concrete, 473 feet long.

Concrete surfaces generally appear to be in satisfactory condition. A minor crack was noted in crown of pipe, 173 feet from downstream end. Crack appears to be hairline. Joints of pipe appear to be tight.

<u>Embankment Drains</u> - 8 inch diameter corrugated metal pipe (left and right)

Left - televised from downstream to upstream against flow up to the right angle, pipe bend located 107 feet from downstream end. Pipe clogged with reddish brown silt size material which was flushed out with a power washer prior to televising. Wash water tailings included some fine root mass and fragments of the bituminous coating used for corrosion protection on the corrugated metal pipe. Reddish brown staining on the side walls of the pipe extend the full 107 foot length, providing some evidence of the degree of clogging and potential source of material inflow. Based upon the staining patterns within the drain, estimated depths of blockage appear to have been about 90% at 40 feet from the end, 80% at 50 feet, and 40% at 60 feet. The only observed pipe joint occurs at 67 feet. Beyond the joint, pipe perforations are visible on each side. Staining at the one third full level is slightly below the perforations (see plate 1), providing evidence that embankment material of similar color may be migrating into the pipe from this location. At 88 feet, perforations consist of a double line of holes on the right side of the pipe only (embankment left looking downstream). There is no evidence of staining to indicate the perforations in this vicinity are allowing material to migrate in from the embankment. However, as shown by plate 2, the side wall staining abruptly

Video Tape No. 1 Union Springs - Continued

3 feet of the pipe bend to the right (embankment left). This strongly suggests that material is migrating into the drain from a source located further within the filter trench aligned parallel to the dam crest, where pipe gradients are likely higher.

Right - televised against flow up to the capped off end of pipe located 111 feet from the downstream end. From the outlet end, pipe appeared to be clogged with reddish brown silt size material. Upon flushing and prior to televising, noted that the wash water tailings changed from reddish brown initially to brown with a sandy constituent. Side wall staining revealed by televising indicates most of the pipe was probably about 60% clogged prior to flushing. First evidence of perforations in pipe noted in the 30 to 40 foot range, but perforations may be obscured from view by soil within ranges before and after that area. Beyond 92 feet, the left side of pipe (embankment right) is perforated on double lines extending along the mid line of the drain and slightly below the midline. Perforations, throughout the right side of pipe are a suspected source of soil migration into the drain. The sandier material is probably from the filter and its presence reduces the possibility that deposition within the drain was caused by turbid tailwater submerging the drain outlets, i.e., in the absence of flow velocity, the heavier sand particles would not transport into the outlet end as readily as silt size particles.

Apparent Intent of Design

Review of the 1967 as-built embankment drain details, along with the results of design phase slope stability analysis contained in the 1978 Phase I Inspection Report revealed the following:

- 1. The right embankment drain was intended to be capped, as revealed by the televised inspection. Eventhough there is no pipe extending through a filter on the right side of the embankment, the 108 foot length of bituminous coated drain pipe is shown to be perforated to within 10 feet of the outlet end. Also, a 3 foot wide trench drain of fine filter material (sand) extends more than 150 feet up the right abutment.
- 2. Both the right and left embankment drains are shown to be sloped at 2.6% along alignments parallel to the principal spillway. Beyond the televised 90° elbow (termination of TV inspection), the left drain pipe extends 300 feet left on a 4.2% slope.
- 3. By design, the embankment drains (left and right) are perforated with 3/16 inch diameter holes up to within 10 feet of the outlet end. All of the perforated pipe was to be embedded in a coarse filter material (gravel) with a minimum 8 inch cover on the pipe, followed by a minimum 8 inch cover of fine filter material (sand).

Video Tape No. 1 Union Springs - Continued

4. The slope stability analysis during design was based upon the Swedish Circle Method, assuming saturated (consolidated - undrained) soil parameters. All of the tested soils were classified GM (silty gravels, gravel - sand - silt mixture) as per the Unified Soil Classification System. Based on the original design, the lowest computed factor of safety for the downstream slope is 1.33 with no embankment drains and 1.66 with the drains.

Video Tape No. 2 Dam No. 16502 Lower North River No. 78 Briery Branch

Conditions at the Time of Inspection

Pool level was below orifice. Cold water intake pipe flow was temporarily cut-off for the duration of riser and outfall conduit inspections. Leaks in left wall of riser were also plugged with rags and rubber matting prior to televising interior.

Riser - Approximate height 47 feet.

Two holes in left wall about 34 feet below the top of the riser are connected by a hear horizontal crack, which appears to be evidence of an improperly prepared cold joint during construction. Plate 3 provides a view of the cracks after the estimated 25,000 gallons per day (GPD) flow was curtailed by packing the cracks with rags and rubber matting. Concrete surfaces otherwise appear to be generally satisfactory, with aggregate exposure below the normally wetted zone, starting at the orifice level. The sluice gate does not appear to be leaking.

Outfall Conduit - 36 inch diameter concrete, 470 feet long.

Concrete surfaces generally appear to be in satisfactory condition. Possible cracks were noted at distances of 138 feet, 170 feet and 383 feet from the outlet end, with possible seepage (wetness) at the middle (1+70) crack. Joints of pipe appear to be tight.

Embankments Drains

Not applicable

Video Tape No. 3 Dam No. 01507 Upper North River No. 77 Hearthstone

Conditions at Time of Inspection

Pool level about 12 inches below orifice at time of inspection. Cold water intake pipe flow was temporarily cut-off for the duration of riser and outfall conduit inspection.

<u>Riser</u> - Approximate height 49 feet.

The upstream, downstream and right side walls of the riser are cracked, generally in the range from 25 to 45 feet below the top of the riser. Seepage was noted on the joint cracks within the upstream and downstream faces. Probing of the joints was possible to depths of 1 to 4 inches on the downstream face where leakage was estimated to be 10,000 gpd at the worst location. On the upstream wall face, joint probing was possible to a depth of 13 inches at an angle of about 30° off vertical. Leakage at the upstream wall location was estimated at 3000 gpd. Concrete surfaces otherwise appear to be in satisfactory condition. The sluice gate does not appear to be leaking. Leakage along the downstream wall is shown by plate 4.

Outfall Conduit - 48 inch diameter concrete, 570 feet long.

Concrete surfaces generally appear to be in satisfactory condition. Minor cracks were noted in the crown of pipe in the range from 43 to 343 feet from the downstream end. Cracks are hairline with no visible seepage. Joints of pipe appear to be tight.

Embankment Drains

Not Applicable
Video Tape No. 4 Dam No. 01514 South River No. 19 Waynesboro Nursery

Conditions at Time of Inspection

No flow through primary spillway, water bailed into the riser to float a leader line through the conduit prior to televising. Water level within impoundment is low enough to expose top of sluice gate on upstream exterior side of riser.

<u>Riser</u> - Approximate height 8 feet.

Concrete condition is generally satisfactory. Concrete aggregate surfaces are exposed below normal pool level, but the surfaces are not pitted or spalling. Minor hairline cracking noted within upper 3 feet of structure.

Outfall Conduit - 24 inch diameter concrete, 194 feet long.

Concrete surfaces generally appear to be in satisfactory condition. Joints of pipe appear to be tight.

Embankment Drain - 10 inch diameter corrugated metal pipe (right side only).

No flushing required to clear drain prior to televising. Televised against flow up to right angle bend in pipe located 72 feet from downstream end. Corrugated metal pipe appears to be in satisfactory condition. Video Tape No. 4 Dam No. 01522 South River No. 7 Wilda

Conditions at Time of Inspection

No flow through primary spillway. Water was used to float a leader line through the conduit prior to televising.

Riser - Approximate height 13 feet.

Concrete surfaces on interior of riser appear to be coated with a sealer. Concrete condition appears to be satisfactory. Noted a sock in sluice gate which the owner indicates is sealing a leak.

Outfall Conduit - 24 inch diameter concrete, 253 feet long.

Concrete surfaces generally appear to be in satisfactory condition. Joints of pipe appear to be tight.

Embankment Drain - 6 inch diameter (left only).

No flushing required to clear drain prior to televising. Televised against flow up to right angle bend in pipe located 98 feet from downstream end. Helical corrugated metal pipe appears to be in satisfactory condition. Video Tape No. 5 Dam No. 01509 South River No. 6 Sengers Mountain Lake

Conditions at Time of Inspection

No flow through primary spillway. Water used to float a leader line through the conduit prior to televising.

Riser - Approximate height 11 feet.

Concrete surfaces appear to be severely pitted. The sluice gate does not appear to be leaking.

Outfall Conduit - 24 inch diameter concrete, 343 feet long.

Concrete surfaces appear to be in satisfactory condition. Joints of pipe appear to be tight.

Embankment Drain - 6 inch diameter corrugated metal pipe (left only).

No flushing required to clear drain prior to televising. Televised against flow up to right angle bend in pipe located 123 feet from downstream end. Corrugated metal pipe appears to be in satisfactory condition. Video Tape No. 6 Dam No. 08907 Leatherwood Creek No. 6

Conditions at Time of Inspection

Orifice flow cut-off for duration of riser and outfall conduit inspections.

Riser - Approximate height 20 feet.

Concrete condition generally appears to be satisfactory. Top slab of riser is cracked. No visible leaks. The sluice gate does not appear to be leaking.

Outfall Conduit - 24 inch diameter concrete, 210 feet long.

Concrete surfaces generally appear to be in satisfactory condition. Pipe joints appear to be tight.

Embankment Drains - 6 inch diameter corrugated metal pipe (left and right)

Televised against flow up to pipe bend located 54 feet from downstream end, both left and right sides. Both pipes clogged with reddish brown silt size material which was flushed out with a power washer prior to televising. Wash water tailings did not include any fragments of bitumastic coating from the pipe. Settlement has possibly caused pipe sag, as evidenced by partially submerged conditions 15 to 20 feet into drains. Pipe condition appears to be satisfactory. Perforations were visible in the upstream 25 feet of the right drain.

Apparent Intent of Design

Review of the 1964 as-built embankment drain details along with results of the design phase slope stability analysis in the 1981 Phase I inspection report revealed the following:

- 1. The left drain is capped at the end. Eventhough there is no pipe extending through a filter on the left side of the embankment, a 54 foot length of B.C.C.M.P. extending parallel to the principal spillway is shown to be perforated to within 24 feet of the outlet end. Also, a connecting 3 foot wide trench drain of gravelly sand extends about 50 feet up the left abutment.
- 2. Both the right and left embankment drains are shown to be sloped at 0.75% along alignments parallel to the principal spillway. Beyond the 90° elbow (termination of TV inspection), the right drain pipe extends 260 feet right on a 0.5% slope.

Video Tape No. 6 Leatherwood Creek No. 6 Continued

- 3. By design, the minimum cover over the perforated pipes is 12 inches. The plans specify "Lay Perforations Down". Filter limits were specified within a band of gravelly sand gradations.
- 4. Compressible foundation materials were to be replaced with compacted backfill beneath the outfall conduit and parallel embankment drains. Trench drains parallel to the crest were also excavated through the most compressible natural materials and the undercut was backfilled with filter sand.
- 5. The slope stability analysis during design was based upon the Swedish Circle Method. Assuming a fully developed phreatic line, the computed factor of safety for a 2 ¹/₂:1 downstream slope was 1.43 using the lowest strength materials tested. Assuming operable drains, the designers computed a 2.0 factor of safety. The asbuilt downstream slope also included a 15 foot berm to satisfy short-term stability requirements for end of construction conditions.

Video Tape No. 7 Dam No. 08902 Leatherwood Creek No. 5

Conditions at Time of Inspection

Orifice flow temporarily cut-off for duration of riser and outfall conduit inspections.

Riser - Approximate height 36 feet.

Concrete condition generally appears to be satisfactory, with one minor spall in corner of upstream wall (possibly related to form removal). The sluice gate does not appear to be leaking.

Outfall Conduit - 36 inch diameter concrete, 332 feet long.

Concrete surfaces generally appear to be in satisfactory condition. Pipe joints appear to be tight.

Embankment Drains - 6 inch diameter corrugated metal pipe (left and right)

Televised against flow up to bend located 75 feet from downstream end, both left and right sides. Viewing poor beyond root mass located 24 feet into left drain and sag located 40 feet into right drain. Submerged conditions beyond 24 and 40 feet, respectively, may be the result of settlement. Visible pipe condition appears to be satisfactory.

Apparent Intent of Design

Review of the 1981 Phase I Inspection Report revealed the following:

- 1. Both the left and right embankment drains are shown to be 80 feet long B.C.C.M.P. parallel to the principal spillway, with perforations to within 30 feet of the outlet.
- 2. Both of the drains are shown to be sloped at 0.75% along alignments parallel to the principal spillway. Beyond the 90° elbow (termination of TV inspection), drains extend about 20 feet and 80 feet parallel to the crest on the left and right sides, respectively.
- 3. By design, the filter surrounding the perforated drain pipes consists of a coarse filter material (gravel) with a minimum 12 inch cover on the pipe, followed by a minimum 12 inch cover of fine filter material (sand).
- 4. The design report contains recommendations for a trench drain to control the phreatic line and relieve pressures from seepage through the partially weathered rock. Design phase slope stability calculations were based upon the Swedish Circle method and indicated a 1.47 downstream slope factor of safety with no drain.

Video Tape No. 8 Dam No. 04504 Johns Creek No. 4

Conditions at Time of Inspection

No flow through riser at time of inspection. Pool level several inches below invert of cold water pipe. Water bailed into riser to float a leader line through the conduit prior to televising.

Riser - Approximate height 39 feet.

Concrete condition generally appears to be satisfactory. Aggregate surfaces exposed below the orifice (normal pool) level, about 21 feet below the top. Surface patching noted on left wall, about 1 foot below the orifice. No evidence of leakage.

Outfall Conduit - 30 inch diameter concrete, 278 feet long.

Evidence of crack repairs throughout the full length of conduit. Minor cracks noted in crown of pipe. None of the cracks appear to be leaking. Joints of pipe appear to be tight.

Embankment Drains - 6 inch diameter corrugated metal pipe (left and right).

Both of the embankment drains outlet through the left and right side walls of an impact basin. Unable to televise beyond a second bend located about 4 feet inside of both drains.

Apparent Intent of Design

The original design report conclusions contained within the 1979 Phase I Inspection Report indicate the need for a drain to control the phreatic line and prevent piping in the deep boulder areas of both abutments. Perforated pipe outlets were to be extended across the flood plain section, and blind trenches up the abutments. A 1.57 factor of safety was computed for the $2\frac{1}{2}$:1 downstream slope with an embankment drain. Computations were reportedly based on total stress soil parameters. Video Tape No. 9 Dam No. 04501 Johns Creek No. 2

Conditions at Time of Inspection

Pool level about 12 inches below orifice at time of inspection. Cold water intake pipe flow was temporarily cut-off for the duration of riser and outfall conduit inspections.

Riser - Approximate height 32 feet.

Concrete condition generally appears to be satisfactory, with exposed aggregate faces and some minor pitting at depths in excess of about 17 feet from the top. Noted zones of concrete deterioration are relatively minor, generally occurring in corners, and as such are possibly related to form removal during construction. The worst areas appeared to be only isolated spalls, ¹/₄ inch to 1 inch deep along the interior right wall, 20 to 25 feet below the top. A few hairline cracks were noted in the upstream wall, but there was no evidence of leakage. The sluice gate does not appear to be leaking.

Outfall Conduit - 30 inch diameter concrete, 289 feet long.

Concrete surfaces generally appear to be in satisfactory condition. Longitudinal minor hairline cracks were noted in the pipe segment located 34 feet from downstream end. Joints of pipe generally appear to be tight, even though the joints are not grout sealed. Reddish brown staining along crown of conduit at 6th joint downstream from riser (208 feet upstream of plunge pool) provides evidence of possible leakage. As shown by plates 5 and 6, the joint does not appear to be leaking at present, despite its location, which is probably below the phreatic line.

Embankment Drains - 6 inch diameter corrugated metal pipe (left and right).

Right - reddish brown silt size material was partially clogging outlet of right drain. Elected to flush drain before attempting to televise. Flushed drain to bend at 57 feet. Very little of the flush water returned to the outlet end. Initially the tailings were reddish brown and silty, but eventually the tailings turned into a brown, medium to coarse graded sand. Successfully televised full length of drain on withdrawal phase of second attempt. The visible portions of the corrugated metal pipe appear to be in satisfactory condition. Based on side wall staining, estimated that the pipe was about half clogged with sand prior to flushing. Sand is suspected to be from the filter, but source of migration from perforations or a break in pipe was not observed. At 57 feet, pipe bends left (toward embankment right).

Left - Drain appeared to be clean at outlet end. Attempted to televise, but televising revealed pipe was approximately 75% blocked with sand at a distance of 11 feet from outlet end. Televised 39 feet into drain from outlet before sand blockage prohibited further advance of camera. Conditions shown by plate 7 are as viewed from the 39 foot (camera refusal) mark prior to flushing the pipe. Upon flushing, almost none of the flush water was returned at the outlet end, but the flushing did clear the

Video Take No. 9 Johns Creek No. 2 continued

pipe sufficiently to permit successful televising the camera withdrawal phase from a point 50 feet from the outlet end. As viewed, the drain is completely clogged with sand at 50 feet, (7 feet downstream of the 90° elbow location in the right drain). The visible portions of the corrugated metal pipe appear to be in satisfactory condition. Cracks in the bituminous coating appear to be visible in the crown of pipe but perforations were not observed and are probably obscured by the soil infilling, which generally covers at least the bottom half of the drain pipe. Full depth clogging at the drain elbow provides reason to suspect a primary source of filter material migration from the left embankment portion of the drain.

Apparent Intent of Design

Foundation drain details are not included within the 1979 Phase I Inspection Report. The selected as-built plans included within that document do, however, indicate that the foundation drain extends left and right of the principal spillway along a line coinciding with the interface of the shale core and compacted downstream shell. The available information does not indicate where the pipes are terminated, but it appears that a 12 foot wide drainage blanket extends into the base of the core material and blind trenches extend up the relatively steep abutments. The design report recommended the use of fine concrete aggregate for the drain construction, which is consistent with the visual gradation of sand observed within the drain pipes. Specified perforation sizes are not known for the embankment drains at this site. However, if the pipe perforations are 3/16 inch diameter, e.g., as per the as-built plans for Union Springs Dam (which was also built in 1967), then migration of the filter sand into the drain pipes could readily occur without an intermediate coarser filter medium covering the perforations.

The design report indicated the conduit can be placed on bedrock. The sixth joint downstream of the riser where staining was observed on the pipe crown (reference plates 5 and 6) is very likely the first joint downstream of the cut off trench, which contains compressible soils.

Original design stability analysis were performed using a modification of the Swedish Circle Method, assuming that the location of the phreatic line is controlled by drainage. Calculated factors of safety for the zoned embankment downstream 2½:1 slope are not legible in the Phase I Report.

Video Tape No. 10 Dam No. 01513 South River No. 24 Happy Hollow

Conditions at the Time of Inspection

Wier flow temporarily cut-off for duration of riser and outfall condui, inspections.

<u>Riser</u> - Approximate Height 14 feet.

Riser replaced as part of 1984 dam rehabilitation. Concrete condition appears to be satisfactory. No deficiencies noted. Sluice gate condition appears to be good and has reportedly been operated in the past 2 years. Stem and guides are inside of the riser.

Outfall Conduit - 24 inch diameter concrete, 185 foot long.

Concrete surfaces appear to be in satisfactory condition. Conduit was replaced in 1984 (note casting dates on interior of pipe). Joints are sealed and tight.

Embankment Drains - 6 inch diameter corrugated metal pipe (left and right).

The portion of drains parallel to principal spillway were replaced during the 1984 dam rehabilitation.

Left - televised against flow up to right angle pipe bend located 68 feet from downstream end and also televised withdrawal. Helical CMP is generally clean and judged to be in satisfactory condition. Double line of perforations (lower right, embankment left) in the range from 54 to 62 feet from the outlet end. Perforated portion appears to have been embedded in crushed stone.

<u>Right</u> - televised against flow up to right angle pipe bend located 72 feet from downstream end and also televised withdrawal. Helical CMP is generally clean and judged to be in satisfactory condition. Double line of perforations (lower left, embankment right) in the range from 66 to 68 feet from the outlet end. Perforated portion appears to have been embedded in crushed stone. A tear in the crown of pipe was noted 26 feet from downstream end. The tear does not appear to be leaking, nor is there evidence of soil migration into the drain at this location

Apparent Intent of Design

The 1984 as-built plans indicate that the dam rehabilitation was completed May 30, 1985. The embankment drain replacements parallel to the outfall conduit were indicated to be non-perforated,

Video Tape No. 10 Happy Hollow Continued

even though perforations were observed on both the left and right sides. At the bend where televising ended, the new drains were connected to the existing trench drain which extends 109 feet left and right parallel to the dam crest, connecting to blind trenches at each abutment. Filter material surrounding the drain pipe was specified as a clean sand and gravel mixture with a 2 foot minimum cover on the pipe.

Video Tape No. 10 Dam No. 01502 South River No. 25 Toms Branch

Conditions at Time of Inspection

Flow over wier (about 2 inches) was temporarily cut-off for the duration of riser and outfall conduit inspections.

Riser - Approximate Height 17 feet.

Adjacent landowner reports that the riser was replaced about 10 years ago because of deteriorating concrete. Existing concrete surfaces appear to be surface treated with a sealer inside and outside. Concrete condition appears to be generally satisfactory, with some evidence of minor pitting. Construction joints are tight with no apparent evidence of leakage. The sluice gate does not appear to be leaking.

Outfall Conduit - 24 inch diameter concrete, 371 feet long.

Concrete surfaces generally appear to be in satisfactory condition. Exposed aggregate faces throughout the length of conduit, but little evidence of pitting. Circumferential crack in pipe segment located 81 feet from downstream end. Joints of pipe appear to be tight.

Embankment Drain - 2 inch diameter iron pipe (left only).

Televised up to capped off end of pipe located 17 feet from downstream end. The pipe is either ductile iron or cast iron and does not appear to have any perforations or potential source of infiltration. Conditions within the upstream end of pipe are shown by plate 8.

Apparent Intent of Design

The typical sections contained within the 1978 Phase I Inspection Report indicate that the design includes an embankment drain. However, the design phase stability analyses are not available to indicate the dependence of the original design on drainage conditions created by the embankment drain. If built in accordance with the 1956 design plans, the dam would have a 10 inch diameter non-perforated corrugated metal pipe outlet on the left side, extending 138 feet back into the embankment. From that point, the plans indicate 10 inch perforated pipes extending right and left, 64 feet and 340 feet, respectively, with connecting 4 foot by 4 foot bank drains extending an additional 21 feet up the right abutment and 48 feet up the left abutment. There is no indication that these features were constructed.

Video Tape No. 11 Dam No. 01501 South River No. 26 Inch Branch

Conditions at Time of Inspection

Riser flow temporarily cut-off for duration of riser and outfall conduit inspections.

Riser - Approximate Height 15 feet.

Concrete surfaces are pitted and are judged to be in poor condition, yet remain serviceable. No leakage observed at construction joints. No leaks observed at sluice gate. Operator stem is missing.

Outfall Conduit - 24 inch diameter concrete, 309 feet long.

Concrete surfaces generally appear to be in satisfactory condition. Pipe joints appear to be tight.

Embankment Drain - 8 inch diameter corrugated metal pipe (left only).

Reddish brown silt size material was present at outlet end, but the drain did not appear to need flushing in order to televise. At 10 feet from outlet end, televising revealed a blockage of about 90%. Sampling from the camera revealed that the blockage consisted of brown silt with no sand constituent. After several forced attempts to advance the camera beyond the blockage, televising was possible to a point 45 feet from the downstream end before the camera advance was again blocked by the rough edges of a pipe joint. Plate 9 shows apparent evidence of soil migration through the pipe joint at that location. The video footage count on the photograph at that point is incorrect.

Apparent Intent of Design

As-built drawings contained in the 1980 Phase I Inspection Report indicate that the embankment drain consists of a 144 foot length of 8 inch, non-perforated corrugated metal pipe, which connects to perforated pipe beyond a 60° "Y" located at the filter trench. An 8 inch perforated pipe extends 132 feet towards the left side of the embankment and 148.6 feet towards the right, with 4 foot by 4 foot bank drains extending an additional 80 feet up the left and right abutments. The perforated pipe was positioned in the center of a 4'6" square filter trench containing river run sand and gravel. According to the Phase I Inspection Report, design phase stability calculations are unavailable.

Video Tape No. 12 Dam No. 01508 South River No. 23 Robinson Hollow

Conditions at Time of Inspection

Very slight riser flow. Used rags to temporarily impede flow for duration of riser and outfall conduit inspections.

Riser - Approximate height 16 feet.

Concrete surfaces are pitted and are judged to be in poor condition, yet remain serviceable. No leakage observed at construction joints. No leakage observed at sluice gate.

Outfall Conduit - 24 inch diameter concrete, 306 feet long.

Concrete surfaces generally appear to be in satisfactory condition, with some minor aggregate exposure throughout length of pipe. Pipe joints generally appear to be tight, however, grout at joints is typically missing or cracked.

Embankment Drains - 8 inch diameter corrugated metal pipe (left and right).

Left- clear flow, but drain outlet partially clogged with reddish brown silt size material. Pipe was flushed with power washer. Wash water tailings reddish brown initially then brown. All of tailings appear to be silt with no sand. Carnera was advanced to refusal at 62 feet from downstream end, but viewing was not possible beyond 10 feet where water within an apparent sag in the pipe submerges the carnera.

Right- embankment seepage right of outlet conduit was investigated by removing soil and rock slough covering the outlet of a right embankment drain. Flow was clear, but pipe outlet partially clogged with reddish brown silt size material. First attempts to televise drain revealed that the drain was more than 50% clogged. Flushed drain with a power washer. Washwater tailings revealed reddish brown silt to brown and included numerous items of debris, specifically wood fragments, crushed aggregate, and bituminous coating from the pipe. After flushing, televising was possible up to a bend located 121 feet from the outlet end. Pipe appears to be in satisfactory condition, with bituminous coating losses near the outlet end. Siltation within the drain extends the full length up to the bend at 121 feet. Conditions at about 100 feet from the outlet are shown by plate 10.

Apparent Intent of Design

The 1979 Phase I Inspection Report indicates that the design data and as-built records for this 1956 dam were not available for review.

Video Tape No. 13 Dam No. 01511 South River No. 4 Lofton

Conditions at Time of Inspection

Less than an inch depth of flow into riser, not including the 1 inch garden hose siphon clamped over the side wall. No blockage of flow required for inspection.

Riser - Approximate height 18 feet.

Interior concrete surfaces are pitted and exterior exposures of aggregate and reinforcing steel were observed in the supports for the top slab of the riser. The riser concrete is judged to be in poor condition, yet the structure remains serviceable. Concrete conditions are shown by plates 11 and 12. No leaks were observed in the concrete riser or at the sluice gate.

Outfall Conduit - 24 inch diameter concrete, 316 feet long.

Concrete surfaces appear to be in satisfactory condition. Joints of pipe generally appear to be tight, however, grout seals at the joints are somewhat deteriorated.

Embankment Drains

Not applicable.

Video Tape No. 14 Dam No. 01512 South River No. 11 Canada Run

Conditions at Time of Inspection

No flow through primary spillway.

Riser - Approximate height 9 feet.

Concrete surfaces appear to be in satisfactory condition. No apparent leaks in riser walls. The sluice gate does not appear to be leaking.

Outfall Conduit - 24 inch diameter concrete, 179 feet long.

Concrete surfaces generally appear to be in satisfactory condition. Joints of pipe appear to be tight.

Embankment Drain - 8 inch diameter corrugated metal pipe (left only).

Flushing not required prior to televising. Televised up to the "Y" connection located 62 feet from downstream end. The corrugated metal pipe appears to be in satisfactory condition. Reddish brown silt in bottom 20% of pipe throughout entire run. Surface of dry silt appears to contain ripples, possibly indicative of wave action. The surface appearance may suggest that the silt was either deposited or riffled on the surface by receding tailwater which submerged the outlet end.

Apparent Intent of Design

As-built drawings contained in the 1978 phase I Inspection Report indicate that the embankment drain consists of a 64 foot length of 8 inch non-perforated corrugated metal pipe, which connects to a 67° "Y" located at the filter trench. A 6 inch perforated pipe extends 200 feet towards the left side of the embankment and 300 feet towards the right, with 4 foot by 4 foot bank drains extending an additional 25 feet up the left and right abutments. The perforated pipe was positioned in the center of a 4 feet square filter trench containing clean sand and gravel. According to the Phase I Inspection Report, design phase stability calculations are unavailable.



APPENDIX B



PLATE 1 - UNION SPRINGS Left embankment drain, 75 feet from outlet end. Note perforations left and right, with staining to the ¹/₃ full level just below perforations.



PLATE 2 - UNION SPRINGS

Left embankment drain, 104 feet from outlet end. Note double line of perforations on right side only (embankment left). Staining on left transitions from 1/3 full to 1/2 full within 3 feet of bend to right (embankment left).



PLATE 3 - BRIERY BRANCH Segment of riser leak, interior left wall, 34 feet below top. Note rubber matting in hole to stem flow.



PLATE 4 -HEARTHSTONE Riser Leak, interior downstream wall, 36 feet below top.



PLATE 5 - JOHNS CREEK NO. 2 Outfall conduit joint staining at crown -- 208 feet from downstream end.



PLATE 6 - JOHNS CREEK NO. 2 Outfall conduit joint staining at 208 feet from downstream end, straight on view.

PLATE 7 - JOHNS CREEK NO. 2 Left embankment drain sand clog as viewed 39 feet from outlet end prior to flushing.



PLATE 8 - TOMS BRANCH Embankment drain (2 inch iron pipe) as viewed near end cap, 17 feet from outlet end. No perforations or apparent source of inflow.



PLATE 9 - INCH BRANCH Soil migration through embankment drain joint, 45 feet from outlet end.



PLATE 10 - ROBINSON HOLLOW Right embankment drain siltation as viewed about 100 feet from outlet end.



PLATE 11 - LOFTON Deterioration of concrete, interior wall of riser near top. Note pitting and friable condition revealed by chipping with a hammer.



PLATE 12 - LOFTON Loss of concrete section and exposed reinforcing steel on exterior of riser at the waterline.



Johns Creek Dam No. 1, McDaniels Lake Dam No. 04502



Johns Creek Dam No. 2 Dam No. 04501 Johns Creek Dam No. 3 Dam No. 04503



Johns Creek Dam No. 4 Dam No. 04504



Leatherwood Creek Dam No. 2 Dam No. 08905



Leatherwood Creek Dam No. 3 Dam No. 08904





Leatherwood Creek Dam No. 5 Dam No. 08902



Leatherwood Creek Dam No. 6 Laurel Park Dam No. 08907

Lower North River No. 80, Union Springs Dam Dam No. 16501



Lower North River No. 78, Briery Branch Dam No. 16502



South River Dam No. 24, Happy Hollow Dam No. 01513



South River Dam No. 25, Toms Branch Dam No. 01502



South River Dam No. 26, Inch Branch Dam No. 01501



South River Dam No. 23, Robinson Hollow Dam No. 01508



South River Dam No. 7, Wilda Dam No. 01522



South River Dam No. 11, Canada Run Dam No. 01512



South River Dam No. 19, Waynesboro Nursery Dam No 01514



South River Dam No. 6, Sengers Mountain Lake Dam No. 01509



South River Dam No. 4, Lofton Lake Dam No. 01511



Upper North River Dam No. 77, Hearthstone Lake Dam No. 01507





SHEET <u>1</u> <u>1</u>

TELEVISION INSPECTION LOG

< Z

CLIENT :]	DIVISIO	N OF DAM SAFE	TY JOB # : <u>31246</u> DATE : <u>AUGUST 11, 1997</u> TIME : <u>1100</u>
LOCATION	DAM N	0. 16501, LOWEI	R NORTH RIVER NO. 80, UNION SPRINGS
TELEVISIN	G: RISE	R INTERIOR	STATIONING FROM : TOP OF RISER PIPE :
DUTY : 1	rig no. <u>3</u>	46 OPERATOR J	LP VIDEO TAPE: 01
STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00	1	5	Begin at top of opening downstream side of intake tower.
0+02	2	35	
0+53		905	Top of riser to top of downstream side of intake tower outlet pipe.
+		905	Left side wall of intake tower. Invert of gate opening is 51'. Gate opening is 3' wide x 2.5' high.
+			Rubber in good condition and no evidence of leakage. 1.8' wall thickness. Invert to 12" pipe
+			is 31'.
+		1664	All left side wall.
+		1665	Begin upstream wall.
0+51		2255	29' square opening.
+		2256	Right side wall.
+	_	2503	
+	-		Minor pitting of concrete mostly at 30' to bottom of intake. All measurements from top of riser.
+			
+			
+			
+			
+			
SEE BACK F	OR CODES I	FOR: MANHOLE TYPE, 1	MANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

[31246\TYLOGS\TYLOG_01]

GANNETT FLEMING, INC.

		TELEVISUAL INSPECTION I	LOOLUP C	DDES	MAN	HOLE TYPE
ł	RUN INT	POPMATION	MAINLINE INFORMATION		I BR	
	CODE	COMMENTS	CODE	COMMENTS	2 PR 3 BL	ECAST
	1	BEGIN RUN	45	APPARENT CRITICAL POINT OF SAG. *** -INCHES OF LIQUID		HER
l	5	BEGIN PIPE	46	DROP CONNELTION AT 6 D'ELOCK		
	3	END PIPE	47	PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION		
Ł	4	END KUN KUN LUNJIJIS UN MAM TUUT FILE SECTIONS	49	CRACKED PIPE AT JOINT		
	16	SAME PRINT AS ENCOUNTERED ON PREVIOUS SETUP	50	SHEAR CRACK		
I	i i	RUN HAS NUT BEEN LLEANED PRIDE TO INSPECTION	51	LINEAR CRACK		
ł	8	RUN HAS BEEN CLEANED PRIUR TO INSPECTION	52	ELGIN LINEAR CRACK		
L	9	RUN REQUIRES CLEANING	54	MULTIPLE CRACKS	MIN	HOLP HIM
L	1 10	BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55	BEGIN MULTIPLE CRACKS	ព្រករប	
L	112	EXTERNAL REPAIR REQUIRED	56	END MULTIPLE CRACKS		ETOCAM MU
L	13	CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE		JIKLAN PR
L	14	PIPE DEFLECTION THRU RUN OBSERVED	20 59	END CRUSHED PIPE		WIGSTIC HIT
L	115	UNABLE ID CUNTINUE DUE ID	60	PIECES MISSING (*** -SIDE)	•	
L	IONT D	JEAD VITAN	61	HOLE IN PIPE		
L	JOINT IL	ATVERATION	62	CHANGE IN PIPE TYPE FROM TO		
ł	CODE	COMMENTS	63	CHANGE IN PIPE SECTION LENGTH FROM WAN FEET		
Ļ	21		64	CHANGE OF DIRECTION ***		
ł	25	JOINT - LEAKING	65	INSIGNIFICANT FLOW DBSERVED		
L	23	JUINT - SLIGHT ROOT PENETRATION	66	FLOW APPEARS TO BE EXFILTRATING		
L	24	JOINT - MODERATE ROOT PENETRATION	67			
Į	25	HINT - VIOC OR OPEN	69	CONTINUES		
F	27	JUINT - VERTICALLY MISALIGNED	70	SLIGHT ROOT PENETRATION	HDP	TYPE
L	58	JOINT - HORIZONTALLY MISALIGNED	71	MODERATE ROOT PENETRATION	1116	
Ł	29	JOINT - BEGIN SAG	72	SEVERE ROOT PENETRATION	1 10	
Į	31	22A9 T23T RIA - TAIDL				.г :Р
Ł	35	JUINT - AIR TEST FAIL	PERAIC	LINEVERTATION	3 RC	P
Ł	33	JUINT - REPAIRED, ANN GALLONS OF GROUT	CODE	COMMENTS	4 CI	P OR DIP
I.	35	JUNT - NSIGNTEICANT FLOW DESCRYED	00			/C (1151)
ł	36	JUINT - FLUV APPEARS TO BE EXFILTRATING	80	SERVICE CUNN, ### D'CLUCK PUSITION, WYE DR TEE	6 01	
ł.	1		01	PROT. WAR -INCHES		
Ł			85	HOUSE NO.		
L			83	SERVICE CONNECTION CRACKED		
Ł			84	SCIGHT ROUT PENETRATION		
1			86	SEVERE ROOT PENETRATION		
			87	INTERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED		
	1		88	INTERMITTENT FLOW, SUMP PUMP CUNNECTED, VERIFIED		
1	1		89	INSIGNIFICANT FLOW OBSERVED	DVT	I
			90	SEBARE CUMM - VID IECT DVCC		
I			92	SERVICE CONN AIR TEST FAIL		V CINLY
ł			93	SERVICE CONN. + NOT TESTED, NO CLEANOUT ACCESS	5 1/	V & AIR TE
ł	1		94	SERVICE CONN WATER SATURATION TEST PASS	3 1	V. AIR TEST
I		AAN LTPE DATA IN CUMMENTS	72	SERVILE LUNN WATER SATURATION TEST FAIL		V L REPAIR

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| | | | Т | ELEVISION | INSI | PECTION | LOG | | | |
| CLIENT : L | DIVISIO | N OF DAM SAFE | ТҮ | | JOB # | : 31246 | DATE : AUGUST 11, | 1997 | TIME : | 1330 |
| LOCATION: | DAM N | O. 16501, LOWEI | R NORTH RI | VER NO. 80, UNI | ON SI | PRINGS | | · · · · · · · · · · · · · · · · · · · | | |
| TELEVISING | : OUT | FALL CONDUIT | STA' | FIONING FROM : DO | OWNS | TREAM ENI | D PIPE : 30", RC | P, 437 FT | | |
| DUTY : <u>1</u> R | IG NO. <u>3</u> | 46 OPERATOR J | LP | VIDEO TAPE: 01 | | | | | | |
| STATION | CODE | VIDEO FOOTAGE | COMMENTS | | | | | | | |
| 0+00 | 1 | 2780 | | | | | | _ | | |
| 0+02 | | 2905 | | | | | | | | |
| 1+73 | 49 | 3466 | | | | ····· | | | | |
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(31246\TVLOGS\TVLOG_02)

	TELEVISUAL INSPECTION I	LOOKUP CO	DES	MANHOLE TYPE
RUN IN	PORMATION	MAINLI	NE INFORMATION	1 BRICK
CODE	COMMENTS	CODE	COMMENTS	2 PRECAST 3 BLOCK
1	BEGIN RUN Begin Pipe	45 46	APPARENT CRITICAL POINT OF SAG, ### -INCHES OF LIQUID DROP CONNECTION AT 6 D'CLOCK	
3	END PIPE	47 48	CRACKED PIPE AT SERVICE CONNECTION PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION	
5	CHD TELEVISUAL INSPECTION	49 50	CRACKED PIPE AT JDINI Shear Crack	
7	RUN HAS NOT BEEN CLEANED PRIOR TO INSPECTION BUN HAS NOT DEEN CLEANED PRIOR TO INSPECTION	51 52	LINEAR CRACK	
9	RUN REQUIRES CLEANING	53 54	END LINEAR CRACK MULTIPLE CRACKS	MANHOLE MA
11	BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55 56	BEGIN MULTIPLE CRACKS END MULTIPLE CRACKS	
13	CAN BE INTERNALLY REPAIRED PHYL DELLECTION THRU RUN DBSERVED	57 50	CRUSHED PIPE	1 UPSTREAM MH. 2 DOWNSTREAN MH
15	UNABLE TO CONTINUE DUE TO ***	59 60	END CRUSHED PIPE PIECES HISSING (*** -SIDE)	
JOINT I	INFORMATION	61 62	HOLE IN PIPE CHANGE IN PIPE TYPE FROM TO	
CODE	comments	63	CHANGE IN PIPE SECTION LENGTH FROM WAA FEET TO ANY FEET	
55 51	JOINT - LEAKING	64 65	CHANGE OF DIRECTION *** INSIGNIFICANT FLOW OBSERVED	
23 24	JOINT - SLIGHT ROOT PENETRATION JOINT - MODERATE ROOT PENETRATION	66 67	FLUW APPEARS TO BE EXFILTRATING BEGIN	
25	JUINT - SEVERE ROOT PENETRATION JUINT - WIDE OR OPEN	68 69	END CONTINUES	
27	JOINT - VERTICALLY MISALIGNED JOINT - HORIZONTALLY MISALIGNED	70 71	SLIGHT ROOT PENETRATION MODERATE ROOT PENETRATION	PIPE TYPE
30	AZ MILL - BLGIN SAG AD - THIDL AD SAG	12	SEVERE ROUT PENETRATION	1 VCP
32	ALA TEST PASS IIINT - AIR TEST PASS IIINT - BERALCE - FALLONE OF CURUE IIINT - BERALCE - FALLONE OF CURUE	SERVICE	S INFORMATION	2 ACP 3 RCP
34	JUNT - NOT TESTED, UNABLE TO ISOLATE	CODE	COMMENTS	4 CIP OR DIP 5 PVC
36	JOINT - FLOW APPEARS TO BE EXFILTRATING	80 81	SERVICE CONN., *** D'CLOCK POSITION, WYE DR TEE SERVICE CONN., *** D'CLOCK POSITION CUT-IN, PROT. #** -INCHES	6 OTHER
		83 83	HOUSE ND. SERVICE CONNECTION CRACKED	
		84 85	SLIGHT ROUT PENETRATION MODERATE ROUT PENETRATION	
		86 87	SEVERE ROOT PENETRATION INTERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED	
		88 89	INTERMITTENT FLOW, SUMP PUMP CONNECTED, VERIFIED INSIGNIFICANT FLOW DBSERVED	DUTY
		90 91	SERVICE CONN AIR TEST PASS	
		92	SERVICE CONN AIR TEST FAIL SERVICE CONN NOT TESTED, NO CLEANDUT ACCESS	2 TV & AIR TEST
	*** TYPE DATA IN COMMENTS	95	SERVICE LUNN WATER SATURATION TEST PASS SERVICE CONN WATER SATURATION TEST FAIL	L REPAIR 4 TV L REPAIR

GANNET MING, INC.

SHEET 1

TELEVISION IN SPECTION LOG

CLIENT : DIVISION OF DAM SAFETY JOB # : 31246 DATE : AUGUST 11, 1997 TIME : 1745 LOCATION: DAM NO. 16501, LOWER NORTH RIVER NO. 80, UNION SPRINGS TELEVISING : LEFT EMBANKMENT DRAIN STATIONING FROM : OUTLET END PIPE : 08", CMP, 107 FT VIDEO TAPE: 01 OPERATOR JLP DUTY:1 RIG NO. 346 COMMENTS **STATION** CODE VIDEO FOOTAGE Corrugated pipe. 0 + 004303 1 4327 0 + 022 0 + 094349 Deposits. 0+6727 Bend in pipe to the right. 4628 1 + 07+++ + ++ + + + +++ SEE BACK FOR CODES FOR: MANHOLE TYPE, MANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

[31246\TVLOGS\TVLOG_03]

	TELEVISUAL INSPECTION I	OOKUP C	0005	MANHOLE TYPE
RUN IN	FORMATION	MAINU	INF INFORMATION) BRICK
CODE	COMMENTS	CODE	COMMENTS	2 PRÉCAST 3 BLOCK
1	REGIN PLIN	45	APPARENT CRITICAL POINT OF SAG. ### -INCHES OF LIQUID	4 UTHER
2	BEGIN PIPE	46	DROP CONNECTION AT 6 D'CLOCK	
3	END PIPE	47	CRACKED PIPE AT SERVICE CONNECTION	
4	END RUN RUN CONSISTS OF ### FOOT PIPE SECTIONS	4B	PERIPHERAL LEAK AROUND CUT-IN SERVICE CUNNEL TIDN	
5	END TELEVISUAL INSPECTION	49	CKALKED FIFE AT JUINT	
é	SAME POINT AS ENCIUNTERED UN PREVIOUS SETUP	50	I INFAR CRACK	
,	RUN HAS NUT BEEN LEEANED POING IN INSPECTION	52	BEGIN LINEAR CRACK	
9	RUN HAS BLEW CLEANLE FRIDE TO HIST CONDA	53	END LINEAR CRACK	r
io i	FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	54	MULTIPLE CRACKS	i MANIHOLE (H)
ł	BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55	BEGIN MULTIPLE CRACKS	
5	EXTERNAL REPAIR REQUIRED	50	CONSULT FIDE	
3	CAN BE INTERNALLY REPAIRED	59	BEGIN CRUSHED PIPE	> DOWNSTREAM MH
4	PHT PUTTELTING PROFEDUATEVED UNARE TO CONTINUE DUE TO NUM	59	END CRUSHED PIPE	
-	WHITE IS CONTINUE FOR THE TE	60	PIECES MISSING (*** -SIDE)	
NNT I	NFORMATION	61	HOLE IN PIPE	
/1111 I		62	CHANGE IN PIPE TYPE FROM TO	
UDE	COMMENTS	63	CHANGE IN MIRE SECTION LENGTH FROM MAN FEET	
21	GINT	64	CHANGE DE DIRECTION WWW	
2	JOINT - LEAKING	65	INSIGNIFICANT FLOW DBSERVED	
3	JUINT - SLIGHT ROOT PENETRATION	66	FLOW APPEARS TO BE EXFILTRATING	
24	JOINT - MODERATE ROOT PENETRATION	67	BEGIN	
25	JOINT - SEVERE ROOT PENETRATION	60	END	
6	JUNT - WIDE, UR DREN IDINT - MEDTICALLY MIRALICHED	67 70	CUNTINUES	
20	JUINT - VERTLALLT MISALIUNED JOINT - HOPIZONTALLY MISALIUNED	71	MANERATE RATE REALINN	PIPE TIPE
9	JOINT - BEGIN SAG	72	SEVERE ROOT PENETRATION	
30	JOINT - END SAG	•		1 VCP
- IL	JUNI - AN IEST FAN	SERVIC	R INFORMATION	2 ACP
33	JOINT - REPAIRED 400 GALLONS OF GROUT	AND F		
14	JOINT - NOT TESTED, UNABLE TO ISOLATE	WDE	COMMENIS	S PVC
35	JUINT - INSIGNIFICANT FLOW DBSERVED	80	SERVICE CONN, *** D'CLOCK POSITION, WYE OR TEF	6 DTHER
70	JUNN - FLOW APPEARS TO BE EXFILTRATING	8)	SERVICE CONN. *** D'CLOCK POSITION CUT-IN	L
		07	PROT, WHA -INCHES	
		82	HLUSE NU.	
		0J 84	SUNVILL CONNECTION CRACKED	
		85	HODERATE RIVIT PENETRATION	
		86	SEVERE ROOT PENETRATION	
		87	INTERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED	
		66	INTERMITTENT FLOW, SUMP PUMP CONNECTED, VERIFIED	
		89	INSIGNIFICANT FLOV DBSERVED	i duty
		90	FLUX IS USAGE	
		71 92	SEBAILE CONN - VID JEET EVIT	1 TV DNLY
		93	SERVICE CONN - NOT TESTED NO CLEANDUT ACCESS	TZET RIA & VI S
		94	SERVICE CONN VATER SATURATION TEST PASS	3 TV, AIR TEST
	*** TYPE DATA IN CONHENTS	95	SERVICE CONN WATER SATURATION TEST FAIL	1 REPAIR
				A TV & REPAIR

x			GANNETT MING, INC. SHEET 1 1								
			TELEVISION INSPECTION LOG								
CLIENT : D	IVISIO	N OF DAM SAFE	TY JOB # : 31246 DATE : AUGUST 11, 1997 TIME : 1815								
LOCATION:	CATION: DAM NO. 16501, LOWER NORTH RIVER NO. 80, UNION SPRINGS										
relevising	: RIGH	IT EMBANKMEN	T DRAIN STATIONING FROM : OUTLET END PIPE : 08", CMP, 111 FT								
DUTY : 1 R	UTY: 1 RIG NO. 346 OPERATOR JLP VIDEO TAPE: 01										
STATION	CODE	VIDEO FOOTAGE	COMMENTS								
0+00	1	4630	Corrugated pipe.								
0+02	_2	4651									
0+12			Possible hole or lining torn.								
0+22			Debris on left side of pipe.								
1+11		4900	Line is plugged off at this point.								
+											
+			From 0+39 to plug debris build-up.								
+											
+											
+											
+											
+											
+											
+											
+											
+											
+											
SEE BACK FO	OR CODES I	OR: MANHOLE TYPE, N	MANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.								

[31246\TVLOGS\TVLOG_04]

	TELEVISUAL INSPECTION I	MANHOLE TYPE		
RUN IN	PORMATION	MAINL	INE INFORMATION	
1 CODE	COMPARIES	CODE	COMMENTS	3 BLOCK
1 2 3 4 5 6 7 8 9 10 11 12	BEGIN RUN BEGIN RUN BEGIN PIPE END RUN RUN CONSISTS OF *** FOOT PIPE SECTIONS END TELEVISUAL INSPECTION SAME PIINT AS ENCOUNTERED ON PREVIOUS SETUP RUN HAS NOT BEEN CLEANED PRIOR TO INSPECTION RUN HAS BEEN CLEANING FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE BALANCT OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE EXTERNAL REPAIR REQUIRED	45 46 47 48 49 50 51 52 54 55 54 55 55	APPARENT CRITICAL POINT OF SAG, *** -INCHES OF LIQUID DROP CONNECTION AT 6 O'CLOCK CRACKED PIPE AT SERVICE CONNECTION PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION CRACKED PIPE AT JOINT SHEAR CRACK LINEAR CRACK BEGIN LINEAR CRACK END LINEAR CRACK BEGIN MULTIPLE CRACKS END MULTIPLE CRACKS END MULTIPLE CRACKS	MANHOLI HN
13	CAN BE INTERNALLY REPAIRED	5/	RECIN CONSIDER DIDE	2 DUNSTREAM MH
14 15	PIPE DEFLECTION THRU RUN OBSERVED UNABLE TO CONTINUE DUE TO WWW NDOBLETION	58 59 60 61	BEGIN EROSHED PIPE END CRUSHED PIPE PIECE'S HISSING (*** -SIDE) HDLE IN PIPE	
JOINT	ATURALIUN	62	CHANGE IN PIPE TYPE FROM TO	
21 21 22	COMMENTS JOINT JOINT - LEAKING	63 64 65	CHANGE IN PIPE SECTION LENGTH FROM WWW FEET TD ##W FEET CHANGE OF DIRECTION ### INSIGNIFICANT FLOW OBSERVED	
23 24 25 26	JOINT - SLIGHT RODT PENETRATION JOINT - MODERATE ROOT PENETRATION JOINT - SEVERE ROOT PENETRATION JOINT - WIDE OR DPEN	67 68 69	EUD BEGIN CONTINUES	
27 28 29 30	JOINT - VERTICALLY MISALIGNED JOINT - HORIZONTALLY MISALIGNED JOINT - BEGIN SAG JOINT - FND SAG	70 71 72	SLIGHT ROOT PENETRATION MODERATE ROOT PENETRATION SEVERE ROOT PENETRATION	
31	JUNT - AIR TEST FASS JUNT - AIR TEST FALL ALL TEST FALL	SERVIC	E INFORMATION	2 ACP 3 RCP
34	JOINT - NOT TESTED, UNABLE TO ISOLATE	CODE	COMMENTS	5 PVC
35	JOINT - INSIGNIFICANT FLOW OBSERVED JOINT - FLOW APPEARS TO BE EXFLUTRATING	80 81 83 84 85 86 87	SERVICE CONN, *** D'CLOCK POSITION, WYE DR TEE SERVICE CONN. *** D'CLOCK POSITION EUT-IN, PRUI. *** -INCHES HOUSE NO. SERVICE CONNECTION CRACKED SLIGHT ROOT PENETRATION MODERATE ROOT PENETRATION SEVERE ROOT PENETRATION INTERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED	6 DTHER
		09 90	INITERATITENT FLOW, SUMP PUMP CONNECTED, VERIFIED INSIGNIFICANT FLOW OBSCRVED FLOW IS USAGE	DUTY
		92 93 94	SERVICE CUNN AIR TEST PASS SERVICE CUNN AIR TEST FAIL SERVICE CUNN NOT TESTED, NO CLEANOUT ACCESS SERVICE CONN NOT TESTED, NO CLEANOUT ACCESS	I TV DNLY 2 TV & AIR TEST 3 TV AIR TEST
	NEN TYPE DATA IN COMMENTS	95	SERVICE CONN WATER SATURATION TEST FAIL	L REPAIR 4 TV L REPAIR

GANNETT 'ING, INC.

SHEET 1 (

TELEVISION IN CECTION LOG

CLIENT : I	DIVISIO	N OF DAM SAFE	JOB # : 31246 DATE : AUGUST 12, 1997 TIME : 1055						
LOCATION:	DAM N	O. 16502, LOWE	R NORTH RIVER NO. 78, BRIERY BRANCH						
TELEVISING	: <u>RISE</u>	R INTERIOR	STATIONING FROM : TOP OF RISER PIPE :						
DUTY : 1 R	IG NO. <u>3</u>	46 OPERATOR J	LP VIDEO TAPE: 02						
STATION	CODE	VIDEO FOOTAGE	COMMENTS						
0+00	1	5	Downstream wall.						
0+02	2	35	Downstream wall.						
+		700	Downstream wall.						
+		701	Left side wall.						
0+34			Two holes in wall with near horizontal crack leaking estimated 2500 gpd. Also, prior to televising						
+			both holes on left side wall were partially blocked with rags and rubber matting. Leaks are						
+			worse than they appear on video.						
0+32			12" line plugged off. Crack begins at one hole and leads to another.						
+		1170	Bottom intake pipe at 0+32'.						
+		1171	Upstream wall.						
+		1640	Right side gate valve opening 36" gate valve appears to be in good condition; no leakage.						
+		1884							
+									
+									
+									
+	1								
+									
+									
SEE BACK FO	OR CODES I	FOR: MANHOLE TYPE, M	MANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.						

131246\TVLOGS\TVLOG_051

	TELEVISUAL INSPECTION I	LOOKUP CO	DES	MINTAL P TYPP
RUN IN	FORMATION	MAINU	NR INFORMATION	
MADE				2 PRECAST
CONP	WHATU?	CUDE	COMMENIS	3 BLOCK
1	BEGIN RUN	45	APPARENT CRITICAL POINT OF SAG. *** -INCHES OF LIQUID	4 UTHER
2	BEGIN PIPE	46	DROP CONNECTION AT 6 D'CLOCK	
3	END PIPE	47	CRACKED PIPE AT SERVICE CUNNELTION	
4	[N]) KONT KONTONZIZUZ DE ANA LOUIT LULE ZECTIONZ	40	CRACKED PIPE AT JOINT	
5	CANE PRINT AS ENCRUTION	50	SHEAR CRACK	
7	RUN HAS NOT BEEN CLEANED PRIDE TO INSPECTION	51	LINEAR CRACK	
8	RUN HAS BEEN CLEANED PRIOR TO INSPECTION	52	BEGIN LINEAR CRACK	
.9	RUN REQUIRES CLEANING	53 54	MULTIPLE CRACKS	MANTION PALM
10	RALANTE OF FLEW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55	BEGIN MULTIPLE CRACKS	BARHOLL TW
15	EXTERNAL REPAIR REQUIRED	56	END MULTIPLE CRACKS	
13	CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE	I UPSTREAM MH.
14	PIPE DEFLECTION THRU RUN OBSERVED	59	END CRUSHED PIPF	E DUWNSTREAM P
15		60	PIECES MISSING (*** -SIDE)	•
IONT I	NFORMATION	61	HOLE IN PIPE	
		62	CHANGE IN PIPE TYPE FRUM TO	
JUL	COMMENTS	63	TO ANA FEET	
21	THIOL	64	CHANGE OF DIRECTION ***	
55	JOINT - LEAKING	65	INSIGNIFICANT FLOW OBSERVED	
23	JOINT - SLIGHT ROOT PENETRATION	66	FLUV APPEAKS TU BE EXFILIRATING	
24 25	IDINT - SEVERE ROOT PENETRATION	68	END	
56	JOINT - WIDE OR OPEN	69	CONTINUES	ſ
27	JOINT - VERTICALLY MISALIGNED	70	SLIGHT ROOT PENETRATION	PIPE TYPE
28	JOINT - HORIZONTALLY MISALIGNED	72	MUDERATE RUUT PENETRATION	
30	JUNT - END SAG			
34	JOINT - AIR TEST PASS	CPDVI/S	THROPH LETION	2 ACP
35	JOINT - AIR TEST FAIL	DFFLICE		3 RCP
33	JUINT - REPAIRED, ### GALLUNS OF GROUT IDINT - NOT TESTED 1HIABLE TO ISOLATE	CODE	COMMENTS	4 CIP OR DIP
35	JUINT - INSIGNIFICANT FLOW DBSERVED	80		6 OTHER
36	JOINT - FLOW APPEARS TO BE EXFILTRATING	81	SERVICE CONN. VIN D'CLOCK POSITION, WIE OR TEE	
			PROT. WAR -INCHES	
		82	HOUSE NO.	
		84		
		85	HODERATE ROUT PENETRATION	
		86	SEVERE ROOT PENETRATION	
		67	INTERMITIENT FLOW, PUSSIBLE SUMP PUMP CONNECTED	
		89	INSIGNIFICANT FLOW OBSERVED	DICTY
		90	FLOW IS USAGE	
		91	SERVICE CONN AIR TEST PASS	
		93	SERVICE CONN - NOT TESTED NO CLEANDUT ACCESS	2 IV LINLY
		94	SERVICE CONN - WATER SATURATION TEST PASS	3 TV, AIR TEST
	ARA TYPE DATA IN COMMENTS	95	SERVICE CONN WATER SATURATION TEST FAIL	& REPAIR
				4 TV & REPAIR

SHEET I Or I

TELEVISION INSPECTION LOG

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : AUGUST 12, 1997 TIME : 1400

LOCATION: DAM NO. 16502, LOWER NORTH RIVER NO. 78, BRIERY BRANCH

TELEVISING : OUTFALL CONDUIT

STATIONING FROM : DOWNSTREAM END PIPE : 36", RCP, 470 FT

OPERATOR JLP VIDEO TAPE: 02 DUTY : 1 RIG NO. 346

STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00	1	2157	
0+02	_2	2200	
1+38		2617	Possible hair line crack.
1+70		2756	Possible hair line crack. Possible seepage.
3+83 ·		3520	Possible crack in pipe.
4+70		3729	
+		3745	8' and 12' pipe sections.
+			
+			
+			
+			
+			
+			
+			
+			
-+-			
+			
SEE BACK FO	R CODES F	OR: MANHOLE TYPE, N	MANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

	TELEVISUAL INSPECTION L	OOKUP CO	DES	MANHOLE TYPE
UN INF	ORMATION	VE INFORMATION	1 BRICK	
ODE	COMMENTS	CODE	COMMENTS	2 PRECAST 3 BLOCK
1	BEGIN RUN	45	APPARENT CRITICAL POINT OF SAG INCHES OF LIQUID	4 DTHER
2	BEGIN PIPE	46	DROP CONNECTION AT 6 D'CLOCK	L
3	END PIPE	47	CRACKED PIPE AT SERVICE CONNECTION	
	CND ICTCATATA THEOCCILON	40	PERIFIERAL LEAR AROUND LUTAIN SERVICE CONNECTION	
)	CANE DOINT AS ENDOINTERED ON PREVIOUS SETUP	50	SHEAR CRACK	
	RUN HAS NOT BEEN CLEANED PRIOR TO INSPECTION	51	LINEAR CRACK	
	RUN HAS BEEN CLEANED PRIOR TO INSPECTION	52	BEGIN LINEAR CRACK	
	RUN REQUIRES CLEANING	53		MINTOLP AM
	FLOW CAN BE ATTRIBUTED TO GENERAL JUINI LEAKAGE	55	BEGIN MULTIPLE CRACKS	NAVHOLT AM
	BALANLI UN TLUW LAN BE ATTRIBUTED TO GENERAL SOUNT CENERGE	56	END MULTIPLE CRACKS	
	CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE	1 UPSTREAM MH.
	PIPE DEFLECTION THRU RUN OBSERVED	58	BEGIN CRUSHED PIPE	2 DOWNSTREAM MH.
	UNABLE TO CONTINUE DUE TO ###	57 60	PIFCES MISSING (*** -SIDE)	
งร ก	JONN / TINN	61	HOLE IN PIPE	
ui n	(PULMATION	62	CHANGE IN PIPE TYPE FROM TO	
)I	COMMENTS	63	CHANGE IN PIPE SECTION LENGTH FROM WAW FEET	
		64	LU ### FLL CHANGE DE DIRECTION ###	
	ININT - LEAKING	65	INSIGNIFICANT FLOW DBSERVED	
1	JUINT - SLIGHT ROOT PENETRATION	66	FLUV APPEARS TO BE EXFILTRATING	
	JOINT - MODERATE ROOT PENETRATION	67	BEGIN	
	JUINT - SEVERE RUOI PENETRATIUN	60 60	CONTINUES	
	IDINT - VERTICALLY MISALIGNED	70	SLIGHT ROOT PENETRATION	BIBY TYDY
1	JUINT - HORIZONTALLY MISALIGNED	71	MODERATE ROUT PENETRATION	I TUL IIIS
)	JOINT - BEGIN SAG	72	SEVERE ROOT PENETRATION	
	JUNI - LNU SAU MINI - AND TEST DASS			
	JUINT - AIR TEST FAIL	SERVICE	INFORMATION	
	JOINT - REPAIRED, GALLONS OF GROUT	MUDE	ONALPHTC	4 CIP OR DIP
	JOINT - NOT TESTED, UNABLE TO ISOLATE	CUDE	COMMENTS	5 PVC
	JUINT - INSIGNIFICANT FLOW DUSERVED	80	SERVICE CONN, *** D'CLOCK POSITION, WYE OR TEE	6 DTHER
	Suma FLOW AFFERTS TO BE EXTERNATING	81	SERVICE CONN., NOW D'CLOCK POSITION, CUT-IN,	
		82		
		83	SERVICE CONNECTION CRACKED	
		84	SLIGHT ROUT PENETRATION	
		85	MUDERATE ROUT PENETRATION	
		87	INTERMITIENT FLACTON PASSING SHAD DIAD CONNECTED	
		88	INTERMITTENT FLOW, SUMP PUMP CONNECTED, VERIFIED	
		89	INSIGNIFICANT FLOW OBSERVED	DUTY
		90	FLUY IS USAGE	
		71 92	SERVICE CONN - AIR JEST FAN	I TY DNLY
		93	SERVICE CONN NOT TESTED, NO CLEANOUT ACCESS	2 TV & AIR TEST
		94	SERVICE CUNN - VATER SATURATION TEST PASS	3 TV, AIR TEST
	NEW AVAILABLE IN CONTRACTOR	06		

GANNETT **!ING, INC.**

TELEVISION INSPECTION LOG

CLIENT :	DIVISIO	N OF DAM SAFE	TY JOB # : 31246 DATE : AUGUST 13, 1997 TIME : 1000							
LOCATION	CATION: DAM NO. 01507, UPPER NORTH RIVER NO. 77, HEARTHSTONE									
TELEVISIN	LEVISING : RISER INTERIOR STATIONING FROM : TOP OF RISER PIPE :									
DUTY : <u>1</u>	RIG NO. <u>3</u>	46 OPERATOR J	LP VIDEO TAPE: 03							
STATION	CODE	VIDEO FOOTAGE	COMMENTS							
+		5	Downstream wall.							
+		35								
0+25			Minor crack.							
0+26	_		Minor crack.							
0+29	_		Possible seepage through joint, 3" penetration into joint.							
0+33			Seepage through wall and cracks.							
0+34			Seepage through wall. Hole in wall 1" penetration.							
0+36)+36 Hole in wall leaking an estimated 10,000 gpd. 4" penetration.									
0+49			Bottom of intake.							
+	_		Downstream wall.							
+		1173	Left sidewall.							
+	_	1548	Left sidewall.							
+		1549	Upstream wall.							
0+22		1835	Invert to square opening is 22'.							
0+44			Hole in wall, leaking estimated 3,000 gpd. 13" penetration at an angle.							
0+48		2193	Gate valve opening is 5" from bottom. 35" deep. No leakage.							
0+41	-	2345	Rightside wall.							
0+28			Top of slope upstream.							
0+26			Minor crack 3' from downstream. 5' from w.p. stream corner.							
0+23			Minor crack.							
+			Minor crack top slab.							
+		2887								
SEE BACK	FOR CODES I	OR: MANHOLE TYPE, M	IANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.							

	TELEVISUAL INSPECTION	LOOKUP C	DDES	MANHOLE TYPE
RUN IN	PORMATION	MAINL	INE INFORMATION	1 BRICK
())]]	27449440	CODE	2THENDO	2 PRECAST
CUDP .		CODE	(UMMEAI)	4 DTHER
1	BEGIN RUN	45	APPARENT CRITICAL POINT OF SAG, ### -INCHES OF LIQUID	
2	FNN PIPE	46		
,		48	PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION	
4	CND TELEVISIAL INSPECTION	49	CRACKED PIPE AT JOINT	
6	SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP	50	SHEAR CRACK	
7	RUN HAS NOT BEEN CLEANED PRIOR TO INSPECTION	51	LINEAR CRACK	
0	RUN HAS BEEN CLEANED PRIOR TO INSPECTION	52	PLUIN LINLAK LKALK	
9	RUN REDUIRES LEEANING	54	MULTIPLE CRACKS	
1	BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55	BEGIN HULTIPLE CRACKS	BUTURANE A.M.
2	EXTERNAL REPAIR REQUIRED	56	END MULTIPLE CRACKS	
3	CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE	
4	PIPE DEFLECTION THRU RUN OBSERVED	59		C DUWNSTREAM
2		60	PIECES MISSING (*** -SIDE)	L
NNT I	NTONATION	61	HOLE IN PIPE	
an 1		62	CHANGE IN PIPE TYPE FROM TO	
)DL	COMMENTS	63	CHANGE IN PIPE SECTION LENGTH FROM MAN FLET	
		64	CHANGE DE DIRECTION ###	
ż	JOINT - LEAKING	65	INSIGNIFICANT FLOW DBSERVED	
3	JOINT - SLIGHT ROOT PENETRATION	66	FLOV APPEARS TO BE EXFILTRATING	
4	JOINT - MODERATE ROOT PENETRATION	67	BEGIN	
2 6	JUNT - SEVERE RUUT PENETRATION	60	CAD CAN DE S	
7	JOINT - VERTICALLY MISALIGNED	70	SLIGHT ROOT PENETRATION	NOP TOP
28	JOINT - HORIZONTALLY MISALIGNED	71	MODERATE ROOT PENETRATION	INF IIIP
9	JOINT - BEGIN SAG	72	SEVERE ROOT PENETRATION	
-0 11	JUINT - END SAG IDINT - AIR TEST RASS			
12 .	JAINT - AIR TEST FAIL	SERVIC	E INFORMATION	
3	JUINT - REPAIRED, GALLONS OF GROUT	MUL	27 MUM	4 CIP OR DIP
4	JEINT - NUT TESTED, UNABLE TE ISULATE	CUPE	COMPLEXIO	5 PVC
6	JUINT - FLUV APPEARS TO BE EXFLUTRATING	80	SERVICE CONN. *** D'CLOCK POSITION, WYE OR TEE	6 OTHER
		01	PROT MAN -INCHES	••••••••••••••••••••••••••••••••••••••
		85	HOUSE NO.	
		83	SERVICE CONNECTION CRACKED	
		84	SLIGHT ROUT PENETRATION	
		85 86	MUDEKATE RUUT PENETRATION	
		87	INTERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED	
		88	INTERMITTENT FLOW, SUMP PUMP CONNECTED. VERIFIED	
		89	INSIGNIFICANT FLOV OBSERVED	DUTY
		90	FLUY IS USAGE	
		וע 92	SERVICE CONN - AIR TEST PASS	
		9 <u>5</u>	SERVICE CONN NOT TESTED, NO CLEANDUT ACCESS	2 TV & AIR TE
		94	SERVICE CONN WATER SATURATION TEST PASS	3 TV. AIR TEST
	AAA TAUT DATA IN COMMENTS	95	SERVICE CONN WATER SATURATION TEST FAIL	L REPAIR
				A TV & RE

TTP

1	PL TYPE	
1 2 3 4 5 6	VCP ACP RCP CIP OR DIP PVC DTHER	

[UTY
3	TV DNLY
2	TV & AIR TEST
3	TV, AIR TEST

- PAIR

GANNETI MING, INC.

SHEET 1 1

TELEVISION INSPECTION LOG

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : AUGUST 13, 1997 TIME : 1230

LOCATION: DAM NO. 01507, UPPER NORTH RIVER NO. 77, HEARTHSTONE

TELEVISING : OUTFALL CONDUIT STATIONING FROM : DOWNSTREAM END PIPE : 48", RCP, 570 FT

DUTY : 1 RIG NO. 346 OPERATOR JLP VIDEO TAPE: 03

STATION	CODE	VIDEO FOOTAGE	COMMENTS				
0+00	1	3118					
0 + 02	2						
0+43	49						
0+90	51						
2+37			Begin minor cracks.				
2+43			End minor cracks.				
2+48	49						
2+65			Minor crack.				
3+00			Minor crack.				
3+27	49		Minor crack at joint.				
3+43	49		Minor crack at joint.				
5+70							
+		4501	12' pipe sections.				
+							
+							
+							
+	.]						
+							
+		-					
+							
+							
+							
SEE BACK F	SEE BACK FOR CODES FOR: MANHOLE TYPE, MANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.						

	TELEVISUAL INSPECTION	LOOKUP (DDES	MANHOLE TYPE
RUN IN	POLMATION	MAINU	INE INFORMATION	I BRICK
CODE	COMMENTS	CODE	COMMENTS	3 BLOCK
1		45	APPARENT CRITICAL POINT OF SAG. *** -INCHES OF LIQUID	4 OTHER
2	BEGIN PIPE	46	DROP CONNECTION AT 6 O'CLOCK	
3	END PIPE	47	CRACKED PIPE AT SERVICE CONNECTION	
4	END RUN, RUN CONSISTS OF WAM FULLY PIPE SECTIONS	48	CRACKED PIPE AT ININI	
	END TELEVISUAL INSPECTION SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP	50	SHEAR CRACK	
7	RUN HAS NOT BEEN CLEANED PRIOR TO INSPECTION	51	LINEAR CRACK	
8	RUN HAS BEEN CLEANED PRIOR TO INSPECTION	52	BEGIN LINEAR CRACK	
9	RUN REQUIRES CLEANING	ວມ 54		MANTIOLE AND
10	RALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55	BEGIN MULTIPLE CRACKS	BIANHOLE VIV
12	EXTERNAL REPAIR REQUIRED	56	END MULTIPLE CRACKS	
13	CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE	2 DOWNSTREAM MH
14	PIPE DEFLECTION THRU RUN DUSERVED	59	END CRUSHED PIPE	E DUWNSTREAM TAS
15		60	PIECES HISSING (*** -SIDE)	
JOINT	RPORMATION	61	HOLE IN PIPE	
COD#		62	CHANGE IN PIPE TYPE FRUM TU CHANGE IN PIPE SECTION LENGTH EROM AND FEET	
	COMMENTS	6.5	TO ### FEET	
21	тирс	64	CHANGE OF DIRECTION ***	
55	JOINT - LEAKING	65	INSIGNIFICANT FLOW DBSERVED	
23	JUNI - SLIGHT KUUT PENETRATION INNT - MUDERATE ROOT PENETRATION	67	BEGIN	
25	JUINT - SEVERE ROOT PENETRATION	68	END	
56	JDINT - VIDE OR DPEN	69	CONTINUES	
27	JUINT - VERTICALLY MISALIGNED	70		PIPE TYPE
29	JOINT - HURIZUNTALLT MISALIGNED JOINT - BEGIN SAG	72	SEVERE ROOT PENETRATION	<u>}</u>
30	JOINT - END SAG			
32	JUNT - AIR TEST FAIL	SERVIC	I INFORMATION	
23	JUINT - REPAIRED, GALLONS OF GROUT	CODF	ZTANDAN	4 CIP OR DIP
34	JUNT - NOT TESTED, UHABLE TU ISOLATE IDINT - INSIGNEDIANT FLOW OBSERVED	WD6	COMALENTS	5 PVC
36	JUNT - FLUV APPEARS TO BE EXFLUERATING	80	SERVICE CONN, *** O'CLOCK POSITION, WYE UR TEE	6 LIHER
}		ot	PRDI. WAR - INCHES	
		85	HOUSE ND.	
1		83	SERVICE CONNECTION CRACKED	
		85	ACIGHT RUCH PENETRATION	
		86	SEVERE ROOT PENETRATION	
		87	INTERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED	
		89	INTERMITIENT FLOW, SUMP PUMP CONNECTED, VERIFIED	NITT
		90	FLOV IS USAGE	ווטע
		91	SERVICE CONN AIR TEST PASS	
1		56	SERVICE CONN AIR TEST FAIL	
Į.		7.) 94	SERVICE CUNN WATER SATURATHIN TEST PASS	3 TV, AIR TEST
1	ZTRIMHOU NI ATAO NI ATAO YA	95	SERVICE CUNN WATER SATURATION TEST FAIL	& REPAIR
1				I 4 TV L REPAIR

GANNETT 1ING, INC.

SHEET 1 L

TELEVISION INSPECTION LOG

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : AUGUST 13, 1997 TIME : 1230

LOCATION: DAM NO. 01514, SOUTH RIVER NO. 19, WAYNESBORO NURSERY

 TELEVISING : RISER INTERIOR
 STATIONING FROM : TOP OF RISER
 PIPE : ______

DUTY : 1 RIG NO. 346 OPERATOR JLP VIDEO TAPE: 04

STATION	CODE	VIDEO FOOTAGE	COMMENTS
+		5	Downstream wall.
+		35	8' from bottom of intake to top of riser slab.
+	_	318	Left side wall.
+		382	Upstream wall.
+		507	Right side wall.
+		590	
+			
+		591	Outside of intake tower.
+		592	Left wall
+		686	Upstream wall.
+		935	
+		936	Right side wall.
+		1079	Downstream wall.
+		1270	3' from top hairline crack.
+			
+			
+			
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+			
+			
+			
+			
SEE BACK FO	R CODES F	OR: MANHOLE TYPE, N	IANIIOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

131340/TYLOGS/TYLOG (M)

	Tash a INTERN		
eux in	PORMATION	MAINL	INE INFORMATION
CODE	coknenis	CODE	COMMENTS
1	BEGIN RUN	45	APPARENT ERITICAL POINT OF SAG, ### -INCHES OF LIQUID
è	BEGIN PIPE	46	DROP CONNECTION AT 6 D'CLOCK
3	END PIPE	47	CRACKED PIPE AT SERVICE CONNECTION
1	END RUN RUN CONSISTS OF *** FOOT PIPE SECTIONS	48	PERIPHERAL LEAK ARDUND CUT-IN SERVICE CONNECTION
5	END TELEVISUAL INSPECTION	49	LRACKED PIPE AT JOINT
6	SAME PHINT AS ENCOUNTERED ON PREVIOUS SETUP	50	SHEAR CRACK
2	RUN HAS NUT BEEN CLEANED PRIDE TO INSPECTION	51	LINEAR CRACK
8	RUN HAS BEEN CLEANED PRIDE TO INSPECTION	52	BEGIN LINEAR CRACK
9	RUN REDUIRES CLEANING	53	END LINEAR CRACK
10	FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	54	MULTIPLE CRACKS
11	BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55	BEGIN MULTIPLE CRACKS
15	EXTERNAL REPAIR REQUIRED	56	END MULTIPLE CRACKS
13	CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPL
14	PIPE DEFLECTION THRU RUN OBSERVED	58	BEGIN CRUSHED PIPE
15	UNABLE TO CONTINUE DUE TO	59	END CRUSHED PIPE
		60	LIFE? HI22INF (*** -217F)
JOINT I	NPOLMATION	61	NULL IN FIFL CHANCE IN DIDE TYPE FORM TO
		62	CHANGE IN FIFE FIFE FRUM TH CHANGE IN DIDE SECTION LENGTH FOOM WAR FEFT
WDL	COMMENTS	63	THE ARE THE ACTION CONTRACTOR TO THE
21	IOINT	64	CHANGE DE DIRECTION NEW
22		65	INSTENDED TO THE OFFICE
27	HINT - SEIGHT POOT PENETPATION	66	FLOW APPEARS TO BE EXFLUTRATING
24	IDINT - MODERATE RODT PENETRATION	67	BEGIN
25	JOINT - SEVERE ROOT PENETRATION	60	END
26	JDINT - WIDE OR DPEN	69	CONTINUES
27	JUINT - VERTICALLY HISALIGNED	70	SLIGHT ROOT PENETRATION
58	JUINT - HORIZONTALLY MISALIGNED	71	HODERATE ROOT PENETRATION
29	JOINT - BEGIN SAG	72	SEVERE RUDI PENETRATION

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CODE COMMENTS

- 80 SERVICE CONN, *** D'CLOCK POSITION, WYE DR TEE 81 SERVICE CONN. ... D'CLOCK POSITION CUT-IN. PROL MAR -INCHES
- 85 HOUSE NO.

95

- 83 SERVICE CONNECTION CRACKED
- **B4** SLIGHT ROUT PENETRATION
- 85 HOUERATE ROOT PENETRATION
- 86 SEVERE ROOT PENETRATION
- 87
- INTERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED 88 INTERMITTENT FLOW, SUMP PUMP CONNECTED, VERIFIED
 - INSIGNIFICANT FLOW DBSERVED
- 89 90 FLOW IS USAGE
- 91
- SERVICE CONN. AIR TEST PASS 92 SERVICE CONN. - AIR TEST FAIL
- 93
- SERVICE CONN. NOT TESTED, NO CLEANDUT ACCESS 94 SERVICE CONN. - WATER SATURATION TEST PASS SERVICE CONN. - WATER SATURATION TEST FAIL

WHH TYPE DATA IN COMMENTS

JUINT - END SAG

JOINT - AIR TEST PASS

JUINT - AIR TEST FAIL

the mean management of the second second

30

31

35 33

34

35

36

JUINT - REPAIRED, +++ GALLONS OF GROUT JUINT - NOT TESTED, UNABLE TO ISOLATE

JOINT - FLOW APPEARS TO BE EXFILTRATING

JDINT - INSIGNIFICANT FLOW OBSERVED

GANNE 4ING, INC.

SHEET 1 i

TELEVISION INSPECTION LOG

CLIENT : I	CLIENT : DIVISION OF DAM SAFETY JOB # : 31246 DATE : AUGUST 14, 1997 TIME : 100								
LOCATION:	DAM N	O. 01514, SOUTH	RIVER NO. 19, WAYNESBORO NURS	SERY					
TELEVISING	ELEVISING : OUTFALL CONDUIT STATIONING FROM : RISER PIPE : 24", RCP, 194 FT								
DUTY : 1 R	IG NO. <u>3</u>	46 OPERATOR J	LP VIDEO TAPE: 04						
STATION	CODE	VIDEO FOOTAGE	COMMENTS						
0+00	1	1270							
0+02	2	1300							
1+94		2008	15' pipe sections.						
+		2025				·····			
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SEE BACK F	OR CODES	FOR: MANHOLE TYPE, I	IANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODE	S					

EWN EVOLUATION MAINLINE INFORMATION CODE COMMENTS CODE COMMENTS 1 EEGIN PIPE 45 APPARENT CENTER A TOTAL POINT OF SAG, *** - INCRES OF LIQUID 2 END PIPE 45 APPARENT CENTER A TOTAL POINT OF SAG, *** - INCRES OF LIQUID 3 END PIPE 45 APPARENT CENTER A TOTAL POINT OF SAG, *** - INCRES OF LIQUID 4 END PIPE 45 CRACKED PIPE AT SERVICE CONNECTION 5 END PIPE 45 CRACKED PIPE AT SERVICE CONNECTION 6 SARE POINT AS ENDIFICRE TO INSPECTION 55 LICEAR ARGUND CONTINUE CONNECTION 6 SARE ALCARTOP PIPE TO INSPECTION 55 LICEAR CRACK 7 POINT AS SEEN CLEARED PIPE TO INSPECTION 55 LICEAR CRACK 8 RED INSPECTION CONSECUTION 55 LICEAR PORTOR OF PARCENCE 9 FROM HAS INDIC OCT AND CONSECUTION 55 LICEAR RECARCE 9 FROM HAS INDIC OCT AND CONSECUTION 55 LICEAR RECARCE 9 FROM HAS INDIC OCT AND CONSECUTION 55 LICEAR RECARCE 9 FROM HAS INDIC OCT AND CONSECUTION 55 LICEAR RECARCE 9	MANHOLE TYPE
CODE CODE CODE CODE CODE 1 ECGN PUPE 5 APPAREIN CRUITED. POINT OF SAG. *** - INCHES OF LIQUID 2 ECGN PUPE 5 APPAREIN CRUITED. POINT OF SAG. *** - INCHES OF LIQUID 3 ECGN PUPE 5 APPAREIN CRUITED. POINT OF SAG. *** - INCHES OF LIQUID 4 ECGN PUPE 5 APPAREIN CRUITED. POINT OF SAG. *** - INCHES OF LIQUID 5 SAR POINT SECTION 5 APPAREIN CRUITED. POINT OF SAG. *** - INCHES OF LIQUID 5 SAR POINT SECTION 5 APPAREIN CRUTENCE CONNECTION 6 SAR POINT SECTION 5 ECGN LINEAR CRACK 7 RUM HAS NOT DECNEARD PRIOR TO DESERVED 5 ECGN LINEAR CRACK 8 RUM HAS SEEN CLEANED PRIOR TO DEGRERAL JOINT LEAKAGE 5 FLOW CALLEAR POINT OF SAG. *** - INCHES OF LIQUID 10 FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE 5 FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE 5 11 BALANCE DF FLOW AND DESERVED 5 ECGN LINEAR CRACK 5 12 LINEAR CRACK 5 FLOW PRESCHE PIPE 5 13 LINEAR CRACK 5 FLOW PRESCHE PIPE	
UDUE UNREAND UDUE UNREAND 1 BECGN PUP 2 BECGN PUP 3 END PUP 4 END RUN CONSISTS D 5 END PUP 4 END RUN CONSISTS D 6 SAME PRINT AS CNOWLERED ON PREVIOUS SETUP 6 SAME PRINT AS ENCOUNTERED ON PREVIOUS SETUP 7 FULL HAS MOI BEEN ELEANED PRIDE TO INSPECTION 8 RUN HAS MOI BEEN ELEANED PRIDE TO INSPECTION 9 RUN HAS MOI BEEN ELEANED PRIDE TO INSPECTION 9 RUN HAS MOI BEEN ELEANED PRIDE TO INSPECTION 9 RUN HAS MOI BEEN ELEANED PRIDE TO INSPECTION 10 PERINTRAL LEAK AROUND CUT INSPECTION 11 PERINTRALLY REPARED 12 EXTERNAL KEPAINED 13 CAN BE ANTERNOLLY REPAIRED 14 PERINTRALLY REPAIRED 15 UNARLE TU CONTINUE ON DESTRYED 16 PERINTRATING THE REPAIRED 17 PERINTRATION THEU RUN DESTRYED 18 UNARLE TU CONTINUE DUE TO *** 19 UNARLE TU CONTINUE AND DESTRYED 10 THERMINICHT THEU REPARED 20 JOI	2 PRECAST
1 BEGIN RUM 45 APPARENT CRITICAL POINT OF SAC, *** - INCHES OF LIQUID 2 BEGIN RUM 45 APPARENT CRITICAL POINT OF SAC, *** - INCHES OF LIQUID 3 END PIPE 46 DROP CONNECTION AS DUCCTON 47 4 END RUM RUM CONSISTS DF *** FOOT PIPE SECTIONS 49 CRACKED PIPE AT JOINT END RUM CONSISTS DF *** FOOT PIPE SECTION 5 END TELECYLLANED PRIOR TO INSPECTION 50 SHAR REAL APPARENT CRITICAL POINT OF SAC CONNECTION 6 SAME PINI AS INCONTICKED ON PREVIDUS SETUP 50 SHAR REAL 20 SHAR REAL 7 PUM HAS NOT BEEN CLEANED PINOR TO INSPECTION 50 SHAR REAL CRACKED PIPE AT JOINT 8 RUM HEADINES CLEANING TO GENERAL JOINT LEAKAGE 54 MULTIPLE CRACKS 10 BEING REDAR FROMER TO GENERAL JOINT LEAKAGE 55 BEGIN RULI PIPE CRACKS 11 BEING REDAR REAL REPAIR REDURED 59 BEING REDURED PIPE 50 12 LANNED WILL DELETION THAU RUN DBSERVED 59 END RULI PIPE SECTION *** 13 CAN RED PIPE 50 END RULI PIPE SECTION LEAKAGE 50 14 PIPE DEFLECTION THAU RUN DBS	3 BLOCK
2 BEGIN PIPE 46 DROP CONNECTION AT 6 DUCLOCK 4 END PIPE 47 CRACKD PIPE ALL SERVICE CONNECTION 4 END RUK RUN CONSISTS OF *** FOOT PIPE SECTIONS 49 PERIPHERAL LEAK ARDUND CUT-IN SERVICE CONNECTION 5 END RUK RUN CONSISTS OF *** FOOT PIPE SECTION 50 SIGLAR CHACK 6 SAME POINT AS ENCLURAND PIPE ALL CLAIR OF PIPE ALL DIANT CONNECTION 50 LINEACE PIPE ALL CLAIR AND CUT-IN SERVICE CONNECTION 7 PUN HAS BETA LELEAND PRIOR TO INSPECTION 50 SIGLAR CHACK 51 8 RUN HAS BETA LELEAND COTTINUE DIA CONNECTION 52 LINEACK 54 MULTIPLE CHACKS 10 FLUE VISAN ECONIEST CONTROL DINSPECTION 52 LINEACK 54 MULTIPLE CHACKS 11 PUT CAN BE ATTRIBUTE TO GENERAL JOINT LEAKAGE 54 MULTIPLE CHACKS 55 ECON MULTIPLE CHACKS 12 DUNT CONDUCTION THEO RUN DESERVED 58 BEGIN ROUSED PIPE 59 ECON MULTIPLE CHACKS 14 PIPE DIFLECTION *** 50 LINEACE IN PIPE SECTION *** FEET 15 UNABLE TU CONTINUE DUE TO *** 58 BEGIN ROUSERYED PIPE 59 E	4 0110
3 END PIPE END PUR ANN CONSISTS OF *** FOOT PIPE SECTIONS 47 4 END PRIM RUN CONSISTS OF *** FOOT PIPE SECTIONS 49 5 END TELEVISUAL INSPECTION 49 5 END TELEVISUAL INSPECTION 49 6 SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP 50 7 PUN HAS NOT BEEN CLEANED PHIOR TO INSPECTION 50 8 RUN REQUIRES CLEANED PHIOR TO INSPECTION 50 9 RUN REQUIRES CLEANED PHIOR TO INSPECTION 50 9 RUN REQUIRES CLEANED PHIOR TO INSPECTION 50 9 RUN REQUIRES CLEANED PHIOR TO INSPECTION 50 10 FLEDV CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE 50 11 BALAGED OF THE ADDINT TO MERCHAL SCHERAL JOINT LEAKAGE 50 12 CATERE THREAT LEAKING 50 ECON MULTIPLE CRACKS 13 CATERE THECTION THE REDURED TO THE SCHERAL SCH	
4 END RUN RUN CONSISTS UP ARA FULLY PLY SECTION 50 SEARCE DIPLETATION 50 5 END RUN RUN ECONSISTS UP ARA FULLY PLY SECTION 50 SEARCE REAL 30 6 SAME POINT AS ENCLONTERED DINSPECTION 50 SEARCE REAL 30 7 RUN HAS NOT BEEN CLEANED PRIOR TO INSPECTION 50 SEARCE REAL 51 8 RUN HAS BEEN CLEANED PRIOR TO INSPECTION 52 BEGIN LINEAR CRACK 9 RUN HAS BEEN CLEANED PRIOR TO INSPECTION 52 BEGIN LINEAR CRACK 10 RECOVER WE ATTRIBUTE DI GENERAL JOINT LEAKAGE 54 MULTIPLE CRACKS 11 BUANCE DE FLETENT REDURED 59 EGIN MULTIPLE CRACKS 12 CATIER ATTREDURED 59 EGIN MULTIPLE CRACKS 13 CAN BE INTERNALTY REPAIRED 59 EGIN MULTIPLE CRACKS 14 PIPE DEFLECTION THAR ROUND BESEVED 59 EGIN MULTIPLE CRACKS 15 UNABLE TU CONTINUE DUE TO *** 60 PIECES MISSING (*** -SIBE) 16 UCANT MODISTREED 59 EGIN MULTIPLE CRACKS 17 JUINT + LEAKING 61 COMMENTS 18 JUINT + MODISTREET	
3 END TELEVISION INPORTATION OF PREVIOUS SETUP 50 SIEAR CRACK 4 SAME PRINT AS ENCLONNED PRIOR TO INSPECTION 51 LINEAR CRACK 9 RUM HAD BEEN CLEANING TO SPECTION 52 EGIN LINEAR CRACK 9 RUM HAD BEEN CLEANING TO SPECTION 52 EGIN LINEAR CRACK 9 RUM HAD BEEN CLEANING TO SERVED 53 ELMICAR CRACK 9 RUM HAD BEEN CLEANING TO SERVED 53 ELMICARKS 10 BLANCE OF TIOW CAN BE ATTREBUTED TO GENERAL JOINT LEAKAGE 54 MULTIPLE CRACKS 11 BLANCE OF TIOW CAN BE ATTREBUTED TO GENERAL JOINT LEAKAGE 54 MULTIPLE CRACKS 12 CATERNAL REPAIR REQUIRED 59 EGIN DENSIEND PIPE 57 13 CAN BE ATTREBUTE RED 59 EGIN DENSIEND PIPE 59 14 PIPE DEFLECTION THRU RUN DBSERVED 59 EGIN DENSIEND FIPE 50 14 PIPE DEFLECTION THRU RUN DBSERVED 59 EGIN DENSIEND FIPE 50 15 UNANTIS 64 CHANGE IN PIPE SECTION LENGTH FROM *** FEET 10 21 JOINT - MODERATE RODT PENETRATION 64<	
7 POINT MAS NOT BEEN CLEANED PRIOR TO INSPECTION 51 LINEAR CRACK 8 RUN HAS BEEN CLEANED PRIOR TO INSPECTION 52 BEGIN LINEAR CRACK 9 RUN REQUIRES CLEANED PRIOR TO INSPECTION 52 BEGIN LINEAR CRACK 9 RUN REQUIRES CLEANED PRIOR TO INSPECTION 52 BEGIN LINEAR CRACK 10 FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE 54 MULTIPLE CRACKS 12 CATARN REPAIRED 30 CAN BE INTERNALLY REPAIRED 55 BEGIN RULLIPLE CRACKS 13 CAN BE INTERNALLY REPAIRED 57 REUN RUSSIED PIPE 56 FUN WULTPLE CRACKS 14 PIPE DEFLECTION THRU RUN OBSERVED 59 END WULTPLE CRACKS 56 FUN WULTPLE CRACKS 15 UNABLE TU CONTINUE NUB DUE TO *** 59 END WULTPLE CRACKS 56 FUN WULTPLE CRACKS 16 HOLE IN PIPE SERVICE ON THRU RUN OBSERVED 50 FUN WULTPLE CRACKS 56 16 HOLE IN PIPE SERVICE RUN TO 60 FUN WULTPLE CRACKS 56 17 JOINT - SUGARTINS 61 HOLE IN PIPE FUE RUN TO 70 16 JOINT - SUGART ROOT PEN	
8 RUN HAS BEEN CLEANED PRIDE TO INSPECTION 52 BEGIN LINEAR CRACK 9 RUN HAS BEEN CLEANED PRIDE TO INSPECTION 53 CHD LINEAR CRACK 9 RUN HAS BEEN CLEANED STERVEN 54 HULTIPLE CRACKS 10 FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE 54 HULTIPLE CRACKS 12 EXTERNAL REPAIR REQUIRED 55 BEGIN HULTIPLE CRACKS 13 CAN BE INTERNALLY REPAIRED 57 CRUSSED PIPE 14 PIPE DETLECTION THRU RUN DBSERVED 58 BEGIN HULTIPLE CRACKS 15 UNABLE TU CONTINUE DUE TO *** 59 END CRUSSED PIPE 160 PIECES HISSING C*** - SIDE3 61 HOLE IN PIPE FROM HOW TO 161 HOR CRUSSED 62 CHANGE IN PIPE TYPE TROM TO 62 CHANGE IN PIPE 17 JOINT ELAKING 63 CHANGE IN PIPE TYPE TROM TO 62 CHANGE IN PIPE 21 JOINT ELAKING 64 CHANGE IN PIPE FROM HOW HERE 70 22 JOINT ELAKING 65 FLOW CRUSSED FLOW 70 70 23 JOINT	
9 RUN REQUIRES CLEANING 53 LINU CINEAR LRACK 10 FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE 54 MULTIPLE CRACKS 11 BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE 55 BEGIN MULTIPLE CRACKS 12 EXTENDA REPAIR REQUIRED 55 BEGIN MULTIPLE CRACKS 13 CAN BE INTERNALLY REPAIRED 57 CRUSHED PIPE 14 PIPE DEFLECTION THRU NU DBSERVED 58 BEGIN CRUSHED PIPE 15 UNABLE TU CONTINUE NU DBSERVED 59 END MULTIPLE CRACKS 16 HOLTPLE DEFLECTION THRU NU DBSERVED 59 END MULTIPLE CRACKS 17 UNABLE TU CONTINUE NU DBSERVED 59 END CRUSHED PIPE 18 UNABLE TU CONTINUE NU DBSERVED 59 END CRUSHED PIPE 19 UNABLE TU CONTINUE NU DBSERVED 59 END CRUSHED PIPE 10 THE PIPE 50 ENT PIPE 50 11 JOINT - LEAKING 60 PIECES MISAGENER 50 12 JOINT - SUGAT ROOT PENETRATION 65 INSIGNITICANT FLOW DESERVED 12 JOINT - MORTATE ROOT PENETRATION 67 ECON DE	
10 FLOW CAN BE ATTRIBUTED TO GENERAL JUINT LEARAGE 54 MORTHEL CRACKS 11 BALANCE OF FLUE CAN BE ATTRIBUTED TO GENERAL JUINT LEARAGE 55 BEGIN MULTIPLE CRACKS 12 EXTERNAL REPAIR REQUIRED 56 END MULTIPLE CRACKS 13 CAN BE INTENALLY REPAIRED 57 CRUSTED PIPE 14 PIPE DEFLECTION TINUE DUE TO *** 59 BEGIN CRUSTED PIPE 15 UNABLE TU CONTINUE DUE TO *** 59 BEGIN CRUSTED PIPE 16 UNABLE TU CONTINUE DUE TO *** 59 BEGIN CRUSTED PIPE 17 UNABLE TU CONTINUE DUE TO *** 59 BEGIN CRUSTED PIPE 18 UNABLE TU CONTINUE DUE TO *** 59 BEGIN CRUSTED PIPE 19 UNABLE TU CONTINUE DUE TO *** 50 CRUSTED PIPE 20 JOINT SECON CRUSTED PIPE 50 21 JOINT - SECON CRUSTED PENETRATION 63 CHANGE OF DIRECTION *** 22 JOINT - SECON PENETRATION 64 CHANGE OF DIRECTION *** 23 JOINT - SECON PENETRATION 65 INSIGNIFICANT FLOW MARTIPE 24 JOINT - SECON PENETRATION 66 END 25 <td>MANTION P AND</td>	MANTION P AND
11 BALANCI DI TIDI CAN DI ATTRIBUED CONTREL 12 EXTERNAL REPAIR REDINEED 55 CRUSHED PIPE 13 CAN BE INTERNALLY REPAIRED 57 CRUSHED PIPE 14 PIPE DEFLECTION THRUN DBSERVED 58 BEGIN CRUSHED PIPE 15 UNABLE TU CONTINUE DUE TO *** 59 END MULTIPIE TRACKS 16 HOLE TIDI THRUN DBSERVED 58 BEGIN CRUSHED PIPE 17 UNABLE TU CONTINUE DUE TO *** 59 END MULTIPIE TRACKS 18 UNABLE TU CONTINUE DUE TO *** 59 END MULTIPIE TRACKS 19 UNABLE TU CONTINUE DUE TO *** 59 END CRUSHED PIPE 10 UNABLE TU CONTINUE DUE TO *** 59 END CRUSHED PIPE 11 UNABLE TU CONTINUE DUE TO **** 61 HOLE IN PIPE STERVE 14 PIPE EAKING 63 CHANGE IN PIPE TYPE FROM TO TO **** 15 UDINT ELAKING 64 CHANGE OF DIRECTION **** FEET 16 HOLE IN PIPE SECONT PORTARATION 66 FLOW APPEARS TO BE EXFLORATER DOT **** FEET 16 JOINT - SELOWID PENETRATION 67 <t< td=""><td></td></t<>	
13 CAN BE THEORIE TO REPART 57 CRUSHED PIPE 14 PIPE DEFLECTION THRU RUN DBSERVED 59 END CRUSHED PIPE 15 UNABLE TU CONTINUE DUE TO *** 59 END CRUSHED PIPE 16 CAN BE THEOLON THRU RUN DBSERVED 59 END CRUSHED PIPE 15 UNABLE TU CONTINUE DUE TO *** 59 END CRUSHED PIPE 16 CHARGE IN PIPE TYPE FROM TO 61 HOLE IN PIPE 17 CAN MERTIN 62 CHARGE IN PIPE TYPE FROM TO 18 JOINT LEAKING 62 CHARGE IN PIPE TYPE FROM TO 19 JOINT LEAKING 64 CHARGE IN PIPE TYPE FROM TO 21 JOINT LEAKING 64 CHARGE IN PIPE TYPE FROM TO 22 JOINT - LEAKING 65 INSIGNIFICANT FLOU DESERVED 23 JOINT - LEAKING 65 INSIGNIFICANT FLOU DESERVED 24 JOINT - SUGAT ROOT PENETRATION 65 INSIGNIFICANT FLOU DESERVED 25 JOINT - SUGAT ROOT PENETRATION 67 BEGIN 26 JOINT - SUGAT ROOT PENETRATION 69 CONTINUES 27 JOINT - BERTR	
14 PIPE DEFLECTION THRU RUN DBSERVED 58 BEGIN CRUSHED PIPE 15 UNABLE TU CONTINUE DUE TO *** 59 ECON CRUSHED PIPE 16 HOLE IN PIPE FOD CRUSHED PIPE 17 UNABLE TU CONTINUE DUE TO *** 60 PIECES HISSING (*** - SIBE) 16 HOLE IN PIPE FOD CRUSHED PIPE 17 DOINT ECANOE IN PIPE TYPE FROM TO 18 DOINT ECANOE IN PIPE SECTION LENGTH FROM *** FEET 19 JOINT ECANOE IN PIPE SECTION LENGTH FROM *** FEET 10 ### SOUNT - KEAKING 63 CHANGE IN PIPE SECTION LENGTH FROM *** FEET 10 ### SOUNT - KEAKING 63 INSIGNIFICANT FLOW DBSERVED 64 21 JOINT - SUCHT ROOT PENETRATION 66 FLOY APPEARS TO BE EXFLICTRATING 22 JOINT - VERTICALLY MISALIGNED 70 SLIGHT ROOT PENETRATION 69 CONTINUES 23 JOINT - VERTICALLY MISALIGNED 71 MDBLRATE ROOT PENETRATION 72 SEVERE ROOT PENETRATION 72 SEVERE ROOT PENETRATION 23 JOINT - VERTICALT MISALIGNED 71 MDBLRATE ROOT PENETRATION 72 SEVERE ROOT PENETRATION 73	L UPSTREAM NH
15 UNABLE TO CONTINUE DUE TO *** 59 END CROSHED PIPE JOINT INFORMATION 60 PIECES MISSING (*** - SIDE) CODE COMMENTS 61 HOLE IN PIPE SECTION LENGTH FROM *** FEET 21 JOINT ELANCE IN PIPE SECTION LENGTH FROM *** FEET 22 JOINT ELANCE IN PIPE SECTION LENGTH FROM *** FEET 23 JOINT - LEAKING 63 24 JOINT - MODERATE ROOT PENETRATION 64 25 JOINT - MODERATE ROOT PENETRATION 65 26 JOINT - VIDE OR OPEN 66 27 JOINT - VIDE OR OPEN 66 28 JOINT - VIDE OR OPEN 67 29 JOINT - VIDE OR OPEN 69 29 JOINT - NOT PENETRATION 67 20 PECIN PECIN 21 JOINT - NOT PENETRATION 67 25 JOINT - NOT PENETRATION 67 26 JOINT - NOT PENETRATION 70 27 JOINT - NOT SAG 71 30 JOINT - NOT SAG 72 31 JOINT - AIR TEST PASS SERVICE INPOLNATION 32 J	2 DOWNSTREAM
JOINT INFORMATION 60 HILLE IN PIPE SILLS JOINT INFORMATION 61 HILLE IN PIPE TO CODE COMMENTS 62 CHANGE IN PIPE SECTION LENGTH FROM #** FEET 21 JOINT - LEAKING 63 CHANGE IN PIPE SECTION LENGTH FROM #** FEET 22 JOINT - SLIGHT ROOT PENETRATION 64 CHANGE OF DIRECTION *** 23 JOINT - SLIGHT ROOT PENETRATION 65 INSIGNIFICANT FLOW DBSERVED 24 JOINT - SLIGHT ROOT PENETRATION 65 INSIGNIFICANT FLOW DBSERVED 25 JOINT - NDE DR DPEN 69 CONTINUES 26 JOINT - VERTICALLY HISALIGNED 70 SLIGHT ROOT PENETRATION 27 JOINT - ND SAG 71 HODERATE ROOT PENETRATION 28 JOINT - ND SAG 72 SELVICE INPOLMATION 30 JOINT - ND SAG 72 SELVICE INPOLMATION 31 JOINT - ND SAG 73 SUMABLE TO JOUNT OF GROUT 32 JOINT - NOT SETED UNABLE TO JOLATE 00 SERVICE INPOLMATION 33 JOINT - NUSINFICANT FLOW OBSERVED 80 SERVICE CONN, *** D'CLOCK POSITION, VYE OR TEE 34	L
JUNIN INFORMATION 62 CHANGE IN PIPE TYPE FROM TO CODE COMMENTS 63 CHANGE IN PIPE SECTION LENGTH FROM *** FEET 21 JOINT 64 CHANGE IN PIPE SECTION LENGTH FROM *** 22 JOINT - LEAKING 64 CHANGE IN PIPE SECTION LENGTH FROM *** 23 JOINT - LEAKING 64 CHANGE IN PIPE SECTION LENGTH FROM *** 24 JOINT - SLIGHT ROOT PENETRATION 64 FLOW APPEARS 10 BE EXFILTRATING 25 JOINT - SUGHT ROOT PENETRATION 66 FLOW APPEARS 10 BE EXFILTRATING 26 JOINT - WOEL OR DEEN 69 CONTINUES 27 JOINT - VOET OR DEEN 69 CONTINUES 28 JOINT - NORIZONTALLY MISALIGNED 70 SLIGHT ROOT PENETRATION 29 JOINT - BEGIN SAG 72 SEVERE ROOT PENETRATION 30 JOINT - REGIN SAG 72 SEVERE ROOT PENETRATION 31 JOINT - NOT TESTED UNABLE TO ISOLATE SLEVICE INFORMATION 32 JOINT - REPARED WARED TO ISOLATE ODE 33 JOINT - REPARED WARED TO ISOLATE SLEVICE CONN, *** OFLOCK POSITION, VYE OR TEE 34 JOINT - REPARED WARE TO ISOLATE	
CODIC COMMENTS 63 CHANGE IN PIPE SECTION LENGTH FROM ### FEET 21 JOINT LEAKING 64 CHANGE IN PIPE SECTION LENGTH FROM ### FEET 22 JOINT - LEAKING 64 CHANGE IN PIPE SECTION LENGTH FROM ### FEET 23 JOINT - SLIGHT ROOT PENETRATION 64 CHANGE IN PIPE SECTION LENGTH FROM ### 24 JOINT - MODERATE ROOT PENETRATION 65 INSIGNIFICANT FLOW DBSERVED 25 JOINT - MODERATE ROOT PENETRATION 69 EONTINUES 26 JOINT - VERTICALLY MISALIGNED 70 SLIGHT ROOT PENETRATION 27 JOINT - NOR JOE OR DENN 70 SLIGHT ROOT PENETRATION 28 JOINT - FUND SAG 72 SEVERE ROOT PENETRATION 29 JOINT - FUND SAG 72 SERVICE INFORMATION 30 JOINT - AIR TEST FAIL SERVICE INFORMATION 31 JOINT - NOT TESTED, UNABLE TO ISOLATE OODE COMMENTS 33 JOINT - FUND APPEARS TO BE EXTIL TRATING 80 SERVICE CONN, *** OFCLOCK POSITION, VYE OR TEE 34 JOINT - FULIW APPEARS TO BE EXTIL TRATING 80 SERVICE CONN, *** OFCLOCK POSITION, VYE OR TEE 35 JUINI - FUL	
21 JOINT 22 JOINT - LEAKING 23 JOINT - SLIGHT ROOT PENETRATION 24 JOINT - SUCRE ROOT PENETRATION 25 JOINT - SEVERE ROOT PENETRATION 26 JOINT - SEVERE ROOT PENETRATION 27 JOINT - VERTICALLY MISALIGNED 28 JUINT - HORIZUNTALLY MISALIGNED 29 JOINT - NOR OR OPEN 29 JOINT - REGIN SAG 30 JOINT - REGIN SAG 31 JOINT - AIR TEST PASS 32 JOINT - NOT PENETRATING 33 JOINT - AIR TEST PASS 34 JOINT - NOT PENETRATING 35 JOINT - FUD DAGE 36 JOINT - FUD DAGE 36 JOINT - FUD DAGE 36 JOINT - FUD DAGE 37 JOINT - FUD DAGE 38 JOINT - FUD DAGE 39 JOINT - AIR TEST PASS 30 JOINT - AIR TEST PASS 31 JOINT - NOT TESTED, UNABLE TO ISOLATE 34 JOINT - FUD DAGE EXTRUTRATING 35 JOINT - FUD DAGE EXTRUTRATING 36 JOINT - FUD APPEARS TO BE EXTRUTRATING <td></td>	
21 JOINT 64 CHANGE OF DIRECTION *** 22 JOINT - LEAKING 65 INSIGNFICANT F.LOW DESERVED 23 JOINT - SLIGHT ROOT PENETRATION 66 FLOW APPEARS TO BE EXFILTRATING 24 JOINT - MODERATE ROOT PENETRATION 67 BEGIN 25 JOINT - VIOC DR DEEN 69 CONTINUES 26 JOINT - VOERTRATION 69 CONTINUES 27 JOINT - HORIZUNTALLY MISALIGNED 70 SLIGHT ROOT PENETRATION 28 JUINT - HORIZUNTALLY MISALIGNED 71 MODERATE ROOT PENETRATION 29 JOINT - BEGIN SAG 72 SEVERE ROOT PENETRATION 30 JOINT - AIR TEST PASS SERVICE INFORMATION 31 JOINT - AIR TEST FAIL OSERVED 33 JOINT - NOT TESTED, UNABLE TO ISOLATE OODE 34 JOINT - NOT DESERVED 80 35 JUINT - FLOW APPEARS TO BE EXFLUE TONN, *** OFCLOCK POSITION, WE OR TEE 36 JUINT - FLOW APPEARS TO BE EXFLUE TRATING 36 JUINT - AIR TEST FAIL 37 JUINT - NOT TESTED, UNABLE TO ISOLATE 38 JUINT - AIR TEST FAIL	
22 JUINT - LEAKING 53 INSTRUCT FUNCTION TO DESERVED 23 JUINT - SLIGHT ROOT PENETRATION 66 FLOW APPEARS TO BE EXFLUTRATING 24 JUINT - MODERATE ROOT PENETRATION 67 BEGIN 25 JUINT - MODERATE ROOT PENETRATION 69 CONTINUES 26 JUINT - VERTICALLY MISALIGNED 70 SLIGHT ROOT PENETRATION 27 JUINT - HORIZUNTALLY MISALIGNED 70 SLIGHT ROOT PENETRATION 28 JUINT - HORIZUNTALLY MISALIGNED 71 MODERATE ROOT PENETRATION 29 JUINT - HORIZUNTALLY MISALIGNED 71 MODERATE ROOT PENETRATION 30 JUINT - HORIZUNTALLY MISALIGNED 72 SEVERE ROOT PENETRATION 31 JUINT - NEGANFELS 72 SERVICE INFORMATION 32 JUINT - AIR TEST FAIL SERVICE ODE 33 JUINT - NEGANFELSUNANT FLOW OBSERVED 80 SERVICE CONN., *** OFCLOCK POSITION. VYE OR TEE 34 JUINT - FLOW APPEARS TO BE EXFLICTRATING 80 SERVICE CONN., *** OFCLOCK POSITION. CUI-IN. 34 JUINT - FLOW APPEARS TO BE EXFLICTRATING 80 SERVICE CONN., *** OFCLOCK POSITION. CUI-IN. 35 JUINT	
23 JOINT - SECIAR TREATOR 60 BEGIN 24 JOINT - SEVERE ROOT PENETRATION 60 END 25 JOINT - SEVERE ROOT PENETRATION 60 END 26 JOINT - VIDE OR DPEN 69 CONTINUES 27 JGINT - VERTICALLY MISALIGNED 70 SLIGHT ROOT PENETRATION 28 JOINT - HORIZUNTALLY MISALIGNED 71 HODERATE ROOT PENETRATION 29 JOINT - HORIZUNTALLY MISALIGNED 72 SEVERE ROOT PENETRATION 30 JOINT - FND SAG 72 SEVERE ROOT PENETRATION 31 JOINT - AIR TEST FAIL SERVICE INFORMATION 32 JOINT - AIR TEST FAIL SERVICE INFORMATION 33 JOINT - NOT TESTED, UNABLE TO ISOLATE OODE 34 JOINT - NOT TESTED, UNABLE TO ISOLATE 60 35 JOINT - FLUV OBSERVED 60 36 JOINT - FLUV OBSERVED 80 36	
25 JOINT - SEVERE ROOT PENETRATION 68 END 26 JOINT - VIDE OR DPEN 69 CONTINUES 27 JUINT - VERTICALLY MISALIGNED 70 SLIGHT ROOT PENETRATION 28 JUINT - HORIZUNTALLY MISALIGNED 71 MODERATE ROOT PENETRATION 29 JOINT - BEGIN SAG 72 SEVERE ROOT PENETRATION 30 JOINT - AIR TEST PASS SERVICE INFORMATION 32 JOINT - AIR TEST FAIL SERVICE INFORMATION 33 JOINT - NOT TESTED, UNABLE TO ISDLATE CODE 34 JOINT - INSIGNIFICANT FLOW OBSERVED 80 36 JUINT - FLUW APPEARS TO BE EXTING 80 36 JUINT - FLUW APPEARS TO BE EXTIN TRATING 80 36 SERVICE CONN. *** OFCLOCK POSITION. WE OR TEE 36 JUINT - FLUW APPEARS TO BE EXTING 80 36 JUINT - FLUW APPEARS TO BE EXTING 81 37 SERVICE CONN. *** OFCLOCK POSITION. WE OR TEE 83 36 JUINT - FLUW APPEARS TO BE EXTING 83 37 SERVICE CONNECTION CRACKED 83 38 SERVICE CONNECTION CRACKED 39	
26 JOINT - WIDE OR DPEN 69 CONTINUES 27 JOINT - VERTICALLY MISALIGNED 70 SLIGHT ROOT PENETRATION 28 JOINT - HORIZUNTALLY MISALIGNED 71 HOBERATE ROOT PENETRATION 29 JOINT - BEGIN SAG 72 SEVERE ROOT PENETRATION 30 JOINT - AIR TEST PASS SERVICE INFORMATION 32 JOINT - AIR TEST FAIL SERVICE INFORMATION 33 JOINT - NOT TESTED, UNABLE TO ISDLATE ODE 34 JOINT - INSIGNIFICANT FLOW OBSERVED 80 36 JUINT - FLOW APPEARS TO DE EXFILTRATING 80 36 JUINT - FLOW APPEARS TO DE EXFILTRATING 80 36 JUINT - FLOW APPEARS TO DE EXFILTRATING 81 36 JUINT - FLOW APPEARS TO DE EXFILTRATING 83 36 JUINT - FLOW APPEARS TO DE EXFILTRATING 83 36 JUINT - FLOW APPEARS TO DE EXFILTRATING 83 37 JUINT - FLOW APPEARS TO DE EXFILTRATING 83 38 SERVICE CONN. *** O'CLOCK POSITION. CUI-IN. PROT. *** -INCHES 39 B0 SERVICE CONNECTION CRACKED 39 SERVICE CONNECTION CRACKED <	
27 JUINT - VERTICALLY MISALIGNED 70 SECURIT RUDT PENETRATION 28 JUINT - HORIZUNTALLY MISALIGNED 71 HOBERATIC ROOT PENETRATION 29 JOINT - BEGIN SAG 72 SEVERE ROOT PENETRATION 30 JOINT - FID SAG 72 SEVERE ROOT PENETRATION 31 JOINT - AIR TEST PASS SERVICE INFORMATION 32 JOINT - AIR TEST F.AIL ODE COMMENTS 33 JOINT - NOT TESTED, UNABLE TO ISOLATE 00 SERVICE CONN. *** OFLOCK POSITION. WE OR TEE 34 JOINT - INSIGNIFICANT FLOW OBSERVED 00 SERVICE CONN. *** OFLOCK POSITION. WE OR TEE 36 JUINT - FLUW APPEARS TO BE EXTLUTRATING 81 SERVICE CONN. *** OFLOCK POSITION. CUT-IN 36 JUINT - FLUW APPEARS TO BE EXTLUTRATING 83 SERVICE CONN. *** OFLOCK POSITION. CUT-IN 36 JUINT - FLUW APPEARS TO BE EXTLUTRATING 83 SERVICE CONNECTION CRACKED 37 B4 SUBAR ROUT PENETRATION 83 SERVICE CONNECTION CRACKED 37 B4 SUBAR ROUT PENETRATION 84 SUBAR ROUT PENETRATION 38 MODERATE ROOT PENETRATION 85 MODERATE ROOT PENETRATION 86	
29 JUINT - BEGIN SAG 72 SEVERE ROUT PENETRATION 30 JUINT - END SAG 72 SEVERE ROUT PENETRATION 31 JUINT - AIR TEST PASS SERVICE INFORMATION 32 JUINT - AIR TEST FAIL SERVICE INFORMATION 33 JUINT - REPAIRED, ### GALLONS OF GROUT ODDE COMMENTS 34 JUINT - NOT TESTED, UNABLE TO ISOLATE 80 SERVICE CONN, ### OFCLOCK POSITION. WE OR TEE 36 JUINT - FLUW APPEARS TO DE EXFLUTRATING 80 SERVICE CONN, ### OFCLOCK POSITION. CUI-IN, PROT - INCHES 36 JUINT - FLUW APPEARS TO DE EXFLUETRATING 80 SERVICE CONN, ### OFCLOCK POSITION. CUI-IN, PROT - INCHES 36 JUINT - FLUW APPEARS TO DE EXFLUETRATING 81 SERVICE CONN, ### OFCLOCK POSITION. CUI-IN, PROT PROT PENETRATION 36 JUINT - FLUW APPEARS TO DE EXFLUETRATING 82 HOUSE NO. 37 BERVICE CONNECTION CRACKED 83 SERVICE CONNECTION CRACKED 38 BERVICE CONNECTION CRACKED 84 SUGHT ROUT PENETRATION 39 SERVICE CONNECTION PENETRATION 85 MODERATE ROUT PENETRATION 39 SERVICE CONT PENETRATION 85 MODERATE ROUT PENETRATION </td <td>(PIPE TIPE</td>	(PIPE TIPE
30 JOINT - END SAG 31 JOINT - AIR TEST FASS 32 JOINT - AIR TEST FAIL 33 JOINT - REPARED, *** GALLONS OF GROUT 34 JOINT - NOT TESTED, UNABLE TO ISDLATE CODE COMMENTS 35 JUINT - INSIGNIFICANT FLOW OBSERVED 80 SERVICE CONN. *** OFCLOCK POSITION. WYE OR TEE 36 JUINT - FLUW APPEARS TO DE EXFLUTRATING 80 SERVICE CONN. *** OFCLOCK POSITION. CUT-IN. 96 SERVICE CONN. *** OFCLOCK POSITION. CUT-IN. 92 HOUSE NO. 83 SERVICE CONNECTION CRACKED 84 SLIGHT ROUT PENETRATION 84 SLIGHT ROUT PENETRATION 85 MODERATE ROUT PENETRATION 86 SEVERE ROUT PENETRATION 86	
31 JOINT - AIR TEST PASS SERVICE INFOLMATION 32 JOINT - AIR TEST FAIL SUPPLY 33 JOINT - REPARED, *** GALLONS OF GROUT CODE COMMENTS 34 JOINT - INSIGNIFICANT FLOW DESERVED 80 SERVICE CONN. *** O'CLOCK POSITION. WYE OR TEE 36 JOINT - FLOW APPEARS TO BE EXFLUETRATING 80 SERVICE CONN. *** O'CLOCK POSITION. CUT-IN. PROT. *** 36 JOINT - FLOW APPEARS TO DE EXFLUENCE 37 JOINT - FLOW APPEARS TO DE EXFLUENCE 38 SERVICE CONN. *** O'CLOCK POSITION. CUT-IN. PROT. *** 39 SERVICE CONNECTION CRACKED 34 SERVICE CONNECTION CRACKED 35 SERVICE CONT PENETRATION 36 MODERATE ROOT PENETRATION 37 B6 SEVERE ROOT PENETRATION	I VCP
32 JUINT - AIR TEST FAIL JUINT - AIR TEST FAIL 33 JUINT - REPARED, *** GALLONS OF GROUT CODE COMMENTS 34 JUINT - NOT TESTED, UNABLE TO ISOLATE B0 SERVICE CONN, *** O'CLOCK POSITION. WYE OR TEE 35 JUINT - FLUW APPEARS TO BE EXFLUETRATING B0 SERVICE CONN, *** O'CLOCK POSITION. CUT-IN, PROT. **** O'CLOCK POSITION. **** O'CLOCK POSITION. **** O'CLOCK POSITION. ****	2 ACP
33 SUBAL SUBAL SUBAL 34 JOINT - NOT TESTED, UNABLE TO ISOLATE CODE COMMENTS 35 JOINT - INSIGNIFICANT FLOW OBSERVED 80 SERVICE CONN, *** O'CLOCK POSITION, WYE OR TEE 36 JOINT - FLOW APPEARS TO DE EXTILITRATING 81 SERVICE CONN, *** O'CLOCK POSITION, CUT-IN, PROT. *** O'CLOCK POSITION, CUT-IN, PROT. *** - INCHES 36 JOINT - FLOW APPEARS TO DE EXTILITRATING 83 SERVICE CONN, *** O'CLOCK POSITION, CUT-IN, PROT. *** O'CLOCK POSITION, CUT-IN, PROT. *** - INCHES 36 JOINT - FLOW APPEARS TO DE EXTILITRATING 83 SERVICE CONNECTION CRACKED 36 JOINT - FLOW APPEARS TO DE EXTILITRATING 83 SERVICE CONNECTION CRACKED 83 SERVICE CONNECTION CRACKED 84 SLIGHT ROOT PENETRATION 84 SLIGHT ROOT PENETRATION 85 MODERATE ROOT PENETRATION 86 SEVERE ROOT PENETRATION 86 SEVERE ROOT PENETRATION	3 RCP
35 JUINT - INSTRUCTERANT FLOW OBSERVED 80 SERVICE CONN, *** O'CLOCK POSITION. WE OR TEE 36 JUINT - FLOW OBSERVED 80 SERVICE CONN, *** O'CLOCK POSITION. WE OR TEE 36 JUINT - FLOW OBSERVED 81 SERVICE CONN, *** O'CLOCK POSITION. WE OR TEE 36 JUINT - FLOW OBSERVED 81 SERVICE CONN., *** O'CLOCK POSITION. CUT-IN, PROT. 36 JUINT - FLOW OBSERVED 82 HOUSE NO. 82 HOUSE NO. 83 SERVICE CONNECTION CRACKED 84 SLIGHT ROOT PENETRATION 85 85 MODERATE ROOT PENETRATION 86	4 CIP OR DIP
36 JUINT - FLUV APPEARS TO BE EXFLUTRATING B) SERVICE CONN. *** INCLOCK POSITION. CUT-IN. 98 HOUSE NO. PROT. *** - INCHES 93 SERVICE CONNECTION CRACKED 94 SLIGHT ROOT PENETRATION 95 MODERATE ROOT PENETRATION 96 SEVERE ROOT PENETRATION	I S PVL
PRD1. ### -INCHES PRD1. ### -INCHES 82 HOUSE NO. 83 SERVICE CONNECTION CRACKED 84 SLIGHT ROUT PENETRATION 85 MODERATE ROUT PENETRATION 86 SEVERE ROUT PENETRATION	
82 HOUSE ND. 83 SERVICE CONNECTION CRACKED 84 SLIGHT ROUT PENETRATION 85 MODERATE ROUT PENETRATION 86 SEVERE ROUT PENETRATION	
03 SERVICE CONNECTION CRACKED 04 SLIGHT ROUT PENETRATION 05 MODERATE ROUT PENETRATION 06 SEVERE ROUT PENETRATION	
84 SLIGHT ROOT PENETRATION 85 MODERATE ROOT PENETRATION 86 SEVERE ROOT PENETRATION	
86 SEVERE ROOT PENETRATION	
07 INTERMITTENT FLOV, POSSIBLE SUMP PUMP CONNECTED I	
BU INTERMITTENT FLOW, SUMP PUMP CUNNECTED, VERIFIED	
09 INSIGNIFICANT FLOW DUSCRVED	I DUTY
90 FLOW IS USAGE	
$\frac{71}{92} = \frac{31}{50} \frac{31}{100} \frac{100}{100} = \frac{71}{100} \frac{100}{100} \frac{100}{100} = \frac{71}{100} \frac{100}{100} \frac{100}{100} = \frac{100}{100} \frac{100}{100} \frac{100}{100} = \frac{100}{100} \frac{100}{100} \frac{100}{100} = \frac{100}{100} \frac{100}{100} \frac{100}{100} \frac{100}{100} = \frac{100}{100} \frac{100}{10$	1 TV ONLY
93 SERVICE COURT - NIC LESA CALL	2 TV & AIR T
94 SERVICE CONN WATER SATURATION TEST PASS	3 TV, AIR TES
*** TYPE DATA IN COMMENTS	
	T IV E REPAI

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- 1231 1231
- PAIR

	1			GANNET	IING, INC.	5	SHEET <u>1</u>
				TELEVISION In	SPECTION L	OG	
CLIENT : I	DIVISIO	N OF DAM SAFE	TY	10	B#: <u>31246</u>	DATE : AUGUST 14, 1997	TIME : 1145
LOCATION:	DAM N	O. 01514, SOUTH	RIVER NO.	19, WAYNESBORO	NURSERY		
TELEVISINC	: <u>RIG</u>	<u>IT EMBANKMEN</u>	T DRAIN	STATIONING FROM :	DUTLET END	PIPE : 10", CMP, 72	FT
DUTY : <u>1</u> R	IG NO. <u>3</u>	46 OPERATOR J	LP	VIDEO TAPE: 04			
STATION	CODE	VIDEO FOOTAGE	COMMENTS				
0+00	1	2025	Corrugated p	ipe.			······································
0+02	2	2048			·····		······································
0+72		2272	Pipe bends to	the left.			
+		2290	······				
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SEE BACK E	DR CODES F	OR MANHOLE TYPE.	1ANHOLE 0+00, PI	PE TYPE, DUTY AND LOOK	UP CODES.		

.	TELEVISUAL INSPECTION L	OOLUP O	ODKS	MANHOLE TYPE
RUN IN	FORMATION	MANU	INE INFORMATION	I BRICK
Wh0				2 PRECAST
YIN	(MURINI)	CUDL	CORMTU (2	
1	BEGIN RUN	45	APPARENT CRITICAL POINT OF SAG, ### -INCHES OF LIQUID	4 80020
ż	BEGIN PIPE	46	DROP CONNECTION AT 6 D'CLOCK	
3	END PIPE	47	CRACKED PIPE AT SERVICE CONNECTION	
4	END RUN, RUN CONSISTS OF *** FOOT PIPE SECTIONS	48	PERIPHERAL LEAK AROUND CUT-IN SERVICE LUNNELTIUM	
5	END TELEVISUAL INSPECTION	49		
6	SAME PHINT AS ENCOUNTERED ON PREVIOUS SETUP	50		
7	RUN HAS NOT BEEN CLEANED PRIDE TO INSPECTION	59		
8	RUN HAS BEEN LLEANED PRIDE ID INSPECTION	53	END LINEAR ERACK	
9	RUN REDUIRES LLEANING	54	MULTIPLE CRACKS	
'	DALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55	BEGIN MULTIPLE CRACKS	
	EXTERNAL REPAIR REDUIRED	56	END MULTIPLE CRACKS	
	CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE	1 UPSTREAM MH.
	PIPE DEFLECTION THRU RUN OBSERVED	58	BEGIN CRUSHED PIPE	2 DOWNSTREAM MH.
	UNABLE TO CONTINUE DUE TO ***	59	END CRUSHED PIPE	
		60	HILLE MIZZING (### -21DE)	
NT I	NPOLMATION	61	PULL IN FIFL	
nw	(A) ID 103 100	63	CHANGE IN PIPE SECTION LENGTH FROM WAR FEET	
DE	COMMENIS	05	TO BEE FEET	
1	JOINT	64	CHANGE OF DIRECTION ###	
ż	JOINT - LEAKING	65	INSIGNIFICANT FLOW DBSERVED	
3	JOINT - SLIGHT ROOT PENETRATION	66	FLOV APPEARS TO BE EXFILTRATING	
4	JOINT - MODERATE ROOT PENETRATION	67	BEGIN	
5	JOINT - SEVERE ROOT PENETRATION	68	END	
6	JOINT - WIDE DR DPEN	69	CUNTINUES	
/ n	JUNI - VERTILALLY MISALIGNED	21) PIPE TYPE
9	IGINT - REGIN SAG	72		
5	JOINT - END SAG			
1	JOINT - AIR TEST PASS	OVBULA	P TUPORU I PION	2 ACP
2	JOINT - AIR TEST FAIL	PTATIC	B INFURNATION 1	3 RCP
3	JUINT - REPAIRED, *** GALLONS OF GROUT	CUDE	CONTRACTO	4 CIP DR DIP
	JUNI - NUT TESTED, UNABLE TO ISOLATE	White		5 PVC
5 6	JUINT - FLOW APPEADS TO BE EVEN TOATING	80	SERVICE CONN, *** D'CLOCK POSITION, WYE OR TEE	6 OTHER
-	STUDY I CUW AFFEARS IN DE EATTEIRAINN	81	SERVICE CONN. *** D'CLOCK POSITION CUT-IN	L
			PRUL WAR -INCHES	
		82	HUUSE NU.	
		84		
		85	MODERATE ROLL RELEATION	
		86	SEVERE ROLL PENELIKATION	
		87	INTERMITTENT FIND POSSIBLE SUMP PUMP CONNECTED	
		68	INTERMITTENT FLOW, SUMP PUMP CONNECTED VERIFICD	
		89	INSIGNIFICANT FLOW OBSERVED	DUTY
		90	FLOW IS USAGE	וועע
		91	SERVICE CONN - AIR TEST PASS	
		92	SERVICE CONN AIR TEST FAIL	I TV DNLY
		93	SERVICE CONN NOT TESTED, NO CLEANOUT ACCESS	2 TV & AIR TEST
		94	SERVICE CUNN WATER SATURATION TEST PASS	3 IV, AIR TEST
	TT THE DOLD IN COMENIA	70	SERVICE CUNN WATER SATURATION TEST FAIL	& KLEAIK

GANNETT 11NG, INC.

SHEET 1 C. 1

TELEVISION INSPECTION LOG

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : AUGUST 14, 1997 TIME : 1420

LOCATION: DAM NO. 01522, SOUTH RIVER NO. 7, WILDA

TELEVISING : RISER INTERIOR STATIONING F	OM : TOP OF RISER PIPE :
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DUTY : 1 RIG NO. 346 OPERATOR JLP VIDEO TAPE: 04

STATION	CODE	VIDEO FOOTAGE	COMMENTS
+		2287	Downstream wall.
+		2355	Left side wall.
+		2406	Upstream wall.
+		2527	Sock in gate valve plugging hole shut.
+		2528	Right side wall.
+		2615	
+			
+		2616	Outside intake tower.
+			Downstream wall.
+		2644	Left side wall.
+		2670	Upstream wall.
+		2740	Right side wall.
+		2782	
+			Total depth 13'.
+		······	
+		-	
+			
+			
+	<u> </u>		
+			
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+			
SEE BACK FO	OR CODES I	FOR: MANHOLE TYPE, N	AANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

TELEVISUAL INSPECTION LOOKUP CODES						
IIN INPORMATION			NE INFORMATION	1 BRICK		
)DR	COMMENTS	())DE	COMMENTS	2 PRECAST 3 BLOCK		
		W		4 OTHER		
	BEGIN RUN	45	APPARENT ERITIEAL PUINT OF SAG, MAR -INCHES OF EIGOID	L		
	DEVIN FIFE	40	CRACKED PIPE AT SERVICE CONNECTION			
	END FILL END FINSISTS OF WAR FOOT PIPE SECTIONS	48	PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION			
	END TELEVISUAL INSPECTION	49	CRACKED PIPE AT JOINT			
	SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP	50	SHEAR CRACK			
	RUN HAS NUT BEEN LLCANED PRIDE TO INSPECTION	51	LINEAR LRALK			
	RUN HAS BEEN CLEANED PRIDE TO INSPECTION	57	END I INFAR FRACK			
	RUN REQUIRES LEEANING	54	HULTIPLE CRACKS			
	BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55	BEGIN MULTIPLE CRACKS			
	EXTERNAL REPAIR REQUIRED	56	END MULTIPLE CRACKS			
	CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE	1 UPSTREAM MH		
	PIPE DEFLECTION THRU RUN DESERVED	50 50		C DUANTINEN		
	UNABLE IU LUNIINUE DUE IU 🖤	60	PIECES HISSING (*** -SIDE)			
7 1	NPOPM 17TON	61	HOLE IN PIPE			
11		65	CHANGE IN PIPE TYPE FROM TO			
ļ	COMMENTS	63	CHANGE IN PIPE SECTION LENGTH FROM WAW FEEL			
-		64	THANGE OF DIRECTION BEE			
	IDINT - LEAKING	65	INSIGNIFICANT FLOW DBSERVED			
	JOINT - SLIGHT ROOT PENETRATION	66	FLOW APPEARS TO BE EXFILTRATING			
	JOINT - HODERATE ROOT PENETRATION	67	BEGIN			
	JOINT - SEVERE ROOT PENETRATION	68	END CRNTINUES			
	JUNT - VEDTEALLY MISALIGNED	70	SUIGHT ROOT PENETRATION	BIBD TTDD		
	JOINT - HORIZONTALLY MISALIGNED	71	MODERALE ROUT PENETRATION	I DIL LIL		
	JOINT - BEGIN SAG	72	SEVERE ROOT PENETRATION			
	22A9 T231 AIA - TAIUC	08810/06				
	JOINT - AIR TEST FAIL	PERAICE	INPURMATION	3 RCP		
	JOINT - REPAIRED, AAA GALLONS OF GROUT	3000	CONTRACTOR OF A DECEMBER OF A	4 CIP DR DIP		
	JUNT - NUT ISSTED, UNABLE TU ISULATE NINT - INSUGNIERANT ELNY ORSERVED			5 PVC		
	JOINT - FLOW APPEARS TO BE EXFLUTRATING	81 80	SERVICE CONN, *** D'CLOCK POSITION, WYE OR TEE SERVICE CONN, *** D'CLOCK POSITION, CUT-IN,	6 UTHER		
			PROT. ### -INCHES			
		85	HUVSE NU.			
		84	SERVICE COMMENTIUM CRACKED			
		85	MODERATE ROUT PENETRATION			
		86	SEVERE ROOT PENETRATION			
		87	INTERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED			
		88	INTERMITTENT FLOW, SUMP PUMP CONNECTED, VERIFIED	D.L.PPT		
		90	ELON IS DEACE	I DUTY		
		91	SERVICE CONN - AIR TEST PASS			
		56	SERVICE CONN AIR TEST FAIL	I TV DNLY		
		93	SERVICE CONN NOT TESTED. NO CLEANOUT ACCESS	2 TV & AIR TE		
	THE DATA IN CONTRACT	94	SERVICE CONN WATER SATURATION TEST PASS	3 TV. AIR TEST		
	THE DATA IN COMPLETS	72	SERVILE LUNN WATER SATURATION TEST FAIL	E REPAIN		



131246\TVLOCS\TVLOC_13)

				GANN 7 1ING, INC.	SHEE	г
				TELEVISION INSPECTION	LOG	
CLIENT : I	DIVISIO	N OF DAM SAFE	TY	JOB # : <u>31246</u>	DATE : AUGUST 14, 1997	TIME : 1500
OCATION:	DAM N	O. 01522, SOUTH	RIVER NO.	7, WILDA		
TELEVISING : OUTFALL CONDUIT				STATIONING FROM : RISER	PIPE : 24", RCP, 253 FT	· · · · · · · · · · · · · · · · · · ·
OUTY : <u>1</u> R	IG NO. <u>3</u>	46 OPERATOR <u>J</u>	LP	VIDEO TAPE: 04		<u></u>
STATION	CODE	VIDEO FOOTAGE	COMMENTS			
0+00	1	2780				
0+02	_2	2803				
2+53		3395	15' pipe sec	tions.		
+		3408				
+						
+						
+						<u> </u>
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TELEVISUAL INSPECTIO	OOKUP CODES	MANHOLE TY
RUN INFORMATION	MAINLINE INFORMATION	I BRICK
CODE COMMENTS	CODE COMMENTS	2 PRECAST 3 BLOCK
CODE COMMENTS 1 BEGIN PIPE 3 END PIPE 3 END PIPE 4 END RUN RUN CONSISTS OF *** FOOT PIPE SECTIONS 5 END TELEVISUAL INSPECTION 6 SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP 7 RUN HAS NOT BEEN CLEANED PRIOR TO INSPECTION 8 RUN HAS BEEN CLEANED PRIOR TO INSPECTION 9 RUN REQUIRES CLEANED PRIOR TO INSPECTION 10 FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE 11 BALANCE UN FLOW REQUIRED 13 CAN BE INTERNALLY REPARED 14 PIPE DEFLECTION THRU RUN DBSERVED 15 UNABLE TO CONTINUE DUE TO *** 10 INT INFORMATION 26 JOINT - SLIGHT ROOT PENETRATION 26 JOINT - MODERATE ROOT PENETRATION 26 JOINT - MODERATE ROOT PENETRATION 26 JOINT - SEVERE ROOT PENETRATION 26 JOINT - VERTICALLY MISALIGNED 27 JOINT - SEVERE ROOT PENETRATION 26 JOINT - VERTICALLY MISALIGNED 27 JOINT - VERTICALLY MISALIGNED 28 JOINT - MORIZONTALLY MISALIGNED 29 JOINT - ROT SAG 30 JOINT - AIR TEST FASS 32 JOINT - AIR TEST FASS 32 JOINT - AIR TEST FASS 32 JOINT - AIR TEST FASS 34 JOINT - NOT TESTED, UNABLE TO ISOLATE 35 JOINT - NOT TESTED, UNABLE TO ISOLATE 36 JOINT - FLOW APPEARS TO BE EXFILTRATING	CODE COMMENTS 45 APPARENT CRITICAL POINT OF SAG. 46 DROP CONNECTION AT 6 D'CLOCK 47 CRACKED PIPE AT SERVICE CONNECT 48 PERIPHERAL LEAK ARDUND CUT-IN S 49 CRACKED PIPE AT JOINT 50 SHEAR CRACK 51 LINEAR CRACK 52 BEGIN LINEAR CRACK 53 END LINEAR CRACK 54 MULTIPLE CRACKS 55 BEGIN MULTIPLE CRACKS 56 END MULTIPLE CRACKS 57 CRUSHED PIPE 58 BEGIN CRUSHED PIPE 60 PIECES MISSING (*** -SIDE) 61 HOLE IN PIPE TYPE FROM TD 63 CHANGE IN PIPE SECTION LENGTH FI 64 CHANGE IN PIPE SECTION LENGTH FI 65 INSIGNIFICANT FLOW DBSERVED 66 FLOW APPEARS TO BE EXFILTRATION 67 BEGIN 68 END 69 CONTINUES 70 SLIGHT ROOT PENETRATION 71 MODERATE ROOT PENETRATION 72 SEVERE ROOT PENETRATION 73 SERVICE CON	ROM === FEET IDN. FRUICE CONNECTION ROM === FEET I UPSTREAM 2 DDVNSTREA 2 DDVNSTREA 2 DDVNSTREA 1 UPSTREAM 2 DDVNSTREA 1 VCP 2 ACP 3 RCP 4 CIP OR DI 5 PVC 6 DTHER DUTY
ANN TYPE DATA IN COMMENTS	91 SERVICE CONN - AIR TEST PASS 92 SERVICE CONN - AIR TEST FAIL 93 SERVICE CONN - NOT TESTED, NO I 94 SERVICE CONN - VATER SATURATIO 95 SERVICE CONN - VATER SATURATIO	CLEANDUT ACCESS 2 IV & AIR 2 IV & AIR 2 IV & AIR 3 TV. AIR T 4 TV & REP

111

- MH (AM MH,

1	IPE TYPE	-
127456	VCP ACP RCP CIP OR DIP PVC DTHER	

D	UTY
1	TV ONLY
3	TV, AIR TEST & REPAIR
- 4	TV & REPAIR

GANNET • 1ING, INC. **TELEVISION INSPECTION LOG**

SHEET 1

CLIENT : DIVISION OF DAM SAFETY JOB # : 31246 DATE : AUGUST 14, 1997 TIME : 1600 LOCATION: DAM NO. 01522, SOUTH RIVER NO. 7, WILDA PIPE : 06", CMP, 98 FT TELEVISING: LEFT EMBANKMENT DRAIN STATIONING FROM : OUTLET END OPERATOR JLP DUTY : 1 RIG NO. 346 VIDEO TAPE: 04 **STATION** CODE VIDEO FOOTAGE COMMENTS Corrugated pipe. 0 ± 00 0 + 02Bend in pipe. 0+98+++ +++++-+-≁ 4-+--4. -<u>}</u>-Ĵ.

(1994) 白垩纪的分子 自己的 法法律问题 化环境门 机 -11 B. 14

- 영향가 - NRL(1997) 58**78**~ innin Loop (...

	TELEVISUAL INSPECTION	LOOLUP C	ODES	MANIHOLE TYPE
I RUN D	TORMATION	MAINI	INE INFORMATION	
CODE	COMMENTS	CODE	COMMENTS	2 PRECAST 3 BLOCK
		45	APPARENT CRITICAL PDINT OF SAG, ### -INCHES OF LIQUID	4 OTHER
3	END PIPE	40	CRACKED PIPE AT SERVICE CONNECTION	
4	END RUN, RUN CONSISTS OF *** FOOT PIPE SECTIONS	48	PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION	
5	CND TELEVISUAL INSPECTION	49	CRACKED PIPE AT JUINT	
6	SAME PINNI AS ENCIUNIERED UN PREVIDUS SETUP DIN HAS NOT BEEN CLEANED PRIDE TO INSPECTION	51	LINEAR CRACK	
é	RUN HAS BEEN CLEANED PRIOR TO INSPECTION	52	BEGIN LINEAR CRACK	
9	RUN REDUIRES CLEANING	53		MANUAL PALM
10	BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55	BEGIN MULTIPLE CRACKS	MANJOLL IN
12	EXTERNAL REPAIR REDINRED	56	END MULTIPLE CRACKS	LIDSTOFAM MH
13	CAN BE INTERNALLY REPAIRED DIDE DEFLECTION THRU DON ORSERVED	58	BEGIN CRUSHED PIPE	2 DOWNSTREAM MH.
15	UNABLE TEL CONTINUE DUE TO WWW	59	END CRUSHED PIPE	
1000	DIDONIALIZAN	60 61	MUE IN PIPE	
I JUINE I	INTURMATION	62	CHANGE IN PIPE TYPE FROM TO	
CODE	COMMENTS	63	CHANGE IN PIPE SECTION LENGTH FROM ### FEET	
21	ากาก	64	CHANGE OF DIRECTION	
55	JUINT - LEAKING	65	INSIGNIFICANT FLOW OBSERVED	
23	JOINT - SLIGHT ROOT PENETRATION	66 67	FLOV APPEARS TO BE EXFILTRATING	
25	JOINT - SEVERE ROOT PENETRATION	69	END	
56	JOINT - WIDE OR OPEN	69	CONTINUES	
28	JUINT - VERTILALLY MISALIUNED IOINT - HORIZONTALLY MISALIUNED	70	ADDERATE ROOT PENETRATION	HPE TYPE
29	JOINT - BEGIN SAG	72	SEVERE RODT PENETRATION	
30	JOINT - END SAG			
32	JOINT - AIR TEST FAIL	SERVIC	E INFORMATION	
33	JOINT - REPAIRED, *** GALLONS OF GROUT	ODF	(MALENTS)	4 CIP OR DIP
35	JUINE - NUE TESTED, UNABLE TU ISULATE JUINE - INSIGNIFICANT FEUN ORSERVED	0000		5 PVC
36	JOINT - FLOW APPEARS TO BE EXFILTRATING	80	SERVICE CONN, ### D'CLOCK POSITION, WYE OR TEE	6 UIHER
			PROT. was -INCHES	
		82	HOUSE ND.	
]]		84	SERVICE CUMPECTION CRACKED	
		85	MODERATE ROOT PENETRATION	
11		86 ภ7	SEVERE ROOT PENETRATION	
		88	INTERMITTENT FLOW, FUSSIBLE SUMP FUMP CUMPLETED	[
11		U9	INSIGNIFICANT FLOW DUSERVED	DUTY
		91	FLUW 15 USAUL SERVICE CONN - AIR FEST PASS	
		92	SERVICE CONN AIR TEST FAIL	1 TV DNLY
		90 94	SERVICE CONN NOT TESTED, NO CLEANOUT ACCESS	1231 RIA VI S
	2TRIMHOD RI ATAD JAYE ###	95	SERVICE CONN WATER SATURATION TEST FAIL	L REPAIR 4 TV L REPAIR

GANNETT ING, INC.

SHEET I O

TELEVISION INSPECTION LOG

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : AUGUST 15, 1997 TIME : 0940

PIPE :

LOCATION: DAM NO. 01509, SOUTH RIVER NO. 6, SENGERS MOUNTAIN LAKE

TELEVISING : RISER INTERIOR STATIONING FROM : TOP OF RISER

DUTY : I RIG NO. 346 OPERATOR JLP VIDEO TAPE: 05

STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00		5	Downstream wall.
+		35	
+		123	Left side wall.
+			
+		190	Upstream wall.
+		247	Gate valve, no leakage.
+		260	Right side wall.
+			
+		374	Outside intake tower.
+			
+			
+			
+			
+			
+			
+			
+			
+			
+			
+			
+			
+			
SEE BACK FO	OR CODES F	OR: MANHOLE TYPE, N	IANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

	MANHOLE TYPE				
RUN INFORMATION			NR INPORMATION		
YANF	2740140	0000	MUT	2 PRECAST	
UNP	CONTREM 10	CUDE	COMMEN 13		
1	BEGIN RUN	45	APPARENT CRITICAL POINT OF SAG. === -INCHES OF LIQUID	4 DINER	
5	BEGIN PIPE	46	DROP CONNECTION AT 6 D'CLOCK		
3	END PIPE	47	CRACKED PIPE AT SERVICE CONNECTION		
4	END KON KON CONSISTS OF ### THULL PIPE SECTIONS	48	PERIPHERAL LEAK ARIJUNI CUI-IN SERVICE CUNNECTION		
5	END TELEVISUAL INSPECTION	49			
5	SAME PHINE AS ENCIUNIERED ON PREVIOUS SEFUE	50	LINEAR CRACK		
<i>'</i>	PIN HAS NOT BEEN LEFANCE PRICE TO INSPECTION	52	BEGIN LINEAR CRACK		
9	RUN REQUIRES CLEANING	53	END LINEAR CRACK		
o o	FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	54	MULTIPLE CRACKS	I MANHOLE HIR	
1	BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55	BEGIN MULTIPLE CRACKS		
5	EXTERNAL REPAIR REQUIRED	56	CONTRACT AND	I LIDSTREAM MH	
3	CAN BE INTERNALLY REPAIRED	58	BEGIN CRUSHED PIPE	2 DOWNSTREAM MH.	
4 5	PIPE DEFLECTION THRO RON DESERVED	59	END CRUSHED PIPE	-	
5		60	PIECES MISSING (*** -SIDE)		
INT I	JPOP MATION	61	HOLE IN PIPE		
uni r	IT V A MATINI	62	CHANGE IN PIPE TYPE FROM TO		
)DL	COMMENTS	63	CHANGE IN PIPE SECTION LENGTH FROM WWW FEET		
		64	FHANGE DE DIDECTION MAN		
:L >2	JUNI - IFAKING	65	INSIGNIFICANT FLOV DBSERVED		
3	JUNT - SLIGHT ROOT PENETRATION	66	FLUV APPEARS TO BE EXFILTRATING		
4	JUINT - MODERATE ROOT PENETRATION	67	BEGIN		
5	JOINT - SEVERL ROOT PENETRATION	60	END		
6	JOINT - VIDE OR DPEN	69 20			
:/ 20	- VERTLALT MISALIUNED MINT - HOPIZANTALLY MISALIUNED	70	MODERATE REAL PENETRATION	PIPE TIPE	
9	JOINT - BEGIN SAG	72	SEVERE ROOT PENETRATION		
0	JOINT - END SAG			1 VCP	
12 11	JIINT - AIR TEST CAU	SERVIC	R INFORMATION	2 ACP	
33	JUINT - REPAIRED GALLENS OF GROUT	0000			
34	JOINT - NOT TESTED, UNABLE TO ISOLATE	WDE	COMMENTS	5 PVC	
35	JUINT - INSIGNIFICANT FLOW OBSERVED	80	SERVICE CONN O'CLOCK POSITION. WYE OR TEF	6 OTHER	
16	JUINT - FLUV APPEARS TO BE EXFILTRATING	81	SERVICE CONN., *** D'CLOCK POSITION CUT-IN.	L	
			PRDT. #AR -INCHES		
		85	HOUSE NO.		
		83	SLRVICE CONNECTION CRACKED		
		64 85			
		BE			
		87	INTERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED		
		88	INTERMITTENT FLOW, SUMP PUMP CONNECTED, VERIFIED		
		89	INSIGNIFICANT FLOW DBSERVED	DUTY	
		90	I LUY IS USAGE		
		0.			
		91	SERVICE CONN AIR TEST PASS		
		91 92 93	SERVICE CONN AIR TEST PASS SERVICE CONN AIR TEST FAIL SERVICE CONN NOT VESTED NO CLEANDUT ACCESS	I TV DNLY 2 TV & AIR TEST	
		91 92 93 94	SERVICE CONN AIR TEST PASS SERVICE CONN AIR TEST FAIL SERVICE CONN NOT TESTED, NO CLEANDUT ACCESS SERVICE CONN VATUR SATURATION TLST PASS	I TV DNLY 2 TV & AIR TEST 3 TV, AIR TEST	

GANNET MING, INC.

SHEET I

TELEVISION INSPECTION LOG

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : AUGUST 15, 1997 TIME : 1315

LOCATION: DAM NO. 01509, SOUTH RIVER NO. 6, SENGERS MOUNTAIN LAKE

TELEVISING : OUTFALL CONDUIT STATIONING FROM : DOWNSTREAM END PIPE : 24", RCP, 343 FT

DUTY : I RIG NO. 346 OPERATOR JLP VIDEO TAPE: 05

STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00	l	539	
0+02	2	550	
3+43	3	1540	15' pipe sections.
+			
+			
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+			
SEE BACK FO	R CODES F	OR: MANHOLE TYPE, N	IANIIOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

[31246\TYLOGS\TYLOG_16]

	TELEVISUAL INSPECTION	LOOKUP C	DDES	
RUN IN	FORMATION	INE INFORMATION		
CODE	CONDIENTS	CODE	COMMENTS	5
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 JOINT 1 CODK 21 22 23 24 25 26 27 28 29 20	BEGIN RUN BEGIN PIPE END RUN, RUN CONSISTS OF *** FOOT PIPE SECTIONS END RUN, RUN CONSISTS OF *** FOOT PIPE SECTIONS END TELEVISUAL INSPECTION SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP RUN HAS NOT BEEN CLEANED PRIOR TO INSPECTION RUN HAS NOT BEEN CLEANED PRIOR TO INSPECTION RUN HAS DELEN CLEANED PRIOR TO INSPECTION RUN HAS DELEN CLEANED PRIOR TO INSPECTION RUN HAS DELEN CLEANED FOO GENERAL JOINT LEAKAGE BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE EXTERNAL REPAIR REQUIRED CAN BE INTERNALLY REPAIRED PIPE DEFLECTION THRU RUN OBSERVED UNABLE TO CONTINUE DUE TO *** NYOLMATION COMMENTS JOINT - LEAKING JOINT - SEVERE ROOT PENETRATION JOINT - SEVERE ROOT PENETRATION JOINT - VIDE IR DPEN JOINT - VIDE IR DPEN JOINT - VERTICALLY MISALIGNED JOINT - MORTALLY MISALIGNED JOINT - BEGIN SAG	454 47 48 47 48 50 51 53 55 55 55 55 56 61 62 63 64 56 67 69 71 7 7	APPARENT CRITICAL POINT OF SAG. *** -INCHES OF LIQUID DROP CONNECTION AT 6 D'CLOCK CRACKED PIPE AT SERVICE CONNECTION PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION CRACKED PIPE AT JOINT SHEAR CRACK LINEAR CRACK END LINEAR CRACK END LINEAR CRACK BEGIN MULTIPLE CRACKS END MULTIPLE CRACKS CRUSHED PIPE BEGIN CRUSHED PIPE PIECES MISSING (*** -SIDE) MOLE IN PIPE CHANGE IN PIPE TYPE FROM TO CHANGE IN PIPE SECTION LENGTH FROM *** FEET TO *** FEET CHANGE OF DIRECTION *** INSIGNIFICANT FLOV DBSERVED FLOV APPEARS TO BE EXFLITRATING BEGIN CONTINUES SLIGHT ROOT PENETRATION SEVERE ROOT PENETRATION	
31	22A9 T23T 91A - TMUL 22A9 T23T 91A - TMUL	SERVIC	R INFORMATION	2
33	JUINT - RIK TEST FAIL JUINT - REPAIRED, ### GALLONS OF GROUT	CODE	COMMENTS	4
34 35 36	JOINT - NOT TESTED, UNABLE TO ISOLATE JUINT - INSIGNIFICANT FLOW OBSERVED JUINT - FLOW APPEARS TO BE EXFILTRATING	80 81 82 83 84 85 86 85 86 87 86 87 86 87 89 90 91	VURDIDITIU SERVICE CONN, *** O'CLOCK POSITION, WYE OR TEE SERVICE CONN, *** O'CLOCK POSITION, CUT-IN, PROT. *** -INCHES HOUSE ND. SERVICE CONNECTION CRACKED SLIGHT ROOT PENETRATION MODERATE ROOT PENETRATION INTERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED INTERMITTENT FLOW, SUMP PUMP CUNNECTED, VERIFIED INSIGNIFICANT FLOW OBSERVED FLOW IS USAGE SERVICE CONN AIR TEST PASS	56
	27MHDD NI ATA IN COMMENTS	92 90 94 95	SERVICE CONN AIR TEST FAIL SERVICE CONN NOT TESTED. NO CLEANOUT ACCESS SERVICE CONN WATER SATURATION TEST PASS SERVICE CONN WATER SATURATION TEST FAIL	

MANHOLE TYPE

BRICK PRECAST BLOCK OTHER

MANHOLE	H
1 UPSTRE 2 DOWNST	AM MH. REAM MH.
PIPE TYPE	
3 RCP 4 CIP DR	DIP
5 PVC 6 DTHER	
	· · · · · · · · · · · · · · · · · · ·
5 t MTD	
DUTY	

- TV LINET TV & AIR TEST TV. AIR TEST & REPAIR TV & REPAIR

GANNETT 11NG, INC.
TELEVISION INSPECTION LOG

× 2

SHEET <u>I</u>

CLIENT :]	DIVISIO	N OF DAM SAFE	TY		JOB # : <u>31246</u>	DATE : AUGUST 15, 1997	TIME : 1315
LOCATION:	DAM N	O. 01509, SOUTH	RIVER NC). 6, SENGERS MC	OUNTAIN LAKE		
TELEVISING	: LEF	r embankment	T DRAIN	_ STATIONING FROM	1 : OUTLET END	PIPE : 06", CMP, 123 FT	
DUTY : <u>1</u> R	IG NO. <u>3</u>	46 OPERATOR J	LP	VIDEO TAPE: 05			
STATION	CODE	VIDEO FOOTAGE	COMMENTS	S			
0+00	1	1540	Corrugated	l pipe.			
0+02	2	1551					
+							
1+23		1834	Bend in pig	pe.			·_···
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+							
SEE BACK FO	OR CODES F	OR: MANHOLE TYPE, M	IANIIOLE 0+00,	PIPE TYPE, DUTY AND LO	OKUP CODES.		
[31246\TVLOC	SITVLOG_I	6.2]					

	TELEVISUAL INSPECTION L	OOLUP CO	DBS	MANHOLE TYPE
RUN INFORM	IA TION	MAINLINE INFORMATION		I BRICK
លារា ហារ		0007	MARTIN	2 PRECASI
	ILITEN IO	CODE		4 DTHER
E BEG	IN RUN	45	APPARENT CRITICAL POINT OF SAG. *** -INCHES OF LIQUID	
5 BEQ.	IN PIPE	46	DRUP CUNNELTION AT 5 UTLUCK	
3 END		4/	DEDIDUEDAL LEAK ARDIND CUT-IN SERVICE CONNECTION	
4 END	KNY KNY CNYJYLY NE ANA FOUL MAE SECLINAZ	49	CRACKED PIPE AT JOINT	
S END	E POINT AS ENCOUNTERED ON PREVIOUS SETUR	50	SHEAR CRACK	
2 DIN	HAS NOT BEEN CLEANED PRIDE TO INSPECTION	51	LINEAR CRACK	
8 RUN	HAS BEEN CLEANED PRIOR TO INSPECTION	52	BEGIN LINEAR CRACK	
9 RUN	REQUIRES CLEANING	53	END LINEAR CRACK	
10 FLO	W CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	54	MULTIPLE LRACKS	MANHOLE IH
II BAL	ANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JUINT LEAKAGE	55	SUD WHITTELE CRACKS	
12 EXT	LKNAL KLPAIK KLUUIKLU	57	CRUSHED PIPE	I UPSTREAM MH.
4 PLPF	E DEFIFETION THRU RUN OBSERVED	58	BEGIN CRUSHED PIPE	2 DOWNSTREAM M
5 UNA	BLE TU CONTINUE DUE TO ***	59	END CRUSHED PIPE	L
		60	PIECES MISSING (*** -SIDE)	
OINT INFOR	MATION	61	HULL IN PIPL	
		62	CHANGE IN PIPE SECTION LENGTH FROM MAN FEFT	
UDE UDE	MDER IS	05	ID AND FEET	
51 JOH	NT	64	CHANGE OF DIRECTION ***	
55 JUN	NT - LEAKING	65	INSIGNIFICANT FLOW DBSERVED	
53 JON	NT - SLIGHT ROOT PENETRATION	66	FLOW APPEARS TO BE EXFILTRATING	
24 JON	NT - MODERATE ROOT PENETRATION	67	BEGIN	
20 101	NT - SEVERE RUDI PENEIRATIUN	60 69	CONTINUES	
27 101	NT - VERTICALLY MISALIGNED	70	SLIGHT ROOT PENETRATION	BIBP TYDE
10L 85	NT - HORIZONTALLY MISALIGNED	71	HODERATE ROOT PENETRALION	
29 JOIN	NT - BEGIN SAG	72	SEVERE RUDT PENETRATION	
30 1011	NT - END SAG			1 VCP
31 301	NT - AIR TEST PASS	SERVICE	INFORMATION	2 ACP
יוחו ווחו 25	NT - RÉPATREN ANN GALLONS DE GROUT	JUE 1 IVE		3 REP
34 JOH	NT - NOT TESTED, UNABLE TO ISOLATE	CUDE	COMMENTS	
35 JOH	NT - INSIGNIFICANT FLOW DASERVED	80		6 DTHER
36 JUN	NT - FLOW APPEARS TO BE EXFILTRATING	อ้	SERVICE CONN. NOK D'CLOCK POSITION, WIE UN TEL	
			PROL WAR -INCHES	
		85	HOUSE NO.	
		83	SERVICE CONNECTION CRACKED	
		84	SLIGHT ROOT PENETRATION	
		85	PUDLKAIL KUUI PENETRATION	
		87	INTERMITTENT FURY PASSING SHUD DHUD CONNECTED	
		88	INTERMITTENT FLOW, SUMP PUMP CONNECTED VEDICIED	
		69	INSIGNIE ITANT FLOW OBSERVED	DIFT

90

FLOW IS USAGE

SERVICE CONN. - AIR TEST PASS

SERVICE CONN. - AIR TEST FAIL SERVICE CONN. - AIR TEST FAIL SERVICE CONN. - NOT TESTED, NO CLEANOUT ACCESS SERVICE CONN. - WATER SATURATION TEST FAIL

*** TYPE DATA IN COMMENTS

DUTY

- Y JAO VT I T23T RIA & VT S T23T RIA ,VT C
- & REPAIR
- 4 TV & REPAIR

GANNET 11NG, INC.

SHEET I

TELEVISION INSPECTION LOG

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 22, 1997 TIME : 0900

LOCATION: DAM NO. 08907, LEATHERWOOD CREEK NO. 6

TELEVISING : RISER INTERIOR

STATIONING FROM : TOP RISER

PIPE :

DUTY : 1 RIG NO. 346 OPERATOR JLP VIDEO TAPE: 06

STATION	CODE	VIDEO FOOTAGE	COMMENTS		
+		0	Total depth is 19.7' 2' x 6' opening.		
+		35	Downstream wall is 7.9' to top of intake.		
+			Opening of intake is 2 x 13.		
0+15		570	Seam in wall. No leakage.		
+			17.2' to top of outfall pipe.		
+		687	Left side wall.		
+		905	Bottom of slab. Left side crack.		
0+17		910	Upstream wall.		
+			Top of gate valve. Gate valve has no leakage.		
+		1235	Right side wall.		
+		1419	Bottom of slab crack.		
+		1445	End.		
+					
+		1445	Outside intake tower.		
+		1608			
+					
+					
+					
+					
+	1				
+					
+					
SEE BACK FOR CODES FOR: MANIIOLE TYPE, MANIIOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.					

TELEVISUAL INSPECTION LOOKUP CODES				
RUN INFORMATION			INE INFORMATION	
CODE	COMMENTS	CODE	COMMENTS	2 PRECAST 3 BLOCK
1	BEGIN RUN	45	APPARENT CRITICAL POINT OF SAG *** -INCHES OF LIQUID	
2	BEGIN PIPE	46	CRACKED PIPE AT SERVICE CONNECTION	
4	END RUN RUN CONSISTS OF ANN FOOT PIPE SECTIONS	48	PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION	
5	END TELEVISUAL INSPECTION	49	CRACKED PIPE AT JOINT	
6	SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP	50	SHLAR URALN	
, e	RUN HAS NUT BEEN CLEANED PRIDE TO INSECUTION	5'e	BEGIN LINEAR CRACK	
9	RUN REQUIRES CLEANING	53	END LINEAR CRACK	
10	FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	54	MULTIPLE CRACKS	MANHOLL III
11	BALANCE OF FLOW CAN BE ATTRIBUTED TO DENERAL JUINT LEARADE	56	END HULTIPLE CRACKS	
13	CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE	I UPSTREAM MH.
14	PIPE DEFLECTION THRU RUN OBSERVED	58	BEGIN CRUSHED PIPE	2 DOWNSTREAM MH
15	UNABLE TO CONTINUE DUE TO ***	59	END CRUSHED PIPE	
		61	HOLE IN PIPE	
JOINT D	A PURMATIUN	62	CHANGE IN PIPE TYPE FROM TO	
CODE	COMMENTS	63	CHANGE IN PIPE SECTION LENGTH FROM WAN FEET	
21		64	CHANGE OF DIRECTION AND	
22	JDINT - LEAKING	65	INSIGNIFICANT FLOV DBSERVED	
23	JOINT - SLIGHT ROOT PENETRATION	66	FLOW APPEARS TO BE EXFILTRATING	
24	JOINT - MODERATE ROOT PENETRATION	67	BEGIN	
25	JUINT - VIDE OD ODEN	69	CONTINUES	
27	JOINT - VERTICALLY MISALIGNED	70	SLIGHT ROOT PENETRATION	NDF TYPF
28	JOINT - HORIZONTALLY MISALIGNED	71	HODERATE ROOT PENETRATION	INCINE
29	JOINT - BEGIN SAG	72	SEVERE RUDT PENETRATION	1 1/69
30	JULY - END SAG 22A9 12'H NIA - END	008000		
32	JUINT - AIR ILST FAIL	PERAIC	L INPULMATION	3 RCP
33 34	JUNT - REPAIRED, 400 GALLONS OF GROUT JOINT - NOT TESTED, UNABLE TO ISOLATE	CODE	COMMENTS	4 CIP OR DIP
35	JOINT - INSIGNIFICANT FLOW OBSERVED	60	SERVICE CONN. *** O'CLOCK POSITION, WYE OR TEE	6 DTHER
36	JOINT - FLOV APPEARS TO BE EXFILTRATING	81	SERVICE CONN. *** D'CLOCK POSITION, CUT-IN.	L
		0.2	PROT. WAR -INCHES	
		83	SERVICE CONNECTION CRACKED	
		94	SEIGHT ROOT PENETRATION	
		85	HODERALE ROOT PENETRATION	
		96 87	NICONVERSION FUNCTION	
		88	INTERMITTENT FLOW, SUMP PUMP CONNECTED, VERIFIED	
		89	INSIGNIFICANT FLOV OBSERVED	DUTY
		90	FLOW IS USAGE	
		92	SERVICE CONN - AIR IEST PASS	1 TV DNLY
		93	SERVICE CONN NOT TESTED, NO CLEANOUT ACCESS	2 TV & AIR TEST
		94	SERVICE CONN WATER SATURATION TEST PASS	3 TV, AIR TEST
	NAN TYPE DATA IN COMMENTS	95	SERVICE CONN WATER SATURATION TEST FAIL	

GANNETT 1 ING, INC.

SHEET _____ Or ____

TELEVISION INSPECTION LOG

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 22, 1997 TIME : 1030

LOCATION: DAM NO. 08907, LEATHERWOOD CREEK NO. 6

TELEVISING :	OUTFALL CONDUIT	STATIONING FROM : OUTLET END	PIPE : 24", RCP, 212 FT

DUTY : 1 RIG NO. 346 OPERATOR JLP VIDEO TAPE: 06

STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00	1	1610	
0+02	2	1640	
2+10	3		
2+12	4		16' sections.
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<u>+</u>			
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+			
SEE BACK FO	R CODES F	OR: MANHOLE TYPE, M	1ANIIOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

[31246\TVLOGS\TVLOG_18]

	TELEVISUAL INSPECTION L	NOTOL O		MANHOLE TYPE
RUN INFORMATION			INE INFORMATION	1 BRICK
ነባበም		MU	and	2 PRECAST
NVD	CONTRATO	CODE		4 DTHER
I	BEGIN RUN	45	APPARENT CRITICAL POINT OF SAG, WWW -INCHES OF LIVUID	
2	BEGIN PIPE	46	DRUP LUNNELTIUN AT & D'LLULK	
3	END PIPE	47	PERIPUSPAL LEAK ARTIND CUT-IN SERVICE CONNECTION	
4	FUD KOV KDV COVINITY DE 404 LODI LILE SECTIONS	49	CRACKED PIPE AT JOINT	
5	END HELEVISIAL INSPECTION PPEVIAIS SETUP	50	SHEAR CRACK	
7	DUN HAS NOT REEN LIFANER PRIDE TO INSPECTION	51	LINEAR CRACK	
Ĥ	RUN HAS BEEN CLEANED PRIOR TO INSPECTION	52	BEGIN LINEAR CRACK	
9	RUN REQUIRES CLEANING	53	END LINEAR CRACK	
0	FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	54		MANHOLE IH
1	BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55 54	CND MULTIPLE CRACKS	
Ş	EXTERNAL REPAIR REQUIRED	57		I LIPSTREAM MH
د ۵	PIPE DEFIECTION THREE PIN ORSERVED	58	BEGIN CRUSHED PIPE	2 DOWNSTREAM MH.
5		59	END CRUSHED PIPE	-
		60	PIECES MISSING (+++ -SIDE)	
HNT I	NYORMATION	61	HOLE IN PIPE	
0 m #		62	CHANGE IN PIPE FECTION LENGTH FROM WHE FEET	
UDE	COMMENTS	00	TO any FFFT SECTION LENGTH FROM WE FEET	
21	ININT	64	CHANGE OF DIRECTION ###	
22	JDINT - LEAKING	65	INSIGNIFICANT FLOW DBSERVED	
23	JOINT - SLIGHT ROOT PENETRATION	66	FLOW APPEARS TO BE EXFILTRATING	
24	JOINT - MODERATE ROOT PENETRATION	67	BEGIN	
25	JOINT - SEVERE ROOT PENETRATION	68	END	
:6 .7	JUINT - VIDE UR DPEN IDINT - VERTIGALLY MISALIGNED	59 70		
28	JUNT - VERTGALLT MISALIUNED	70	MODERATE ROOT PENETRATION	PIPE TIPE
29	JOINT - BEGIN SAG	72	SEVERE ROOT PENETRATION	
30	JOINT - END SAG			1 VCP
л 32	JUNT - AIR TEST PASS	SERVIC	E INFORMATION	
ມລື	JUINT - REPAIRED, A## GALLONS OF GROUT	OUDE	COLLIADATO	
34	JOINT - NOT TESTED, UNABLE TO ISOLATE	CUDE	COMMPU 12	5 PVC
с L АГ	UNNI - FEDU ARPEARS TO BE CYCHITRATHE	80	SERVICE CONN, *** O'CLOCK POSITION, WYE DR TEE	6 DTHER
	ANNAL FERE OUTERNALIN DE LATIFIENTING	81	SERVICE CONN. *** D'CLOCK POSITION CUT-IN	
		62	PRUT, WAR -INCHES	
		84	NUUSI, NU. SERVICE EDNNEETIDN CRACKED	
		84	SEIGHT ROOT PENETRATION	
		85	MODERATE ROOT PENETRATION	
		86	SEVERE ROOT PENETRATION	
		87	INTERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED	
		88	INTERMITTENT FLOW, SUMP PUMP CONNECTED, VERIFIED	
		89	INSIGNIFICANT FLOW DBSERVED	1 DUTY
		90 91	SERVICE CONN - AND TEST PASS	
		92	SERVICE CONN AIR TEST FAIL	I TV DNLY
		93	SERVICE CONN NOT TESTED, NO CLEANDUT ACCESS	2 TV & AIR TEST
		94	SERVICE CONN WATER SATURATION TEST PASS	3 TV, AIR TEST
			· · · · · · · · · · · ·	
SHEET 1

TELEVISION INSPECTION LOG

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 22, 1997 TIME : _

LOCATION: DAM NO. 08907, LEATHERWOOD CREEK NO. 6

TELEVISING : LEFT EMBANKMENT DRAIN STATIONING FROM : OUTLET END PIPE : 06", CMP, 54 FT

DUTY : 1 RIG NO. PORTABLE OPERATOR JLP VIDEO TAPE: 06

STATION	CODE	VIDEO FOOTAGE	COMMENTS						
0+00	1		Corrugated pipe.						
0+02	2								
0+20	29								
0+53	30								
0+54			Appeared to be bend in pipe. (As-built plans indicate pipe terminates.)						
+		· · · · · · · · · · · · · · · · · · ·							
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SEE BACK FO	OR CODES F	OR: MANHOLE TYPE, N	ANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.						
[31246\TVLOC	[]1246/TVLOGS/TVLOG 19]								

	TELEVISUAL INSPECTION I	OOLUP CO		MANHOLE TYPE
RUN INFORMATION			NE INFORMATION	I BRICK
ODE	COMMENTS	CODE	COMMENTS	2 PRECAST 3 BLOCK
1	BEGIN RUN	45	APPARENT CRITICAL POINT OF SAG, *** -INCHES OF LIQUID	4 DIHER
2	BEGIN PIPE	46 47	DROP CONNECTION AT 6 D'CLOCK	
4	END RUN RUN CONSISTS OF ### FOOT PIPE SECTIONS	48	PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION	
5	END TELEVISUAL INSPECTION	49	CRACKED PIPE AT JDINT	
67	SAME PHINT AS ENCHUNTERED UN PREVILIUS SETUP PHN NAS NUT REEN LITENTE PRIOR TO INSPECTION	51	LINEAR CRACK	
é	RUN HAS BEEN CLEANED PRIOR TO INSPECTION	52	BEGIN LINEAR CRACK	
9	RUN REQUIRES CLEANING	53	END LINEAR CRACK	MINTIOUP ALM
1	BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55	BEGIN MULTIPLE CRACKS	INARIOLL THE
2	EXTERNAL REPAIR REDUIRED	56 57	END HULTIPLE CRACKS	I LIDSTOCAN NU
3	CAN BE INTERNALLY REPAIRED PIPE DEFLECTION THRU RUN (UBSERVED	58	BEGIN CRUSHED PIPE	2 DOWNSTREAM
5	UNABLE TU CONTINUE DUE TO ***	59	END CRUSHED PIPE	
	UTABLE TAN	61	HOLE IN PIPE	
		62	CHANGE IN PIPE TYPE FROM TO	
JDL	COMMENTS	63	LHANGE IN PIPE SECTION LENGTH FROM WAW FELT	
21	ТиЮс	64	CHANGE OF DIRECTION ***	
22	JOINT - LEAKING JOINT - SLICHA DOOT PENETRATION	65 66	INSIGNIFICANT FLOW DBSERVED	
24	JOINT - MODERATE ROOT PENETRATION	67	BEGIN	
5	JOINT - SEVERE ROOT PENETRATION	68 69		
27	JUINT - VERTICALLY MISALIGNED	70	SLIGHT ROOT PENETRATION	BIBP TVDP
/8	JOINT - HORIZONTALLY HISALIGNED	71	HODERATE ROOT PENETRATION	INPINE
9	JUIN - BLUIN JAG	10	SEVERE RULI PENETRATIUN	
J	JOINT - AIR TEST PASS	SERVICE	INFORMATION	2 ACP
	JUNT - REPAIRED, NON GALLONS OF GROUT	MAR		A CIP OR DIP
34	JUNT - NOT TESTED, UNABLE TO ISOLATE	WILL	COMMENTS	5 PVC
36	JOINT - FLOW APPEARS TO BE EXFILTRATING	80 SI	SERVICE CONN. *** D'CLOCK POSITION, VYE OR TEE	6 UTHER
		-,	PRDI. WHE -INCHES	
		85	HOUSE NO.	
		84	SLIGHT ROOT PENETRATION	
		85	MODERATE ROOT PENETRATION	
		87	SEVERE RUDI PENETRATIUN	
		88	INTERMITTENT FLOW, SUMP PUMP CONNECTED, VERIFIED	
		90	INSIGNIFICANT FLOV OBSERVED	DUTY
		91	SERVICE CONN AIR TEST PASS	
		56 16	SERVICE CONN AIR TEST FAIL	2 IV LAIP TE
		94	SERVICE CONN WATER SATURATION TEST PASS	3 TV, AIR TEST
			· · · · · · · · · · · · · · · · · · ·	

GANNETT /ING, INC.

SHEET I ON 1

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TELEVISION INSPECTION LOG

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 22, 1997 TIME : _____

LOCATION: DAM NO. 08907, LEATHERWOOD CREEK NO. 6

TELEVISING : RIGHT EMBANKMENT DRAIN STATIONING FROM : OUTLET END PIPE : 06", CMP, 54 FT

DUTY : 1 RIG NO. PORTABLE OPERATOR JLP VIDEO TAPE: 06

STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00	1		Corrugated pipe.
0+02	2		
0+15	29		
0+29	30		Perforations in pipe begins.
0+54			Bend in pipe.
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			I

TELEVISUAL INSPECTION	LOOKUP C	DDRS	MANHOLE TYPE
UN INFOLMATION		INE INFORMATION	i BRICK
) DE COMMENTS	CODE	COMMENTS	3 BLOCK
I BEGIN RUN	45	APPARENT CRITICAL POINT OF SAGINCHES OF LIQUID	4 OTHER
2 BEGIN PIPE	46	DROP CONNECTION AT 6 D'CLOCK	f
3 END PIPE	47	CRACKED PIPE AT SERVICE CONNECTION	
END RUN, RUN CONSISTS OF ANA FOOT PIPE SECTIONS	48	PERIPHERAL LEAK ARDIND COTAIN SERVICE CONNECTION	
END TELEVISUAL INSPECTION	47	SHEAR CRACK	
JUM HAS ANT DECH CLEANED PRIOR TO INSPECTION	51	LINEAR CRACK	
RUN HAS BEEN CLEANED PRIOR TO INSPECTION	52	BEGIN LINEAR CRACK	
RUN REQUIRES CLEANING	53	END LINEAR CRACK	MANTIOLE ALM
FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	54 55	REGIN MULTIPLE CRACKS	MAAHOLL TW
BALANCE OF FLUV CAN BE ATTRIBUTED TO GENERAL JUINT LEARAGE	56	END HULTIPLE CRACKS	
CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE	I UPSTREAM MH.
PIPE DEFLECTION THRU RUN OBSERVED	58	BEGIN CRUSHED PIPE	S DUANZIKEW MH
UNABLE TO CONTINUE DUE TO ###	27	LND LKUSHED PIPE PIECES MISSING (### -SIDE)	
	61	HOLE IN PIPE	
I INFORMATION	62	CHANGE IN PIPE TYPE FROM TO	
COMMENTS	63	CHANGE IN PIPE SECTION LENGTH FROM WAW FEET	
	64	IU APE ILLI Change de digertion man	
JUINT - LEAKING	65	INSIGNIFICANT FLOW OBSERVED	
JOINT - SLIGHT ROOT PENETRATION	66	FLOW APPEARS TO BE EXFILTRATING	
JOINT - MODERATE ROOT PENETRATION	67	DEGIN	
JOINT - SEVERE ROOT PENETRATION	60 69	CONTINUES	
JOINT - WIDE DR DREN JOINT - VERTICALLY MISALIGNED	70	SLIGHT ROOT PENETRATION	BIBY TYPE
JOINT - HORIZONTALLY MISALIGNED	71	MODERATE ROUT PENETRATION	INFILL P
JOINT - BEGIN SAG	72	SEVERE ROOT PENETRATION	1 VCP
JUNI - LND SAG JOINT - AIR TEST PASS	OPRIMA		
JOINT - AIR TEST FAIL	JERAI C	P INTARATION	3 RCP
JUNT - REPAIRED, AND GALLONS OF GROUT	CODE	COMMENTS	4 CIP DR DIP
JOINT - INSIGNIFICANT FLOW DESERVED	90		
JOINT - FLOW APPEARS TO BE EXFILTRATING	81	SERVICE CONN WWW D'CLOCK POSITION, WIE OR THE	<u> </u>
	-•	PRDI. ### -INCHES	
	65	HOUSE NO.	
	83		
	85	MODERATE ROUT PENETRATION	
	86	SEVERE ROOT PENETRATION	
	87	INTERMITTENT FLOV, POSSIBLE SUMP PUMP CONNECTED	
	90	INTERMITIENT FLOW, SUMP PUMP CUNNECTED, VERIFIED	DITT
	90	FLOW IS USAGE	דוטע ן
	91	SERVICE CONN AIR TEST PASS	
	95	SERVICE CONN AIR TEST FAIL	1 TY DNLY
	93	SERVICE CONN NOT TESTED, NO CLEANOUT ACCESS	
*** TYPE DATA IN COMMENTS	95	SERVICE CONN WATER SATURATION TEST PASS	1 REPAIR
	• =	the two metals within antioning an induced	4 TV & REPAIR

GANNET

SHEET 1

TELEVISION INSPECTION LOG

NG, INC.

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 23, 1997 TIME :

LOCATION: DAM NO. 08902, LEATHERWOOD CREEK NO. 5

TELEVISING : RISER INTERIOR

STATIONING FROM : TOP OF RISER

PIPE :

DUTY : 1 RIG NO. 346 OPERATOR JLP VIDEO TAPE: 07

STATION	CODE	VIDEO FOOTAGE	COMMENTS
+			Total depth 36'.
+		0	Downstream wall.
+		520	
+		521	Left side wall.
+		760	
+		761	Upstream wall.
0+12			Concrete span 1/2" deep. 12'.
+		1210	34' top of gate valve. No leakage.
+		1227	Right side wall.
+		_1410	End
+			
+			
+			
+			
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+			
+	••••••		
+			
+			
+			
+			
+		I	
SEE BACK FO	R CODES F	OR: MANHOLE TYPE, M	IANIIOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

(JI240/TYLOGS/TYLOG_21)

·····	TELEVISUAL INSPECTION I	LOOKUP C	DDRS	MANHOLE TYPE
RUN IN	PORMATION	MAINE	INF INFORMATION	BRICK
CODE	COMMENTS	CODE	COMMENTS	2 PRECAST 3 BLOCK
1	BEGIN RUN	45	APPARENT CRITICAL POINT OF SAG, *** -INCHES OF LIQUID	4 DTHER
2	BEGIN PIPE	46	DROP CONNECTION AT 6 O'CLOCK	
4	END FIFE	48	PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION	
5	END TELEVISUAL INSPECTION	49	CRACKED PIPE AT JOINT	
6	SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP	50	SHEAR CRACK	
7	RUN HAS NOT BEEN CLEANED PRIUR TO INSPECTION	52	BEGIN LINEAR CRACK	
9	RUN REDUIRES CLEANING	53	END LINEAR ERACK	
10	FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	54	MULTIPLE CRACKS	MANHOLE +++
1	BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JUINT LEAKAGE	55 56	END MULTIPLE CRACKS	
12	CAN BÉ INTERNALLY REPAIRED	57	CRUSHED PIPE	I UPSTREAM MH.
4	PIPE DEFLECTION THRU RUN ODSERVED	50	UEGIN CRUSHED PIPE	2 DOWNSTREAM
15	UNABLE TO CONTINUE DUE TO ###	59	END CRUSHED FIFE	L
	NRABLE I TAN	6Ĭ	HOLE IN PIPE	
		65	CHANGE IN PIPE TYPE FROM TO	
ODL	COMMENTS	63	THANGE IN PIPE SECTION LENGTH FROM BAS FEET	
21	זאוםנ	64	CHANGE DF DIRECTION ***	
22	JAINT - LEAKING	65	INSIGNIFICANT FLOW DBSERVED	
23	JOINT - SLIGHT ROOT PENETRATION	66	REGIN	
25	JOINT - SEVERE ROOT PENETRATION	60	END	
56	JOINT - VIDE OR OPEN	69	CONTINUES	
27	JOINT ~ VERTICALLY MISALIGNED	70	SLIGHT ROOT PENETRATION	PIPE TYPE
29	JUNI - BEGIN SAG	72	SEVERE ROOT PENETRATION	
30	HINT - END SAG) VCP
32	JUINT - AIR TEST FAIL	SERVIC	E INFORMATION	2 ACP
33 -	JUINT - REPAIRED, A GALLONS OF GROUT	CODE	CONTRACTOR OF CO	
34	JOINT - NOT TESTED, UNABLE TO ISOLATE	CUPE	COMMENTS	5 PVC
35 36	JUINT - INSIGNIFICANT FLUW UBSERVED	80	SERVICE CONN. *** D'CLOCK POSITION. WYE OR TEE	6 DTHER
~~		ម	SERVICE CONN., NEW D'CLOCK POSITION, CUT-IN,	L
		85	HOUSE ND.	
		83	SERVICE CONNECTION CRACKED	
		84	SLIGHT ROUT PENETRATION	
		86	SEVERE ROOT PENETRATION	
		87	INTERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED	
		88	INTERMITTENT FLOW, SUMP PUMP CONNECTED, VERIFIED	DIFT
		90	FLDV 15 USAGE	ווענן
		91	SERVICE CONN AIR TEST PASS	
		92	SERVICE CONN AIR TEST FAIL	
		7 .) 94	SERVICE CONN NUT LESTED, NO CLEANDUT ACCESS	3 TV AIR IL
	WAW TYPE DATA IN COMMENTS	95	SERVICE CONN WATER SATURATION TEST FAIL	L REPAIR
				4 TV L REPAIR

GANNETT I NG, INC.

SHEET 1 OI

TELEVISION INSPECTION LOG

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 23, 1997 TIME :

LOCATION: DAM NO. 08902, LEATHERWOOD CREEK NO. 5

TELEVISING : OUTFALL CONDUIT STATIONING FROM : DOWNSTREAM END PIPE : 36", RCP, 334 FT

DUTY : I RIG NO. 346 OPERATOR JLP VIDEO TAPE: 07

STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00	1	1680	
0+02	2	1711	
3+32	3		
3+34			
+			16' sections.
+			
+			
+			
+			
+			
+			
+			
+			
+			
+			
+			
+			
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+			
SEE BACK FO	R CODES F	OR: MANHOLE TYPE, N	ANNOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

[31246\TVLOGS\TVLOG_22]

	MANHOLE TYPE			
JN INF	OBMATION	MAINLI	NE INFORMATION	1 BRICK
)DE	COMMENTS	CODE	COMMENTS	2 PRECAST 3 BLOCK
	BEĞIN RUN	45	APPARENT CRITICAL POINT OF SAGINCHES OF LIQUID	4 OTHER
	BEGIN PIPE	46	DRDP CONNECTION AT 6 O'CLOCK	
	END PIPE	47	CRACKED FIPE AT SERVICE CUNNELTIUN	
	CHE TOLEVIELAL ANCOCCTION	49	CRACKED PIPE AT JDINI	
	CANE PRINT AS ENCRUNTERED ON PREVIOUS SETUP	50	SHEAR CRACK	
	RUN HAS NUT BEEN CLEANED PRIOR TO INSPECTION	51	LINEAR CRACK	
	RUN HAS BEEN CLEANED PRIOR TO INSPECTION	52	BLUIN LINLAK LKALK	
	RUN REQUIRES CLEANING	54	MULTIPLE CRACKS	MINIMUT AM
	RALANCE DE FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55	BEGIN MULTIPLE CRACKS	MAILIOUE
	EXTERNAL REPAIR REQUIRED	56	END MULTIPLE CRACKS	
	CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE	2 DUVNSTREAM MH.
	THAT THE THE THE THE THE THE	59	END CRUSHED PIPE	E Dettistiction for
		60	PIECES MISSING (*** -SIDE)	
T N	POINATION	61	HOLE IN PIPE	
E 841		62	CHANGE IN PIPE FROM TO CHANGE IN PIPE FROM TO CHANGE IN PIPE SECTION FENGTH FROM WWW FEET	
	COMMENTS	60	10 *** FEET	
	TNIQL	64	CHANGE OF DIRECTION ***	
	JOINT - LEAKING	65	INSIGNIFICANT FLOW OBSERVED	
	JOINT - SLIGHT ROOT PENETRATION	60	ALCIN ANALAKZ IN REFILIKALING	
	JOINT - SEVERE ROOT PENETRATION	68	END	
	JOINT - VIDE OR OPEN	69	CONTINUES	
	JOINT - VERTICALLY MISALIGNED	70	SLIGHT ROOT PENETRATION	PIPE TYPE
	JUINT - HURIZUNTALLY MISALIGNED JUINT - REGIN SAG	71	SEVERE ROOT PENETRATION	
	JOINT - END SAG	· •		1 VCP
	22A9 T23T RIA - THIOL	CPEVIC	THEODWATION	2 ACP
	JOINT - AIR TEST FAIL	OLATIC		3 RCP
	JUNT - RUPARED, AND GALLUNS OF GROOT	CODE	COMMENTS	S PVC
	JUINT - INSIGNIFICANT FLOW DUSERVED	80	SERVICE CONN, *** D'CLOCK POSITION, WYE OR TEE	6 DTHER
	JUINT - FLUW APPEARS TH BE EXTILTRATING	81	SERVICE CONN., *** D'CLOCK POSITION CUT-IN,	
		02	PROT. ### -INCHES	
		83	SERVICE CONNECTION CRACKED	
		84	SLIGHT ROOT PENETRATION	
		85	MODERATE ROOT PENETRATION	
		86 N 7	SEVERE RULL PENETRATION	
		88	INTERMITTENT FLOW, PUBSIBLE SUMP PUMP CUMPELIED	
		89	INSIGNIFICANT FLOW OBSERVED	DUTY
		90	FLOY IS USAGE	
		91	SERVICE CONN AIR TEST PASS	
		93	SERVICE CONN - MIR LEST FAIL SERVICE CONN - NOT TESTED NO CLEANOUT ACCESS	2 TV & AIR TEST
		94	SERVICE CONN WATER SATURATION TEST PASS	3 TV, AIR TEST
	HAH TYPE DATA IN COMMENTS	95	SERVICE CONN - WATER SATURATION TEST FAIL	I & REPAIR

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SHEET 1

TELEVISION INSPECTION LOG

1ING, INC.

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 23, 1997 TIME :

LOCATION: DAM NO. 08902, LEATHERWOOD CREEK NO. 5

TELEVISING : LEFT EMBANKMENT DRAIN STATIONING FROM : OUTLET END PIPE : 06", CMP, 75 FT

DUTY : 1 RIG NO. PORTABLE OPERATOR JLP VIDEO TAPE: 07

STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00	1		Corrugated pipe.
0+02	2		
0+24			Mass of fine roots at sag in pipe.
0+75			Cannot advance camera any further; appears to be pipe bend.
+			
+			Roots are blocking flow.
+			
+			
+			
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· +	1		
	•		
'	•		
		FOR MANHOLE TYPE	I ANUOLE A+00 PIPE TYPE DITTY AND LOOKUP CODES

[31246\TVLOGS\TVLOG_23]

TELEVISUAL INSPECTION LOOKUP CUDES							
JN IN	ORMATION	MAINU	NR INFORMATION	1 BRICK			
מחו		00hB	MINIPUTC	2 PRECAST			
INP	COMPLEX 12	CUDE	COMMENTS	3 BLOCK			
1	BEGIN RUN	45	APPARENT CRITICAL POINT OF SAG. *** -INCHES OF LIQUID	4 DILCK			
2	BEGIN PIPE	46	DROP CONNECTION AT 6 D'CLOCK				
3	END PIPE	47	CRACKED PIPE AT SERVICE CONNECTION				
	END RUN RUN CONSISTS OF *** FOOT PIPE SECTIONS	48	PERIPHERAL LEAK AROUND CUT-IN SERVICE CUNNELTION				
	END TELEVISUAL INSPECTION	49	CRACKED PIPE AT JUINT				
	SAME PRINT AS ENCOUNTERED ON PREVIOUS SETUP	50	SHEAR CRACK				
7	RUN HAS NUT BEEN CLEANED PRIOR TO INSPECTION	51	DECIN LINEAD CRACK				
	RUN HAS BEEN CLEANED PRIDE TO INSPECTION	52 53	END LINEAR ERACK				
	KUN KLUDIKLS ULLANING EURA CAN BE ATTRIBUTED TO GENERAL MINT LEAKAGE	54	MULTIPLE CRACKS	MINTIOLY ALM			
	BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55	BEGIN MULTIPLE CRACKS	BIVITIONS A.A.			
	EXTERNAL REPAIR REQUIRED	56	END MULTIPLE CRACKS				
	CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE	1 UPSTREAM HH.			
	PIPE DEFLECTION THRU RUN OBSERVED	58	BEGIN CRUSHED PIPE	2 DOWNSTREAN MH.			
	UNABLE TO CONTINUE DUE TO MER	59	END CRUSHED PIPE				
	TAAL CONTACT	60	HULE IN DIDE				
NT I	IPOLMATION	62	CHANGE IN PIPE TYPE FROM TO				
n#	MININE CONTRACTOR	63	CHANGE IN PIPE SECTION LENGTH FROM #4. FEET				
DF	(WWWPPUI)		TO *** FEET				
l .	JOINT	64	CHANGE OF DIRECTION ###				
	JOINT - LEAKING	65	INSIGNIFICANT FLOW DBSERVED				
	JUINT - SLIGHT ROOT PENETRATION	66	FLOW APPEARS TO BE EXFILTRATING				
	JOINT - MODERATE ROOT PENETRATION	67					
2	JUNT - SEVERE RULT PENETRATION	0.0	CONTINUES				
	JUNI - WIDE UR DEEN IIINE - VERTICALLY MISALIGNER	70	SLIGHT ROOT PENETRATION	WRP TYPE			
3	JOINT - HORIZONTALLY MISALIGNED	71	HODERATE ROOT PENETRATION	I TIL I ILB			
	JOINT - BEGIN SAG	72	SEVERE ROOT PENETRATION				
)	JOINT - END SAG			I VCP			
	JUINT - AIR TEST PASS	SPRVIC	E INDORMATION	2 ACP			
	JUNT - AIK ILST FALL	UCRING		3 RCP			
	INNT - NETAIRED, 444 GALLUNS DE GRUDT	CODE	COMMENTS	A CIP UR DIP			
ذ	JOINT - INSIGNIFICANT FLOW DESERVED						
,	JOINT - FLOW APPEARS TO BE EXFILTRATING	00 01	SERVICE CONN. *** O'CLOCK POSITION, VIE DR 125				
		-	PRDL MAR -INCHES				
		82	HOUSE ND				
		83	SERVICE CONNECTION CRACKED				
		84	SLIGHT ROOT PENETRATION				
		85	MODERATE ROOT PENETRATION				
		86	SEVERE ROOT PENETRATION				
		87	INTERMITTENT FLOV, POSSIBLE SUMP PUMP CONNECTED				
		60	INTERMITTENT FLOW, SUMP PUMP CONNECTED, VERIFIED	DIFF			
		90	LIUN IC REVEL	דוטע			
		91	SERVICE CONN - AIR TEST PASS				
		92	SERVICE CONN AIR TEST FAIL	I TV DNLY			
		93	SLEVILL LINN NOT TESTED, NO CLEANDUT ACCESS 1	E IV & MIK ILSI			
		93 94	SERVICE CONN NOT TESTED, NO CLEANDUT ACCESS SERVICE CONN WATER SATURATION TEST PASS	3 TV, AIR TEST			

GANNETT I NG, INC.

SHEET I OL

TELEVISION INSPECTION LOG

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 23, 1997 TIME : _____

LOCATION: DAM NO. 08902, LEATHERWOOD CREEK NO. 5

TELEVISING : RIGHT EMBANKMENT DRAIN STATIONING FROM : OUTLET END PIPE : 06", CMP, 75 FT

DUTY : 1 RIG NO. PORTABLE OPERATOR JLP VIDEO TAPE: 07

STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00	1		Corrugated pipe.
0+02	2		
0+40	29		
0+75			Bend in pipe.
+			
+			Possible sag at 0+40, but fine root mass may be blocking flow.
+			
+			
+	·		
+		······	
+			
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<u>↓</u>			
	-	-	
· · · ·	-		
	-[-	
+ +	-	-	
SEE BACK FO	OR CODES F	I FOR: MANHOLE TYPE, N	I IANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

	TELEVISUAL INSPECTION	LOOLUP O	DDES	MA	NHOLE TYPE
RUN	INFORMATION	MAINL	INE INFORMATION	1 B	RICK
CODI	COMMENTS	CODE	COMMENTS	2 Pi 3 Bi 4 Di	RECAST LOCK THER
	BEGIN RUN BEGIN PIPE	45 46	APPARENT CRITICAL POINT OF SAG, *** -INCHES OF LIQUID DROP CONNECTION AT 6 D'CLOCK		
3	END PIPE	47 48	CRACKED PIPE AT SERVICE CONNECTION PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION		
5	END TELEVISUAL INSPECTION	49	CRACKED PIPE AT JOINT		
6	SAME PHINT AS ENCOUNT(.KED ON PREVIOUS SETUP	50 51	LINEAR CRACK		
6	RUN HAS BEEN CLEANED PRIOR TO INSPECTION	52	BEGIN LINEAR CRACK		
10	RUN REQUIRES ELEANING FLOV CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	54	MULTIPLE CRACKS	MAN	UHOLE HH
11	BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55 56	END MULTIPLE CRACKS		
13	CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE		PSTREAM MH.
14	PIPE DEFLECTION THRU RUN OBSERV€D UNABLE TO CONTINUE DUE TO ≪≪™	59	END CRUSHED PIPE		
IODA		60 61	PIECES HISSING (*** -SIDE) HOLE IN PIPE		
JOIN	INFURMATION	65	CHANGE IN PIPE TYPE FROM TO		
CODI	COMMENTS	63	TO BAN FEET		
21		64 65	CHANGE OF DIRECTION		
23	JOINT - LEAKING JOINT - SLIGHT ROOT PENETRATION	66	FLOV APPEARS TO BE EXFILTRATING		
24	JOINT - MODERATC ROOT PENETRATION JOINT - SEVERE ROOT PENETRATION	67 60	END		
26	JUINT - WIDE OR OPEN	69 70	CONTINUES	PIDE	
28	JOINT - VERTLALLY MISALIGNED	71	HODERATE ROOT PENETRATION		
29	JOINT - BEGIN SAG JOINT - END SAG	72	SEVERE ROOT PENETRATION		
31	JOINT - AIR TEST PASS	SERVIC	E INFORMATION	2 A	CP
33	JUINT - AIR TEST FAIL JUINT - REPAIRED, AFF GALLONS OF GROUT	MAR			LP IP OR DIP
34	JOINT - NOT TESTED, UNABLE TO ISOLATE JOINT - INSIGNEICANT FLOV ORSERVED	WDF		S P	
36	JOINT - FLOW APPEARS TO BE EXFILTRATING	8) 80	SERVICE CONN, and D'ELDER POSITION, WE OR TEE SERVICE CONN, NOW D'ELDER POSITION, CUT-IN,		
		85	HOUSE ND.		
		83 84			
		85	MODERATE RULT PENETRATION		
		06 87	SEVERE RULT PENETRATION		
		88 89	INTERMITTENT FLOW, SUMP PUMP CUNNECTED, VERIFIED	nia l	
ł		90	FLOV IS USAGE	וטע	
		92	SERVICE LUNN AIR TEST PASS SERVICE CONN AIR TEST FAIL	1 T	VONLY
		93 94	SERVICE CONN NOT TESTED, NO CLEANOUT ACCESS	2 1	V 4 AIR TEST V. AIR TEST
	*** TYPE DATA IN COMMENTS	95	SERVICE CONN WATER SATURATION TEST FAIL	4 1	

GANNETT IING, INC.

SHEET 1

TELEVISION hasPECTION LOG

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 24, 1997 TIME : 1100

LOCATION: DAM NO. 04504, JOHNS CREEK NO. 4

TELEVISING : RISER INTERIOR STATIONING FROM : TOP OF RISER PIPE :

DUTY : 1 RIG NO. 346 OPERATOR JLP VIDEO TAPE: 08

STATION	CODE	VIDEO FOOTAGE	COMMENTS
+			Total depth 39'
+		5	Downstream wall.
+		691	Left side wall.
+			22' patchwork done.
+			20' seam.
+		1120	Upstream wall.
+			19' top of intake.
+			21' bottom of intake.
+			35' top of valve.
+		_1720	Right side wall.
+			21' cold water pipe. Water level 5" below pipe.
+		2131	End.
+			
+			
+			
+			
+			
+			
+			
+			
+			
+			
SEE BACK FO	R CODES F	OR: MANHOLE TYPE, M	IANIIOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

[]]246/TVLOGS/TVLOG_25]

	TELEVISUAL INSPECTION 1	loolup (a	DBS	MANHOLE TYPE
RUN IN	FOLMATION	MAINU	NE INFORMATION	1 BRICK 2 PRECAST
	COMMENTS	CODE	COMMENTS	3 BLOCK
1 2 3 4 5 6 7 8 9 10 11	BEGIN RUN BEGIN PIPE END RUN RUN CONSISTS OF ### FOOT PIPE SECTIONS END RUN RUN CONSISTS OF ### FOOT PIPE SECTIONS END TELEVISUAL INSPECTION SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP RUN HAS NOT BEEN CLEANED PRIOR TO INSPECTION RUN HAS BEEN CLEANED PRIOR TO INSPECTION RUN HAS BEEN CLEANED PRIOR TO INSPECTION RUN REQUIRES CLEANING FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	45 46 47 48 49 50 51 52 53 54 54 55	APPARENT CRITICAL PDINT OF SAG. *** -1NCHES OF LIQUID DROP CONNECTION AT 6 D'CLOCK CRACKED PIPE AT SERVICE CONNECTION PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION CRACKED PIPE AT JOINT SHEAR CRACK LINEAR CRACK BEGIN LINEAR CRACK END LINEAR CRACK BEGIN MULTIPLE CRACKS BEGIN MULTIPLE CRACKS	4 DTHER MANHOLZ HI
12 13 14	EXTERNAL REPAIR REQUIRED Can be Internally Repaired Pipe Deflection thru run observed	58 57 58	CRUSHED PIPE BEGIN CRUSHED PIPE	1 UPSTREAM MH. 2 DOWNSTREAM MH.
15 100011	UNABLE TO CONTINUE DUE TO *** NTROBULITION	59 60 61	END CRUSHED PIPE PIECES MISSING (=== -SIDE) HOLE IN PIPE	L
CODE	COMMENTS	62 63	CHANGE IN PIPE TYPE FROM TO CHANGE IN PIPE SECTION LENGTH FROM WAR FEET TO ARE FEET	
21 22 23 24 25	JOINT JOINT - LEAKING JOINT - SLIGHT ROOT PENETRATION JOINT - SUBERATE ROOT PENETRATION JOINT - SEVERE ROOT PENETRATION JOINT - SEVERE ROOT PENETRATION	64 65 66 67 68	CHANGE DF DIRECTION *** INSIGNIFICANT FLOW DBSERVED FLOW APPEARS TO BE EXFILTRATING BEGIN END CONTINUES	
27 28 29	JUINT - VERTICALLY MISALIGNED JUINT - HORIZONTALLY MISALIGNED JOINT - BEGIN SAG	70 71 72	SLIGHT RODT PENETRATION MODERATE RODT PENETRATION SEVERE RODT PENETRATION	PIPE TYPE
30 31 32 33 34	AUDU - END SAG ALIOL - THIOL ALION - AIR TEST FAIL ALIONS OF GROUT ALION - NOT TESTED, 400 GALLONS OF GROUT ALION - NOT TESTED, 400 BLE TO ISOLATE	SERVICI CODE	E INFORMATION COMMENTS	I VCP 2 ACP 3 RCP 4 CIP DR DIP 5 PVC
35 36	JUINT - INSIGNIFICANT FLOV OBSERVED JOINT - FLOV APPEARS TO BE EXFILTRATING	80 81 82	SERVICE CONN, *** O'CLOCK POSITION, WYE OR TEE SERVICE CONN, *** D'CLOCK POSITION, CUT-IN, PROI, #** -INCHES	6 OTHER
		83 84 85 86 87	SERVICE CONNECTION CRACKED SLIGHT ROOT PENETRATION MODERATE ROOT PENETRATION SEVERE ROOT PENETRATION INTERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED	
		88 89 90 91 92	INTERMITTENT FLOW, SUMP PUMP CONNECTED, VERIFIED INSIGNIFICANT FLOW DBSERVED FLOW IS USAGE SERVICE CONN AIR TEST PASS SERVICE CONN AIR TEST FAIL	
	NNN TYPE DATA IN CUMMENTS	90 94 95	SERVICE CONN NOT TESTED, NO CLEANDUT ACCESS SERVICE CONN - WATER SATURATION TEST PASS SERVICE CONN WATER SATURATION TEST FAIL	2 TV & AIR TEST 3 TV, AIR TEST & REPAIR 4 TV & REPAIR

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GANNETT F \NG, INC.

SHEET 1 OI

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TELEVISION INSTECTION LOG

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 24, 1997 TIME : 1100

LOCATION: DAM NO. 04504, JOHNS CREEK NO. 4

TELEVISING : OUTFALL CONDUIT

STATIONING FROM : DOWNSTREAM END PIPE : 30", RCP, 280 FT

DUTY : 1 RIG NO. PORTABLE OPERATOR JLP VIDEO TAPE: 08

STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00	1		
0+02	2		
0+64		· _ · · · · · · · · · · · · · · · · · ·	Minor cracks.
2+78	3		
2+80	4		16' pipe sections. Also appears to be minor shear cracks or repairs made
+			to cracks throughout the entire run.
+			
+		<u></u>	
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+			
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+		- <u> </u>	
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+			
+	-		
SEE BACK FO	OR CODES F	OR: MANHOLE TYPE, N	MANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.
[31246\TVLOC	S\TVLOG_2	6]	

	TELEVISUAL INSPECTION I			MANHOLE TYPE
RUN D	FORMATION	MAINL	NE INFORMATION	1 BRICK
CODE	COMMENTS	CODE	COMMENTS	2 PRECAST 3 BLDCK
1	BEGIN RUN	45	APPARENT CRITICAL POINT OF SAG INCHES OF LIQUID	4 UTPER
2	BEGIN PIPE	46	DROP CONNECTION AT 6 D'CLOCK	
3	END PIPE	47	CRACKED PIPE AT SERVICE CONNECTION	
4	END RUN, RUN CONSISTS OF ANA FULL PIPE SECTIONS	40	('RACKED PIPE AT JOINT	
2	SAME PRINT AS ENFRINTERED ON PREVIOUS SETUP	50	SHEAR CRACK	
2	RUN HAS NOT BEEN CLEANED PRIOR TO INSPECTION	51	LINEAR CRACK	
8	RUN HAS BEEN CLEANED PRIOR TO INSPECTION	52	BEGIN LINEAR CRACK	
9	RUN REQUIRES CLEANING	53		MINTON PAIM
10	FLOW CAN BE ATTRIBUTED TO GENERAL JUINT LEAKAGE	55	REGIN MULTIPLE CRACKS	MARINUL IT
12	CYTERNAL REPAIR REALINER	56	END MULTIPLE CRACKS	
13	CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE	I UPSTREAM NH.
4	PIPE DEFLECTION THRU RUN OBSERVED	58	BEGIN CRUSHED PIPE	2 DOWNSTREAM MH
15	UNABLE TU CONTINUE DUE TO ###	57 60	END CRUSHED FIFE	
ANT -	INTO BLA PLOY	61	HOLE IN PIPE	
UNI.		62	CHANGE IN PIPE TYPE FROM TO	
NDI	COMMENTS	63	CHANGE IN PIPE SECTION LENGTH FROM WAW FEET	
~~~				
22	JUNT - LEARING	65	INSIGNIFICANT FLOW ORSERVED	
23	JOINT - SLIGHT ROOT PENETRATION	66	FLOW APPEARS TO BE EXFILTRATING	
24	JOINT - MODERATE ROOT PENETRATION	67	BEGIN	
25	JOINT - SEVERE ROOT PENETRATION	68	END	
26	JDINT - VIDE OR DPEN	69		
29	JUINT - VERTLALLT MISALIUNED IDINT - HODIZONTALLY MISALIUNED	70	MUNEBATE BUDT PENETRATION	PIPE TIPE
29	JDINT - BEGIN SAG	72	SEVERE ROOT PENETRATION	
30	JDINT - END SAG			I VCP
31	JUNT - AIR TEST PASS	SPRVIC	E TREDEMATION	S ACP
33	IDINT - REPAIRED AND GALLONS OF GROUT	DARTIN		
34	JOINT - NOT TESTED, UNABLE TO ISOLATE	CODE	COMMENTS	
35	JOINT - INSIGNIFICANT FLOW OBSERVED	80	SERVICE CONN AND DICLOCK POSITION MYC OP TEE	6 DTHER
36	JOINT - FLOW APPEARS TO BE EXFILTRATING	01	SERVICE CONN D'CLOCK POSITION CUT-IN.	
			PROI, waa -INCHES	
		92	HOUSE ND.	
		84	SUGHT ROOT PENETDATION	
		85	MODERATE ROOT PENETRATION	
		86	SEVERE ROOT PENETRATION	
		87	INTERMITTENT FLOV, POSSIBLE SUMP PUMP CONNECTED	
		66	INTERMETTENT FLOW, SUMP PUMP CONNECTED, VERIFIED	NITTY
		90	FLOW IS USAGE	UUIT
		91	SERVICE CONN AIR TEST PASS	
		92	SERVICE CONN AIR TEST FAIL	I TV DNLY
		93	SERVICE CONN NOT TESTED, NO CLEANOUT ACCESS	
	THE TYPE DATA IN COMMENTS	74 05	SERVICE CONN VATER SATURATION TEST PASS	L DEPAID
	TTT LICE MAIN IN COMPENSA	7.1	SERVICE CURR WATER SATURATION IEST FAIL	

GANNETT I IG, INC.

SHEET I OI

### **TELEVISION INSPECTION LOG**

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 24, 1997 TIME :

LOCATION: DAM NO. 04504, JOHNS CREEK NO. 4

TELEVISING : LEFT EMBANKMENT DRAIN STATIONING FROM : OUTLET END PIPE : 06", CMP, 4 FT

DUTY : 1 RIG NO. PORTABLE OPERATOR JLP VIDEO TAPE: 08

STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00	1		Corrugated pipe.
0+02	2		
0+41			Bend in pipe.
0+03			Bend in pipe.
0+04			Cannot continue due to bends.
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+			
+			
+			
+			
+			
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+		· · · · · · · · · · · · · · · · · · ·	
+			
+			
+		· · ·	
+			
+			
+			
+			
+			
+			
SEE BACK FO	R CODES F	OR: MANHOLE TYPE, M	1ANIIOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

31246\TVLOGS\TVLOG_27]

	TELEVISUAL INSPECTION LOOKUP CODES					
RUN	INFORMATION	MAINLI	NE INFORMATION	I BRICK 2 PRECAST		
CODE	COMMENTS	CODE	COMMENTS			
1	BEGIN RUN	45	APPARENT CRITICAL POINT OF SAGINCHES OF LIQUID	4 01124		
2	BEGIN PIPE	46	DROP CONNECTION AT 6 D'CLUCK			
3	END PIPE	48	PERIPHERAL LEAK ARDUND CUT-IN SERVICE CONNECTION			
l s	END TELEVISUAL INSPECTION	49	CRACKED PIPE AT JOINT			
6	SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP	50	SHEAR CRACK			
2	RUN HAS NOT BEEN CLEANED PRIDE TO INSPECTION	52	BEGIN LINEAR CRACK			
9	RUN REQUIRES CLEANING	53	END LINEAR CRACK	DEL MITCH & ALM		
10	FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	54	REGIN MURTIPLE CRACKS	MANHOLL IN		
11	EXTERNAL REPAIR REQUIRED	56	END MULTIPLE CRACKS			
1 15	CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE	DOWNSTREAM MH		
14	PIPE DEFLECTION THRU RUN OBSERVED	59	END CRUSHED PIPE	E DURNSTREAM THE		
15		60	PIECES HISSING (*** -SIDE)			
MOL	I INFORMATION	61	HOLE IN PIPE			
mp	2 THE THE PARTY AND THE PARTY	63	CHANGE IN PIPE SECTION LENGTH FROM ### FEET			
	COWWWW12		10 ++# FEET			
15		64 45	CHANGE OF DIRECTION ###			
22	JUNT - LLAKING JUNT - SLIGHT ROOT PENETRATION	66	FLOV APPEARS TO BE EXFILTRATING			
24	JUINT - MODERATE ROOT PENETRATION	67	BEGIN			
25	JOINT - SEVERE ROOT PENETRATION	68 69				
27	JUINT - VERTICALLY MISALIGNED	70	SLIGHT RODI PENETRATION	PIPE TYPE		
58	JUINT - HORIZONTALLY MISALIGNED	71	MODERATE ROOT PENETRATION	11101112		
29	JOINT - BEGIN SAG IDINT - END SAG	12	SEVERE ROUT PENETRATION			
31	JUNI - TRIST PASS	CPDVI/		2 ACP		
SC	JOINT - AIR TEST FAIL	<b>DER LICE</b>	, INFOLMATION	3 RCP		
34	JUINT - REFAILED, WABLE TO ISOLATE	CODE	COMMENTS	5 PVC		
35	JUINT - INSIGNIFICANT FLOV DBSERVED	80	SERVICE CONN. *** D'ELOEK POSITION, WYE OR TEE	6 OTHER		
36	JUINT - FLUW APPEARS TO BE EXFILTRATING	81	SERVICE CONN., VIV D'CLOCK HISTION, CUT-IN,			
		82	PRUT, ### -INCHES HOUSE NO			
		85	SERVICE CONNECTION CRACKED			
		84	SLIGHT ROUT PENETRATION			
		86	SEVERE ROOT PENETRATION			
		87	INTERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED			
		88	INTERMITTENT FLOW, SUMP PUMP CONNECTED, VERIFIED	DITT		
		90	FLOV IS USAGE	UUII		
		71	SERVICE CONN AIR TEST PASS			
		90 90	SERVICE CONN AIR TEST FAIL SERVICE CONN NOT TESTED, NO DEFANOUT ACCESS	2 TV & AIR TEST		
		94	SERVICE CONN WATER SATURATION TEST PASS	3 TV. AIR TEST		
	ANA TYPE DATA IN COMMENTS	95	SERVICE CONN WATER SATURATION TEST FAIL	4 TV & REPAIR		

GANNETT NG, INC.

SHEET 1

### **TELEVISION INSPECTION LOG**

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 24, 1997 TIME :

LOCATION: DAM NO. 04504, JOHNS CREEK NO. 4

### TELEVISING : RIGHT EMBANKMENT DRAIN STATIONING FROM : OUTLET END PIPE : 06", CMP, 4 FT

DUTY : 1 RIG NO. PORTABLE OPERATOR JLP VIDEO TAPE: 08

STATION	CODE	VIDEO FOOTAGE	COMMENTS		
0+00	1		Corrugated pipe.		
0+01			Bend in pipe.		
0+04			Unable to continue due to another bend in pipe.		
+					
+					
+					
+					
+					
+					
+					
+					
+	· ·				
+					
+	<u> </u>				
+					
+					
+		1			
+					
+					
+					
+					
+					
SEE BACK FO	OR CODES F	OR: MANHOLE TYPE, M	IANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.		
[31246\TVLOC	[31246\TYLOGS\TYLOG 28]				

TELEVISUAL INSPECTION LOOKUP CODES				
RUN IN	FORMATION	MAINU	INE INFORMATION	1 BRICK
CODE	COMMENTS	CODE	COMMENTS	2 PRÉCAST 3 BLOCK
1	BEGIN RUN	45	APPARENT CRITICAL POINT OF SAG. ### -INCHES OF LIQUID	
2	BEGIN PIPE	46	CRACKED PIPE AT SERVICE CONNECTION	
4	END FIFE	48	PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION	
5	END TELEVISUAL INSPECTION	49	CRACKED PIPE AT JOINT	
6	SAME PRINT AS ENCRUNTERED ON PREVIOUS SETUP	50 51	LINEAD CDALK	
7	RIN HAS NUT BEEN LEEANED PRICE TO INSPECTION	52	BEGIN LINEAR CRACK	
9	RUN REDUIRES CLEANING	53	END LINEAR CRACK	
10	FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	54		MANHOLL +++
11	BALANCE OF FLOW CAN BE ATTRIBUTED TH GENERAL JUINT LEAKAGE	55 56	END MULTIPLE CRACKS	
12	LATERNAL REPAIR REDUIRED	57	CRUSHED PIPE	1 UPSTREAM MH
14	PIPE DEFLECTION THRU RUN DBSERVED	58	BEGIN CRUSHED PIPE	2 DOWNSTREAM M
15	UNABLE TO CONTINUE DUE TO	57 60	END LRUSHED FIFE	L
IOINT I	VPOPULITON	61	HOLE IN PIPE	
		62	CHANGE IN PIPE TYPE FROM TO	
CODE	COMMENTS	63	CHANGE IN PIPE SECTION LENGTH FROM WAW FEET	
21	ταιοι	64	CHANGE OF DIRECTION ===	
55	JOINT - LEAKING	65	INSIGNIFICANT FLOW DBSERVED	
23	JOINT - SLIGHT ROOT PENETRATION	66	FLUW APPEARS TO BE EXFILTRATING	
25	JOINT - SEVERE ROOT PENETRATION	68	END	
26	JOINT - WIDE DR DPEN	69	CONTINUES	
27	JUINT - VERTICALLY MISALIGNED	70		PIPE TYPE
29	JOINT - BEGIN SAG	72	SEVERE ROOT PENETRATION	
30	JOINT - END SAG			1 VCP
31	JOINT - AIR TEST FAU	SERVIC	E INFORMATION	2 ACP
33	JOINT - REPAIRED GALLONS OF GROUT	0000		
34	JOINT - NOT TESTED, UNABLE TO ISOLATE	CUDE	COMMENTS	5 PVC
35	JUINT - INSIGNIFICANT FLUX DBSERVED NUMT - FLUX APPEARS TO BE EVEN FRATING	80	SERVICE CONN, *** O'CLOCK POSITION, WYE OR TEE	6 OTHER
40		81	SERVICE CONN., NEW O'CLOCK POSITION, CUT-IN,	L.,
		82	HOUSE NO.	
		83	SERVICE CONNECTION CRACKED	
		84	SLIGHT ROOT PENETRATION	
		86	SEVERE ROOT PENETRATION	
		87	INTERMITTENT FLOV, POSSIBLE SUMP PUMP CONNECTED	
		88	INTERMITTENT FLOW, SUMP PUMP CONNECTED, VERIFIED	
		90	FLDW IS USAGE	DUTY
		91	SERVICE CONN AIR TEST PASS	
		56	SERVICE CONN AIR TEST FAIL	I TV ONLY
		94	SERVICE CONN NULL LESTER, NO CLEANOUT ACCESS	3 TV, AIR TEST
	NEE TYPE DATA IN COMMENTS	95	SERVICE CONN WATER SATURATION TEST FAIL	L REPAIR

2 3 4	BRICK PRECAST BLOCK DTHER	
   	ANIKOLE (++1)	
5	DOWNSTREAM MH.	
		-
	PPE TYPE	

GANNETT F G, INC.

SHEET 1 OF

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### **TELEVISION INSPECTION LOG**

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 25, 1997 TIME : 0950

LOCATION: DAM NO. 04501, JOHNS CREEK NO. 2

TELEVISING : RISER INTERIOR

_____ STATIONIN

STATIONING FROM : TOP OF RISER

PIPE :_

DUTY : 1 RIG NO. 346 OPERATOR JLP VIDEO TAPE: 08

STATION	CODE	VIDEO FOOTAGE	COMMENTS
+			Total depth 32'.
+			Downstream wall.
+			13' horizontal construction form mark.
+			15' missing nut to bolt on trash rack.
+			17' minor deterioration of concrete (exposed aggregate and pitting in corner).
+			19' top of inlet for cold water pipe.
+			13" opening 13" x 20". 8" cold water pipe.
+			30' to top of outfall pipe.
+		743	Left side wall.
+			24' horizontal form mark.
+		1025	Upstream wall.
+			14' minor deterioration of concrete about 1' long.
+			17' deterioration starts and goes to bottom.
+			21' possible crack (hairline).
+			30' top of gate valve.
+		1491	Right side wall.
+			25'. 1" deep spall.
+			20'. 12" wide vertical spall with 1/4" penetration.
+			
+			
+			
+			
EE BACK FO	)R CODES F	OR: MANHOLE TYPE, M	IANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

31246\TVLOGS\TVLOG_29]

	MANHOLE TYPE			
UN INI	1 BRICK			
ODE	COMMENTS	CODE	COMMENTS	2 PRECAST 3 BLOCK
1	9FGIN RUN	45	APPARENT CRITICAL POINT OF SAG. *** -INCHES OF LIQUID	4 OTHER
2	BEGIN PIPE	46	DROP CONNECTION AT 6 () CLOCK	
	END PIPE	47	CRACKED PIPE AT SERVICE LUNNELTIUN	
	CND RUN RUN CONSISTS OF ### FOUT PIPE SECTIONS	48	CRACKED PIPE AT JUINT	
	SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP	50	SHEAR CRACK	
	RUN HAS NOT BEEN CLEANED PRIDE TO INSPECTION	51	LINEAR CRACK	
	RUN HAS BEEN CLEANED PRIOR TO INSPECTION	52	BEGIN LINEAR LRACK	
	RUN REDUIRES CLEANING	53 54		MANEOUT AND
	PALANCE DE ELTRY CAN RE ATTRIBUTED TO GENERAL JOINT LEARAGE	55	BEGIN MULTIPLE CRACKS	BARLIVIL VW
	LXTERNAL REPAIR REQUIRED	56	END HULTIPLE CRACKS	
	CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE	
	PIPE DEFLECTION THRU RUN DESERVED	59	END CRUSHED PIPE	C DUENSTREAM THE
	UNABLE TO CONTINUE DUE TO """	60	PIECES MISSING (*** -SIDE)	
ת דו	IN MATIN	61	HOLE IN PIPE	
ы ц —		62	CHANGE IN PIPE TYPE FROM TO	
	COMMENTS	ы	LHANGE IN PIPE SECTION LENGTH FROM THE FEET	
	ταία	64	CHANGE OF DIRECTION	
	JOINT - LEAKING	65	INSIGNIFICANT FLOW DBSERVED	
	JOINT - SLIGHT ROOT PENETRATION	66	FLOV APPEARS TO BE EXFILTRATING	
	JOINT - MUDERATE RUDT PENETRATION	68	FND	
	JOINT - VIDE OR OPEN	69	CONTINUES	······
	JUINT - VERTICALLY MISALIGNED	70	SLIGHT ROOT PENETRATION	PIPE TYPE
	JOINT - HORIZONTALLY MISALIGNED	71	MODERATE ROOT PENETRATION	102 112
	JOINT - END SAG	~		1 VCP
	JUINT - AIR TEST PASS	CPBV1/1	INFORMATION	2 ACP
	JOINT - AIR TEST FAIL	DERING	a larona non	3 RCP
	JOINT - NOT TESTED, UNABLE TO ISOLATE	CODE	COMMENTS	
	JOINT - INSIGNIFICANT FLOW OBSERVED	80	SERVICE CONN, *** O'CLOCK POSITION WYE OR TEE	6 DTHER
	JOINT - FLUV APPEARS TO BE EXFILTRATING	81	SERVICE CONN. +++ D'CLOCK POSITION CUT-IN	L
			PROL ### -INCHES	
		86 81	HUUSE NU.	
		84	SLIGHT ROOT PENETRATION	
		85	NODERATE ROOT PENETRATION	
		86	SEVERE ROOT PENETRATION	
		8A	INTERMITIENT FLUM, PUSSIBLE SUMP PUMP CONNECTED	
		89	INSIGNIFICANT FLOW DESERVED	DUTY
		90	FLOW IS USAGE	<b>1</b> 011
		91	SERVICE CONN AIR TEST PASS	1 TH DE Y
		7C 91	SERVICE LUNN - AIR LEST FAIL SERVICE CONN - NOT TESTED NO CLEANDUT AUCESS	2 IV 4 AIR TEST
		94	SERVICE CLINN - WATER SATURATION TEST PASS	3 TV, AIR TEST

GANNET // //ING, INC.

SHEET I I

-7

### **TELEVISION .... SPECTION LOG**

CLIENT : DIVISION OF DAM SAFETY

1

JOB # : 31246 DATE : SEPTEMBER 25, 1997 TIME : ____

LOCATION: DAM NO. 04501, JOHNS CREEK NO. 2

TELEVISING : OUTFALL CONDUIT STATIONING FROM : DOWNSTREAM END PIPE : 30", RCP, 291 FT

DUTY : 1 RIG NO. PORTABLE OPERATOR JLP VIDEO TAPE: 09

STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00	1		
0+02	2		
0+34			Minor cracks at joint.
2+89	3		
2+91	4		16' sections.
+			
+			
+			
+			
+			
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SEE BACK FO	R CODES F	OR: MANIIOLE TYPE, M	(ANIIOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.
131246\TVLOG	STVLOG_3	0)	

	MANHOLE TYPE			
UN IN	ORMATION	MAINU	NR INFORMATION	
ODE	COMMENTS	CODE	COMMENTS	2 PRECAST 3 BLOCK
1	REGIN PLIN	45	APPARENT CRITICAL POINT OF SAG AND -INCHES OF LIQUID	4 OTHER
ż	BEGIN PIPE	46	DROP CONNECTION AT 6 D'CLOCK	
2	END PIPE	47	CRACKED PIPE AT SERVICE CONNECTION	
4	END RUN RUN CONSISTS OF ### FOOT PIPE SECTIONS	48	PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION	
5	END TELEVISUAL INSPECTION	49	CRACKED PIPE AT JUINT	
6	SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP	50 51	INFAR CRACK	
7	RUN HAS NUT HEEN LILANED PRIDE TO INSPECTION	52	BEGIN LINEAR CRACK	
9	RUN MAS BEEN ELEMNED FRUNK TO INSPECTION	53	END LINEAR CRACK	
อ์	FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	54	HULTIPLE CRACKS	MANHOLE HU
l i	BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55	BLUIN MULTIPLE CRACKS	
2	EXTERNAL REPAIR REQUIRED	50		I UPSTREAM MH.
3	CAN BE INTERNALLY REPAIRED	58	BEGIN CRUSHED PIPE	2 DOWNSTREAM MH.
5	UNABLE TO CONTINUE DUE TO WWW	59	END CRUSHED PIPE	
-		60	PIECES HISSING (*** -SIDE)	
int p	TORMATION	61	HULL IN PIPE	
<b>NV</b>		63	CHANGE IN PIPE SECTION LENGTH FROM VAN FEET	
NP	(AWWFUI2		TO ### FEET	
I	TNIQL	64	CHANGE OF DIRECTION ***	
2	JDINT - LEAKING	65	INSIGNIFICANT FLOW OBSERVED	
3	JOINT ~ SLIGHT ROOT PENETRATION	66	RECIN	
4 5	JUINT - MUULKATE KUUT PENETKATIUN ININT - SEVERE ROOT PENETRATION	68	END	
6	JOINT - WIDE OR OPEN	69	CONTINUES	
7	JOINT - VERTICALLY MISALIGNED	70	SLIGHT ROOT PENETRATION	PIPE TYPE
8	JOINT - HORIZONTALLY MISALIGNED	71		
0	JUNT - END SAG	16		J VCP
1	22A9 T211 RIA - TRIOL	CPBVI/	P INFORMATION	2 ACP
2	JOINT - AIR TEST CAIL	<b>DERAIC</b>	LIVIVARIA I IVIV	3 RCP
4	JOINT - REPAIRED, AND GALLINS DE GRUUT JOINT - NOT TESTED, UNABLE TO ISOLATE	CODE	COMMENTS	4 CIP DR DIP 5 PVC
15	JUINT - INSIGNIFICANT FLOW OBSERVED	80	SERVICE CONN, *** O'CLOCK POSITION, WYE DR TEE	6 OTHER
0	JUNI - JEDV APPEARS TO BE EXTLETRATING	81	SERVICE CONN., NOW D'CLOCK POSITION, CUT-IN,	
		82	HOUSE NO.	
		ອັງ	SERVICE CONNECTION CRACKED	
		84	SLIGHT ROUT PENETRATION	
		85	MUDERATE ROOT PENETRATION	
		87		
		88	INTERMITTENT FLOW, SUMP PUMP CONNECTED, VERIFIED	
		89	INSIGNIFICANT FLOW OBSERVED	DITTY
		90	FLOW IS USAGE	
		17 20	SERVICE CONN - AIR TEST PASS	I TV DN Y
		91	SERVICE CONN - AIR LEST FAIL	2 IV L AIR TEST
		94	SERVICE CONN WATER SATURATION TEST PASS	3 TV, AIR TEST

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### GANNETT 'ING, INC. TELEVISION INSPECTION LOG

SHEET 1

CLIENT :	DIVISIO	N OF DAM SAFE	<b>TY</b> JOB # : <u>31246</u> DATE : <u>SEPTEMBER 25, 1997</u> TIME :				
LOCATION: DAM NO. 04501, JOHNS CREEK NO. 2							
TELEVISING	G: LEF	r embankment	C DRAIN   STATIONING FROM : OUTLET END   PIPE : 06", CMP, 50 FT				
DUTY : 1 R	rig no. <u>P</u>	PORTABLE OPE	RATOR JLP VIDEO TAPE: 09				
STATION	CODE	VIDEO FOOTAGE	COMMENTS				
0+00			Corrugated pipe. Also has sand material in pipe.				
0+11			Lots of sand. 3/4 pipe.				
0+39			6" of sand.				
0+50			Unable to continue due to sand.				
+							
+							
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SEE BACK FO	OR CODES F	OR: MANHOLE TYPE, M	ANNIOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.				

MANT
OF SAG, *** -INCHES OF LIQUID LOCK CONNECTION CUT-IN SERVICE CONNECTION
I VCP 2 ACP 3 RCP 4 CIP 5 PVC
Image: Sump Pump connected 6   Image: Sump Pump connected   Image: Sump Pump Connected

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OLE TYPE CK CAST CK ER OLE HN TREAM MH. INSTREAM MH. 191 OR DIP ER DNLY & AIR TEST , AIR TEST REPAIR & REPAIR

SHEET I OF

### **TELEVISION INSPECTION LOG**

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 25, 1997 TIME :

LOCATION: DAM NO. 04501, JOHNS CREEK NO. 2

### TELEVISING : RIGHT EMBANKMENT DRAIN STATIONING FROM : OUTLET END PIPE : 06", CMP, 57 FT

DUTY : 1 RIG NO. PORTABLE OPERATOR JLP VIDEO TAPE: 09

STATION	CODE	VIDEO FOOTAGE	COMMENTS			
0+00	1		Corrugated pipe. Also sand material removed from pipe.			
0+57			Bend in pipe.			
+						
+						
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+						
SEE BACK FO	R CODES F	OR: MANHOLE TYPE, N	ANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.			
131246\TVLOC	31246/TVLOG 321					

	TELEVISUAL INSPECTION	LOOKUP CO	DRS	MANHOLE TYPE
RUN IN	PORMATION	MAINIJ	VE INFORMATION	
CODE	COMMENTS	CODE	COMMENTS	2 PRECAST 3 BLOCK
1 1	BEGIN RUN	45	APPARENT CRITICAL POINT OF SAG. *** -INCHES OF LIQUID	4 DTHER
2	BEGIN PIPE	46	DROP CONNECTION AT 6 D'CLOCK	
	END PIPE	4/	CRACKED PIPE AT SERVICE CUNNELTION	
		49	CRACKED PIPE AT JOINT	
	SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP	50	SHEAR CRACK	
1 7	RUN HAS NOT BEEN CLEANED PRIOR TO INSPECTION	51	LINEAR CRACK	
8	RUN HAS BEEN CLEANED PRIOR TO INSPECTION	52	BEGIN LINEAR CRACK	
9	RUN REQUIRES CLEANING	53		MANDAL P. A.M
10	FLOW CAN BE ATTRIBUTED TO GENERAL JUINT LEAKAGE	55	BEGIN MULTIPLE CRACKS	MANHOLL III
	EXICAND REPAIR REDURED	56	END MULTIPLE CRACKS	
1 13	CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE	1 UPSTREAM MH.
14	PIPE DEFLECTION THRU RUN OBSERVED	58	BEGIN CRUSHED PIPE	2 DOWNSTREAM M
15	UNABLE TH CONTINUE DUE TO	57 60	LND CRUSHED MIME -SIDEY	1
ION I	A TOAN LI MAN	61	HOLE IN PIPE	
	NIUKMAIIUN	62	CHANGE IN PIPE TYPE FROM TO	
	COMMENTS	63	CHANGE IN PIPE SECTION LENGTH FROM ### FEET	
0000			10 ANN FEET	
21	JUNT - LEAKING	64		
23	JOINT - SLIGHT ROOT PENETRATION	66	FLOW APPEARS TO BE EXFILTRATING	
24	JOINT - MODERATE ROOT PENETRATION	67	BEGIN	
25	JOINT - SEVERE ROOT PENETRATION	68	END	
26	JOINT - WIDE OR OPEN	69	CUNTINUES	
28	JUNT - VERTLALLT MISALIUND MINT - HOPIZONTALLY MISALIUNED	70	MODERATE ROAT PENETRATION	PIPE TYPE
29	SONT - BEGIN SAG	75	SEVERE ROOT PENETRATION	
30	DAZ DA3 - THIDL 22A9 1231 AIA - INIGL	SPRVYT	TNTORMATION	2 ACP
33	ININT - REPAIRED ANA GALLONS OF CROUT	0000		
34	JOINT - NOT TESTED, UNABLE TO ISOLATE	CODE	COMMENTS	5 PVC
1 35	JUINT - INSIGNIFICANT FLUW UBSERVED IDINT - FLOW ARRENDE TO BE EVELLEDATING	80	SERVICE CONN, *** D'CLOCK POSITION, WYE OR TEE	6 OTHER
	SUNT - LEDA BELEARS ID DE EXTERNING	81	SERVICE CONN., *** D'CLOCK POSITION, CUT-IN,	
		82	HUISE ND	
11		ยัง	SERVICE CONNECTION CRACKED	
11		84	SLIGHT ROOT PENETRATION	
		85	MODERATE ROOT PENETRATION	
		85	SEVERE RUUT PENETRATIUN	
		88	INTERMITTENT FLOW, SUMP PUMP CONNECTED, VERIFIED	······
		89	INSIGNIFICANT FLOW OBSERVED	DUTY
11		90	FLOW IS USAGE	
11		91	SERVILE LUNN AIR TEST PASS	1 TV DNLY
11		93	SERVICE CONN NOT TESTED NO CLEANOUT ACCESS	2 TV & AIR TES
		94	SERVICE CONN WATER SATURATION TEST PASS	3 TV, AIR TEST
	### TYPE DATA IN COMMENTS	95	SERVICE CONN WATER SATURATION TEST FAIL	L REPAIR
				Į 4 IV ∓ KLPAIR

GANNETT AING, INC.

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### **TELEVISION INSPECTION LOG**

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 29, 1997 TIME : 0830

#### LOCATION: DAM NO. 01513, SOUTH RIVER NO. 24, HAPPY HOLLOW

TELEVISING : RISER INTERIOR STATIONING FROM : TOP OF RISER

STATIONING FROM . TOT

PIPE :

DUTY : 1 RIG NO. 346 OPERATOR JLP VIDEO TAPE: 10

STATION	CODE	VIDEO FOOTAGE	COMMENTS		
+			Total depth 14'.		
+			12' to top of gate valve. No leakage.		
+		266	Downstream wall.		
+		267	Left side wall.		
+		397	Upstream wall.		
+		_677	Right side wall.		
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+	<u> </u>	<u> </u>	l		
SEE BACK FO	SEE BACK FOR CODES FOR: MANHOLE TYPE, MANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.				

[31246\TVLOGS\TVLOG_33]

	MANHOLE TYPE			
RIN INFORMATION			INE INFORMATION	
ODE	COMMENTS	CODE	COMMENTS	2 PRECAST 3 BLOCK
	BEGIN RUN	45	APPARENT CRITICAL POINT OF SAG. = = - INCHES OF LIQUID	4 OTHER
	BEGIN PIPE	46	DROP CONNECTION AT 6 D'CLOCK	
	END PIPE	47	CRACKED PIPE AT SERVICE CONNECTION	
	END RUN, RUN CONSISTS OF ### FOOT PIPE SECTIONS	48	PERIPHERAL LEAK AROUND CUT-IN SERVICE CUNNEL TIDN	
	END TELEVISUAL INSPECTION	49	CRACKED PIPE AT JUINT	
	SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP	50	I INCAD CAN'N	
	PUN HAS NUT HEEN CLEANED PRILIE THE INSPECTION	52	BEGIN LINEAR CRACK	
	RUN HAS BLEN LLEANED PRIDE TO INSPECTION	53	END LINEAR CRACK	
	FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	54	MULTIPLE CRACKS	MANTIOLE III
	BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55	BEGIN HULTIPLE CRACKS	
	EXTERNAL REPAIR REDUIRED	56	END MULTIPLE CRACKS	
	CAN BE INTERNALLY REPAIRED	50	REGIN CRUSHED PIPE	2 DOWNSTREAM MH.
	PIPE DEFFECTION THRU RUN DREFKAFD	59	END CRUSHED PIPE	
	UNABLE TO CONTINUE DUE TO THE	60	PIECES MISSING (*** -SIDE)	
T N	ATO NATION	61	HOLE IN PIPE	
1 11		62	CHANGE IN PIPE TYPE FROM TO	
	COMMENTS	61	CHANGE IN PIPE SECTION LENGTH FROM WAR FEET	
		64	CHANGE OF DIRECTION ###	
	JUINT - LEAKING	65	INSIGNIFICANT FLOW DBSERVED	
	JOINT - SLIGHT ROOT PENETRATION	66	FLOW APPEARS TO BE EXFILTRATING	
	JOINT - MODERATE ROOT PENETRATION	67	BEGIN	
	JOINT - SEVERL ROOT PENETRATION	68		
	JUNT - VEDICALLY NISALIGNED	20		BUBP TTDP
		71	HOUERATE ROOT PENETRATION	I'L HIS
	JOINT - BEGIN SAG	72	SEVERE RUDT PENETRATION	
	JOINT - END SAG			I VCP
	JUNE - AR TEST PASS	SERVIC	R INFORMATION	
	IDINT - REPAIRED ANN GALLONS DE GROUT	0000		
	JOINT - NOT TESTED, UNABLE TO ISOLATE	CODE	COMMENTS	5 PVC
	JUINT - INSIGNIFICANT FLOW DBSERVED	80	SERVICE CONN, *** D'CLOCK POSITION, WYE OR TEE	6 OTHER
	JUINT - ILUV APPEARS III BE EXTILIRATING	81	SERVICE CONN., *** D'CLOCK POSITION CUT-IN,	
		0.0	PROT. #NR -INCHES	
		87 87	HUUSE NU.	
		84	SLIGHT ROUT PENETRATION	
		85	HODERATE ROOT PENETRATION	
		B6	SEVERE ROUT PENETRATION	
		87	INTERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED	
		190 190	INTERMITTENT FLOW, SUMP PUMP CONNECTED, VERIFIED	DICTV
		90	FLOW IS USAGE	זוטע
		91	SERVICE CONN AIR TEST PASS	
		92	SERVICE CONN AIR TEST FAIL	1 TV DNLY
		93	SERVICE CONN NOT TESTED, NO CLEANOUT ACCESS	2 TV & AIR TEST
	NUM TYPE DATA IN COMMENTS	74	SERVICE CONN - WATER SATURATION TEST PASS	J IV, AIK IZSI 1 1 REPAIR
	the second of the second se		SCHETCE COME " WHICH SALURATION ILST FAIL	A TV A DEPAID

GANNE MING, INC.

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### **TELEVISION INSPECTION LOG**

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 29, 1997 TIME : 0935

#### LOCATION: DAM NO. 01513, SOUTH RIVER NO. 24, IIAPPY HOLLOW

#### STATIONING FROM : DOWNSTREAM END PIPE : 24", RCP, 185 FT TELEVISING : OUTFALL CONDUIT

DUTY : I RIG NO. 346 OPERATOR JLP VIDEO TAPE: 10

STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00	1	801	
0+02	2	831	
1+83	3	1459	
1+85	4	1485	19' sections.
+			
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+	<u>]</u>		
SEE BACK FO	R CODES F	OR: MANHOLE TYPE, N	1ANIIOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

[31246\TVLOGS\TVLOG_34]

TELEVISUAL INSPECTION LOOKUP CUDES					
in m	OPMATION	MAINLI	NE ENFORMATION	I BRICK	
				2 PRECAST	
JDE	COMMENTS	CUDE	COMMENTS	3 BLOCK	
1	REGIN RUN	45	APPARENT CRITICAL POINT OF SAG. *** -INCHES OF LIQUID	4 UINER	
2	REGIN PIPE	46	DROP CONNECTION AT 6 D'CLOCK		
วิ	END PIPE	47	CRACKED PIPE AT SERVICE CONNECTION		
Ă	END RUN RUN CONSISTS OF *** FOOT PIPE SECTIONS	48	PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION		
5	END TELEVISUAL INSPECTION	49	CRACKED PIPE AT JUINT		
6	SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP	50	SHEAR CRALK		
7	RUN HAS NOT BEEN CLEANED PRIOR TO INSPECTION	21 59	LINEAR LRACK		
8	RUN HAS BEEN CLEANED PRIOR TO INSPECTION	57	END LINFAR CRACK		
9 0	FUN REQUIRES LEEANING	54	HULTIPLE CRACKS	MANTIOUT AND	
ł	BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55	BEGIN MULTIPLE CRACKS		
2	EXTERNAL REPAIR REQUIRED	56	END HULTIPLE CRACKS		
3	CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE	1 UPSTREAM MIL	
1	PIPE DEFLECTION THRU RUN OBSERVED	58	SEGIN CRUSHED PIPE	2 DUANZIKENA MIL	
5	UNABLE TO CONTINUE DUE TO ###	60	PIFCES MISSING (*** -SIDE)		
INF F		61	HOLE IN PIPE		
14 I U	RVEEA1/UN	62	CHANGE IN PIPE TYPE FROM TO		
)D <b>r</b>	CONDITINTS	63	CHANGE IN PIPE SECTION LENGTH FROM WAN FEET		
פעו			TO ANA FEET		
1	JOINT	64	HANGE UP DIRECTION 444		
2	JUNI - LLAKINU JUNI - SULCHI DOOT DENETRATION	66	FLAW APPEARS IN BE FYELL TRATING		
4	IDINT - MODERATE POINT PENETRATION	67	BEGIN		
5	JOINT - SEVERE ROOT PENETRATION	68	END		
6	JOINT - WIDE OR DPEN	69	CONTINUES		
7	JOINT - VERTICALLY MISALIGNED	70	SLIGHT ROOT PENETRATION	PIPE TYPE	
8	JOINT - HORIZONTALLY MISALIGNED	71	MUDERATE RULT PENETRATION		
<b>7</b>	JUNT - BLUIN JAG	10	SCACKE KUDI LEVETKATION		
10	JOINT - LIND SHO	000440			
2	JUINT - AIR TEST FAIL	SERVICE	S INPUKMATION	3 RCP	
13	JUINT - REPAIRED, GALLONS OF GROUT	MAP	277670.000	4 CIP DR DIP	
14	JOINT - NOT TESTED, UNABLE TO ISOLATE	CUNE	(Natural)	S PVC	
5	JUINT - INSIGNIFICANT FLOW DBSERVED	80	SERVICE CONN., *** O'CLOCK POSITION, WYE OR TEE	6 OTHER	
0	SUNAL - LEUN ALLEAKS IN DE EVLIFIKATIND	81	SERVICE CONN D'CLOCK POSITION CUT-IN		
		03	PRUT. WAR -INCHES		
		8¢ 1973			
		84	SI HUIT PONT PENETRAL		
		85	NODERATE ROOT PENETRATION		
		86	SEVERE ROOT PENETRATION		
		97	INTERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED		
		88	INTERMITTENT FLOW, SUMP PUMP CONNECTED, VERIFIED		
		89	INSIGNIFICANT FLOV OBSERVED	) DUTY	
		90	FLUM IS USAGE		
		71 92	SEBAILE CONN - VID LEGT EVIL	1 TV ONLY	
		93	SERVICE CONN NOT TESTED NO CLEANDUT ACCESS	2 TV & AIR TEST	
		94	SERVICE CONN WATER SATURATION TEST PASS	3 TV. AIR TEST	

SHEET 1 1

### **TELEVISION INSPECTION LOG**

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 29, 1997 TIME : 0935

### LOCATION: DAM NO. 01513, SOUTH RIVER NO. 24, HAPPY HOLLOW

#### TELEVISING : LEFT EMBANKMENT DRAIN STATIONING FROM : OUTLET END PIPE : 06", CMP, 68 FT

DUTY : 1 RIG NO. 346 OPERATOR JLP VIDEO TAPE: 10

STATION	CODE	VIDEO FOOTAGE	COMMENTS			
0+00	1	1484	Corrugated pipe.			
0+02	2	1502				
0+54			Perforation begins.			
0+62			Perforation ends.			
0+67			Pipe joint.			
0+68			Bend in pipe.			
+						
+						
+						
+						
+						
+						
+						
+						
+						
+						
+						
+						
+						
<u>*</u>						
+	.					
+	<u> </u>					
SEE BACK FO	SEE BACK FOR CODES FOR: MANIIOLE TYPE, MANIIOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.					

[31246\]"VLOG\$\TVLOG_35]

	TELEVISUAL INSPECTION LOOKUP CODES					
RUN IN	TROPMATION	MAINLE	NY INROBATION			
CODE	COMMENTS	CODE	COMMENTS	2 PRECAST 3 BLOCK		
1 2 3	BEGIN RUN BEGIN PIPE END PIPE	45 46 47 48	APPARENT CRITICAL POINT OF SAG, *** -INCHES OF LIQUID DROP CONNECTION AT 6 D'CLOCK CRACKED PIPE AT SERVICE CONNECTION PERIPHERAL LEAK ARRUND CUT-IN SERVICE CONNECTION			
567	END ROW ROW CONSISTS OF ADD FOR THE SECTIONS END REVISION AS ENCOUNTERED ON PREVIOUS SETUP RUN HAS NOT BEEN CLEANED PRIOR TO INSPECTION NUMBER REVISION OF ADDRESS PRIOR TO INSPECTION	49 50 51	CRACKED PIPE AT JOINT SHEAR CRACK LINEAR CRACK BEGIN INFAR CRACK			
9 10 11	RUN REQUIRES CLEANING FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	53 54 55 56	END LINEAR CRACK MULTIPLE CRACKS BEGIN MULTIPLE CRACKS FND MULTIPLE CRACKS	MANHOLE		
12 13 14 15	CAN BE INTERNALLY RECOVERATED PIPE DEFLECTION THRU RUN OBSERVED UNABLE TO CONTINUE DUE TO	57 58 59 60	CRUSHED PIPE BEGIN CRUSHED PIPE END CRUSHED PIPE PIFCES MISSING (*** -SIDE)	I UPSTREAD 2 DOWNSTR		
JOINT I CODE	INFORMATION COMMENTS	61 62 61	HOLE IN PIPE CHANGE IN PIPE TYPE FROM TO CHANGE IN PIPE SECTION LENGTH FROM ### FEET TO ### FEET			
21 22 23 24 25	JOINT JOINT - LEAKING JOINT - SLIGHT ROOT PENETRATION JOINT - MODERATE ROOT PENETRATION JOINT - SEVERE ROOT PENETRATION	64 65 66 67 68	CHANGE OF DIRECTION *** INSIGNIFICANT FLOW OBSERVED FLOW APPEARS TO BE EXFILTRATING BEGIN END			
26 27 28 29	JOINT - WIDE OR DPEN JOINT - VERTICALLY MISALIGNED JOINT - HORIZONTALLY MISALIGNED JOINT - BEGIN SAG	69 70 71 72	SLIGHT ROOT PENETRATION MDDERATE ROUT PENETRATION SEVERE ROOT PENETRATION	PIPE TYPE		
30 31 32 33 34	DAD - TRIDU DAD - TRIDU ZAP TEST PASS JUAT - AIR TEST PASS JUAT - KLPAIRED, 444 GALLONS OF GROUT JUAT - KLPAIRED, UNABLE TO ISOLATE	SERVICI CODE	INFORMATION COMMENTS	1 VCP 2 ACP 3 RCP 4 CIP OR 1 5 PVC		
35 36	JOINT - INSIGNIFICANT FLOV OBSERVED JOINT - FLOV APPEARS TO BE EXFILFRATING	80 81 82	SERVICE CONN, *** O'CLOCK POSITION, WYE DR TEE SERVICE CONN, *** D'CLOCK POSITION, CUT-IN, PROT. *** -INCHES HOUSE NO	6 DTHER		
		83 84 85 86	SERVICE CONNECTION CRACKED SLIGHT ROOT PENETRATION MODERATE ROOT PENETRATION SEVERE ROOT PENETRATION			
		87 88	INTERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED INTERMITTENT FLOW, SUMP PUMP CONNECTED, VERIFIED	<b></b>		
		89 90	INSIGNIFICANT FLOW OBSERVED FLOW IS USAGE	DUTY		
		91 92 93 94	SERVILE CUNN AIR TEST PASS SERVICE CUNN AIR TEST FAIL SERVICE CUNN NOT TESTED. NO CLEANDUT ACCESS SERVICE CUNN WATER SATURATION LEST PASS	1 TV DNL1 2 TV & AI 3 TV, AIR		
	ANA TITE HATA IN COMMENTS	נל	SERVICE LUNN WATER SATURATION TEST FAIL	4 TV L RE		

### 1171

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TREAM MH.

?	IPE TYPE
123456	VCP ACP RCP CIP OR DIP PVC OTHER

D	UTY
5	TV DNLY TV & AIR TEST
Э	TV, AIR TEST & REPAIR
4	TV & REPAIR

GANNETT IING, INC.

SHEET I (

### **TELEVISION INSPECTION LOG**

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 29, 1997 TIME : 0935

#### LOCATION: DAM NO. 01513, SOUTH RIVER NO. 24, HAPPY HOLLOW

### TELEVISING : RIGHT EMBANKMENT DRAIN STATIONING FROM : OUTLET END PIPE : 06", CMP, 72 FT

DUTY : 1 RIG NO. 346 OPERATOR JLP VIDEO TAPE: 10

STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00	1	2160	Corrugated pipe.
0+02	2	2181	
0+66			Slight gap at joint. Also begin perforations.
0+68			End perforations.
0+72			Bend in pipe.
0+26			Minor split in pipe.
+			
+			
+			
+			
+			
+			
+			
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+			
+			
+			
+	<u> </u>		
SEE BACK FO	R CODES F	<u>OR: MANIJOLE TYPE, N</u>	IANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

	TELEVISUAL INSPECTION	LOOLUP O	ODES	MANHOLE	TYPE
RUN IN	TO D MATION	MAINU	INR INFORMATION	I BRICK	
CODE	COMMENTS	CODE	COMMENTS	2 PRECAST 3 BLOCK	ſ
		45	APPARENT CRITICAL POINT OF SAG WWW -INCHES OF LIQUID	4 DTHER	
	BEGIN RUN	46	DRDP CONNECTION AT 6 D'CLOCK		
1 3	END PIPE	47	CRACKED PIPE AT SERVICE CONNECTION		
4	END RUN RUN CONSISTS OF *** FOOT PIPE SECTIONS	48	PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION		
5	END TELEVISUAL INSPECTION	49	CRACKED PIPE AT JUINT		
6	SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP	50	INFAR CRACK		
	RUN HAS NUT BEEN CLEANED PRIOR TO INSPECTION	52	BEGIN LINEAR CRACK		
9	RUN REQUIRES CLEANING	53	END LINEAR CRACK		
10	FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	54	HULTIPLE CRACKS	MANHOLE	H
1 11	BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55	EPIN WOLFILLE CHACKE		
12	EXTERNAL REPAIR REQUIRED	57		1 UPSTREA	AM MH
14	PIPE DEFLECTION THRU RUN OBSERVED	58	BEGIN CRUSHED PIPE	2 DOWNST	REAM
15	UNABLE TO CONTINUE DUE TO ***	59	END CRUSHED PIPE		
		60	PIECES MISSING (*** -SIDE)		
JOINT	INFORMATION	62	CHANGE IN PIPE TYPE FROM TO		
mn	(ALL DE LA D	63	CHANGE IN PIPE SECTION LENGTH FROM ### FEET		
CODE	COMPENIS		TO === FEET		
21	тис	64	CHANGE OF DIRECTION ***		
25	JOINT - LEAKING	66	FIELD APPEADS TO BE EVEN TRATING		
24	JUNI - SCIGHT RUUT PENETRATION	67	BEGIN		
25	JOINT - SEVERE ROOT PENETRATION	68	END		
56	JOINT - WIDE OR OPEN	69	CONTINUES		
27	JOINT - VERTICALLY MISALIGNED	70		PIPE TYPE	
29	JUNT - REGIN SAG	72	SEVERE ROOT PENETRATION		······
30	JOINT - END SAG	•		1 VCP	
31	JOINT - AIR TEST PASS	SPRYIC	E INFORMATION	2 ACP	
33	JUNT - REPAIRED. 444 GALLONS OF GROUT	00000			<b>n</b> 10
34	JOINT - NOT TESTED, UNABLE TO ISOLATE	CUNE	COMMENTS	5 PVC	211
35	JUNT - INSIGNIFICANT FLOW OBSERVED	80	SERVICE CONN, *** D'CLOCK POSITION, WYE DR TEE	6 OTHER	
30	JUNI - ILUW APPEARS IU BE EXIII IXAIING	81	SERVICE CONN D'CLOCK POSITION. CUT-IN.	L	
		02	PRUL WAA -INCHES		
		83			
		84	SLIGHT ROOT PENETRATION		
		85	HODERATE ROOT PENETRATION		
		86	SEVERE ROOT PENETRATION		
		88	INTERMITTENT FLOW, PUSSIBLE SUMP PUMP CONNECTED		
		89	INSIGNIFICANT FLOW OBSERVED	DITT	
		90	FLOV IS USAGE	ווטע	
		91	SERVICE CONN AIR TEST PASS		
}		56	SERVICE CONN AIR TEST FAIL		1 10 TC
		7J 94	SERVICE CONN - VATER SATURATION TOST DASS		יות וע דרכי
1			ACTION CONTR. MULLY SULOKWIIDE (F3) LW33	1 0	

### TYPE DATA IN COMMENTS

- 95 SERVICE CONN. - WATER SATURATION TEST FAIL

THER	
NHOLE HI	
IPSTREAM MH. DWNSTREAM MH.	

PIPE TYPE			
123456	VCP ACP RCP CIP OR DIP PVC OTHER		

D	UTY
1	TV DINLY
5	TV & AIR TEST
3	TV, AIR TEST
	& REPAIR
4	TV & REPAIR
GANNETT ING, INC.

SHEET 1 L

## **TELEVISION INSPECTION LOG**

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 29, 1997 TIME : 1310

LOCATION: DAM NO. 01502, SOUTH RIVER NO. 25, TOMS BRANCH

TELEVISING : **RISER INTERIOR** 

STATIONING FROM : TOP OF RISER PIPE :

DUTY : I RIG NO. 346 OPERATOR JLP VIDEO TAPE: 10

STATION	CODE	VIDEO FOOTAGE	COMMENTS
+			Total depth 17'.
+			15' top of gate valve.
+		2853	Downstream wall.
+		2855	Left side wall.
+			15' construction joint.
+		2974	Upstream wall. Concrete pitting 6'.
+		······	15' minor pitting above gate valve.
+		3087	Right side wall.
+		3181	
+			
+			
+			
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+	<u> </u>	<u> </u>	
SEE BACK FO	R CODES F	OR: MANHOLE TYPE, N	IANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

[31246\TVLOGS\TVLOG_37]

OINATION     MAINLINE INFORMATION       COMMENTS     CODE     COMMENTS       BEGIN RUN     45     APPARENT CRITICAL POINT OF SAG. *** -INCHES OF LIQUID       BEGIN RUN     45     APPARENT CRITICAL POINT OF SAG. *** -INCHES OF LIQUID	I BRICK 2 PRECAST 3 BLOCK 4 OTHER
COMMENTS BEGIN RUN BEGIN PIPE 45 APPARENT CRITICAL POINT OF SAG, *** -INCHES OF LIQUID 46 DROP CONNECTION AT & D'CLOCK	2 PRECAST 3 BLOCK 4 OTHER
BEGIN RUN 45 APPARENT CRITICAL POINT OF SAG, *** -INCHES OF LIQUID BEGIN PIPE 46 DROP CONNECTION AT & D'CLOCK	
REGIN PIPE 46 DROP CONNECTION AT & D'CLOCK	
A CONTRACT DIDE AT FOULER EDWERTION	
END PIPE 47 CRACKED PIPE AT SERVICE CONNECTION A7 CRACKED PIPE AT SERVICE CONNECTION A9 PERIPHERAL LEGAL ADDING CONTAINS CONTAINS CONTAINS CONTAINS	
END RON RON LUNSISTS OF AN FOUT FIFE SECTIONS 49 CRACKED PIPE AT JOINT	
SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP 50 SHEAR CRACK	
RUN HAS NUT KEEN CLEANED PRIOR TO INSPECTION SI LINEAR CRACK	
RUN HAS BEEN CLEANED PRIOR TO INSPECTION 52 BEGIN LINEAR LKACK	
RUN REQUIRES LELANING	MANTIOLY AND
BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE 55 BEGIN MULTIPLE CRACKS	BIANNOUL FIR
EXTERNAL REPAIR REQUIRED 56 END MULTIPLE CRACKS	
CAN BE INTERNALLY REPAIRED 57 CRUSHED PIPE	
Inable Fill Cinit Inde Kin (Deck VCD) 50 END CRUSHED PIPE	E DUBNSTREAM F
60 PIECES MISSING (*** -SIDE)	
(POINATION 6) HOLE IN PIPE	
WMMENIS	
JOINT 64 CHANGE OF DIRECTION ***	
JOINT - LEAKING 65 INSIGNIFICANT FLOW DESERVED	
JUINT - SLIGHT KUUT PENETRATION 66 TEUM APPEARS TU BE EXFILIRATING	
JUINT - FIDURATE RDUT FENTRATION 60 END	
JUINT - WIDE OR OPEN 69 CONTINUES	
JUINT - VERTICALLY MISALIGNED 70 SLIGHT ROOT PENETRATION	PIPE TYPE
JUINT - HURIZUNTALLY MISALIGNED /1 HUDEKATE KUDI PENETKATIGN JUINT - HURIZUNTALEY MISALIGNED /1 HUDEKATE KUDI PENETKATIGN	
JOINT - END SAG	) VCP
NOTATING THE REPORT TO THE REPORT OF THE REP	2 ACP
JUINT - AIR TEST FAIL JUINT - BRANGED ARY CALLONS DE CROUT	3 RCP
JUINT - REPAIRED - GALLINS OF DRUGT CODE COMMENTS	4 CIP DR DIP
JUINT - INSIGNIFICANT FLOW OBSERVED BO SERVED BO SERVED BO SERVICE CONN AND DELEGATION WAS DO TEC	
JOINT - FEDV APPEARS TO BE EXFLUTRATING BI SERVICE CONN. +++ UCLOCK POSITION, CUT-IN	
PROT. #A# -INCHES	
	1
85 MODERATE ROOF PENETRATION	
BE SEVERE ROOT PENETRATION	
87 INTERMITTENT FLIV, PUSSIBLE SUMP PUMP CONNECTED	
BO INSTRUCTION FLOW, SUM POMP CUNNECTED, VERITED BO INSTRUCT	DITTY
90 FLDW IS USAGE	ווטע
91 SERVICE CONN - AIR TEST PASS	h The Charles
92 SERVICE CONN - AIR TEST FAIL	
73 SERVICE CUNN NUT TESTED, NU CLEANDUL ACCESS 94 SERVICE CUNN - VALES SATURATION TEST PASS	3 TV, AIR TEST
NAN LYPE DATA IN COMMENTS 95 SERVICE CONN WATER SATURATION TEST FAIL	L REPAIR

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4 TV & REPAIR

GANNETT MING, INC. TELEVISION has PECTION LOG

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 29, 1997 TIME : 1310

SHEET <u>I</u> I

7

LOCATION: DAM NO. 01502, SOUTH RIVER NO. 25, TOMS BRANCH

## TELEVISING : OUTFALL CONDUIT STATIONING FROM : DOWNSTREAM END PIPE : 24", CMP, 373 FT

DUTY : 1 RIG NO. 346 OPERATOR JLP VIDEO TAPE: 10

STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00	1	3258	
0+02	2	3270	
0+81		3474	Possible shear crack.
3+71	3	4259	
3+73		4275	16' sections.
+			Also, exposed aggregate throughout entire run.
+			
+			
+			
+			
+			
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+	[		
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+			
+	-		
+			
+	<u> </u>		
SEE BACK FO	OR CODES	FOR: MANHOLE TYPE, M	MANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

[31246/TVLOGS/TVLOG_38]

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	TELEVISUAL INSPECTION L	OOLUP (	DES	MANHOLE TYPE
IN IN	ORMATION	MAINIJ	NR INFORMATION	1 BRICK
۸P		000F	munut	2 PRECAST
V6	COMMENTS	CODE	WEELNID	4 OTHER
	BEGIN RUN	45	APPARENT CRITICAL POINT OF SAG, ### -INCHES OF LIDUID	
	BEGIN PIPE	46	DRUP LUNNELTIUN AT 6 U'LLULK	
	END PIPE	4/ 48	PERIPHERAL LEAK ARDIND CUT-IN SERVICE CONNECTION	
	END TELEVISIAL INSPECTION	49	CRACKED PIPE AT JOINT	
	SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP	50	SHEAR CRACK	
	RUN HAS NOT BEEN CLEANED PRIOR TO INSPECTION	51	LINEAR CRACK	
	RUN HAS BEEN CLEANED PRIOR TO INSPECTION	52	BLGIN LINEAR LRALK	
	RUN REDURES CLEANING	54	MULTIPLE CRACKS	MANUAL P AND
	BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55	BEGIN MULTIPLE CRACKS	BUVINIAN ALM
	EXTERNAL REPAIR REQUIRED	56	END HULTIPLE CRACKS	
	CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE	I UPSTREAM MH.
	PIPE DEFLECTION THRU RUN UBSERVED	59	END CRUSHED PIPE	C DUWNSTREAM M
		60	PIECES MISSING (*** -SIDE)	1
ΤD	BUSTICA	61	HOLE IN PIPE	
: н		62	CHANGE IN PIPE TYPE FROM TO	
Į.	COMMENTS	63	TO AND THE SECTION LENGTH FROM ANA FLET	
	กาพม	64	CHANGE DE DIRECTION ###	
	JOINT - LEAKING	65	INSIGNIFICANT FLOW DBSERVED	
	JOINT - SLIGHT ROOT PENETRATION	66	FLOW APPEARS TO BE EXFILTRATING	
	JOINT - MODERATE ROOT PENETRATION	67	BEGIN	
	JUNT - SEVERE RUUT PENLIKATUN	69	CONTINUES	
	JUINT - VERTICALLY MISALIGNED	70	SLIGHT ROOT PENETRATION	BIBP TYPP
	JOINT - HORIZONTALLY MISALIGNED	71	HODERATE ROOT PENETRATION	III III F
	JOINT - BEGIN SAG	72	SEVERE RODT PENETRATION	
	2249 1231 914 - 10101 - 10102 - 10101			
	JOINT - AIR TEST FAIL	SERVIC	S INFORMATION	
	JOINT - REPAIRED, ANN GALLONS OF GROUT	MDP	MARINE CONTRACTOR OF THE OWNER OF	4 CIP OR DIP
	JOINT - NOT TESTED, UNABLE TO ISOLATE	CONF	COMPLET 19	S PVC
	JUNNI - THSTUNG ILANT FLUW DESERVED	80	SERVICE CONN, *** O'CLOCK POSITION, WYE OR TEE	6 OTHER
		81	SERVICE CONN. *** D'CLOCK POSITION, CUT-IN,	·
		82	HURL ND	
		83	SERVICE CONNECTION CRACKED	
		84	SLIGHT ROOT PENETRATION	
		85	MODERATE ROOT PENETRATION	
		86 N7	SEVERE RULL PENETRATION	
		88	INTERMITTENT FLOW, PUSSIBLE SUMP PUMP CONNECTED VEDECED	
		89	INSIGNIFICANT FLOW DBSERVED	NITY I
		90	FLOW IS USAGE	Port.
		91	SERVICE CONN AIR TEST PASS	A TY DATY
		72	SERVICE FORM - ART TESTER AN OF CANDUS ACCEPT	2 TV LAIR TEST
		94	SERVICE CONN VATER SATURATION TEST PASS	3 TV, AIR TEST

GANNETT / MING, INC.

SHEET 1 O

## TELEVISION IN **CONTINUE**

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 29, 1997 TIME : 1310

## LOCATION: DAM NO. 01502, SOUTH RIVER NO. 25, TOMS BRANCH

## TELEVISING : LEFT EMBANKMENT DRAIN STATIONING FROM : OUTLET END PIPE : 02", CIP or DIP, 17 FT

DUTY : 1 RIG NO. 346 OPERATOR JLP VIDEO TAPE: 10

STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00	1	4275	2" pipe. (Video tape audio refers to as 4" 2" is correct.)
0+02	2	4291	
0+17		4398	Line is capped off at end (no inflow source?)
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SEE BACK F	DR CODES I	FOR: MANHOLE TYPE, M	I

{31246\TVLOGS\TVLOG_39}

	TELEVISUAL INSPECTION 1	LOOKUP CC	DES	
				MANHOLE
I RUN IN	(FORMATION	MAINLI	NE INFORMATION	I BRICK
CODE	COMMENTS	CODE	COMMENTS	2 PRECAST 3 BLOCK
	BEGIN RUN	45	APPARENT CRITICAL POINT OF SAG INCHES OF LIQUID	
2	BEGIN PIPE	46	DROP CONNECTION AT 6 D'CLOCK	
3	END PIPE	47	CRACKED PIPE AT SERVICE CONNECTION	
4	END RUN, RUN CONSISTS OF ### FUOT PIPE SECTIONS	49	CRACKED PIPE AT JOINT	
	END TELEVISION, INSPECTION SAME PRINT AS ENCOUNTERED ON PREVIÔUS SETUP	50	SHEAR CRACK	
1 5	RIN HAS NOT BEEN CLEANED PRIOR TO INSPECTION	51	LINEAR CRACK	
Ь.	RUN HAS BEEN CLEANED PRIOR TO INSPECTION	52	BEGIN LINEAR CRACK	
9	RUN REQUIRES CLEANING	53		MANDOLP
10	FLOW CAN BE ATTRIBUTED TO GENERAL JUINT LEAKAGE	54		
111	BALANCE OF FLUW CAN BE ATTRIBUTED TO GENERAL OUTRY CEREMON	56	END MULTIPLE CRACKS	·
12	CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE	1 UPSTREA
14	PIPE DEFLECTION THRU RUN ODSERVED	50	BEGIN CRUSHED PIPE	2 DOVNSTR
15	UNABLE TU CONTINUE DUE TO	59	END CRUSHED PIPE	L
		60	HILE IN BIDE HITEP WIDPING (484 -2105)	
JOINT	INFOLMATION	62	CHANGE IN PIPE TYPE FROM TO	
CODE	AND THE SECOND	63	CHANGE IN PIPE SECTION LENGTH FROM ### FEET	
TUNR	COMMENTS		TD *** FEET	
15	TUIDE	64	CHANGE OF DIRECTION ###	
55	JOINT - LEAKING	65	ELUCI ADDEADS TO DE EVENT DATING	
23	JUINT - SCIGHT KUUT PENETRATION IDINT - WODERATE ROOT PENETRATION	67	BEGIN	
25	JOINT - SEVERE ROOT PENETRATION	68	END	
26	JOINT - VIDE OR OPEN	69	CONTINUES	
27	JUINT - VERTICALLY MISALIGNED	70	SLIGHT ROOT PENETRATION	PIPE TYPE
58	JOINT - HORIZONTALLY MISALIGNED	/1	MUDERATE RIJUT PENETRATION	1
29	JUNT - BLUIN SAG	<i>'E</i>	SEVERE RUDT PENETRATION	
31 -	22A9 F23T RIA - INIO	00010	TRADUCTION .	
sc	JOINT - AIR TEST FAIL	SERVICE	S INFURNATION	3 RCP
33	JOINT - REPAIRED, *** GALLONS OF GROUT	MDF	OWNER	4 CIP DR
34	JOINT - NOT TESTED, UNABLE TO ISOLATE	CODE	COMMENTS	5 PVC
35	JUINT - ELOV APPEARS TO BE EXCHITRATING	80	SERVICE CONN. *** O'CLOCK POSITION, WYE OR TEE	6 OTHER
1 30		81	SERVICE CONN., *** D'CLOCK POSITION, CUT-IN,	
		02	PRUL ### - INCHES	
		83	SERVICE CONNECTION CRACKED	
		84	SLIGHT ROOT PENETRATION	
		85	MODERATE ROOT PENETRATION	
		86	SEVERE ROOT PENETRATION	
		87	INTERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED	
		88 89	INTERMITIENT FLOW, SUMP PUMP CONNECTED, VERIFIED	DITY
		90	FLOV IS USAGE	דוטע ן
		91	SERVICE CONN AIR TEST PASS	
		92	SERVICE CONN AIR TEST FAIL	1 TV DNL
		93	SERVICE CONN NOT TESTED, NO CLEANDUT ACCESS	
	*** TYPE DATA IN COMMENTS	77	SERVICE CONN - VALER SATURATION TEST CAN	1 REPAI
	<ul> <li>Another data set to set</li></ul>		SERVICE CURR WATER SATURATION IEST FAIL	

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## TYPE

am MH. Ream MH.

DIP

TV LINET TV & AIR TEST TV, AIR TEST & REPAIR TV & REPAIR

SHEET I 1

## **TELEVISION A ... PECTION LOG**

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 30, 1997 TIME : 0900

## LOCATION: DAM NO. 01501, SOUTH RIVER NO. 26, INCH BRANCH

TELEVISING : **RISER INTERIOR** STATIONING FROM : **TOP OF RISER** PIPE : _____

DUTY : 1 RIG NO. 346 OPERATOR JLP VIDEO TAPE: 11

STATION	CODE	VIDEO FOOTAGE	COMMENTS
+			Total depth 15'.
+		347	Downstream wall.
+		348	Left wall.
+		560	Upstream wall.
+			13' top of gate valve, no stem on intake tower.
+			Right side wall.
+		873	Intake tower concrete is pitted on all walls.
+			· · · · · · · · · · · · · · · · · · ·
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SEE BACK FO	OR CODES F	OR: MANHOLE TYPE, M	IANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

TELEVISUAL INSPECTION	LOOKUP C	ODES	MANHOLE TYPE
IN INFORMATION	MAINL	INE INFORMATION	I BRICK
DE COMMENTS	CODE	COMMENTS	2 PRECAST 3 BLOCK
BEGIN RIN	45	APPARENT CRITICAL POINT OF SAG. ### -INCHES OF LIQUID	4 DTHER
2 BEGIN PIPE	46	DROP CONNECTION AT 6 D'CLOCK	
END PIPE	47	CRACKED PIPE AT SERVICE CONNECTION	
END RUN RUN CONSISTS OF ### FOOT PIPE SECTIONS	48 49	CRACKED PIPE AT JOINT	
SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP	50	SHEAR CRACK	
RUN HAS NOT BEEN CLEANED PRIOR TO INSPECTION	51	LINEAR CRACK	
RUN HAS BEEN CLEANED PRIDE TO INSPECTION	52 53	END LINEAR CRACK	
FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	54	MULTIPLE CRACKS	MANHOLE HM
BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55 56	BEGIN MULTIPLE CRACKS	
EXTERNAL REPAIR REQUIRED	57	CRUSHED PIPE	I UPSTREAM MH.
PIPE DEFLECTION THRU RUN OBSERVED	58	BEGIN CRUSHED PIPE	2 DOWNSTREAM MH.
UNABLE TO CONTINUE DUE TO WV#	60	PIECES MISSING (*** -SIDE)	
TINTOPALTION	61	HOLE IN PIPE	
	62	CHANGE IN PIPE TYPE FROM ID CHANGE IN PIPE SECTION FENGTH FROM WWW FEFT	
COWWPU12	00	TO ANY FEET	
	64	CHANGE OF DIRECTION ***	
JUINT - LEAKING JUINT - SLIGHT ROOT PENETRATION	66	FLOW APPEARS TO BE EXFILTRATING	
JOINT - MODERATE ROOT PENETRATION	67	BEGIN	
JOINT - SEVERE ROOT PENETRATION	69	END CONTINUES	
JOINT - VERTICALLY MISALIGNED	70	SLIGHT ROOT PENETRATION	PIPE TYPE
JOINT - HORIZONTALLY MISALIGNED	71	MODERATE RODI PENETRATION	1112 1112
JOINT - END SAG	r 6-		1 VCP
22AP T23T RIA - INIG	SERVIC	TE INFORMATION	2 ACP
JOINT - REPAIRED, AND GALLONS OF GROUT	MNP		A CIP OR DIP
JOINT - NOT TESTED, UNABLE TO ISOLATE	CUNE	COMMEN 19	5 PVC
JOINT - FLOV APPEARS TO BE EXFILTRATING	80	SERVICE CONN, *** D'CLOCK POSITION, WYE OR TEE	6 OTHER
	01	PROT. WAR -INCHES	
	85	HOUSE NO.	
	83 64	SERVICE CONNECTION CRACKED	
	85	MODERATE ROOT PENETRATION	
	86 97	SEVERE ROOT PENETRATION	
	88	INTERMITTENT FLOW, PUSSIBLE SUMP PUMP CUNNECTED	<b></b>
	89	INSIGNIFICANT FLOV OBSERVED	DUTY
	90 91	FLUW IS USAGE	
	sé	SERVICE CONN - AIR TEST FAIL	1 TV DNLY
	93	SERVICE CONN NOT TESTED, NO CLEANOUT ACCESS	TZET RIA # VI S
WAW TYPE DATA IN COMMENTS	95	SERVICE CONN WATER SATURATION TEST FAIL	& REPAIR

4 TV & REPAIR

GANNETT NG, INC.

SHEET I O

## **TELEVISION INSPECTION LOG**

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 30, 1997 TIME : 0900

## LOCATION: DAM NO. 01501, SOUTH RIVER NO. 26, INCH BRANCH

TELEVISING : OUTFALL CONDUIT STATIONING FROM : DOWNSTREAM END PIPE : 24", RCP, 311 FT

DUTY :1 RIG NO. 346 OPERATOR JLP VIDEO TAPE: 11

STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00	1	1115	
0+02	2	1130	
3+09	3	2289	
3+11	4	2305	16' sections.
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+	1	<u>l</u>	
SEE BACK FO	OR CODES F	OR: MANHOLE TYPE, N	1ANIIOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.
131246\TVLOC	S\TVLOG 4	n	

## TELEVISUAL INSPECTION LOOKUP CODES

## RUN INFORMATION

#### CODE COMMENTS

- BEGIN RUN
- BEGIN PIPE 2
- 3 END PIPE
- END RUN RUN CONSISTS OF ### FOOT PIPE SECTIONS 4
- END THEVISION INSPECTION 5
- SAME PHINT AS ENCHUNTERED ON PREVIOUS SETUP L
- RUN HAS NOT HEEN CLEANED PRIDE TO INSPECTION 7
- RUN HAS BEEN CLEANED PRIDE 1D INSPECTION 8
- RUN REQUIRES CLEANING 9
- FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE 10 BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE
- 11 EXTERNAL REPAIR REQUIRED
- 12
- CAN BE INTERNALLY REPAIRED 13
- PIPE DEFLECTION THRU RUN OBSERVED 14
- UNABLE TO CONTINUE DUE TO ### 15

### JOINT INFORMATION

#### CODE COMMENTS

- 51 JOINT
- JUINT LEAKING 55
- 23 JOINT - SLIGHT ROOT PENETRATION
- JOINT MODERATE ROOT PENETRATION 24
- 25 JOINT - SEVERE ROOT PENETRATION
- JUINT WIDE OR OPEN 56
- JOINT VERTICALLY MISALIGNED 27
- 28 JOINT - HORIZONTALLY MISALIGNED
- JOINT BEGIN SAG 29
- 30 JOINT - END SAG
- JOINT AIR TEST PASS 31
- JUINT AIR TEST FAIL 35
- JOINT REPAIRED, .... GALLONS OF GROUT 33
- 34 JOINT - NOT TESTED, UNABLE TO ISOLATE
- 35 JOINT - INSIGNIFICANT FLOW OBSERVED

*** TYPE DATA IN COMMENTS

JOINT - FLOW APPEARS TO BE EXFILTRATING 36

MAINLINE INFORMATION

#### CODE COMMENTS

- APPARENT CRITICAL POINT OF SAG, *** -INCHES OF LIQUID 45
- DROP CONNECTION AT 6 D'CLOCK 46
- CRACKED PIPE AT SERVICE CONNECTION 47
- PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION 48
- CRACKED PIPE AT JDINI 49
- 50 SHEAR CRACK
- LINEAR CRACK 51
- BEGIN LINEAR CRACK 52
- END LINEAR CRACK 53
- MULTIPLE CRACKS 54
- BEGIN MULTIPLE CRACKS 55
- END HULTIPLE CRACKS 56
- 57 CRUSHED PIPE
- BEGIN CRUSHED PIPE 58
- 59 END CRUSHED PIPE
- 60 PIECES MISSING (+++ -SIDE)
- HOLE IN PIPE 61
- 62 CHANGE IN PIPE TYPE FROM TO
- CHANGE IN PIPE SECTION LENGTH FROM *** FEET 63
- TO ### FEET
- CHANGE OF DIRECTION .... 64
- 65 INSIGNIFICANT FLOW DBSERVED
- FLOW APPEARS TO BE EXFILTRATING 66
- 67 BEGIN
- 68 END
- CONTINUES 69
- SLIGHT ROOT PENETRATION 20
- 71 MODERATE ROOT PENETRATION
- 72 SEVERE ROOT PENETRATION

### SERVICE INFORMATION

### CODE COMMENTS

- 80 SERVICE CONN, *** O'CLOCK POSITION, WYE OR TEE SERVICE CONN. *** D'CLOCK POSITION CUT-IN. 81 PROT. ### -INCHES
- 85 HOUSE NO.

95

- 83 SERVICE CONNECTION CRACKED
- SLIGHT ROUT PENETRATION 84
- 85 MODERATE ROUT PENETRATION
- 86 SEVERE ROOT PENETRATION 87
- INTERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED 68
- INTERMITTENT FLOW, SUMP PUMP CONNECTED, VERIFIED 69 INSIGNIFICANT FLOW DESERVED
  - FLOW IS USAGE
- 90 91
- SERVICE CONN. AIR TEST PASS 56 SERVICE CONN. - AIR TEST FAIL
- SERVICE CONN. NOT TESTED, NO CLEANDUT ACCESS 93
- 94 SERVICE CUNN. - WATER SATURATION TEST PASS
  - SERVICE CONN. WATER SATURATION TEST FAIL

- MANHOLE TYPE
  - BRICK 1
  - 5 PRECAST BLOCK
- з 4 OTHER

- MANHOLE ++
- I UPSTREAM MH. 2 DOWNSTREAH MH.

- HPL TTPL VCP 1 ACP З 3 RCP
- CIP OR DIP 4
- 5 PVC
- DTHER 6
  - DUTY
- TV DNLY 1
- 2 TV & AIR TEST 3 TV, AIR TEST
- L REPAIR
- TV & REPAIR

GANNETT IING, INC.

SHEET 1 C

## **TELEVISION INSPECTION LOG**

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 30, 1997 TIME : 0900

## LOCATION: DAM NO. 01501, SOUTH RIVER NO. 26, INCH BRANCH

## TELEVISING : LEFT EMBANKMENT DRAIN STATIONING FROM : OUTLET END PIPE : 08", CMP, 45 FT

DUTY : I RIG NO. 346 OPERATOR JLP VIDEO TAPE: 11

STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00	1	2302	Corrugated pipe.
0+02	2	2325	
0+45		2735	Joint slightly separated with soil coming into pipe through joint.
+			Cannot continue televising beyond bent edge of joint.
+			
+			
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SEE BACK FO	DR CODES F	OR: MANHOLE TYPE, N	ANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

[31246\TVLOGS\TVLOG_42]

TELEVISUAL INSPECTION	DOLUP CODES	MANHOLE
PUN INFORMATION	MAINI INE INFORMATION	
CODE COMMENTS	CODE COMMENTS	2 PRECAS 3 BLOCK
CODI       COMMENTS         1       BEGIN PIPE         3       END PIPE         3       END PIPE         3       END PIPE         4       END RUL RUN CONSISTS OF **** FODT PIPE SECTIONS         5       END TELEVISUAL INSPECTION         6       SAME POINT AS ENCOUNTERED DN PREVIOUS SETUP         7       RUN HAS NOT BEEN CLEANED PRIDE TO INSPECTION         8       RUN HAS BEEN CLEANED PRIDE TO INSPECTION         9       RUN REQUIRES CLEANING         10       FLUV CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE         11       BALANCE OF FLOW CAN UE ATTRIBUTED TO GENERAL JOINT LEAKAGE         12       EXTERNAL REPAIR REQUIRED         13       CAN BE INTERNALLY REPAIRED         14       PIPE DEFLECTION THRU RUN DBSERVED         15       UNABLE TO CONTINUE DUE TO ***         JOINT       SEVERE ROOT PENETRATION         23       JOINT - SEVERE ROOT PENETRATION         24       JOINT - SEVERE ROOT PENETRATION         25       JOINT - SEVERE ROOT PENETRATION         26       JOINT - VERTICALLY MISALIGNED         27       JOINT - WIDE OR OPEN         28       JOINT - NOT SAG         39       JOINT - AIR TEST FASIS         30	CODE       COMMENTS         45       APPARENT CRITICAL PDINT OF SAG. *** -INCHES OF L         46       DRUP CONNECTION AT 6 D'CLOCK         47       CRACKED PIPE AT SERVICE CONNECTION         48       PERIPIERAL LEAK ARQUND CUT-IN SERVICE CONNECTION         49       CRACKED PIPE AT JOINT         50       SHEAR CRACK         51       LINEAR CRACK         52       BEGIN LINEAR CRACK         53       END LINEAR CRACK         54       MULTIPLE CRACKS         55       BEGIN MULTIPLE CRACKS         56       END MULTIPLE CRACKS         57       CRUSHED PIPE         58       BEGIN CRUSHED PIPE         59       END CRUSHED PIPE         60       PIECES MISSING (*** -SIDE)         61       HOLE IN PIPE         62       CHANGE IN PIPE TYPE FROM TO         63       CHANGE IN PIPE SECTION LENGTH FROM *** FEET         64       CHANGE DF DIRECTION ****         65       INSIGNIFICANT FLOW DBSERVED         66       FLOW APPEARS TO BE EXFILTRATING         67       BEGIN         68       END         69       CONTINUES         70       SLIGHT ROOT PENETRATION         71	IOUID 3 BLOCK 4 DTHER 4 MANHOLE 1 UPSTRE 2 DOWNST 2 DOWNST 1 VCP 2 ACP 3 RCP 4 CIP OR 5 PVC 6 DTHER
*** TYPE DATA IN COMMENTS	PROT. *** -INCHES D2 HOUSE ND. B3 SERVICE CONNECTION CRACKED B4 SLIGHT ROOT PENETRATION B5 MODERATE ROOT PENETRATION B6 SEVERE ROOT PENETRATION B7 INTERMITTENT FLOW, DUSSIBLE SUMP PUMP CONNECTED B8 INTERMITTENT FLOW, DUSSIBLE SUMP PUMP CONNECTED B8 INTERMITTENT FLOW, DUSSIBLE SUMP PUMP CONNECTED B9 INSIGNIFICANT FLOW DBSERVED 90 FLOW IS USAGE 91 SERVICE CONN AIR TEST PASS 92 SERVICE CONN NOT TESTED, NO CLEANOUT ACCESS 94 SERVICE CONN WATER SATURATION TEST PASS 95 SERVICE CONN WATER SATURATION TEST FAIL	DUTY I TV DAL 2 TV L 3 TV, AI 5 REPA

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]	AANHOLE IHM
1 2	UPSTREAM MH. DOWNSTREAM MH.
	'PE TYPE
5	VCP ACP RCP
4	

D	UTY
1 2 3	TV DNLY TV & AIR TEST TV, AIR TEST
	1 REPAIR

4 TV & REPAIR

GANNETT MING, INC.

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 30, 1997 TIME : 0900

PIPE :

SHEET 1 C

1

## LOCATION: DAM NO. 01508, SOUTH RIVER NO. 23, ROBINSON HOLLOW

TELEVISING : RISER INTERIOR

STATIONING FROM : TOP OF RISER

DUTY : 1 RIG NO. PORTABLE OPERATOR JLP VIDEO TAPE: 12

STATION	CODE	VIDEO FOOTAGE	COMMENTS
+			Total depth 16'.
+			Downstream wall.
+		745	Left side wall.
+		920	Upstream wall. 14' to top of gate valve.
+		1200	Right side wall.
+		1416	End.
+			
+			Concrete within entire tower is pitted.
+			
+			
-+			
+			
+			
+			
+			
+			
+			
+			
+			
+			
+			
+			
SEE BACK FO	OR CODES F	OR: MANHOLE TYPE, M	1ANHOLE 0+00, PIPE TYPE, BUTY AND LOOKUP CODES.

[31246\TVLOGS\TVLOG_43]

N INFORMATION DE COMMENTS BEGIN PUN BEGIN PIPE END PIPE END PUPE END PUPE END PUPE END PUPE CONSISTS OF *** FOOT PIPE SECTIONS SOUT LEFEVISION INSPECTION	MAINL CODE 45 46 47	COMMENTS Apparent critical point of SAG, www -inches of Liquid	1 BRICK 2 PRECAST 3 BLOCK
DE COMMENTS BEGIN RUN BEGIN PIPE END RUN RUN CONSISTS OF *** FOOT PIPE SECTIONS CHILD FUELSUAL INSPECTION	45 46	COMMENTS APPARENT CRITICAL POINT OF SAG. *** -INCHES OF LIQUID	2 PRECAST
BEGIN RUN BEGIN PIPE END RUN RUN CONSISTS OF ### FOOT PIPE SECTIONS END RUN RUN CONSISTS OF ### FOOT PIPE SECTIONS	45 46 47 48	APPARENT CRITICAL POINT OF SAG. *** -INCHES OF LIQUID	
BEGIN PIPE END PIPE END RUN RUN CONSISTS OF ### FOOT PIPE SECTIONS GND TELEVISION INSPECTION	46 47 48		4 910CR
END PIPE END RUN RUN CONSISTS OF ### FOOT PIPE SECTIONS CND RUE FUISIDAL INSPECTION	47	DROP CONNECTION AT 6 D'CLOCK	
END RUN, RUN CONSISTS OF ### FOOT PIPE SECTIONS	<b>4</b> H	CRACKED PIPE AT SERVICE CUNNELTION	
CAIN TELEVINIAL INNELLIUN	49	PRACKED PIPE AT JOINT	
SAME PRINT AS ENCLUNTERED ON PREVIOUS SETUR	50	SHEAR CRACK	
PIN HAS NIT BEEN CLEANED PRIOR TO INSPECTION	51	LINEAR CRACK	
RUN HAS BEEN CLEANED PRIDE TO INSPECTION	52	BEGIN LINEAR CRACK	
RUN REQUIRES CLEANING	53	END LINEAR LRACK	MANTION & ALM
FLOW CAN BE ATTRIBUTED TO GENERAL JUINT LEAKAGE		RECIN MULTIPLE CRACKS	
BALANCE OF FLUW LAN BE ATTRIBUTED TO GENERAL JUIT	56	END MULTIPLE CRACKS	
CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE	1 UPSTREAM M
PIPE DEFLECTION THRU RUN DBSERVED	50	BEGIN CRUSHED PIPE	S DOANZIKEAN
UNABLE TU CONTINUE DUE TO MAM	57 60	END CRUSHED PIFE	L
	61	HOLE IN PIPE	
AT INTURMATION	65	CHANGE IN PIPE TYPE FROM TO	
AL COMMENTS	63	CHANGE IN PIPE SECTION LENGTH FROM ### FEET	
		TE AND TELT	
	67	INSIGNIFICANT FLOW OBSERVED	
JOINT - SLIGHT ROOT PENETRATION	66	FLOW APPEARS TO BE EXFILTRATING	
JOINT - MODERATE ROOT PENETRATION	67	BEGIN	
JOINT - SEVERE ROOT PENETRATION	68	END	
JOINT - VIDE OR OPEN	69 70		BIRT TTHE
JOINT - HORIZONTALLY MISALIGNED	71	MODERATE ROOT PENETRATION	FILL HILD
JOINT - BEGIN SAG	72	SEVERE ROOT PENETRATION	
JOINT - END SAG			1 VCP
JUNI - AN TEST FAN	SERVIC	T. INFORMATION	2 ACP
JUNT - REPAIRED. 400 GALLONS DE GROUT	0000		
JOINT - NOT TESTED, UNABLE TO ISOLATE	CODE	COMMENTS	5 PVC
JOINT - INSIGNIFICANT FLOW OBSERVED	80	SERVICE CONN O'CLOCK POSITION WYE OR TEE	6 OTHER
JOINT - FLOW APPEARS TO BE EXFILTRATING	81	SERVICE CONN D'CLOCK POSITION, CUT-IN	L
	83	SERVICE CONNECTION CRACKED	
	84	SLIGHT ROOT PENETRATION	
	85	MODERATE ROOT PENETRATION	
	86	SEVERE RODT PENETRATION	
	87	INTERNITIENT FLOW, POSSIBLE SUMP PUMP CONNECTED	
	00 A9	INSIGNIFICANT FLOW, SUMP PUMP CUNNECTED, VERIFIED	DIATY
	90	FLUV IS USAGE	ווטע
	91	SERVICE CONN AIR TEST PASS	
	92	SERVICE CONN AIR TEST FAIL	
	93	SERVICE CONN - VATER SATURATION TEST BASS	3 TV. AIR TE
NUMBER OF TAMES AND A TAKEN A T	95	SERVICE CONN WATER SATURATION TEST FAIL	L REPAIR

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- H. I MH,

!	PPE TTPE	
123456	VCP ACP RCP CIP OR DIP PVC OTHER	

- TZST ST
- R

GANNETT MING, INC.

SHEET 1 Oi

#### TELEVISION IN: **CTION LOG**

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 30, 1997 TIME : 0900

## LOCATION: DAM NO. 01508, SOUTH RIVER NO. 23, ROBINSON HOLLOW

TELEVISING : OUTFALL CONDUIT

STATIONING FROM : DOWNSTREAM END PIPE : 24", RCP, 308 FT

DUTY : 1 RIG NO. PORTABLE OPERATOR JLP VIDEO TAPE: 12

STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00	1		
0+02	2		
3+06	3		
3+08			16' sections.
+			
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+			
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+			
+			
+			
+			
+			
+			
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SEE BACK FO	R CODES F	OR: MANHOLE TYPE, N	IANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

31246\TVLOGS\TVLOG_44]

		TELEVISUAL INSPECTION I	LOOKUP C	DDES	Г	MANHOLE TYPE
	RUN IN	FORMATION	MAINL	INE INFORMATION	-	BRICK
I	CODE	COMMENTS	CODE	COMMENTS		PRECAST BLOCK
I	1	BEGIN RUN	45	APPARENT CRITICAL POINT OF SAGINCHES OF LIQUID	Ľ	+ OTHER
ł	2	BEGIN PIPE	46 47	DROP CONNECTION AT 6 D'OLDOCK CRACKED PIPE AT SERVICE CONNECTION		
Ł	4	END PIPE FND RUN RUN CONSISTS OF ### FOOT PIPE SECTIONS	48	PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION		
ł	s	END TELEVISUAL INSPECTION	49	CRACKED PIPE AT JOINT		
L	6	SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP	50	FINEAR CRACK		
L		RUN HAS NUT BEEN CLEANED PRIOR TO INSPECTION	52	BEGIN LINEAR CRACK		
I	9	RUN REDUIRES CLEANING	53	END LINEAR CRACK		37431TIOT # 44M
Ł	10	FLOW CAN BE ATTRIBUTED TO GENERAL JUINT LEAKAGE	54	REGIN MIN THE CRACKS		MANIKULL IMM
L	12	EXTERNAL REPAIR REQUIRED	56	END HULTIPLE CRACKS		
Ł	13	CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE		UPSTREAM MH.
L	14	PIPE DEFLECTION THRU RUN OBSERVED	58	BEGIN CRUSHED PIPE	6	DOWNSTREAM MR.
	12	UNABLE TO CONTINUE DUE TO HER	60	PIECES HISSING (+++ -SIDE)		
	JOINT D	VPORMATION	61	HOLE IN PIPE		
I	CODE		63	CHANGE IN PIPE TRUE TO CHANGE IN PIPE TRUE TO		
Ł	1 CUMP	COMPTUD CONTRACTOR		TO ### FEET		
ł	21	JUINT	64	CHANGE OF DIRECTION NUM		
Ł	22	JUNT - LEAKING JUNT - SUIGHT ROOT PENETRATION	65 66	FLUW APPEARS TO BE EXENTRATING		
1	24	JUINT - HODERATE ROOT PENETRATION	67	BEGIN		
I	25	JOINT - SEVERE ROOT PENETRATION	68			
I	27	JUNT - VERTICALLY MISALIGNED	70	SLIGHT ROOT PENETRATION		NOT TYPE
I	28	JOINT - HORIZONTALLY MISALIGNED	71	HODERATE ROOT PENETRATION		
ł	29	JUINT - BEGIN SAG	15	SEVERE ROOT PENETRATION	<u> </u>	
L	31	JUNI - AIR TEST PASS	APRUM/			P ACP
I	32	JUNT - AIR TEST FAN	PERAIC	P INFORMATION		RCP
	34	JUNT - REPARED, ACCEUNS DE GRUUT JUNT - NUT TESTED UNARIE TU ISDUATE	CODE	COMMENTS	1 :	I CIP OR DIP
L	35	JDINT - INSIGNIFICANT FLOW DBSERVED	80	SERVICE CONN AND DICLOCK DOSITION AVE OD TEC		S ATHER
L	36	JOINT - FLOV APPEARS TO BE EXFILTRATING	81	SERVICE CONN. *** D'CLOCK POSITION CUT-IN.		
l				PROT. WAR -INCHES		
L			87 81	HUUSE NUE SERVICE CONNECTION CRACKED		
I			84	SLIGHT ROOT PENETRATION		
			85	MODERATE ROUT PENETRATION		
I			ช6 ค7	SEVERE RUDI PENETRATION		
I	1		88	INTERMITTENT FLOW, SUMP PUMP CONNECTED. VERIFIED		
I			89	INSIGNIFICANT FLOW OBSERVED		DUTY
1			90 91	SERVICE CONN - AIR TEST PASS		
	1		se	SERVICE CONN AIR TEST FAIL	I :	TV DNLY
ł			93	SERVICE CONN NOT TESTED. NO CLEANOUT ACCESS		2 TV & AIR TEST
	1	*** TYPE DATA IN COMMENTS	95	SERVICE CONN WATER SATURATION TEST PASS	I '	L REPAIR
1	1	· · · · · · · · · · · · · · · · · · ·	-			

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## **TELEVISION INSPECTION LOG**

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 30, 1997 TIME :

## LOCATION: DAM NO. 01508, SOUTH RIVER NO. 23, ROBINSON HOLLOW

## TELEVISING : RIGHT EMBANKMENT DRAIN STATIONING FROM : OUTLET END PIPE : 08", CMP, 121 FT

DUTY : 1 RIG NO. PORTABLE OPERATOR JLP VIDEO TAPE: 12

STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00	1		Corrugated pipe.
0+02			
1+21			Bend in pipe.
+			
+			
+			
+			
+			
+			
++			
+			
+			
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+			
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+			
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+			
+			
SEE BACK FC	R CODES F	OR: MANHOLE TYPE, M	IANIIOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

	TELEVISUAL INSPECTION LOOK UP CODES					
	RUN INFORMATION	MAINL	INE INFORMATION	i BRICK		
	CODE COMMENTS	CODE	COMMENTS	2 PRECAST 3 BLDCK		
	I BEGIN RUN	45	APPARENT CRITICAL POINT OF SAG, === -INCHES OF LIQUID			
	2 BEGIN PIPE	46	CRACKED PIPE AT SERVICE CONNECTION			
	A CALD PUR PUR CONSISTS OF ### FOOT PIPE SECTIONS	48	PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION			
	5 END TELEVISUAL INSPECTION	49	CRACKED PIPE AT JOINT			
	6 SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP	50	INFAR CRACK			
	7 RUN HAS NOT BEEN LEEANED PRIDE TO INSPECTION	52	BEGIN LINEAR CRACK			
	9 RUN REQUIRES CLEANING	53	END LINEAR CRACK			
	10 FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	54		MANHOLE III		
	11 BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JUINT LEAKAGE					
	12 EXTERNAL REPAIR REQUIRED	57	CRUSHED PIPE	1 UPSTREAM MH.		
	14 PIPE DEFLECTION THRU RUN OBSERVED	50	BEGIN CRUSHED PIPE	2 DOWNSTREAM ME		
	15 UNABLE TO CONTINUE DUE TO ###	57	PIECES MISSING (+++ -SIDE)			
Η,	10107 1000111 (TOV	61	HOLE IN PIPE			
	IVIAL INFORMATION	62	CHANGE IN PIPE TYPE FROM TO			
	DODE COMMENTS	63	CHANGE IN PIPE SECTION LENGTH FROM THE FLET			
	21 เป็นไม่ไ	64	CHANGE OF DIRECTION ***			
	22 JUINT - LEAKING	65	INSIGNIFICANT FLOW DBSERVED			
	23 JUNT - SLIGHT ROOT PENETRATION	66 67	FLUW APPEARS TO BE EXFILTRATING			
	24 JOINT - SEVERE ROOT PENETRATION	68	END			
	26 JOINT - WIDE DR DPEN	69	CONTINUES			
	27 JUINT - VERTICALLY MISALIGNED	70	NUDERATE RUDT PENETRATION	PIPE TYPE		
	29 JOINT - BEGIN SAG	72	SEVERE ROOT PENETRATION			
	30. JOINT - END SAG			I VCP		
	31 JUNT - AIR TEST PASS 32 JUNT - AIR TEST FAH	SERVIC	B INFORMATION			
	33 JOINT - REPAIRED, *** GALLONS OF GROUT	OUDE	MANPATY	4 CIP OR DIP		
	34 JOINT - NOT TESTED, UNABLE TO ISOLATE	WINT	WENER D	5 PVC		
	35 JUINT - FLOV APPEARS TO BE EXFLUTING	80	SERVICE CONN. *** O'CLOCK POSITION, WYE OR TEE	6 OTHER		
		61	PRDI waw -INCHES	<u></u>		
		82	HOUSE NO.			
		83	SERVICE CONNECTION CRACKED			
		84	ACTIVITY RULE PENETRATION			
		86	SEVERE ROOT PENETRATION			
		87	INTERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED			
		88 89	INTERNITIENT FLOW, SUMP PUMP CONNECTED, VERIFIED	DUTY		
		90	FLOW IS USAGE	μυιτ		
		91	SERVICE CONN AIR TEST PASS			
		92	SERVICE CONN AIR TEST FAIL	2 IV LAIR TEST		
		94	SERVICE CONN WATER SATURATION TEST PASS	3 TV, AIR TEST		
	ANN TYPE DATA IN COMMENTS	95	SERVICE CONN WATER SATURATION TEST FAIL			

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GANNETT I ING, INC.

## **TELEVISION INSPECTION LOG**

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : SEPTEMBER 30, 1997 TIME :

## LOCATION: DAM NO. 01508, SOUTH RIVER NO. 23, ROBINSON HOLLOW

## TELEVISING : LEFT EMBANKMENT DRAIN STATIONING FROM : OUTLET END PIPE : 08", CMP, 10 FT

DUTY : 1 RIG NO. PORTABLE OPERATOR JLP VIDEO TAPE: 12

STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00	1		Corrugated pipe.
0+02	2		
0+10	29		Sag.
+			
+			Had camera up line 62', but no visibility. Possible bend at 62'.
+			
+			
+			
+			
+			
+			
+			
+			
+			
+			
+			
+			
+			
+	<u> </u>		
+			
+			
+	l		
SEE BACK FO	OR CODES H	OR: MANHOLE TYPE, M	IANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

TELEVISUAL INSPECTION L	OOLUP C	ODES	MANHOLE TYPE
RUN INFORMATION CODE COMMENTS	MAINL CODE	INE INFORMATION COMMENTS	1 BRICK 2 PRECAST 3 BLOCK
I BEGIN RUN BEGIN PIPE BEGIN PIPE CONSISTS OF *** FOOT PIPE SECTIONS END TELEVISUAL INSPECTION SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP RUN HAS NOT BEEN CLEANED PRIOR TO INSPECTION RUN HAS NOT BEEN CLEANED PRIOR TO INSPECTION RUN HAS NOT BEEN CLEANED PRIOR TO INSPECTION RUN HAS BEEN CLEANED PRIOR TO INSPECTION RUN REQUIRES CLEANING FLOV CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE CXTERNAL REPAIR REQUIRED CAN BE INTERNALLY REPAIRED CAN BE INTERNALLY REPAIRED SUMABLE TU CONTINUE DUE TO *** SOINT INFORMATION CODE COMMENTS 21 JOINT 22 JOINT - LEAKING 23 JOINT - SLIGHT ROOT PENETRATION 24 JOINT - MODERATE ROOT PENETRATION 25 JOINT - SEVERE ROOT PENETRATION 26 JOINT - VIDE OR OPEN 27 JOINT - VERTICALLY MISALIGNED	45 46 47 48 49 50 51 52 53 54 55 56 57 59 60 62 64 62 64 62 64 66 67 68 69 70	APPARENT CRITICAL POINT OF SAG. *** -INCHES OF LIQUID DROP CONNECTION AT 6 O'CLOCK CRACKED PIPE AT SERVICE CONNECTION PERIPHERAL LEAK ARDUND CUT-IN SERVICE CONNECTION CRACKED PIPE AT JOINT SHEAR CRACK LINEAR CRACK BEGIN LINEAR CRACK END LINEAR CRACK BEGIN HULTIPLE CRACKS END MULTIPLE CRACKS END MULTIPLE CRACKS END MULTIPLE CRACKS END MULTIPLE CRACKS END CRUSHED PIPE BEGIN CUSHED PIPE PIECES MISSING (*** -SIDE) MOLE IN PIPE CHANGE IN PIPE SECTION LENGTH FROM *** FEET TO *** FEET CHANGE OF DIRECTION *** INSIGNIFICANT FLOW DBSERVED FLOW APPEARS TO BE EXFLITRATING BEGIN END CONTINUES SLIGHT ROOT PENETRATION	A DTHER MANHOLL (H) I UPSTREAM MH. 2 DOWNSTREAM MH.
28 JUINT - HURIZONTALLY MISALIGNED 29 JUINT - HURIZONTALLY MISALIGNED 29 JUINT - BEGIN SAG 30 JUINT - AIR TEST PASS 32 JUINT - AIR TEST PAIL 33 JUINT - AIR TEST FAIL 34 JUINT - NOT TESTED, UNABLE TO ISULATE 35 JUINT - INSIGNIFICANT FLOW OBSERVED 36 JUINT - FLOW APPEARS TO BE EXFILTRATING 37 JUINT - FLOW APPEARS TO BE EXFILTRATING 38 JUINT - FLOW APPEARS TO BE EXFILTRATING	71 72 <b>SERVIC</b> <b>CODE</b> 80 81 82 83 84 85 86 87 88 89 90 91 92 93 95	MODERATE ROOT PENETRATION SEVERE ROOT PENETRATION <b>SEVERE ROOT PENETRATION</b> <b>SERVICE CONN. *** D'CLOCK POSITION. WYE DR TEE SERVICE CONN. *** D'CLOCK POSITION. CUT-IN. PROT. *** -INCHES HOUSE NO. SERVICE CONNECTION CRACKED SLIGHT ROOT PENETRATION MODERATE ROOT PENETRATION SEVERE ROOT PENETRATION NITERMITTENT FLOW. PUMP CONNECTED INTERMITTENT FLOW. SUMP PUMP CONNECTED SERVICE CONN AIR TEST PASS SERVICE CONN AIR TEST FAIL SERVICE CONN WATER SATURATION TEST PASS SERVICE CONN WATER SATURATION TEST PASS SERVICE CONN WATER SATURATION TEST FAIL</b>	$\frac{1}{2} \frac{1}{2} \frac{1}$
*** TYPE DATA IN COMMENTS	93 94 95	SERVICE CONN NOT TESTED, NO CLEANOUT ACCESS SERVICE CONN WATER SATURATION TEST PASS SERVICE CONN WATER SATURATION TEST FAIL	23

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GANNETT MING, INC.

SHEET 1 1

## **TELEVISION INSPECTION LOG**

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : OCTOBER 1, 1997 TIME :

## LOCATION: DAM NO. 01511, SOUTH RIVER NO. 4, LOFTON

TELEVISING : RISER INTERIOR

STATIONING FROM : TOP OF RISER PIPE :

DUTY : 1 RIG NO. 346 OPERATOR JLP VIDEO TAPE: 13

STATION	CODE	VIDEO FOOTAGE	COMMENTS
+			Total depth 18'.
+		133	Downstream wall.
+		134	Left side wall.
+		266	Upstream wall.
+		444	Right side wall.
+			
+			Also, concrete is pitted, all 4 walls.
+			
+			
+			
+			
+			
+			
+			
+			
+			
+			
+			
+			
+			
+			
+			
SEE BACK FO	R CODES F	OR: MANHOLE TYPE, M	IANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

131246\TVLOGS\TVLOG_471

	TELEVISUAL INSPECTION I	LUCKUP (		MANHOLE TYPE
UN IN	FORMATION	MAINIJ	NE INFORMATION	1 BRICK
ODE	COMMENTS	CODE	COMMENTS	2 PRECAST 3 BLOCK
,	BEGIN RUN	45	APPARENT CRITICAL POINT OF SAGINCHES OF LIQUID	
2	BEGIN PIPE	46	DROP CONNECTION AT 6 D'CLOCK	
3	END PIPE	47	CRACKED PIPE AT SERVICE CONNECTION	
4	END RUN RUN CONSISTS OF ### FOOT PIPE SECTIONS	48	COACKEN DIDE AT IDINI	
5	END TELEVISUAL INSPECTION	50	SHEAR CRACK	
5	SAME PHINT AS ENCIUNITRED DIVERTIDOS SETUP	51	LINEAR CRACK	
, a	RUN HAS BEEN CLEANED PRIOR TO INSPECTION	52	BEGIN LINEAR CRACK	
\$	RUN REDUIRES CLEANING	53	END LINEAR CRACK	
	FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	54 55	MULTIPLE CRACKS	MANHOLE HW
	RALANCE UN FLUM CAN BE ATTRIBUTED TO GENERAL SUBAT CENERGE	56	END HULTIPLE CRACKS	
	CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE	1 UPSTREAM M
	PIPE DEFLECTION THRU RUN OBSERVED	58	BEGIN CRUSHED PIPE	2 DOWNSTREAM
	UNABLE TO CONTINUE DUE TO ###	59	END CRUSHED PIPE	L
NA 1	MODILITAN	61	HIRE IN PIPE	
<b>Π</b> Ι Ι	NFURMATION	65	CHANGE IN PIPE TYPE FROM TO	
)I	CONDUCTS	63	CHANGE IN PIPE SECTION LENGTH FROM ### FEET	
	JUNT - I CARING	69 65	UNANUL UF DIRECTUN ### INSTGNIETEANT FLOU ORSERVED	
	JUINT - SLIGHT ROOT PENETRATION	66	FLOW APPEARS TO BE EXFLUTRATING	
	JOINT - MODERATE ROOT PENETRATION	67	BEGIN	
	JOINT - SEVERE ROOT PENETRATION	68	END	
	JUINT - WIVE UR UPEN IDINT - VERTICALLY MISALIGNER	67 70		BUBE WITTER
	JOINT - HORIZONTALLY MISALIGNED	71	MODERATE ROUT PENETRATION	
	JOINT - BEGIN SAG	72	SEVERE ROOT PENETRATION	
•	JOINT - END SAG			1 VCP
, · ·	JUNI - AIR TEST FAU	SERVIC	E INFORMATION	
	JUINT - REPAIRED GALLONS OF GROUT	CODE	018/07	
	JUINT - NOT TESTED, UNABLE TO ISULATE	CODE	WEATRAIS	5 PVC
	JUINE - INSIGNIEICANT ELUM DESERVED IDINE - EEDV ARREARS IN DE EVELTAATINE	80	SERVICE CONN, *** D'CLOCK POSITION, WYE OR TEE	6 DIHER
		81	SERVICE CONN., *** D'CLOCK POSITION, CUT-IN,	L
		82	HAUSE NO	
		63	SERVICE CONNECTION CRACKED	
		84	SLIGHT ROUT PENETRATION	
		85	MUDERATE RUOT PENETRATION	
		อวั		
		88	INTERMITTENT FLOW, SUMP PUMP CONNECTED. VERIFIED	<b></b>
		89	INSIGNIFICANT FLOV OBSERVED	DI/TY
		90	FLOV IS USAGE	
		ול 92	SERVICE CONN - AIR LEST PASS	I TV DNLY
		9 <u>3</u>	SERVICE CONN - NOT TESTED, NO CLEANDUT ACCESS	2 TV & AIR TI
		94	SERVICE CONN WATER SATURATION TEST PASS	3 TV, AIR TES
	THE DATA IN COMPLETE	95		

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GANNET. MING, INC.

SHEET 1 1

## **TELEVISION INSPECTION LOG**

CLIENT :	DIVISIO	N OF DAM SAFE	TY	JOB # : 31246 DATE : OCTOBE	<b>R 1, 1997</b> TIME :
LOCATION	I: DAM N	0. 01511, SOUTH	RIVER NO.	, LOFTON	
TELEVISIN	ig : <u>OUT</u>	FALL CONDUIT		TATIONING FROM : DOWNSTREAM END PIPE : 24",	RCP, 318 FT
DUTY : <u>1</u>	RIG NO. <u>P</u>	ORTABLE OPE	RATOR JLP	VIDEO TAPE: <u>13</u>	
STATION	CODE	VIDEO FOOTAGE	COMMENTS		
0+00	1				
0+02	2				
3+16	3				
3+18	4		16' sections.		
+					
	-				
+					
+					
<del>_</del>					
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+	-				
+	-				
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+				· · · · · · · · · · · · · · · · · · ·	
+					
+					
SEE BACK	FOR CODES	FOR: MANHOLE TYPE, I	IANHOLE 0+00, P	E TYPE, DUTY AND LOOKUP CODES.	

[3]246\7VLOGS\TVLOG_48]

#### TELEVISUAL INSPECTION LOOKUP CODES MANHOLE TYPE **RUN INFORMATION** MAINLINE INFORMATION BRICK PRECAST Т 5 COMMENTS CODE COMMENTS CODE з BLOCK OTHER 4 APPARENT CRITICAL POINT OF SAG. *** -INCHES OF LIQUID 45 BEGIN RUN DROP CONNECTION AT 6 U'CLOCK 46 2 BEGIN PIPE CRACKED PIPE AT SERVICE CONNECTION 47 END PIPE 3 PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION END RUN RUN CONSISTS OF *** FOOT PIPE SECTIONS 48 4 CRACKED PIPE AT JOINT 49 END TELEVISUAL INSPECTION 5 50 SHEAR CRACK SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP 6 RUN HAS NOT BEEN CLEANED PRIDE TO INSPECTION 51 LINEAR CRACK 7 BEGIN LINEAR CRACK 52 RUN HAS BEEN CLEANED PRIDE TO INSPECTION 8 END LINEAR CRACK 53 RUN REDUIRES CLEANING 9 MANHOLE HI MULTIPLE CRACKS FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE 54 10 BEGIN MULTIPLE CRACKS BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE 55 11 56 END MULTIPLE CRACKS EXTERNAL REPAIR REQUIRED 12 UPSTREAM MH. 57 CRUSHED PIPE 1 CAN BE INTERNALLY REPAIRED 13 DOWNSTREAM MH. BEGIN CRUSHED PIPE 58 PIPE DEFLECTION THRU RUN OBSERVED 2 14 59 END CRUSHED PIPE UNABLE TO CONTINUE DUE TO *** 15 PIECES MISSING (*** -SIDE) 60 61 HOLE IN PIPE JOINT INFORMATION 62 CHANGE IN PIPE TYPE FROM TO 63 CHANGE IN PIPE SECTION LENGTH FROM ### FEET CODE COMMENTS TO ### FEET 64 CHANGE OF DIRECTION ### 51 THIDL INSIGNIFICANT FLOW DESERVED 65 22 JUINT - LEAKING JUINT - SLIGHT ROOT PENETRATION 66 FLOW APPEARS TO BE EXFILTRATING 23 67 BEGIN JOINT - MODERATE ROOT PENETRATION 24 JOINT - SEVERE ROOT PENETRATION 60 END 25 69 CONTINUES 26 JOINT - WIDE DR DPEN 70 SLIGHT ROOT PENETRATION HPE TYPE JOINT - VERTICALLY MISALIGNED 27 MODERATE ROOT PENETRATION 28 JOINT - HORIZONTALLY MISALIGNED 71 JOINT - BEGIN SAG 72 SEVERE RUDT PENETRATION 29 30 JOINT - END SAG VCP 31 JUINT - AIR TEST PASS 5 ACP SERVICE INFORMATION JUINT - AIR TEST FAIL. RCP 35 з 33 JUINT - REPAIRED, .... GALLONS OF GROUT 4 CIP OR DIP CODE COMMENTS JOINT - NOT TESTED, UNABLE TO ISULATE 34 5 PVC JOINT - INSIGNIFICANT FLOW OBSERVED 35 6 DTHER 80 SERVICE CONN, *** O'CLOCK POSITION, WYE OR TEE JUINT - FLOW APPEARS TO BE EXFILTRATING 36 8 SERVICE CONN. ... D'CLOCK POSITION CUT-IN. PROT. WHR -INCHES HOUSE ND. 85 83 SERVICE CONNECTION CRACKED 84 SLIGHT ROOT PENETRATION 85 MODERATE ROOT PENETRATION SEVERE ROOT PENETRATION 86 07 INTERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED 88 INTERMITTENT FLOW, SUMP PUMP CONNECTED, VERIFIED INSIGNIFICANT FLOW OBSERVED 89 DUTY 96 FLOW IS USAGE 91 SERVICE CONN. - AIR TEST PASS 92 SERVICE CONN. - AIR TEST FAIL TV DNLY 1 93 SERVICE CONN. - NOT TESTED, NO CLEANOUT ACCESS TV & AIR TEST 2 SERVICE CONN. - WATER SATURATION TEST PASS 3 TV. AIR TEST 94 L REPAIR 95 **### TYPE DATA IN COMMENTS** SERVICE CONN. - WATER SATURATION TEST FAIL TV & REPAIR

GANNETT F NG, INC.

SHEET 1 OI

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## **TELEVISION INSPECTION LOG**

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : OCTOBER 2, 1997 TIME :

LOCATION: DAM NO. 01512, SOUTH RIVER NO. 11, CANADA RUN

TELEVISING : RISER INTERIOR

STATIONING FROM : TOP OF RISER PIPE :____

DUTY : 1 RIG NO. 346 OPERATOR JLP VIDEO TAPE: 14

STATION	CODE	VIDEO FOOTAGE	COMMENTS
+			Total depth 9'.
+		119	Downstream wall.
+		120	Left side wall.
+		237	Upstream wall.
+		502	Right side wall.
+		754	
+			
+			
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+		<u> </u>	
SEE BACK FO	OR CODES F	OR: MANHOLE TYPE, N	IANHOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

	TELEVISUAL INSPECTION L	OOKUP ()	ODES
RUN IN	FORMATION	MAINL	INE INFORMATION
CODE	COMMENTS	CODE	COMMENTS
<b>XDI</b> 1 2 3 4 5 6 7 8 9 10 11 13 14 15 <b>OINT I</b> <b>XDI</b> 22 23 23 23 23 23 23 23 23 23	COMMENTS BEGIN RUN BEGIN PIPE END RUN RUN CONSISTS OF *** FOOT PIPE SECTIONS END RUN RUN CONSISTS OF *** FOOT PIPE SECTIONS END RUN RUN CONSISTS OF *** FOOT PIPE SECTIONS END RUN RUN CONSISTS OF *** FOOT PIPE SECTIONS RUN HAS NOT HEEN CLEANED PRIOR TO INSPECTION RUN HAS BEEN CLEANED PRIOR TO INSPECTION RUN HAS BEEN CLEANED PRIOR TO INSPECTION RUN RECUIRES CLEANING FLOV CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE BALANCE OF FLOV CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE EXTERNAL REPAIRED PIPE DEFLECTION THRU RUN OBSERVED WINBLE TO CONTINUE DUE TO *** <b>TOPOLYNATION</b> JOINT SLIGHT ROOT PENETRATION JOINT SLIGHT ROOT PENETRATION JOINT MODERATE ROOT PENETRATION JOINT MOT SEVER DOT PENETRATION JOINT MODERATE ROOT PENETRATION JOINT MODE	CODE 45 46 47 48 49 50 51 52 53 54 55 57 58 56 57 58 56 67 68 69 70 71 72 SERVIC CODE 80 81 82 83 84 85 86 87 88 80 81 82 83 84 85 85 85 85 85 85 85 85 85 85	COMMENTS APPARENT CRITICAL PDINT OF SAG. *** -INCHES OF LIDUID DROP CONNECTION AT 6 D'CLOCK CRACKED PIPE AT SERVICE CONNECTION PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION CRACKED PIPE AT JOINT SHEAR CRACK LINEAR CRACK BEGIN LINEAR CRACK END LINEAR CRACK END LINEAR CRACK END LINEAR CRACK END LINEAR CRACK END UNITPLE CRACKS END MULTIPLE CRACKS END MULTIPLE CRACKS CRUSHED PIPE BEGIN CRUSHED PIPE BEGIN CRUSHED PIPE PIECES HISSING (*** -SIDE) HOLE IN PIPE SECTION LENGTH FROM *** FEET TO *** FEET CHANGE IN PIPE SECTION *** INSIGNIFICANT FLOW OBSERVED FLOW APPEARS TO BE EXFLITRATING BEGIN END CONTINUES SLICHT RODI PENETRATION MODERATE RODI PENETRATION SEVERE RODI PENETRATION SERVICE CONN, *** O'CLOCK POSITION, VYE OR TEE SERVICE CONN, *** O'CLOCK POSITION UT IN SERVICE CONN, *** O'CLOCK POSITION UT IN SERVICE CONNECTION CRACKED SLICHT RODI PENETRATION SERVICE CONNECTION CRACKED SLICHT RODI PENETRATION MODERATE ROOT PENETRATION SERVICE CONNECTION CRACKED SLICHT ROOT PENETRATION MODERATE ROOT PENETRATION SERVICE CONNECTION CRACKED SLICHT ROOT PENETRATION MODERATE ROOT PENETRATION MODERATE ROOT PENETRATION SERVICE CONNECTION CRACKED SLICHT ROOT PENETRATION MODERATE ROOT PENETRATION MODERATE ROOT PENETRATION SERVICE CONNECTION CRACKED SLICHT ROOT PENETRATION MODERATE ROOT PENETRATION NITERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED NITERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED
	ANN TYPE DATA IN COMMENTS	88 89 90 91 92 93 93 94 95	INTERMITTENT FLOW, SUMP PUMP CONNECTED, VERIFIED INSIGNIFICANT FLOW OBSERVED FLOW IS USAGE SERVICE CONN AIR TEST PASS SERVICE CONN AIR TEST FAIL SERVICE CONN NOT TESTED, NO CLEANOUT ACCESS SERVICE CONN WATER SATURATION TEST PASS SERVICE CONN WATER SATURATION TEST FAIL

£

I BRICK	
2 PRECAST 3 BLOCK 4 OTHER	
MANHOLE III	7
I UPSTREAM MH.	-
NDE TYPE	-1
HPE TTPE	
HPL TTPL VCP 2 ACP 3 RCP 4 CIP DIP	

- 2 TV & AIR TEST 3 TV, AIR TEST & REPAIR 4 TV & REPAIR

GANNETT 4ING, INC.

SHEET 1

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## **TELEVISION INSPECTION LOG**

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : OCTOBER 2, 1997 TIME : ____

LOCATION: DAM NO. 01512, SOUTH RIVER NO. 11, CANADA RUN

TELEVISING : OUTFALL CONDUIT ______ STATIONING FROM : DOWNSTREAM END PIPE : 24", RCP, 181 FT

DUTY : 1 RIG NO. 346 OPERATOR JLP VIDEO TAPE: 14

STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00	1	964	
0+02	2	978	
1+79	3	1703	
1+81	4	1721	16' sections.
+			
+			
+			
+			
+			
+			
+			
+			
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+		·	
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+			
+			
SEE BACK FO	R CODES F	OR: MANHOLE TYPE, N	IANIIOLE 0 + 00, PIPE TYPE, DUTY AND LOOKUP CODES.

[31246/TVLOGS/TVLOG_50]

TELEVISUAL INSPECTION I	LOOKUP CO	DBS	MANHOLE TYPE
IN INFORMATION	MAINLE	NE INFORMATION	1 BRICK
DE COMMENTS	CODE	COMMENTS	2 PRECAST 3 BLOCK
BEGIN RUN	45	APPARENT CRITICAL POINT OF SAG, ### -INCHES OF LIQUID	4 OTHER
BEGIN PIPE	46	DROP CONNECTION AT 6 D'CLOCK	
END PIPE	4/ 48	PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION	
END RUN, RUN CUNSISTS UP ANA FUUT MIME SECTIONS	49	CRACKED PIPE AT JOINT	
SAME POINT AS ENCOUNTERED ON PREVIOUS SETUP	50	SHEAR CRACK	
RUN HAS NOT BEEN CLEANED PRIDE TO INSPECTION	52	BEGIN LINEAR CRACK	
RUN HAS BEEN LLEANED FRIDK ID INSFECTION RUN HAS BEEN LLEANED FRIDK ID INSFECTION	53	END LINEAR CRACK	
FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	54	MULTIPLE CRACKS	MANHOLE H
BALANCE OF FLOW CAN BE ATTRIBUTED TO GENERAL JOINT LEAKAGE	55 56	BEGIN MULTIFLE CRACKS	
EXTERNAL REMAIN REMUNED	57	CRUSHED PIPE	1 UPSTREAM MH.
PIPE DEFLECTION THRU RUN OBSERVED	58	BEGIN CRUSHED PIPE	2 DOWNSTREAM MH.
UNABLE TO CONTINUE DUE TO ###	57 60	PIECES MISSING (*** -SIDE)	L
	61	HOLE IN PIPE	
	62	CHANGE IN PIPE TYPE FROM TO	
COMMENTS	63	CHANGE IN PIPE SECTION LENGTH FROM BEB FEET	
	64	CHANGE OF DIRECTION ###	
JOINT - LEAKING	65	INSIGNIFICANT FLOW OBSERVED	
JOINT - SLIGHT ROOT PENETRATION	66 67	RECIN BECIN	
JUINT - MUDERATE RUUT PENETRATIUN IDINT - SEVERE ROOT PENETRATION	68	END	
JOINT - WIDE OR OPEN	69	CONTINUES	
JOINT - VERTICALLY MISALIGNED	70 71		PIPE TYPE
JUINT - MURIZUNTALLT MISALIUNED JDINT - BEGIN SAG	72	SEVERE ROOT PENETRATION	
JOINT - END SAG			
JOINT - AIR TEST FAIL	SERVIC	E INFORMATION	3 RCP
JDINT - REPAIRED, AND GALLONS OF GROUT	MUDE	COMMENTS	4 CIP DR DIP
JUNT - NOT TESTED, UNABLE TO ISQUATE			
JOINT - FLOW APPEARS TO BE EXFLITRATING	80 81	SERVICE CONN. ### U'LLOCK PUSITION, WYE OR ILL SERVICE CONN. ### D'CLOCK POSITION CUT-IN	
	~1	PRDT. THE -INCHES	
	82		-
	05 84	SLIGHT RODT PENFIRATION	
	85	NODERATE ROOT PENETRATION	
	86	SEVERE ROOT PENETRATION	
	87	INTERMITTENT FLOW, POSSIBLE SUMP PUMP CONNECTED	
	89	INSIGNIFICANT FLOW OBSERVED	DITT
	90	FLOW IS USAGE	<b>NULL</b>
	91	SERVICE CONN AIR TEST PASS	
	93	SERVICE CONN AIR LEST FAIL SERVICE CONN NOT TESTED, NO CLEANDUT ACCESS	2 TV & AIR TEST
	94	SERVICE CONN WATER SATURATION TEST PASS	3 TV, AIR TEST
ANN TYPE DATA IN COMMENTS	95	SERVICE CONN WATER SATURATION TEST FAIL	1 & REPAIR
			A TV & OFDAID

- 88 89
- 90 91 92 93 93 94 95

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4 TV & REPAIR

GANNETT (ING, INC.

SHEET I C

## **TELEVISION INSPECTION LOG**

CLIENT : DIVISION OF DAM SAFETY

JOB # : 31246 DATE : OCTOBER 2, 1997 TIME :

LOCATION: DAM NO. 01512, SOUTH RIVER NO. 11, CANADA RUN

## TELEVISING : LEFT EMBANKMENT DRAIN STATIONING FROM : OUTLET END PIPE : 08", CMP, 63 FT

DUTY : 1 RIG NO. 346 OPERATOR JLP VIDEO TAPE: 14

STATION	CODE	VIDEO FOOTAGE	COMMENTS
0+00	1		Corrugated pipe.
0+02	2		
0+62			Service connection from both sides 3 o'clock and 9 o'clock pipe plugged off.
0+63			
+			Also, sand in bottom of pipe throughout entire run.
+			
+			
+		·	
+			
-+	<b> </b>		
+			
+ 			
+			
+			
+			
+			
+	<b> </b>		
+			
<b>↓</b> +			
+			
+	-		
+		<u> </u>	
SEE BACK FO	OR CODES I	OR: MANHOLE TYPE, N	ANNOLE 0+00, PIPE TYPE, DUTY AND LOOKUP CODES.

[31246\TVLOGS\TVLOG_51]

	TELEVISUAL INSPECTION 1	LOOKUP CO	DRS	MANHOLE T
RUN IN	PORMATION	MAINLI	NE INFORMATION	+ BRICK
CODE	COMMENTS	CODE	COMMENTS	2 PRECAST 3 BLOCK
1	BEGIN RUN	45	APPARENT CRITICAL PUINT OF SAG, *** -INCHES OF LIQUID	
5	BEGIN PIPE	46	DRUP CONNECTION AT 6 O'CLUCK	
3	END PIPE	48	PERIPHERAL LEAK AROUND CUT-IN SERVICE CONNECTION	
	CND RUN, RUN LUNSISTS OF ANA COULT INC SECTIONS	49	CRACKED PIPE AT JOINT	•
	CANC PRINT AS ENCOUNTERED ON PREVIDUS SETUP	50	SHEAR CRACK	
5	RIN HAS NOT HEEN CLEANED PRIUR TO INSPECTION	51	LINEAR CRACK	
8	RUN HAS HEEN CLEANED PRIDE TO INSPECTION	55	BEGIN LINEAR CRACK	
9	RUN REQUIRES CLEANING	5J 54		
10	FLOW CAN BE ATTRIBUTED TO GENERAL JUINT LEAKAGE	55	BEGIN HULTIPLE CRACKS	BUTTION AL
	BALANLE DE FELINE CAN DE ATTRIBUTED TO GENERAL SOUTH CENTROL	56	END MULTIPLE CRACKS	
13	CAN BE INTERNALLY REPAIRED	57	CRUSHED PIPE	1 UPSTREAM
14	PIPE DEFLECTION THRU RUN OBSERVED	50	BEGIN CRUSHED PIPE	S DUANSTRE
15	UNABLE TU CONTINUE DUE TO ###	57 60	END CRUSHED FIFC	
		61	HOLE IN PIPE	
JUINT I	INFURMATION	62	CHANGE IN PIPE TYPE FROM TO	
mn	CUT THE STATE OF STAT	63	CHANGE IN PIPE SECTION LENGTH FROM WAW FEET	
1 WDP	WMMD(1)			
21	JOINT	64	INCIGNICITY DIRECTION ***	
55	JOINT - LEAKING	66	FILLY APPEARS TO BE EXFLUTRATING	
24	ININT - SCIURI RUUT PENETRATION	67	BEGIN	
25	JOINT - SEVERL ROOT PENETRATION	60	END	
26	JOINT - WIDE OR OPEN	69		
27	JUINT - VERTICALLY MISALIGNED	70	SETURE RULE PENETRATION	PUPL IIPL
28	JUINT - HEGIN SAG	72	SEVERE RUDI PENETRATION	
30	JUINT - END SAG	••		I VCP
31	JUNI - AIR TEST PASS	CPRVICE	INFORMATION	2 ACP
35	JOINT - AIR TEST FAIL	OPHAICS	INTORNATION .	3 RCP
33	JUNT - REPAIRED, ADD GALLONS DE GROUT	CODE	COMMENTS	
1 34	JUNI - NUL IESTED, UNABLE IN ISULAIL			
36	JUINT - FLUV APPEARS TO BE EXFLUTRATING	80	SERVICE CONN. *** D'ELUCK PUSITION, WILL DE TE	<u> </u>
1		01	PRUL MAN -INCIDES	
1		95	HUUSE NO.	
1		03	SERVICE CONNECTION CRACKED	
		84	SLIGHT ROUT PENETRATION	
		85	PURCHARL ROUT PENETRATION	
		87	INTERMITTENT FLOW, PUSSIBLE SUMP PUMP CONNECTED	
		88	INTERMITTENT FLOW, SUMP PUMP CUNNECTED, VERIFIED	
. <b> </b>		89	INSIGNIFICANT FLOW DBSERVED	I DUTY
		90	FLOW IS USAGE	
		91	SERVICE CONN. + AIR TEST PASS	I TV DNLY
		75	SERVICE CONN - AIR TEST FAIL SERVICE CONN - NOT TESTED OF CANDIT ACCESS	2 TV & AIR
		94	SERVICE CONN WATER SATURATION TEST PASS	3 TV, AIR T
	WWW TYPE DATA IN COMMENTS	95	SERVICE CONN WATER SATURATION TEST FAIL	& REPAIR
				Į 4 IV 6 REP

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	HANHOLE TYPE	
1 2 3 4	BRICK PRECAST BLOCK OTHER	
•	ANTHOLE (+)	]
•		
5	UPSTREAM MH. DOWNSTREAM MH.	
	UPSTREAM MH. DOWNSTREAM MH. IPE TTPE	

- 1231 1231
- PAIR

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