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March 5, 2013

2002-967-13

Ms. Chia-Rin Yen
California Department of Toxic Substances Control
9211 Oakdale Avenue
Chatsworth, CA 91311

RE: Storm Sewer Inspection Report
Exide Technologies
Vernon, California

Dear Chia-Rin:

Enclosed please find one (1) original and one (1) hard copy of the Storm Sewer Inspection Report for the North, South and West Yards at the Exide Technologies facility in Vernon, California. An electronic copy of the document will be provided via email. Also enclosed is one copy of the inspection videos.

Please contact Paul Stratman at (610) 840-9122 or Jen DiJoseph at (610) 840-9189 with any questions.

Sincerely,

ADVANCED GEOSERVICES

//Original signed by//

Jennifer W. DiJoseph
Senior Project Professional

//Original signed by//

Paul G. Stratman, P.E.
Senior Project Consultant

REGISTERED PROFESSIONAL ENGINEER
PAUL GERARD STRATMAN
NO. C61595
EXP. 6/30/2014
CIVIL
STATE OF CALIFORNIA

JWD:PGS:vm

Enclosures

cc: Ed Mopas, 2 copies
Fred Ganster, electronic copy

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STORM SEWER INSPECTION REPORT

NORTH, SOUTH AND WEST YARDS

EXIDE TECHNOLOGIES
VERNON, CALIFORNIA

***Prepared for*:**

EXIDE TECHNOLOGIES
Vernon, California

***Prepared by*:**

ADVANCED GEOSERVICES
West Chester, Pennsylvania

Project No. 2002-967-13
March 5, 2013

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1.0 INTRODUCTION

Storm water runoff at the Exide Technologies facility in Vernon California is managed in a series of structures (manholes and inlets) and piping before entering the Drop-Out System at RCRA Interim Status Unit 46 (Pump Sump). Under the RCRA permitting process, the pipes and structures are considered ancillary components of Unit 46. As a condition of the RCRA permit, Exide will be required to upgrade the existing storm water drainage system (pipes and structures) to provide dual containment because the sediment that accumulates within the storm water collection system can contain hazardous concentrations of lead and other inorganic constituents.

Exide has conducted video inspections of the existing pipes at the request of the DTSC with the intent of characterizing the existing condition of the piping system and prioritizing system upgrades to be completed as conditions of the RCRA permit. This report summarizes the video inspections conducted of the storm water piping system in the West, North and South Yards. Video inspections were conducted by Ancon Marine of Signal Hill, California.

Inspections in the West Yard piping system, summarized herein were completed on August 2, 2012. Inspections in the North and South Yard piping systems, summarized herein were completed on December 6, 2012. A written summary of each pipe section was prepared by Advanced GeoServices for the purpose of providing a quick reference for each pipe run and identifying notable conditions. A summary is provided for each yard, as provided in Sections 2.0, 3.0 and 4.0. Recommendations for system upgrades are provided in Section 5.0.

2.0 WEST YARD INSPECTION

2.1 GENERAL

The West Yard storm drainage system contains five (5) circular structures and approximately 526 lineal feet (LF) of pipe. Four (4) of the structures are 4-ft diameter precast concrete with circular grates, and the fifth (identified on the attached figure as "H" or "EX-5") is a 5-ft diameter precast concrete structure and is equipped with a pump to transfer storm water from the West Yard to the South Yard. Pipes range in size from 10 to 15 inches in diameter. See attached Figure 1 for the general layout of the West Yard storm drainage system.

All of the pipes observed in the video of the West Yard are corrugated and reported by the video technician completing the survey to be ABS (acrylonitrile butadiene styrene), a thermoplastic resin compound. The original GNB storm sewer design drawings specify the piping as "heavy duty polyethylene", also a thermoplastic resin. The video shows that the pipes have been slip lined. The pipes contained a significant amount of sediment and required extensive cleaning using high pressure water before video inspection could be completed.

Inspection results for the West Yard storm water piping are summarized below. The location and identification names for West Yard storm water piping are provided on Figure 1. The video technician utilized his own alpha-numeric system (such as EX5 or SD1) to identify the structures. We have included the structure identifications used on the video and the alphabetical designations utilized on the original GNB storm sewer design drawings. At one location, the video technican utilized two different alpha-numeric designation (SD2 and EX2) to identify the same structure.

2.2 PIPE SECTION VIDEO SD1 – SD2 (PIPE RUN 4)

Upstream structure: SD1 (Same as facility designation "Inlet F")

Downstream structure: SD2 (also designated on videos as EX-2 (Same as facility designation "Inlet G"))

Video date: August 2, 2012

Size: 12"

Material: ABS pipe (per video)

Direction of Video: Upstream to Downstream

Length of pipe: 226.1' approx.

Observations:

- Pipe has been slipped lined (appears to be fiberglass cured in-place).
- Scaling or fraying of slip lining is noted along crown of the pipe from 63'to 137', 142' to 175', 185' to 195' and 200' to 206'.
- There is standing water from structure SD1 (Inlet F) to structure SD2 (Inlet G); water level is about 3" at 183' (with sludge).
- Pipe bends to the left at 137' and 187' and to the right at 100' and 183'.

2.3 PIPE SECTION VIDEO EX-2 – EX-5 (PIPE RUN 3)

Upstream structure: EX-2 (also designated on videos as SD2 (Same as facility designation "Inlet G"))

Downstream structure: EX-5 (Same as facility designation "Inlet H")

Video date: August 2, 2012

Size: 15"

Material: ABS pipe (per video)

Direction of Video: Upstream to Downstream

Length of pipe: Not confirmed (survey abandoned at 71.8), approx. 110' per Figure 1.

Observations:

- Pipe has been slipped lined (appears to be fiberglass cured in-place).
- Water in pipe over camera at approximately 20 feet.
- Light color on pipe wall possible split or crack in slip lining at 20 ft.
- Standing water at 44', 55.8', and 67.2'; water level is about 4" at 71.5'.
- Survey abandoned at 71.8' due to sharp alignment change upward (negative slope).

2.4 PIPE SECTION VIDEO EX-5 – EX-3 (PIPE RUN 1)

Upstream structure: EX-3 (also identified as Inlet K)
Downstream structure: EX-5 (also identified as Inlet H)
Video date: August 2, 2012
Size: 12" (per video) (10" on Figure 1)
Material: ABS pipe (per video)
Direction of Video: Downstream to Upstream
Length of pipe: 73.9' approx.
Observations:

- Pipe has been slipped lined (appears to be fiberglass cured in-place).
- Pipe has minor sag from 35' to 40' (shallow standing water).
- There is debris at 45' (small pile), and from 52' to 72' approx. 4" high.

2.5 PIPE SECTION VIDEO EX-4 – EX-5 (PIPE RUN 2)

Upstream structure: EX-4 (also identified as Inlet J) (video incorrectly notes this as the downstream structure)
Downstream structure: EX-5 (also identified as Inlet H) (video incorrectly notes this as the upstream structure)

Video date: August 2, 2012

Size: 10”

Material: ABS pipe (per video)

Direction of Video: Upstream (EX-4) to Downstream (EX-5)

Length of pipe: 115.9’ approx.

Observations:

- Pipe has been slipped lined (appears to be fiberglass cured in-place).
- Pipe appears to sag at 4’, from 9’ to 16’, 54’ to 56’, 74’ to 76’ and 95’ to 97’ (shallow standing water).
- Slip lining across top of pipe in several locations appear to be scaled or frayed.
- Video ends in EX-5. Inflow from EX-3 visible on opposite side of structure. No obvious outlet pipe on east side (right) side of structure.
- EX-5 equipped with pump to transfer stormwater from West Yard to South Yard.

2.6 PIPE SECTION MANHOLE H TO EX-46

The Manhole H to EX-46 pipe section was not video surveyed. Presence of pipe across drainage channel not confirmed.

3.0 NORTH YARD INSPECTION

3.1 GENERAL

The North Yard storm drainage system contains five independent runs of stormwater piping:

- From CL-15 located near South Indiana St, north to CL-14, west to MH-2, and south to MH-6, with four tributary pipe runs. Piping from MH-6 then continues south to the South Yard.
- From an unnamed manhole north to an unnamed manhole south of MH-1, located in the northeast corner of the Baghouse Building.
- From CL-1 north to the pipe termination, located in the northwest corner of the Baghouse Building.
- From an unnamed catch basin to an unnamed catch basin in the southeast corner of the Baghouse Building.
- From an unnamed manhole to an unnamed manhole, located southwest of the RMPS and Reverb Feed Room Buildings.
- From unnamed manhole to an unnamed manhole, located west of the Feed Room Corridor Building.

These pipe runs include twenty-four (24) circular or square structures and approximately 2,175 lineal feet (LF) of pipe. Pipe sizes range from 18 to 36 inches in diameter. See attached Figure 1 for the general layout of the North Yard storm drainage system. North Yard pipe materials include polyvinyl chloride, corrugated metal, and ASB cement. The video shows that pipes have been slip lined. The pipes contained a significant amount of sediment and required extensive cleaning using high pressure water before video inspection could be completed.

Inspection results for this section of North Yard storm water piping are summarized below. The location and identification names for North Yard storm water piping are provided on Figure 1. The video technician utilized his own alpha-numeric system (such as EX-5 or SD1) to identify the structures. We have included the structure identifications used on the video and the alphabetical designations utilized on the original GNB storm sewer design drawings.

3.2 CL-15 to MH-6

The CL-15 to MH-6 pipe run, including its three tributary runs, includes approximately 1,879 lineal feet of pipe and 14 circular or square structures. Pipe sizes range from 18 inch to 36 inches.

Structures CL-15 (EX-11), CL-6 (EX-12), CL-5 (EX-13), and CL-14 (EX-14) are 24 inch by 24 inch pre-cast concrete catch basins. EX-18 and EX-17 are 4-ft diameter concrete catch basins covered by steel plates with holes. MH-1 (EX-15, N MH), MH-2 (NW MH), CL-2 (EX-16), CL-16 (Truck Scales), MH-7 (EX-7, SW MH), and MH-6 are 4-ft diameter concrete catch basins. CL-8 and an unnamed catch basin are now located within the Baghouse Building and are no longer used for stormwater management.

3.2.1 Pipe Section Video EX-11 to EX-12 (Pipe Run 17)

Upstream structure: EX-11 (Same as facility designation “CL-15”)
Downstream structure: EX-12 (Same as facility designation “CL-6”)
Video date: August 9, 2012
Size: 24”
Material: Polyvinyl Chloride pipe (per video)
Direction of Video: Upstream to Downstream
Length of pipe: 133.9 ft approx.

Observations:

- Pipe appears to be corrugated metal and has been slip lined (appears to be fiberglass cured in-place).
- Scaling or fraying of slip lining is noted along the crown of the pipe from EX-11 to EX-12.
- There is standing water from structure EX-11 (CL-15) to EX-12 (CL-6), approximately 6 inches deep.

3.2.2 Pipe Section Video EX-12 – EX-13 (Pipe Run 16)

Upstream structure: EX-12 (Same as facility designation "CL-6")
Downstream structure: EX-13 (Same as facility designation "CL-5")
Video date: August 9, 2012
Size: 24"
Material: Polyvinyl Chloride pipe (per video)
Direction of Video: Upstream to Downstream
Length of pipe: 139.2 ft approx
Observations:

- Pipe appears to be corrugated metal and has been slip lined (appears to be fiberglass cured in-place).
- There is standing water from structure EX-12 (CL-6) to EX-13 (CL-5), approximately 10 inches deep.
- The slip lining at the top of the pipe appears to have scaled from 49 ft to 72 ft and 77 ft to 112 ft.

3.2.3 Pipe Section Video EX-13 – EX-14 (Pipe Run 15)

Upstream structure: EX-13 (also identified as CL-5)
Downstream structure: EX-14 (also identified as CL-14)
Video date: August 9, 2012
Size: 24”
Material: Polyvinyl Chloride pipe (per video)
Direction of Video: Upstream to Downstream
Length of pipe: Abandoned survey at approximately 107.7’ as video unit could not proceed further.
Observations:

- Pipe appears to be corrugated metal and has been slip lined (appears to be fiberglass cured in-place).
- There is standing water/sludge from structure EX-13 (CL-5) to EX-14 (CL-14), about 10” high.
- Structure EX-14 (CL-14) has a 4” hose from the surface discharging into EX-14.

3.2.4 Pipe Section EX-14 – EX-15 (Pipe Run 14)

Pipe section EX-14 (CL-14) to EX-15 (CL-15) could not be video surveyed due to obstructions within the pipe.

3.2.5 Pipe Section Video EX-16 – EX-15 (Pipe Run 18)

Upstream structure: EX-16 (also identified as CL-2)
Downstream structure: EX-15 (also identified as MH-1)
Video date: August 24, 2012
Size: 15” (per video). 24” (per drawing)

Material: Corrugated metal pipe (per video). Lined corrugated metal pipe with slot drain (per drawing).
Direction of Video: Downstream to Upstream
Length of pipe: 120' approx.
Observations:

- Varying amounts of gravel in bottom and sidewalls of pipe, 0 to 71 feet.
- Top of pipe is damaged from 13 to 16 feet.
- Standing water from 13 feet to 35 feet, 59 to 67 feet, and 69 to 85 feet.
- Solid material in bottom and sidewall of pipe, 105 feet to end of pipe.
- Survey abandoned at 108 feet.

3.2.6 Pipe Section Video EX-17 – EX-16 (Pipe Run 19)

Upstream structure: EX-17
Downstream structure: EX-16 (also identified as CL-2)
Video date: August 9, 2012
Size: 15"
Material: Polyvinyl chloride (per video)
Direction of Video: EX-16 to EX-17
Length of pipe: Survey abandoned at 15.4 ft due to solid material in bottom of pipe.
Observations:

- Pipe appears to be corrugated metal and has been slip lined (appears to be fiberglass cured in-place).
- The video identifies EX-17 as the downstream structure; however, site drawings indicate EX-17 is the upstream structure.
- From structure EX-16 to 15.4', there is a solid material with a smooth surface, possibly concrete, in the bottom of the pipe.

Upstream structure: EX-17

Downstream structure: EX-16 (also identified as CL-2)

Video date: August 9, 2012

Size: 15”

Material: Polyvinyl chloride (per video)

Direction of Video: EX-17 to EX-16

Length of pipe: Survey abandoned at 20.3 ft due to solid material in bottom of pipe.

Observations:

- Pipe appears to be corrugated metal and has been slip lined (appears to be fiberglass cured in-place).
- The possible concrete in the bottom of the pipe noted in the EX-16 to EX-17 video ends 20 feet from EX-17. The concrete is approximately 7 inches deep.
- From structure EX-17 to 10’, there is sludge in the bottom of the pipe.

3.2.7 Pipe Section Video EX-18 – EX-17 (Pipe Run 20)

This video was incorrectly labeled EX-16-EX-18. The video should be labeled EX-18 to EX-17.

Upstream structure: EX-18

Downstream structure: EX-17

Video date: August 9, 2012

Size: 15” (per video). 18” (per drawing)

Material: Polyvinyl chloride pipe (per video). Lined corrugated metal pipe with slot drain (per drawing).

Direction of Video: Downstream (EX-17) to Upstream (EX-18)

Length of pipe: 47’ approx.

Observations:

- Solid material, possibly concrete at bottom of EX-17.

- Standing water in bottom of pipe.
- Survey abandoned due to drop off of solid material to water.

This video was incorrectly labeled EX-18-EX-16. The video should be labeled EX-18 to EX-17.

Upstream structure: EX-18
Downstream structure: EX17
Video date: August 9, 2012
Size: 15" (per video). 18" (per drawing)
Material: Polyvinyl chloride pipe (per video). Lined corrugated metal pipe with slot drain (per drawing).
Direction of Video: Upstream (EX-18) to Downstream (EX-17)
Length of pipe: 47' approx.
Observations:

- Standing water from 19 ft to 47 ft.
- Solid material, possibly concrete, in bottom ½ of pipe at 47 ft. Survey abandoned.

3.2.8 Pipe Section South Of EX-16

Video surveying was not conducted for the pipe connecting in the south side of CL-2 (EX-16). This pipe is disconnected at the Baghouse Building wall.

3.2.9 Pipe Section Video N MH (Same as EX-15/MH-1) – NW MH (Pipe Run 13)

This video file was corrupted and could not be viewed.

3.2.10 Pipe Section Video NW MH – SW MH (Same as EX-7/MH-7) (Pipe Run 12)

Upstream structure: NW MH (also indicated as MH-2 on drawing)
Downstream structure: SW MH (also indicated as MH-7 on drawing)
Video date: November 15, 2012
Size: 36" (per video). 33" (per drawing).
Material: ASB Cement pipe (per drawing)
Direction of Video: Downstream (MH-7) to Upstream (MH-2)
Length of pipe: 225' approx.
Observations:

- Water entering pipe at 0 ft.
- Sludge and solid material in bottom, sides and nearly full diameter of pipe visible from MH-7.
- Standing water in bottom of pipe beginning at MH-7.
- Video abandoned at MH-7.

Upstream structure: NW MH (also indicated as MH-2 on drawing)
Downstream structure: SW MH (also indicated as MH-7 on drawing)
Video date: November 15, 2012
Size: 36" (per video). 33" (per drawing).
Material: ASB Cement pipe (per drawing)
Direction of Video: Upstream (MH-2) to Downstream (MH-7)
Length of pipe: 225' approx.
Observations:

- Sludge in bottom and sidewalls visible from MH-2.
- Standing water visible from MH-2.
- Video abandoned at MH-2.

3.2.11 Pipe Section Video Truck Scales – EX-7 (Pipe Run 11)

Upstream structure: Truck Scales (also identified as CL-16 on drawing)

Downstream structure: EX-7 (also identified as MH-7 on drawing)

Video date: August 24, 2012

Size: 24”

Material: Corrugated metal pipe (per video). Lined corrugated metal pipe with slot drain (per drawing).

Direction of Video: Upstream (Truck Scales) to Downstream (EX-7)

Length of pipe: 250’ approx.

Observations:

- Sediment/sludge in bottom of pipe from 0 to 19 ft and 224 ft to the end of pipe.
- Top of pipe is partially collapsed in two places between 119 and 124 feet.
- Pipe bends approximately 45 degrees to the east at 238 ft.
- Damage to top of pipe beginning at 239 feet.
- Video abandoned at 239 feet.

3.2.12 Pipe Section Video SW MH – MH Cooling Tower (Pipe Run 10)

Upstream structure: SW MH (also indicated as MH-7 on drawing)

Downstream structure: MH COOLING TOWER

Video date: November 15, 2012

Size: 36”

Material: ASB cement pipe (per drawing)

Direction of Video: Upstream (SW MH) to downstream (Cooling Tower MH)

Length of pipe: 238’ approx.

Observations:

- Sludge/solids blocking bottom of pipe at SW MH.

- Standing water at SW MH.
- Video abandoned at SW MH.

3.2.13 Pipe Section CL-8 – MH-6

The pipe from CL-8 in the Baghouse Building to MH-6 was not video surveyed. This pipe and structures are within the building footprint and are not used to manage stormwater.

3.2.14 Pipe Section Unnamed Catch Basin – CL-8

The pipe from the unnamed catch basin to CL-8 was not video surveyed. This pipe and structures are within the building footprint and are not used to manage stormwater. The catch basin has been observed to be filled with sediment.

3.3 NORTHEAST BAGHOUSE BUILDING

The pipe run in the northeast corner of the Baghouse Building includes approximately 100 lineal feet of pipe and 3 unnamed circular structures. This pipe was not video surveyed. Pipe and manhole sizes and materials of construction are unknown. Sump pumps at the northern and central manholes transfer wash down water and roof drain water to the baghouse slurry sump. A portion of the pipe is located within the Baghouse Building.

3.4 NORTHWEST BAGHOUSE BUILDING

The pipe run from CL-1 to the pipe termination is located in the northwest corner of the Baghouse Building. This pipe was not video surveyed. The pipe run includes approximately 65 lineal feet of pipe, 1 square catch basin structure, and a trench drain/sump at the pipe termination. The southern catch basin/sump collects runoff from the corridor. Pipe and catch basin sizes and materials of construction are unknown. This pipe is located within the Baghouse Building.

3.5 SOUTHEAST BAGHOUSE BUILDING

The pipe run in the southeast corner of the Baghouse Building includes approximately 60 lineal feet of pipe and 2 unnamed square catch basin structures. This pipe was not video surveyed. Pipe and catch basin sizes and materials of construction are unknown. The pipe is located within the Baghouse Building.

3.6 SOUTHWEST OF RMPS

The pipe run located southwest of the RMPS and Reverb Feed Room Buildings includes approximately 45 lineal feet of pipe, and 2 unnamed square catch basin structures. This pipe was not video surveyed. Pipe and catch basin sizes and materials of construction are unknown. Water that collects at the northern catch basin is transferred to Interim Status Unit 5.

3.7 WEST OF CORRIDOR

The pipe run located west of the Corridor section of the Reverb Furnace Feed Room Building includes approximately 25 lineal feet of pipe, and two unnamed square catch basin structures. This pipe was not video surveyed. Pipe and catch basin sizes and materials of construction are unknown. Water which collects in the northern catch basin is pumped through an above ground pipe to RMPS.

4.0 SOUTH YARD INSPECTION

4.1 GENERAL

The South Yard storm drainage system (i.e., south of MH-6) contains one run of stormwater piping including seven (7) circular or square structures and approximately 680 lineal feet (LF) of pipe. Pipe sizes range from 10 to 36 inches in diameter. Pipe materials include ASB cement, corrugated metal, and corrugated with bituminous coating. Catch basins are generally 4 ft diameter. The pipes contained a significant amount of sediment and required extensive cleaning using high pressure water before video inspection could be completed. See attached Figure 1 for the general layout of the South Yard storm drainage system.

Inspection results for this section of South Yard storm water piping are summarized below. The location and identification names for South Yard storm water piping are provided on Figure 1. The video technician utilized his own alpha-numeric system (such as EX-5 or SD1) to identify the structures. We have included the structure identifications used on the video and the alphabetical designations utilized on the original GNB storm sewer design drawings.

4.2 MH-6 TO EX-46

The MH-6 to EX-46 pipe run includes approximately 211 lineal feet of pipe and 3 circular structures. The pipe diameter is 36 inches.

4.2.1 Pipe Section MH-6 to EX-19 (Pipe Run 10)

The video for this pipe section was intended to be included in the video SW MH – MH COOLING TOWER in the North Yard. The video was abandoned at the SW manhole. Video is not available for the pipe section between MH-6 and EX-19.

4.2.2 Pipe Section Video EX-19 to EX-10 (Pipe Run 10)

Upstream structure: EX-19

Downstream structure: EX-10 (Same as facility designation “Inlet D”)

Video date: August 23, 2012

Size: 24” (per video). 36” (per drawing).

Material: Corrugated metal (per video). Corrugated metal, 12 gauge BIT coated (per drawing).

Direction of Video: Downstream to Upstream

Length of pipe: 23 ft approx. (from drawing)

Observations:

- Solid/sludge in eastern bottom of pipe prevented passage of video equipment.
- Approximately 4 inches standing water at pipe bottom.
- The upstream structure is visible at the end of the pipe run.

4.2.3 Pipe Section Video EX-10 to EX-46 (Pipe Run 6)

Upstream structure: EX-10 (Same as facility designation “Inlet D”)

Downstream structure: EX-46

Video date: August 23, 2012

Size: 36”

Material: Corrugated metal (per video). Corrugated metal, 12 gauge BIT coated (per drawing)

Direction of Video: Upstream to Downstream

Length of pipe: 75 ft approx.

Observations:

- Standing water in bottom of pipe, approximately 4 inches deep.
- Solids along pipe walls from 17 to 68 feet.
- Water entering through inlet in top of pipe at 57.2 feet.

- Pipe turns approximately 90 degrees to the east through two 45 degree turns from 68 to 72 feet. It is not clear if this pipe section is EX46 to Interim Status Unit 46.

4.2.4 Pipe Section EX-46 to Unit 46

A video survey was not conducted of the pipe section between EX-46 and Interim Status Unit 46.

4.3 INLET A TO INLET D

The Inlet A to Inlet D pipe run includes approximately 469 lineal feet of pipe and 3 circular structures. The pipe diameter ranges from 10 to 12 inches.

4.3.1 Pipe Section EX-7 to EX-8 (Pipe Run 9)

Upstream structure: EX-7 (Same as facility designation "Inlet A")
Downstream structure: EX-8 (Same as facility designation "Inlet B")
Video date: August 6, 2012
Size: 12" on video. 10" on drawing.
Material: Polyvinyl chloride (per video). Corrugated metal (per drawing).
Direction of Video: Upstream to downstream (EX-7 to EX-8)
Length of pipe: 158 ft approx.
Observations:

- Pipe appears to be corrugated metal and has been slip lined (appears to be fiberglass cured in-place).
- There is about 2 inches of sediment/sludge on bottom from 32' to 53'.
- The bottom appears to be sagged from 53' to 58', 69' to 75', 77' to 78', 79' to 83, 84' to 92', 95' to 105', 106' to 117', 118' to 125', 135' to 140', and 141' to 147' (shallow standing water).
- The ceiling is deformed at 58.9'.

- There is debris in the bottom of the pipe at 157'.
- There is a pipe discharging into structure EX-8 from the north. This pipe is not shown on the facility figure.

4.3.2 Pipe Section EX-8 to EX-6 (Pipe Run 8)

This video is mis-named EX-6 to EX-7. The correct name is EX-6 to EX-8.

Upstream structure: EX-8 (Same as facility designation "Inlet B")
Downstream structure: EX-6 (Same as facility designation "Inlet C")
Video date: August 6, 2012
Size: 12" per video. 10" on drawing.
Material: Polyvinyl chloride (per video). Corrugated metal pipe (per drawing).
Direction of Video: Downstream (EX-6) to upstream (EX-8)
Length of pipe: Survey abandoned at 33 ft. 160 ft (per drawing).
Observations:

- Pipe appears to be corrugated metal and lined.
- Pipe appears to be sagged from structure EX-7 to 5', 9' to 10', 19' to 23', 24' to 26' and 27' to 30' (shallow standing water).
- Survey abandoned at 33' (no apparent reason was observed).

This video is mis-named EX-8 to EX-8. The correct name is EX-8 to EX-6.

Upstream structure: EX-8 (Same as facility designation "Inlet B")
Downstream structure: EX-6 (Same as facility designation "Inlet C")
Video date: August 9, 2012
Size: 12" on video. 10" on drawing.
Material: Polyvinyl chloride (per video). Corrugated metal (per drawing).
Direction of Video: Upstream to downstream

Length of pipe: 154.2 ft approx.

Observations:

- Pipe appears to be corrugated metal and has been slip lined (appears to be fiberglass cured in-place).
- There is standing water from structure EX-8 to 7'.
- The bottom seems to be scoured from 24.5' to 26' and from 27' to 30' (standing water).
- There is a dip/sag from 39' to 43', and there is standing water.
- The bottom seems to be scoured/sagged from 52' to 56', 62' to 66', 69' to 72' (standing water).
- The bottom seems to be scoured/sagged from 99' to 100', 103' to 109', 111' to 121', 123' to 127', 128' to 140', 147' to 152' (standing water).

4.3.3 Pipe Section EX-6 to EX-10 (Pipe Run 7)

This video is mis-named EX-6 to EX-3. The correct name is EX-6 to EX-10.

Upstream structure: EX-6 (Same as facility designation "Inlet C")

Downstream structure: EX-10 (Same as facility designation "Inlet D")

Video date: August 9, 2012

Size: 12"

Material: Polyvinyl chloride (per video).

Direction of Video: Upstream to downstream (EX-6 to EX-10)

Length of pipe: Survey abandoned at approximately 155.3 ft

Observations:

- Pipe appears to be corrugated metal and has been slip lined.
- There is standing water from structure EX-6 to structure EX-3.

- The pipe appears to be sagged from structure EX-6 to 14’ (shallow standing water).
- Water level is about 4 inches at 25 ft from EX-6, 8 inches at 100 ft from EX-6 and the pipe is full at 120 ft from EX-6.

5.0 SUMMARY AND RECOMMENDATIONS

5.1 SUMMARY

5.1.1 West Yard

West Yard piping is in generally operable condition with some possible cracks, fiberglass fraying, sagging, small amounts of debris, and standing water. The pipe runs are slip lined. The pipe section between Inlet G (EX-2) and Inlet H (EX-5) has a sharp alignment change upward (negative slope) at approximately 72 feet from EX-2. The slope is believed to change to avoid a utility line.

5.1.2 North Yard

In the North Yard, piping from CL-15 (EX-11) to CL-5 (EX-13) is in generally operable condition with some fiberglass fraying, incoming leakage (possibly water trapped between the pipe wall and slip lining during cleaning), and standing water. The pipe is slip lined.

Pipe from CL-5 (EX-13) to MH-6 and EX-18 to MH-1 contains significant amounts of sludge, solids and standing water and could not be video surveyed in some locations. The top of pipe is damaged 13 to 16 feet east of CL-2 and approximately 239 feet south of CL-16 in the vicinity of the pipe bend to the east. The pipe is slip lined.

The following pipe sections are no longer used for stormwater management:

- South of CL-2 (EX-16);
- Unnamed catch basin to CL-8 to MH-6 at the southwest corner of the Baghouse Building;

- Unnamed manhole to unnamed manhole south of MH-1 at the northeast corner of the Baghouse Building (Note: manholes are used for collection of wash down water and roof drain water);
- CL-1 to pipe termination at the northwest corner of the Baghouse Building; and,
- Unnamed catch basin to unnamed catch basin at the southeast corner of the Baghouse Building (Note: southern catch basin is used for collection of runoff from the corridor).

Piping southwest of RMPS and west of the Corridor provide localized stormwater management. Their condition is unknown as a video survey was not conducted.

5.1.3 South Yard

Pipe from MH-6 to EX-46 contains significant amounts of sludge, solids and standing water and could not be video surveyed in some locations. A 6 inch diameter pipe enters the top of pipe approximately 57 feet south of Inlet D (EX-10). A covered concrete structure with 6 inch diameter pipe was noted on the ground surface at this location.

Piping from Inlet A (EX-7) to Inlet D (EX-10) is in generally operable condition with sagging, some sediment/sludge, and standing water. The pipe is slip lined. The pipe is deformed at 58 feet north of Inlet A (EX-7). A pipe believed to be a roof drain from the structure containing the sanitary sewer meter pit discharges into the north side of Inlet B.

5.2 RECOMMENDATIONS

Recommended activities for the stormwater management system include pipe replacement, pipe installation, and abandonment in-place. These activities are discussed in greater detail below. A conceptual summary of the proposed activities is provided as Figure 2.

5.2.1 Stormwater Management System Replacement

DTSC has indicated that stormwater piping and structures must be double-lined with leak-detection. Existing piping throughout the facility is single lined that was upgraded with slip lining in the 1990s, but does not have leak detection. Given spacial constraints at the ground surface and the extent of damage and solids in existing piping, slip-lining the existing piping in most areas is not feasible. Exide proposes to remove and replace inlets, manholes and piping as shown on Figure 2. Additional piping will be installed along new alignments to complete the stormwater system.

During pipe replacement, when sections of broken or damaged pipe are identified, a hand auger will be conducted to collect soil samples for total Title 22 CAM-17 metals and pH from 0 to 1 feet, 1 to 2 feet and 2 to 3 feet below the pipe while the trench is open. The samples will be screened with a PID. If VOCs are detected with the PID, and odor or staining is present in the sample, then VOC analysis will also be conducted. If results indicate that additional investigation is needed at deeper intervals, additional samples will be collected adjacent to the pipe alignment after installation of the new pipe.

Piping will consist of HDPE pipe inside an HDPE pipe. Piping will be sized during the design to accommodate the 25-year storm. The pipe will have a positive slope in the downstream direction. The intent is that any leakage from the primary pipe would be captured in the secondary pipe and would be conveyed to a leak detection point at the nearest downstream manhole or catch basin. Pipe joints and connections will be water tight butt-fusion welds. Manholes will be double-contained HDPE. Existing manhole/inlet locations will be maintained to the extent possible to maintain existing drainage patterns and avoid repaving the facility. The conceptual stormwater system and conceptual details are provided on Figure 2.

Piping southwest of RMPS and west of the Corridor in the North Yard provide localized stormwater management. These pipe networks will be integrated with the facility-wide stormwater management system to transfer stormwater to the Drop Out System.

5.2.2 Pipe Abandonment

The following pipe runs in the North Yard are not used for stormwater management:

- South of CL-2 (EX-16);
- Unnamed catch basin to CL-8 to MH-6 at the southwest corner of the Baghouse Building;
- Unnamed manhole to unnamed manhole south of MH-1 at the northeast corner of the Baghouse Building (Note: north and center manholes will remain in-service);
- CL-1 to pipe termination at the northwest corner of the Baghouse Building; and,
- Unnamed catch basin to unnamed catch basin in the southeast corner of the Baghouse Building (Note: south manhole will remain in-service).

In addition, the following pipe sections will be removed from service as part of stormwater system upgrades:

- MH-1 to CL-14 (EX-14 to EX-15);
- MH-1 to MH-2 (EX-15 to NW MH);
- CL-16 to MH-7 (Truck Scales to EX-7 or SW MH);
- MH-7 to MH-6;
- Unnamed inlet box and pipe southwest of RMPS; and,
- Unnamed inlet box and pipe west of the Corridor.

The pipes will be abandoned in-place by plugging the ends with concrete and blinding the inlet box.

5.2.3 Schedule

Following DTSC approval of the permit application, a detailed stormwater system design will be prepared. The system will be constructed in four phases over a four year period. The construction sequence is generally summarized as follows:

- Year 1: South Yard and North Yard main piping network
- Year 2: West Yard
- Year 3: North Yard eastern piping network
- Year 4: South Yard eastern piping network

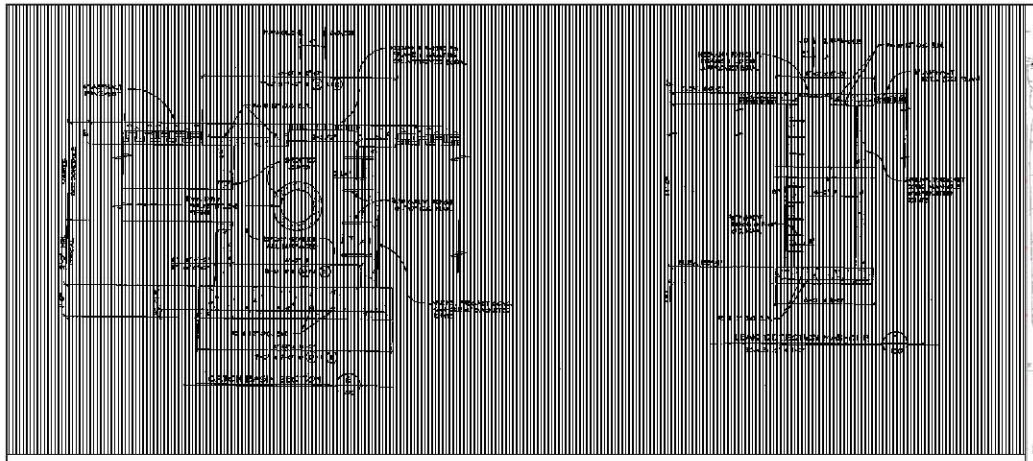
TABLE

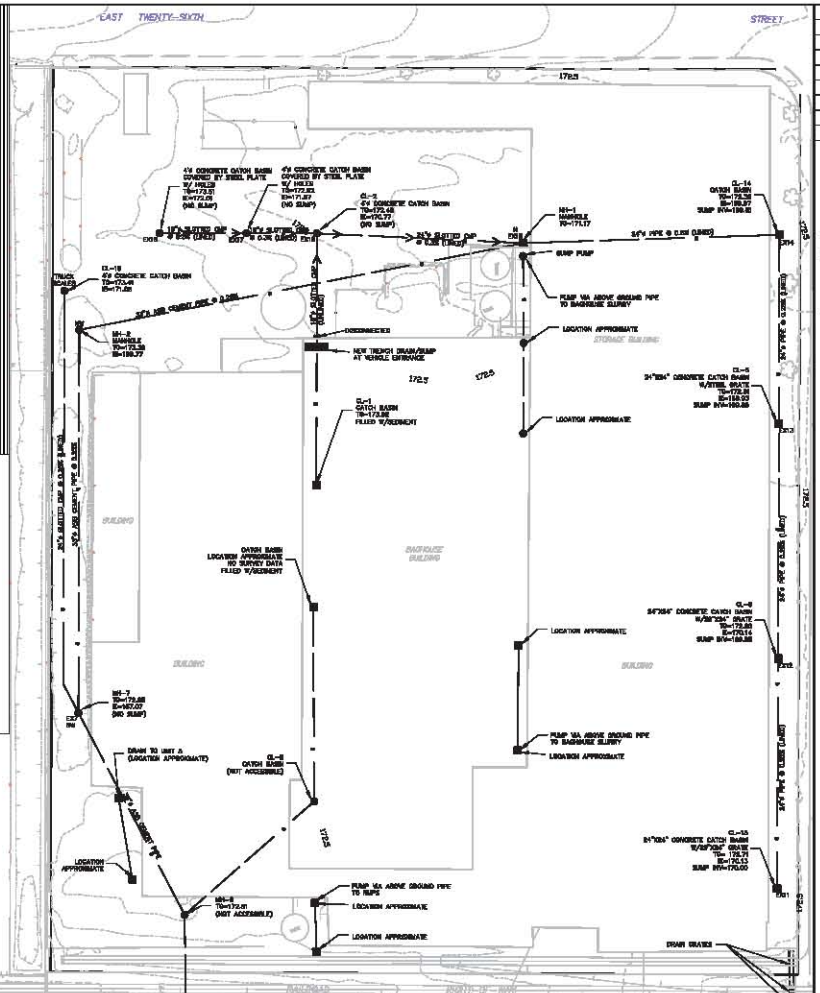
TABLE 1
STORM SEWER PIPE RECOMMENDATIONS SUMMARY
EXIDE TECHNOLOGIES, VERNON, CALIFORNIA

Pipe Run Number	Pipe Run Name	Required 25-yr Flow (cfs)	Existing Pipe Diameter (in) [1]	Length (ft)	Proposed Activity	Upgrade Year	Comments
1	EX3 - EX5, K - H	4.79	12" / 10"	74	Remove and replace	2	Existing configuration too small.
2	EX4 - EX5, J -H	2.19	10" / 9 "	116	Remove and replace	2	Existing configuration too small.
3	EX2 - EX5, G - H	18.67	15" / 12"	110	Remove and replace	2	Existing configuration too small.
4	SD1 - SD2, F - G	15.25	12" / 10"	226	Remove and replace	2	Existing configuration too small. Alignment change at 71.8 ft.
	H - EX46				New pipe	2	
5	EX46 - 46	24.53	36" / 32"	8	Remove and replace	1	
6	EX10 - EX46, D - 46	26.67	36"	75	Remove and replace	1	
7	EX6 - EX10	13.49	12" / 10"	160	Remove and replace	4	Existing configuration too small.
8	EX8 - EX6	10.34	12" / 10"	160	Remove and replace	4	Existing configuration too small.
9	EX7 - EX8	4.55	12" / 10"	158	Remove and replace	4	Existing configuration too small.
10	MH7 - MH6 - EX19 - EX10	9.52	24"	270	Remove and replace MH6 - EX10. Abandon existing and install new pipe alignment MH7 - MH6.	1	Configuration uncertain.
11	Truck Scales - EX7	1.24	24" / 21"	250	Abandon. Seal pipe slots.	1	
12	NW MH - SW MH	7.77	33"	225	Remove and replace	1	
13	N MH - NW MH	8.24	24" / 14"	270	Abandon. New pipe alignment NW MH - EX18.	1	
14	EX15 - EX14, N MH - CL14	3.99	24" / 21.5"	150	Abandon. Pump via above grade pipe.	3	Runs beneath building, obstructed.
15	EX14 - EX13, CL14 - CL5	2.72	24" / 21.5"	108	Remove and replace	3	10 inches sludge in majority of pipe run.
16	EX13 - EX12, CL5 - CL6	2.06	24" / 21.5"	139	Remove and replace	3	
17	EX12 - EX11, CL6 - CL15	1.24	24" / 21.5"	134	Remove and replace	3	
18	EX16 - EX15, CL2 - MH1	0.50	15" / 13"	120	Remove and replace	1	Possible damage to slip lining.
19	EX17 - EX16	0.48	15" / 10"	40	Remove and replace	1	Video abandoned at 15 ft due to obstruction.
20	EX18 - EX17	0.41	15" / 9"	47	Remove and replace	1	1/2 of pipe blocked.

Notes:
1. Existing pipe diameter: Original diameter / Lined diameter.

FIGURES





STORMWATER SEWER DETAILS INLETS A THROUGH H

NOTES:

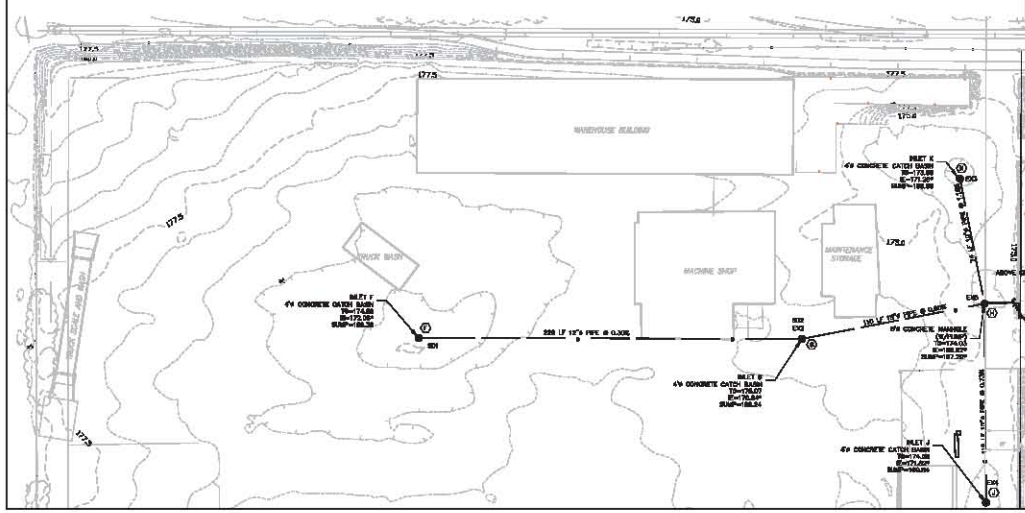
1. SUMP PUMP VIA ABOVE GROUND PIPE TO BAGHOUSE SLURRY
2. DETAILS OBTAINED FROM STORMWATER SEWER DETAILS PLAN, WORK ORDER NUMBER 1240, DRAWING NUMBER 30-724-124, PREPARED BY GHD TECHNOLOGIES LAST REVISED FEBRUARY 2, 1996.
3. DETAILS ARE NOT TO SCALE.

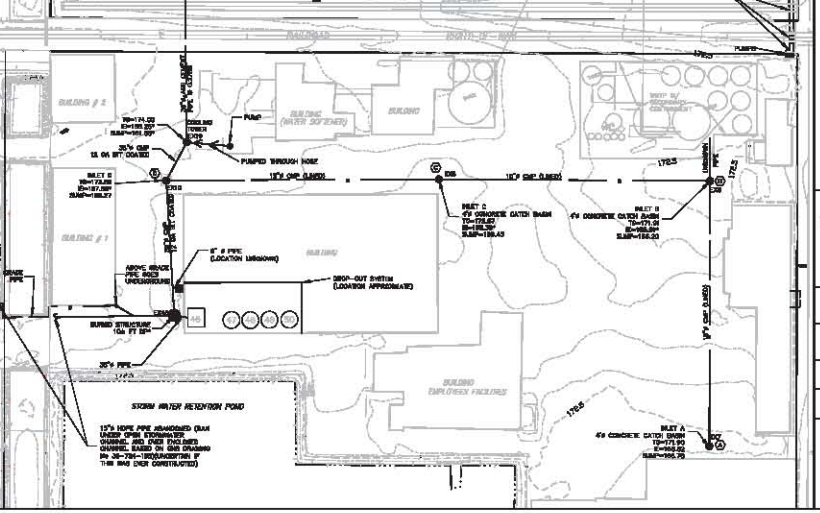
NOTES:

1. BASEMAP ADAPTED FROM HOLLENHAUER GROUP ALTA/ACSM LAND TITLE SURVEY DATED FEBRUARY 28, 2005.
2. FACILITY IMPROVEMENTS SINCE FEBRUARY 28, 2005 ARE NOT SHOWN OR ARE APPROXIMATE.
3. PIPE LOCATIONS, DIAMETERS, AND MATERIALS SHALL BE FIELD CONFIRMED.
4. STORMWATER MANAGEMENT SYSTEM INFORMATION SHOWN FROM FEBRUARY 28, 2005 HOLLENHAUER GROUP ALTA/ACSM LAND TITLE SURVEY; SEPTEMBER 18, 1992 SOUTH YARD PARKING PLAN, 30-1525; NOVEMBER 2, 1992 SITE DEVELOPMENT PLOT PLAN, PLANT SITE PARKING AND DRAINAGE, 30-1124; FEBRUARY 1992 NORTH YARD PLAN, 30-1126-3; FEBRUARY 1992 SOUTH YARD PLAN, 30-724-125; FEBRUARY 1992 WEST YARD PLAN, 30-724-101 AND FIELD OBSERVATIONS PROVIDED BY EXIDE.
5. STORMWATER SYSTEM FIELD CONFIRMED BY ADVANCED GEOSERVICES TO EXTENT PRACTICAL ON SEPTEMBER 18, 2012.
6. * INDICATES ELEVATION CALCULATED USING DESIGN INVERT AND FIELD TG ELEVATION AND SUMP DEPTH.

GRAPHIC SCALE

(IN FEET)
1 inch = 60 ft.





DATE	REVISION

LEGEND:

- BLACKTOP
- BUILDING LINE
- CHAINLINK FENCE
- METAL FENCE
- CONTOURS
- RAIL ROAD
- STORM SEWER PIPE
- CATCH BASIN
- CATCH BASIN
- STORM SEWER MANHOLE W/SOLID LID

ADVANCED Geoservices

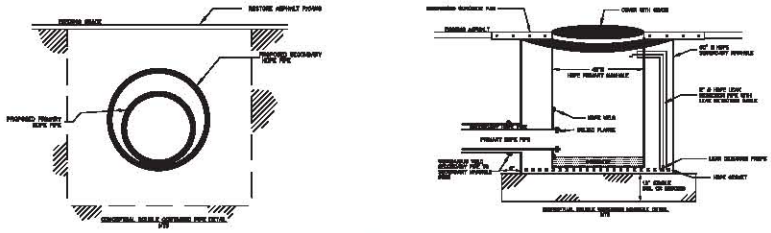
Engineering for the Environment. Planning for People.

1055 ANDREW DRIVE, SUITE A
WEST CHESTER, PENNSYLVANIA 19380

EXIDE TECHNOLOGIES
VERNON, CALIFORNIA

STORM SEWER INSPECTION REPORT

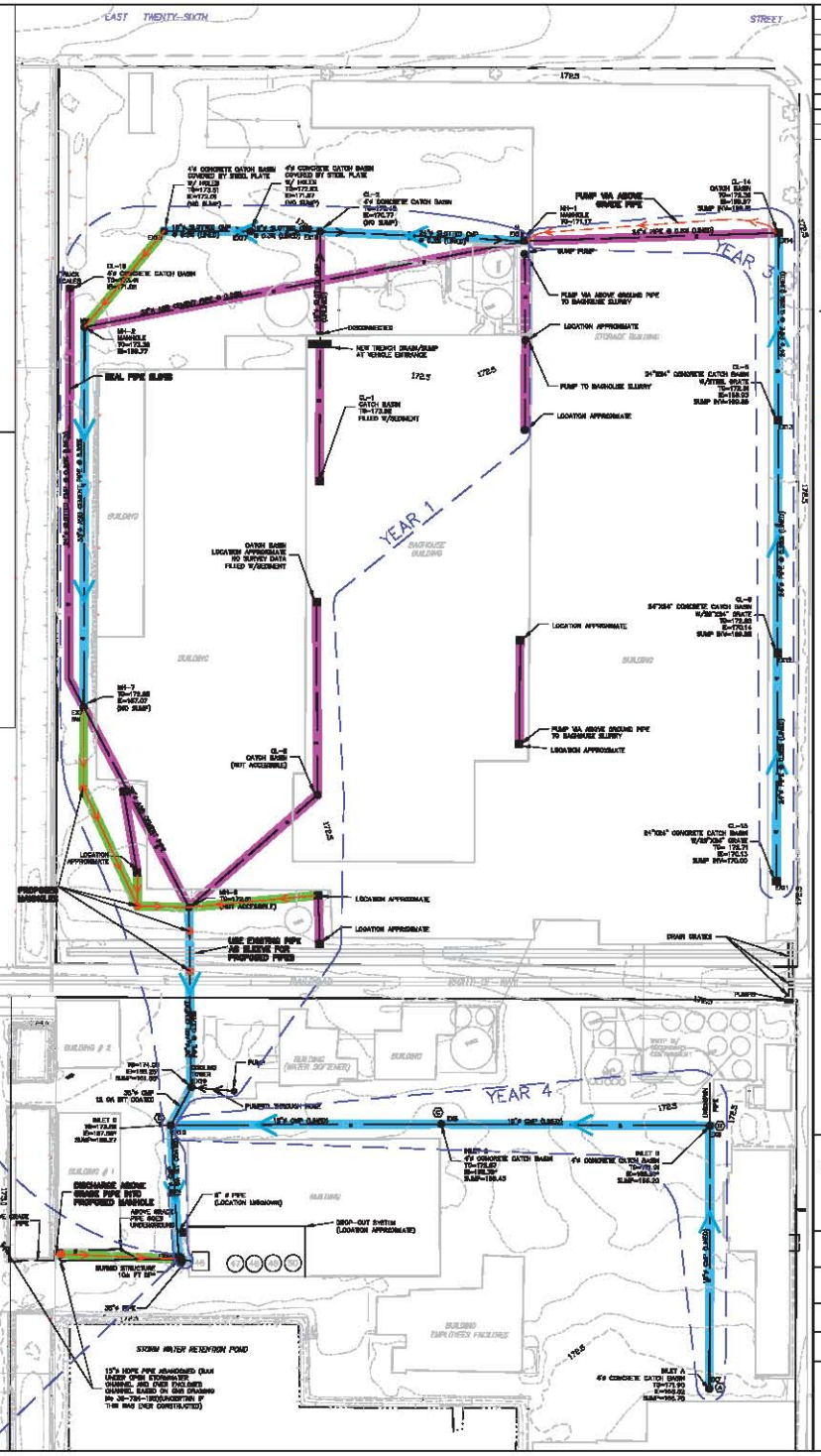
Scale:	NTS
Engineered By:	D.J.S.
Drawn By:	D.J.S.
Checked By:	J.W.D.
Project Mgr:	P.C.S.
Project No:	2012-067
Sheet No:	FIGURE 1



PROPOSED STORMWATER SYSTEM DETAILS

NOTES:

1. BASEMAP ADAPTED FROM HOLLENHAUER GROUP ALTA/ACSM LAND TITLE SURVEY DATED FEBRUARY 28, 2005.
2. FACILITY IMPROVEMENTS SINCE FEBRUARY 28, 2005 ARE NOT SHOWN OR ARE APPROXIMATE.
3. PIPE LOCATIONS, DIAMETERS, AND MATERIALS SHALL BE FIELD CONFIRMED.
4. STORMWATER MANAGEMENT SYSTEM INFORMATION SHOWN FROM FEBRUARY 28, 2005 HOLLENHAUER GROUP ALTA/ACSM LAND TITLE SURVEY; SEPTEMBER 18, 1962 SOUTH YARD PARKING PLAN, 30-1529, NOVEMBER 2, 1962 SITE DEVELOPMENT PLOT PLAN, PLANT SITE PARKING AND DRAINAGE, 30-1534; FEBRUARY 1968 NORTH YARD PLAN, 30-1536-3; FEBRUARY 1968 SOUTH YARD PLAN, 30-724-1529; FEBRUARY 1968 WEST YARD PLAN, 30-724-1531 AND FIELD OBSERVATIONS PROVIDED BY EXIDE.
5. STORMWATER SYSTEM FIELD CONFIRMED BY ADVANCED GEOSERVICES TO EXTENT PRACTICAL ON SEPTEMBER 18, 2012.
6. * INDICATES ELEVATION CALCULATED USING DESIGN INVERT AND FIELD TO ELEVATION AND SUMP DEPTH.



DATE	REVISION

LEGEND:

- BLACKTOP
- BUILDING LINE
- CHAINLINK FENCE
- METAL FENCE
- CONTOURS
- RAIL ROAD
- STORM SEWER PIPE
- CATCH BASIN
- CATCH BASIN
- STORM SEWER MANHOLE W/SOLID LID
- REMOVE AND REPLACE
- ABANDON IN-PLACE
- PROPOSED NEW PIPE ALIGNMENT

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1055 ANDREW DRIVE, SUITE A
WEST CHESTER, PENNSYLVANIA 19380

EXIDE TECHNOLOGIES
VERNON, CALIFORNIA

CONCEPTUAL STORM SEWER SYSTEM

Scale:	AS NOTED
Engineered By:	D.J.S.
Drawn By:	D.J.S.
Checked By:	J.W.D.
Project Mgr:	P.C.S.
Project No:	2002-067
Sheet No:	FIGURE 2

ATTACHMENTA

Ancon Report

Ancon Marine
18518 S. Susana Road
Rancho Dominguez, CA 90221
Phone: 310-522-5110
Fax: 310-522-5158

GraniteXP Observation Report with Still Images

Pipeline segment ref:	Project Name:	Start date/time:	Weather:	Surveyor's name:
SD-1+SD-2	EXCIDE 301-1514 8-2-12	8/2/2012 8:39:56 AM	1	JONES

Upstream manhole No:	Downstream manhole No:	Total length:
SD-1	SD-2	226.1

Additional info:

Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
0.0		START WITH FLOW	No	/		
0.0		AMH	No	/		EXD-SD-1
0.0		MWL	No	/		

Ancon Marine
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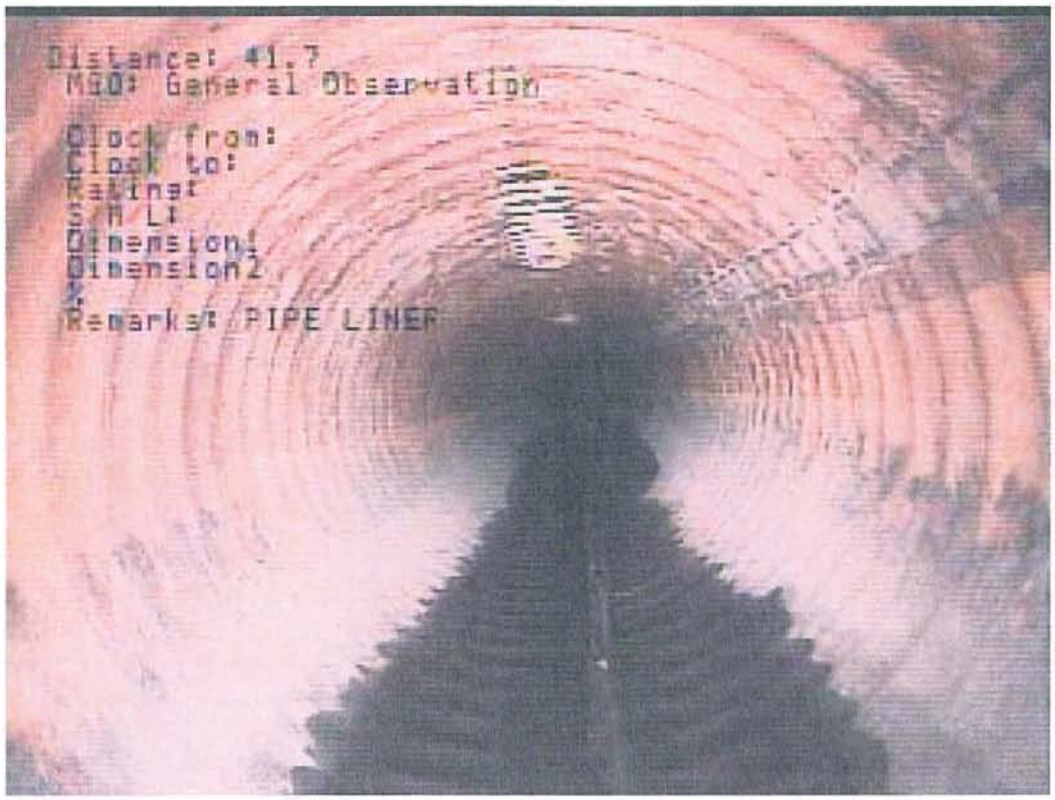
Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
41.7		MGO	No	/		PIPE LINER



Ancon Marine
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Rancho Dominguez, CA 90221
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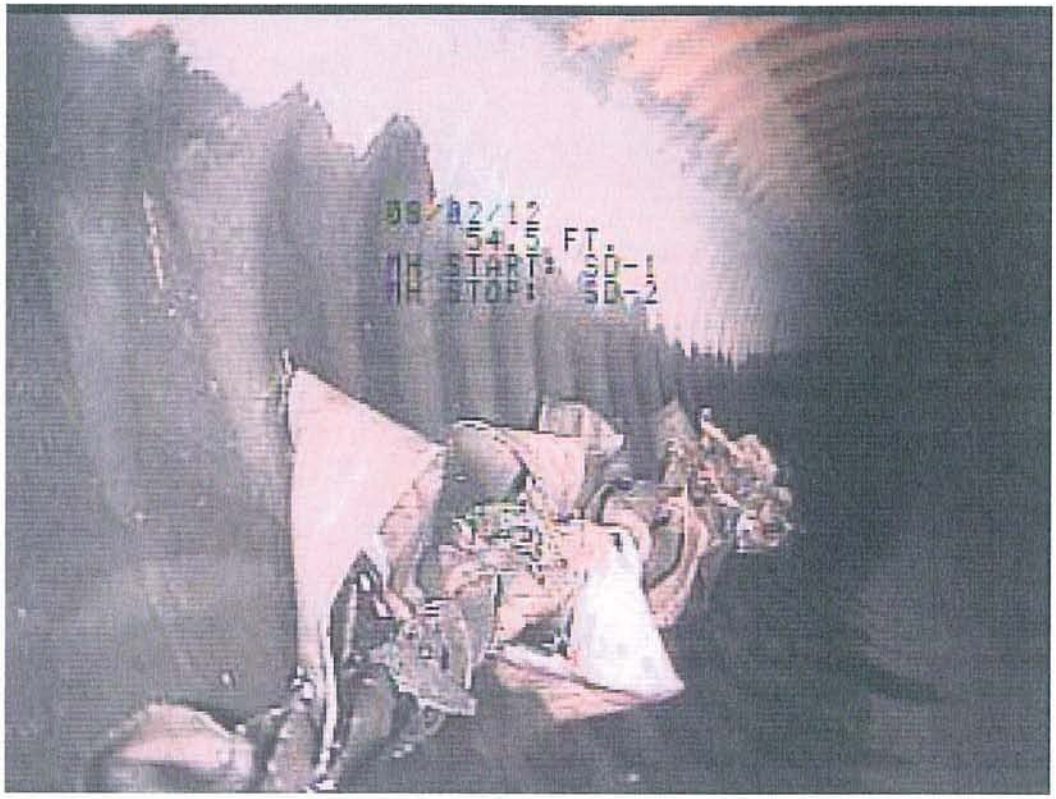
Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
41.7		MGO	No	/		PIPE LINER



226.1		AMH	No	/		EXD-1/SD-2
226.1		STOP	No	/		

Ancon Marine
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Rancho Dominguez, CA 90221
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GraniteXP Observation Report with Still Images

Pipeline segment ref:	Project Name:	Start date/time:	Weather:	Surveyor's name:
EX-2+EX-5	EXCIDE 301-1514 8-2-12	8/2/2012 9:24:05 AM	1	JONES

Upstream manhole No:	Downstream manhole No:	Total length:
EX-2	EX-5	

Additional info:

Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
0.0		START WITH FLOW	No	/		
0.0		AMH	No	/		EXD-1/ EX-2
0.0		MWL	No	/		

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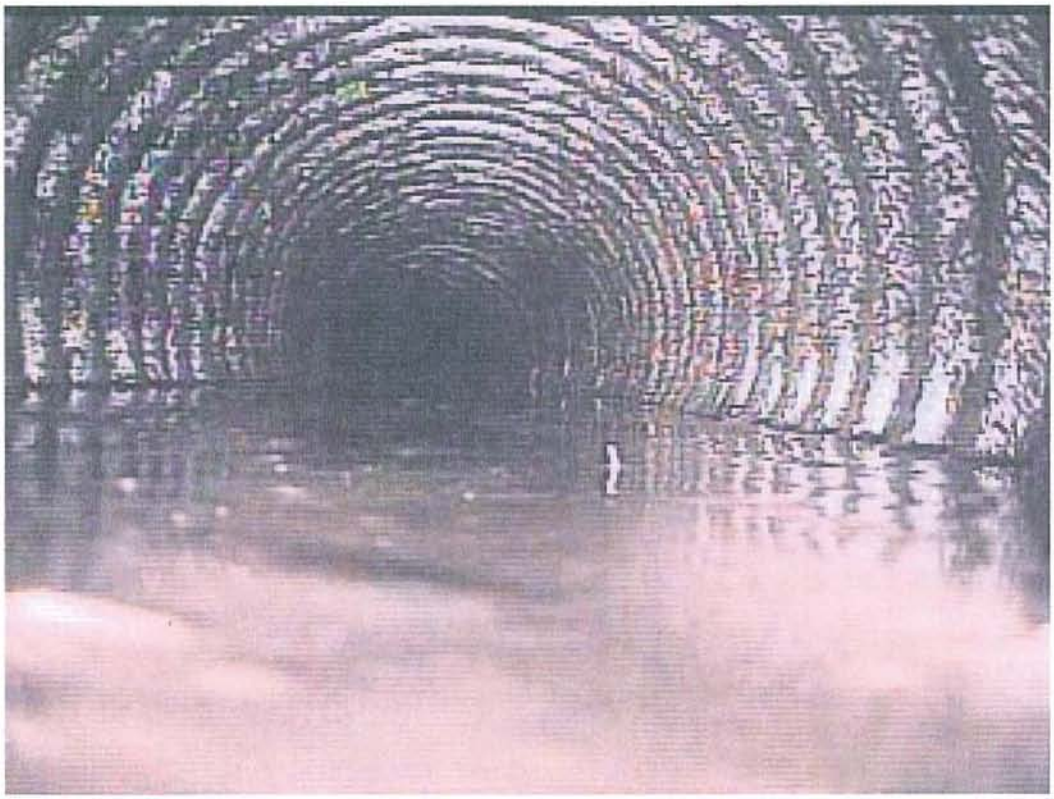
Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
10.4		MWLS	No	/		



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Fax: 310-522-5158

Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
20.1		MCU	No	/		
20.1		MSA	No	/		DUE TO MCU
20.1		STOP	No	/		

Ancon Marine
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GraniteXP Observation Report with Still Images

Pipeline segment ref:	Project Name:	Start date/time:	Weather:	Surveyor's name:
EX-2+EX-5	EXCIDE 301-1514 8-2-12	8/2/2012 10:19:40 AM	1	JONES

Upstream manhole No:	Downstream manhole No:	Total length:
EX-2	EX-5	

Additional info:

Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
0.0		START WITH FLOW	No	/		
0.0		AMH	No	/		EXD-1/ EX-2
0.0		MWL	No	/		

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Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
44.0		MWLS	No	/		

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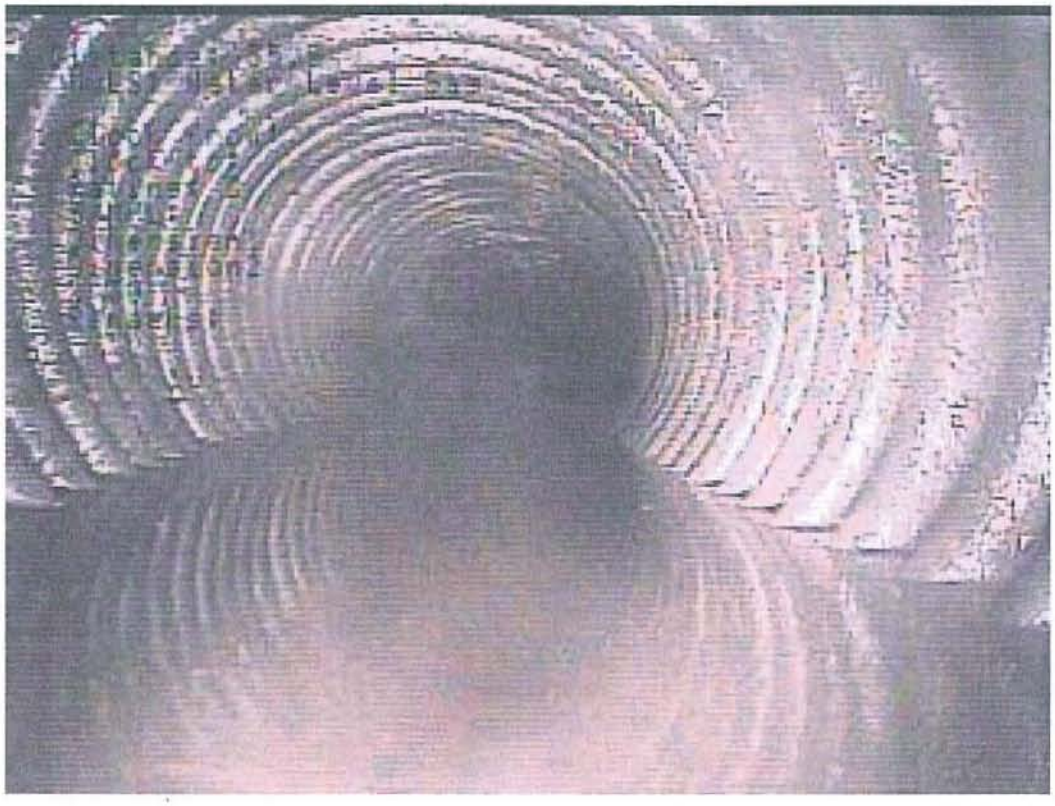
Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
55.8		MWLS	No	/		



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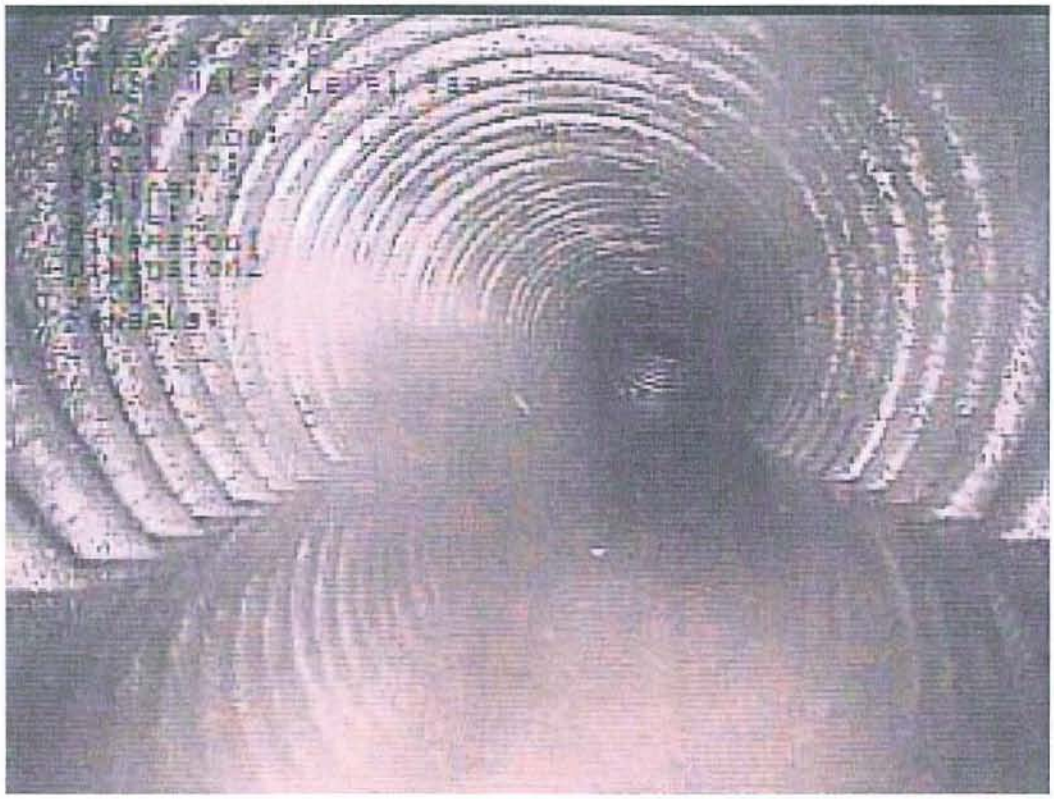
Phone: 310-522-5110
Fax: 310-522-5158

Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
55.8		MWLS	No	/		



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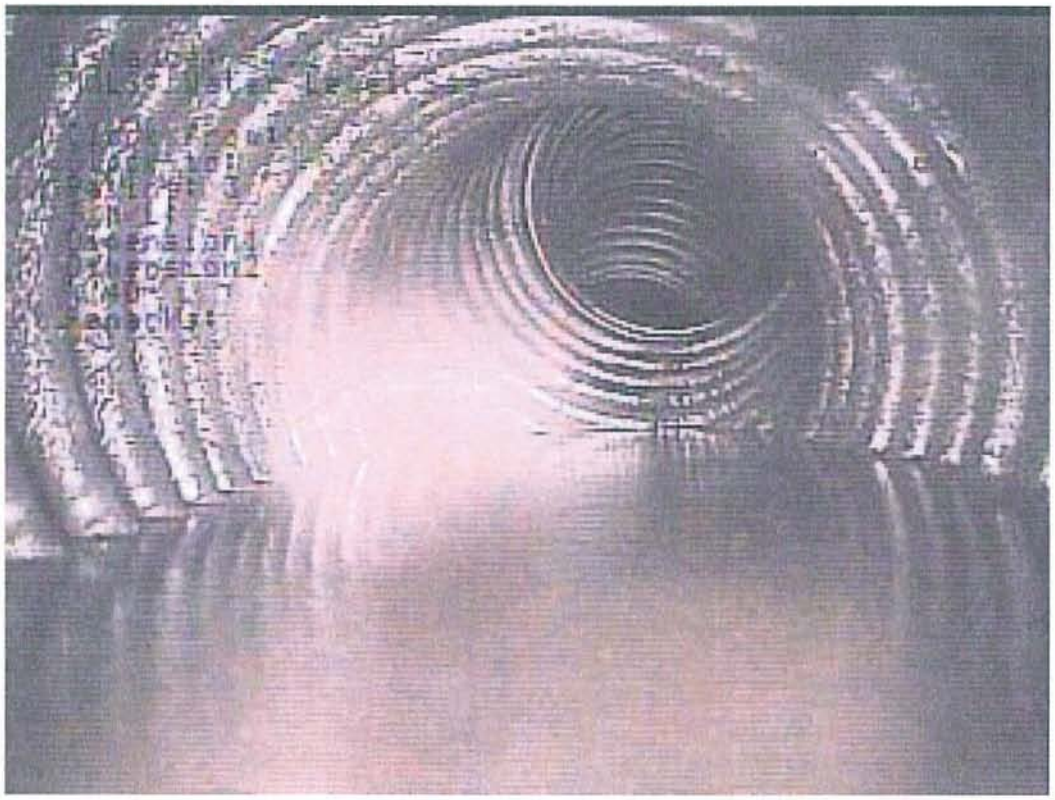
Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
67.2		MWLS	No	/		



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Fax: 310-522-5158

Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
67.2		LRU	No	/		

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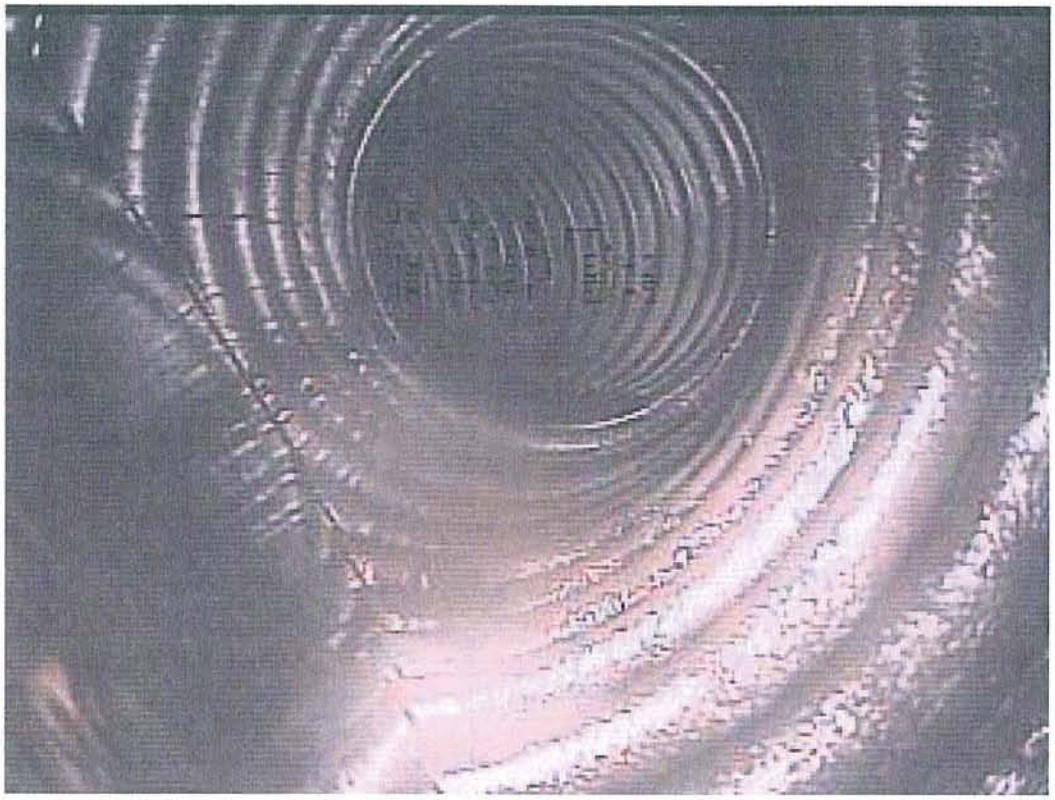
Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
67.2		LRU	No	/		



Ancon Marine
18518 S. Susana Road
Rancho Dominguez, CA 90221
Phone: 310-522-5110
Fax: 310-522-5158

Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
71.8		MSA	No	/		DUE TO LINE CHANGE

71.8		STOP	No	/		

Ancon Marine
18518 S. Susana Road
Rancho Dominguez, CA 90221
Phone: 310-522-5110
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GraniteXP Observation Report with Still Images

Pipeline segment ref:	Project Name:	Start date/time:	Weather:	Surveyor's name:
EX-3+EX-5	EXCIDE 301-1514 8-2-12	8/2/2012 12:22:57 PM	1	JONES

Upstream manhole No:	Downstream manhole No:	Total length:
EX-3	EX-5	73.8

Additional info:

Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
0.0		START AGAINST FLOW	Yes	/		
0.0		AMH	Yes	/		EXD-1/EX-5
0.0		MWL	Yes	/		

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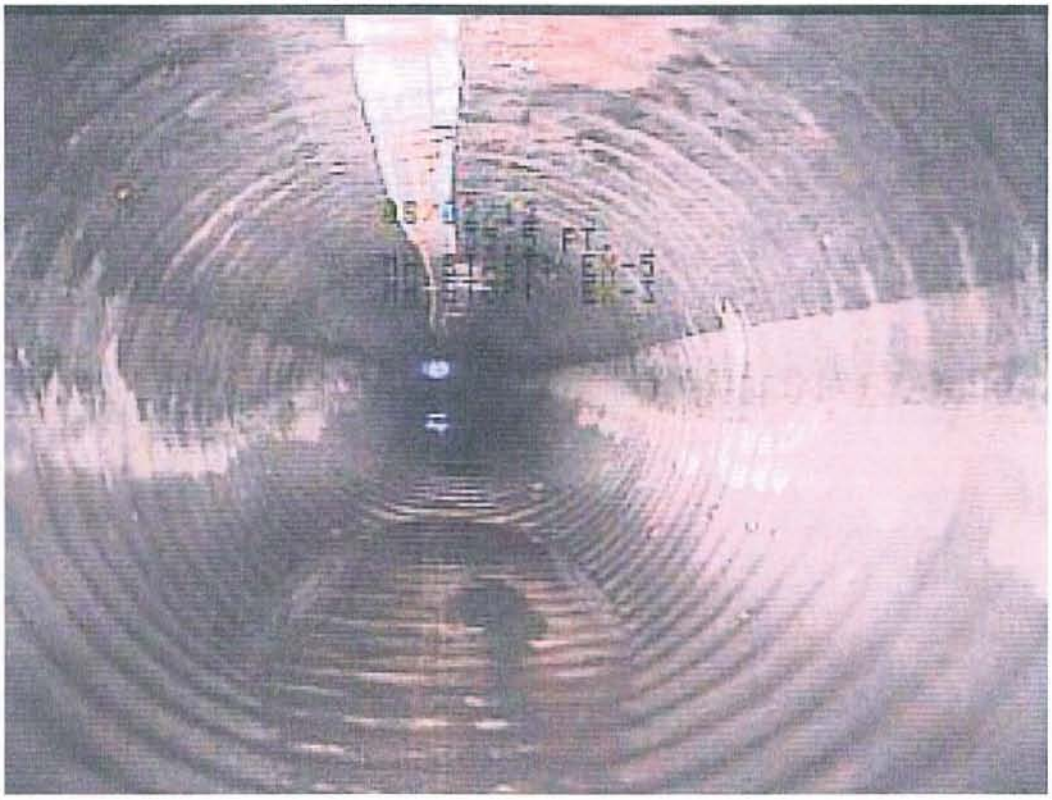
Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
35.5		MWLS	Yes	/		



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Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
53.8	18.2	DSZ	Yes	4 / 7		DEBRIS

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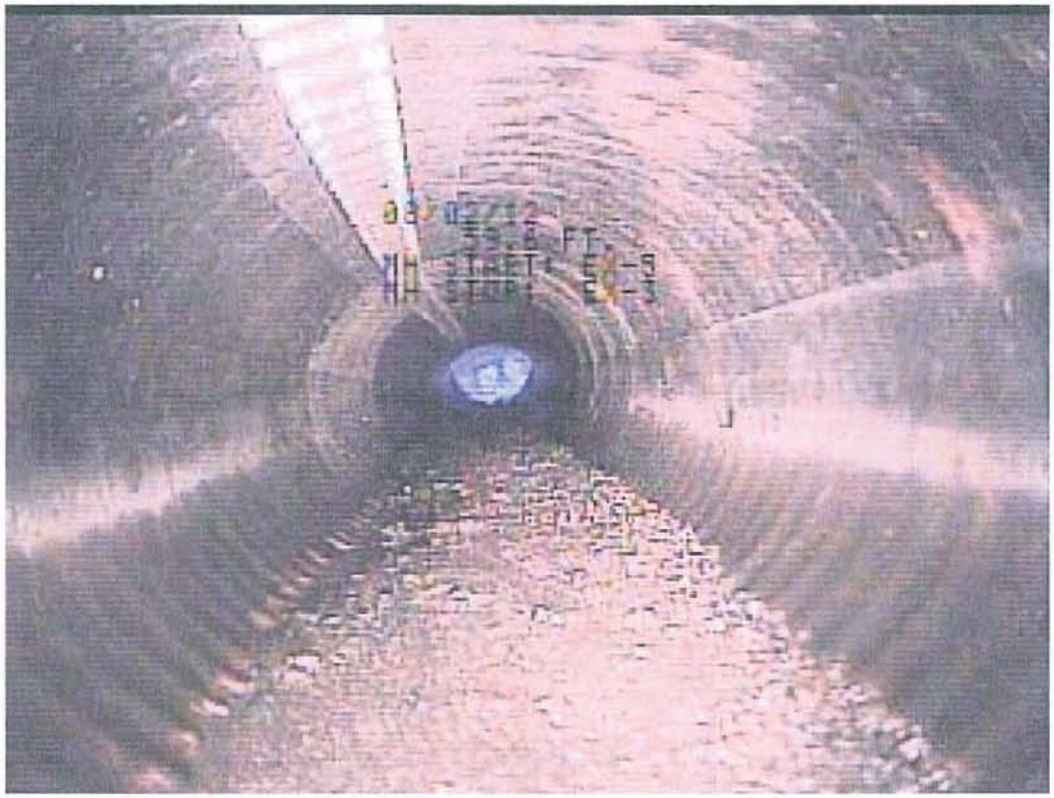
Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
53.8	18.2	DSZ	Yes	4 / 7		DEBRIS



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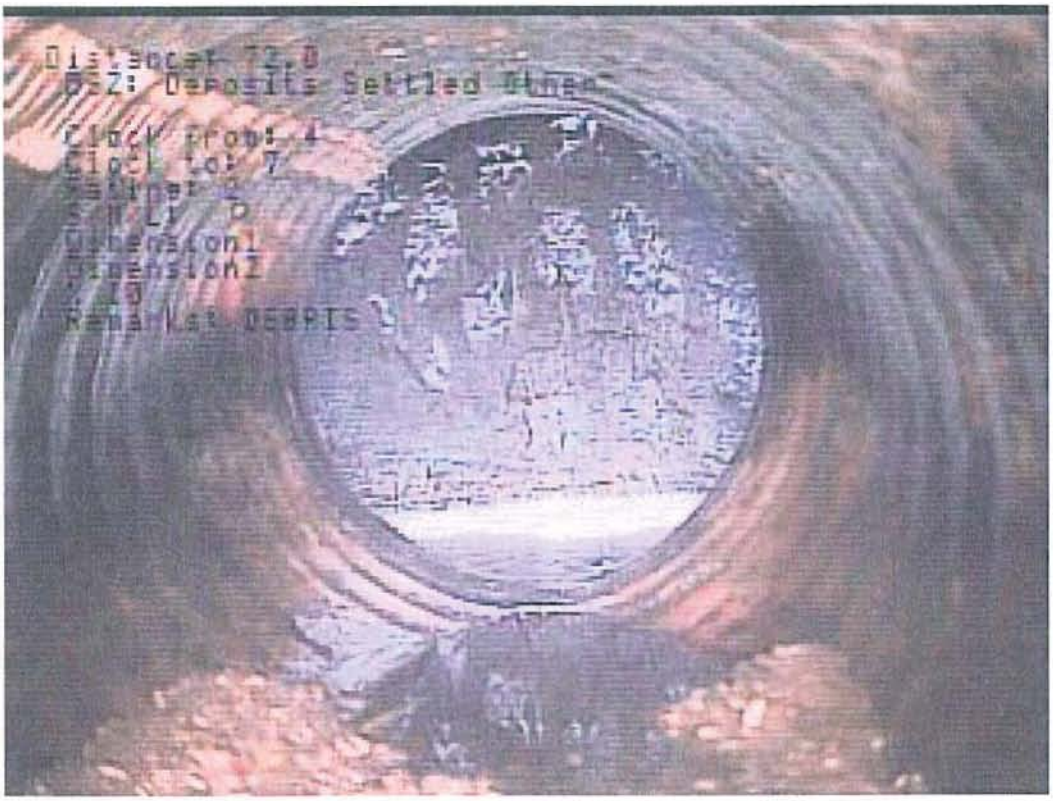
Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
53.8	18.2	DSZ	Yes	4 / 7		DEBRIS



73.8		AMH	Yes	/		EXD-1/EX-3
73.8		STOP	Yes	/		

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GraniteXP Observation Report with Still Images

Pipeline segment ref:	Project Name:	Start date/time:	Weather:	Surveyor's name:
EX-5+EX-4	EXCIDE 301-1514 8-2-12	8/2/2012 1:00:21 PM	1	JONES

Upstream manhole No:	Downstream manhole No:	Total length:
EX-5	EX-4	115.7

Additional info:

Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
0.0		START AGAINST FLOW	Yes	/		
0.0		AMH	Yes	/		EXD-1-EX4
0.0		MWL	Yes	/		

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Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
4.9		DSGV	Yes	4 / 8		

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Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
4.9		MSA	Yes	/		DUE TO GRAVEL

4.9		STOP	Yes	/		

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GraniteXP Observation Report with Still Images

Pipeline segment ref:	Project Name:	Start date/time:	Weather:	Surveyor's name:
EX-5+EX-4	EXCIDE 301-1514 8-2-12	8/2/2012 2:33:15 PM	1	JONES

Upstream manhole No:	Downstream manhole No:	Total length:
EX-5	EX-4	115.7

Additional info:

Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
0.0		START AGAINST FLOW	Yes	/		
0.0		AMH	Yes	/		EXD-1/EX-4
0.0		MWL	Yes	/		

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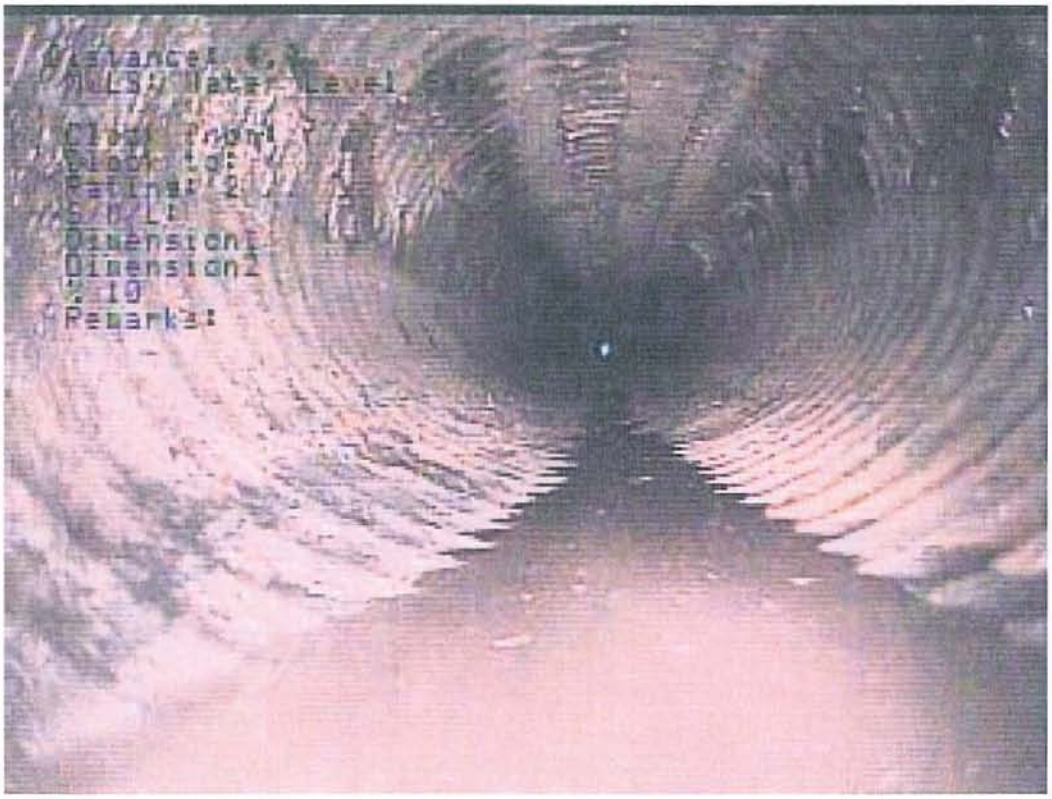
Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
4.0		MWLS	Yes	/		



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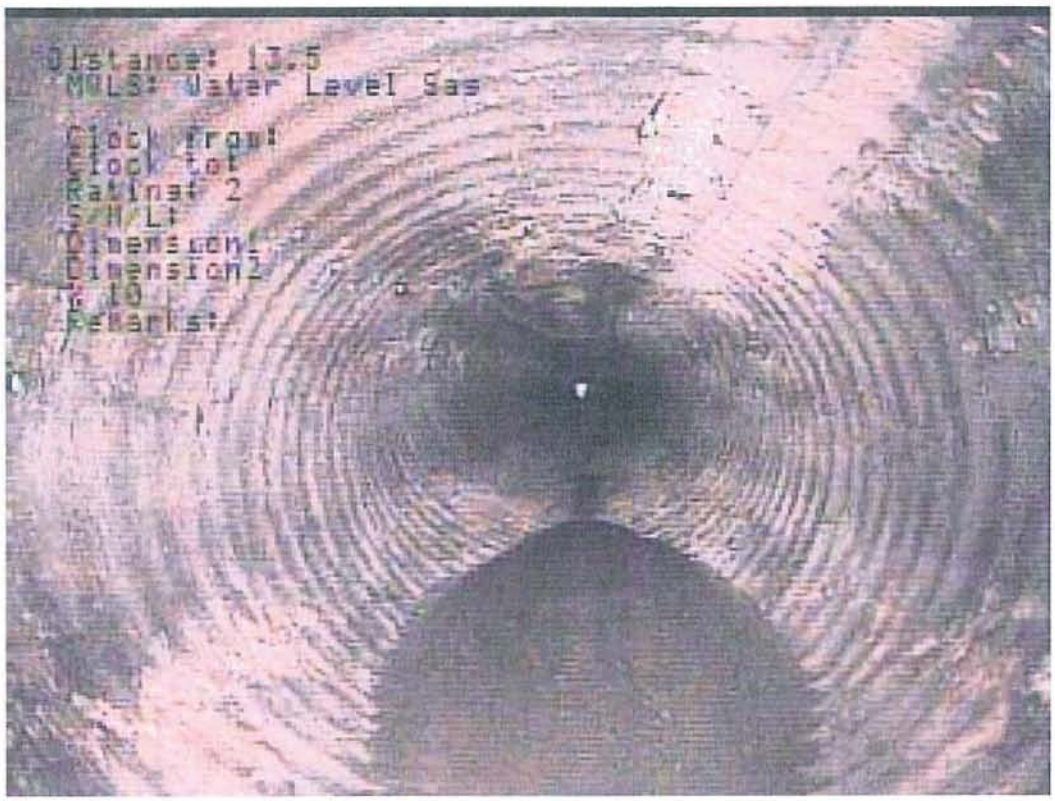
Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
13.5		MWLS	Yes	/		



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Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
74.5		MWLS	Yes	/		

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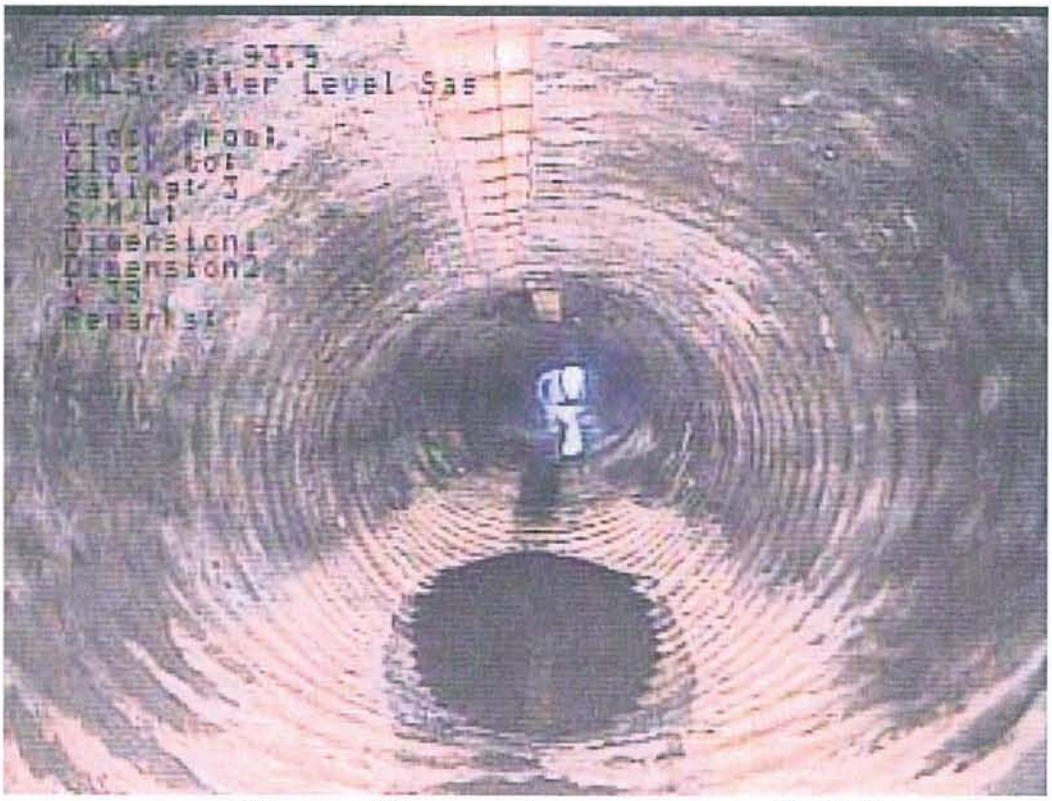
Observations

Distance	Length	Code	Reversed	Clock Pos.	Severity	Comment
93.9		MWLS	Yes	/		



115.7		AMH	Yes	/		EXD-1/EX-5
115.7		STOP	Yes	/		