



City of Winnipeg
Water and Waste Department

Combined Sewer Overflow Management Study

PHASE 3 Technical Memoranda

Appendix No. 9

SONAR SURVEYS

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1. INTRODUCTION

On October 11, 1995, TetrES conducted an examination of the outfalls into the Red River of three combined sewers (Jefferson, Munroe and St. Johns) and three land drainage outfalls (North Kilkenny Drive, Kings Drive and South St. Vital; Figure 1-1).

2. METHODS

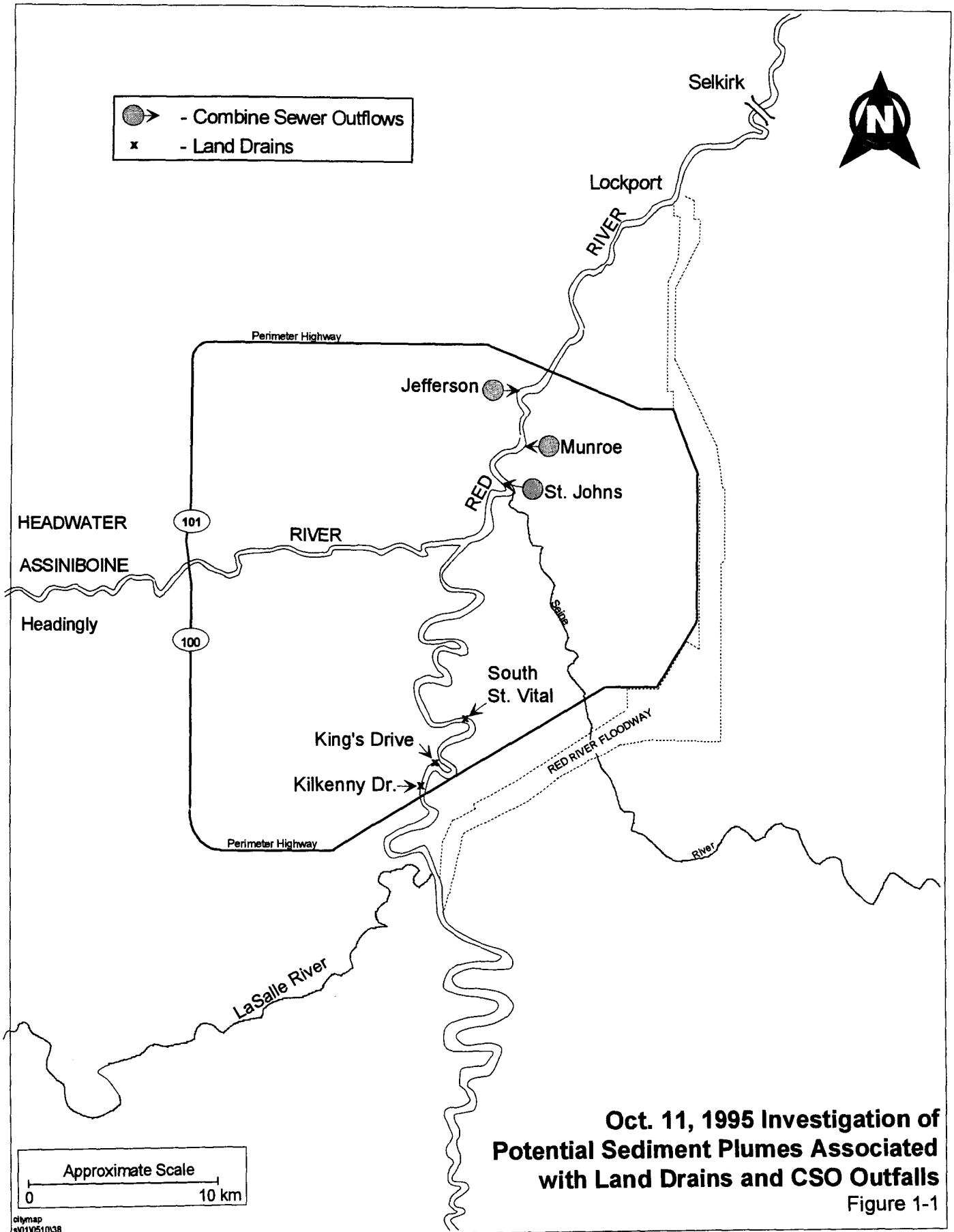
The bottom profile of the Red River near each of the outfalls was examined using a Lowrance Electronics Inc. Model X-15 paper graph recorder SONAR sounding unit. The location of the outfalls and the start and finish point of the outfall sounding transects was determined using a Magellan XL Global Positioning System set up to display UTM co-ordinates based on a NAD-27 Datum. A BOTTOMLINE Fishin' Buddy II portable LCD SONAR was used to assist the boat operator to navigate close to shore and to verify the paper graph sounder results.

At each outfall, four sounding transects were performed (Appendix A). The first three transects were parallel to the shoreline and were started 50 to 100 metres downstream of the outfall and ended approximately 10 metres upstream of the outfall. The first transect was approximately 5 metres from shore, the second approximately 10 metres from shore, and the third approximately 15 metres from shore. The "mark" feature of the paper graph was used to record the location of the outfall during the transect. The fourth transect started at the outfall and proceeded across the river at a right angle to the shoreline.

The field program attempted to duplicate the methods used in a similar field survey conducted by TetrES at these outfalls on October 11, 1994.

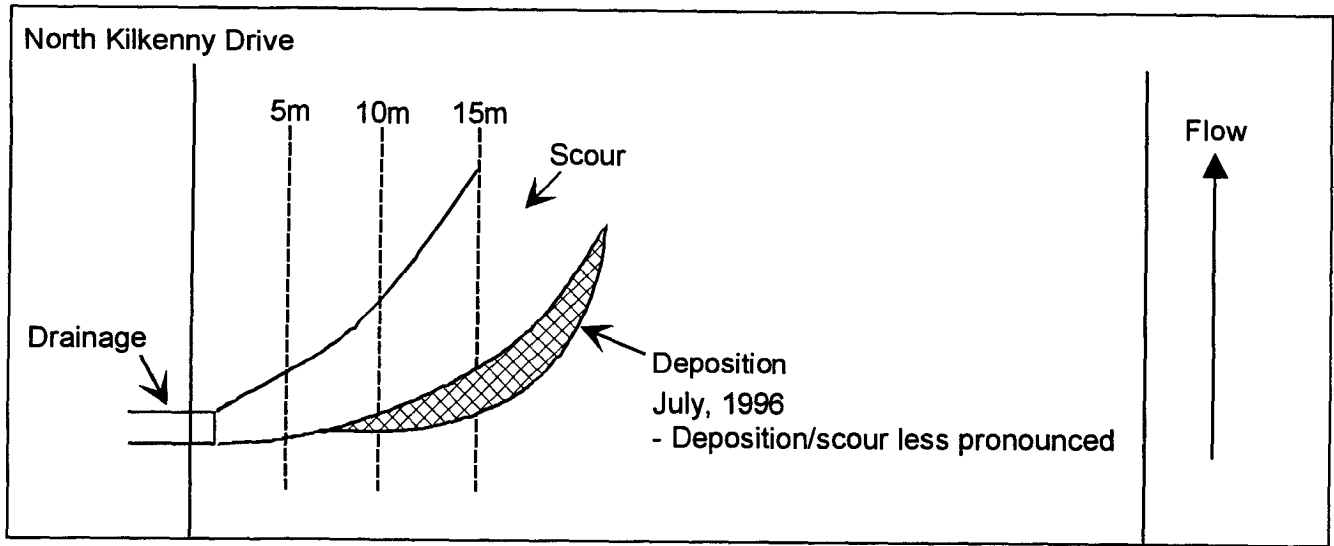
3. RESULTS

Appendix A provides the results of the sounding transects at the six outfalls. Three of the six outfalls (Kings Drive, South St. Vital and Munroe) contain no indication of either scouring or deposition near the discharge (Figure 3-1). These results are in agreement with the October 1,

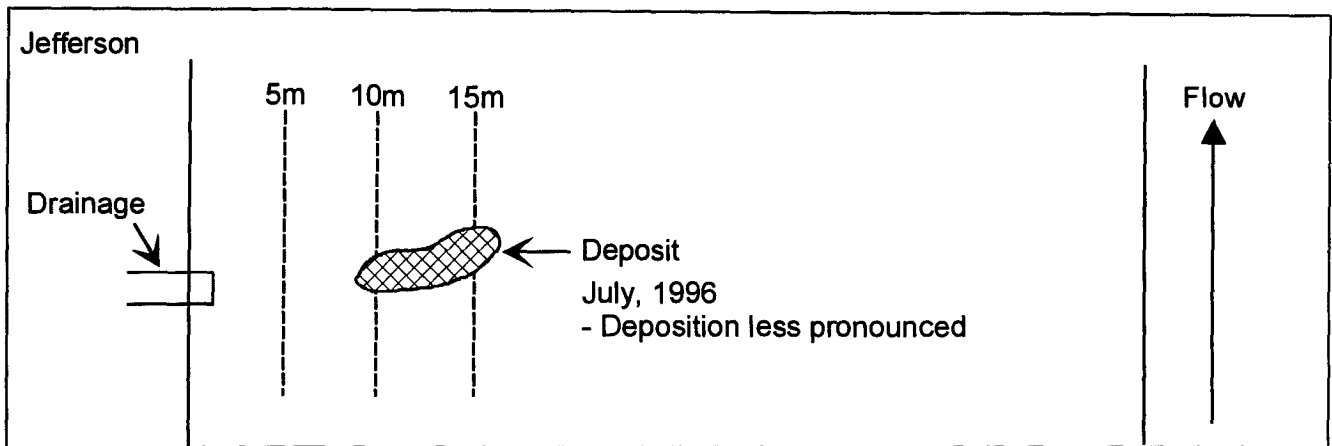


Oct. 11, 1995 Investigation of Potential Sediment Plumes Associated with Land Drains and CSO Outfalls

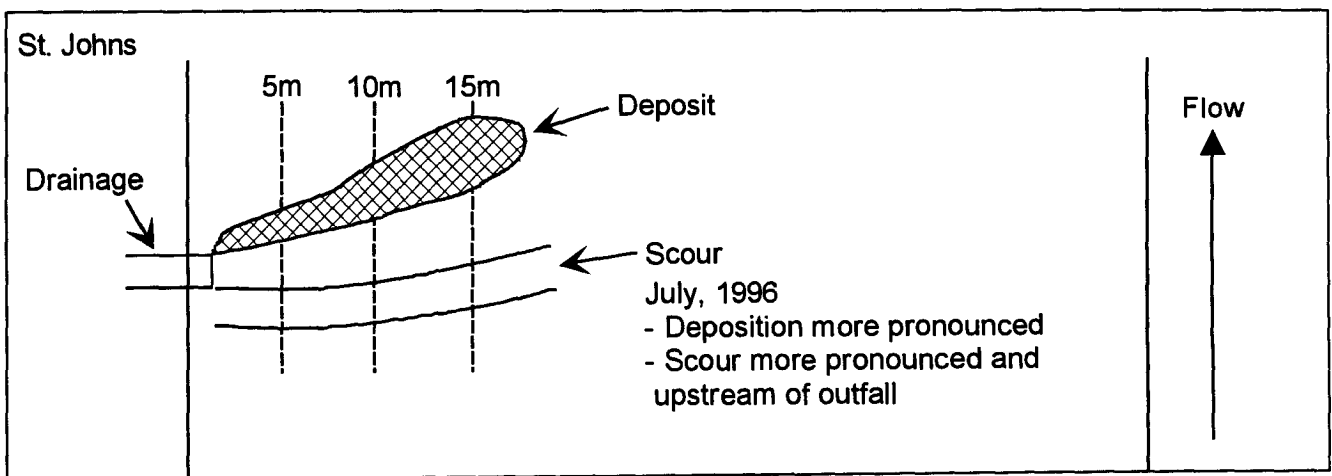
Figure 1-1



Kilkenny Drive Outfall



Jefferson Outfall



St. Johns Outfall

1994 survey of these sites. Three of the outfalls (North Kilkenny Drive, Jefferson and St. Johns) demonstrated evidence of either scouring or deposition or both scouring and deposition.

The North Kilkenny Drive outfall displayed evidence of a downstream scour with a deposition on the leading edge (upstream side) of the scour (Figure 3-1). This feature was not noted during the October 11, 1994 survey, however, a review of the 1994 paper graph results for this outfall suggests that a similar scour/deposit combination was present.

The Jefferson outfall contained a deposition approximately 10 to 15 metres from the shoreline (Figure 3-1). This is in agreement with the results of the 1994 survey.

The St. Johns outfall appeared to contain both a riverbed scour combined with a downstream deposit (Figure 3-1). This result is in agreement with the 1994 survey.

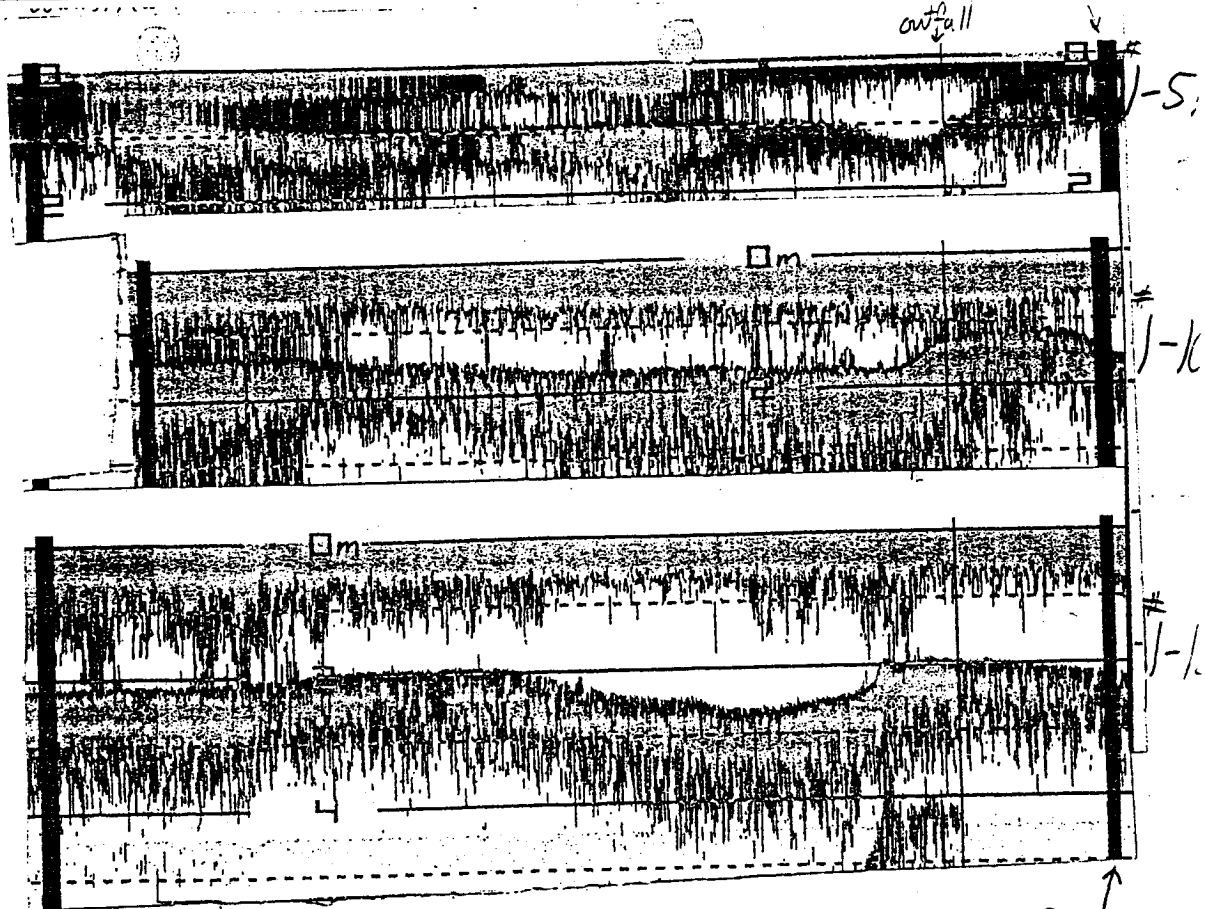
4. CONCLUSION

In general, the results of the survey demonstrate no pattern of river sediment scouring or deposition based on river characteristics. Each outfall into the Red River would have to be examined to be able to determine its potential for scouring or deposition.

APPENDIX A

**SONAR PAPER TRACES OF
THE FIELD SURVEY**

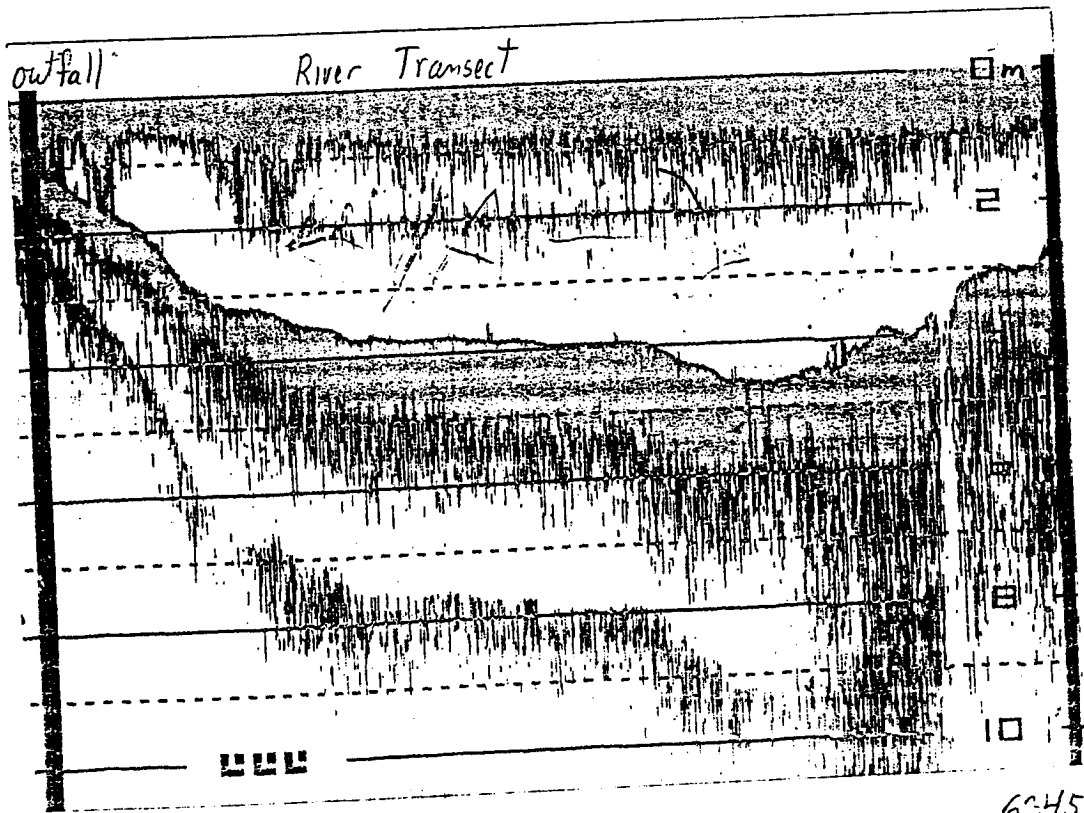
North
 Kilkenny Dr.
 and Drainage



UTM NAP-27
 634404 E
 5517606 N

634366 E
 5517491 N

1A



634507 E
 5517682 N

634553
 5517568

Figure 2

Kings Cr.
Land Drainage

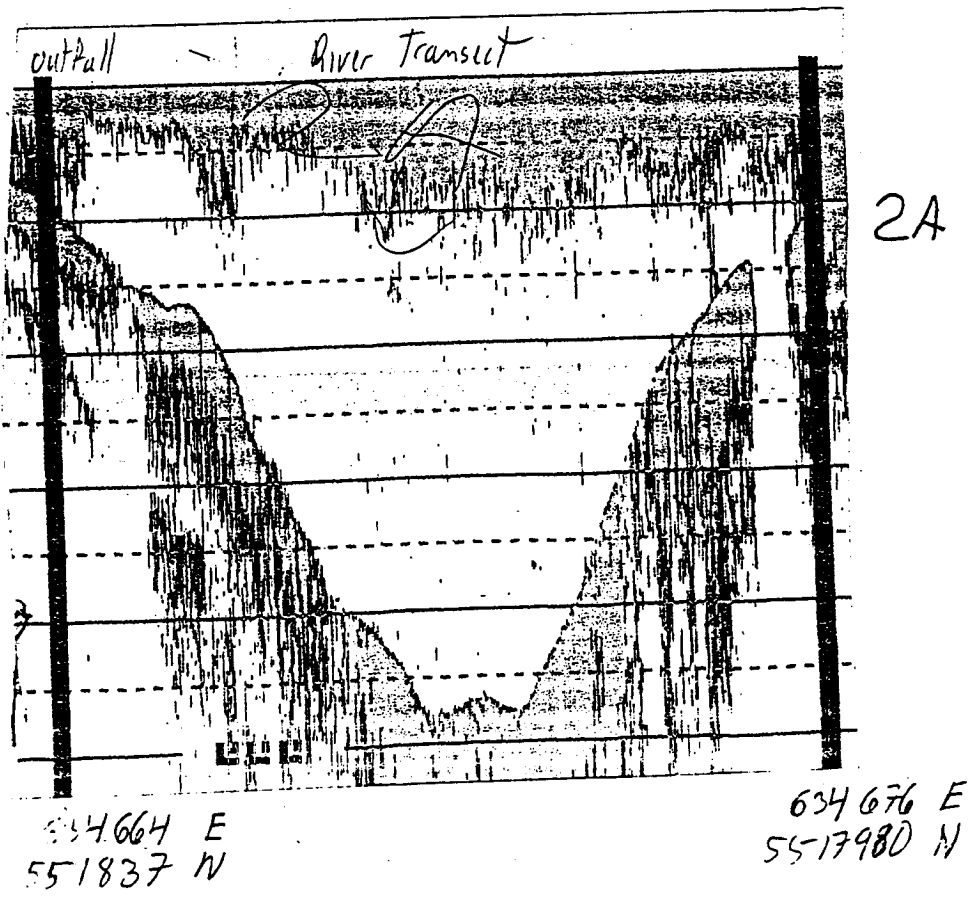
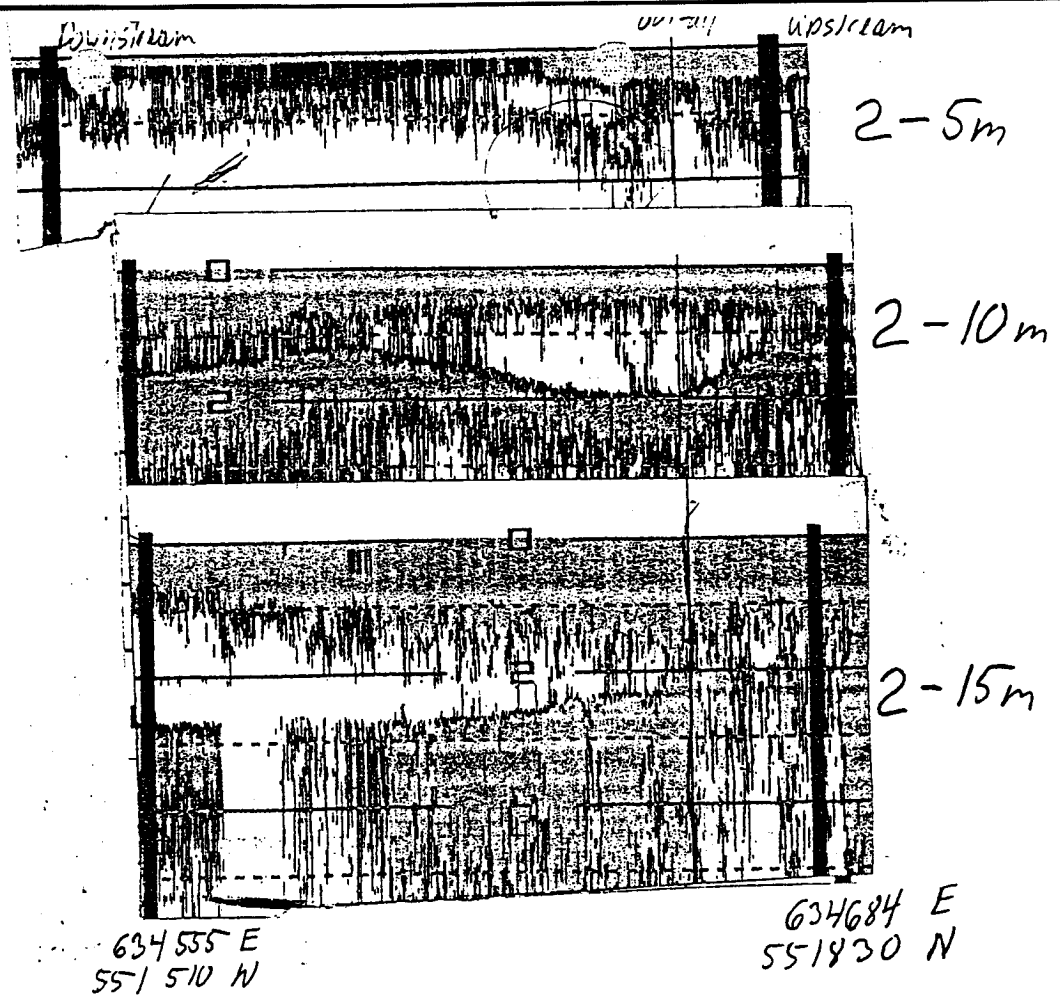


Figure 3

South
St. Vital
Land Drainage

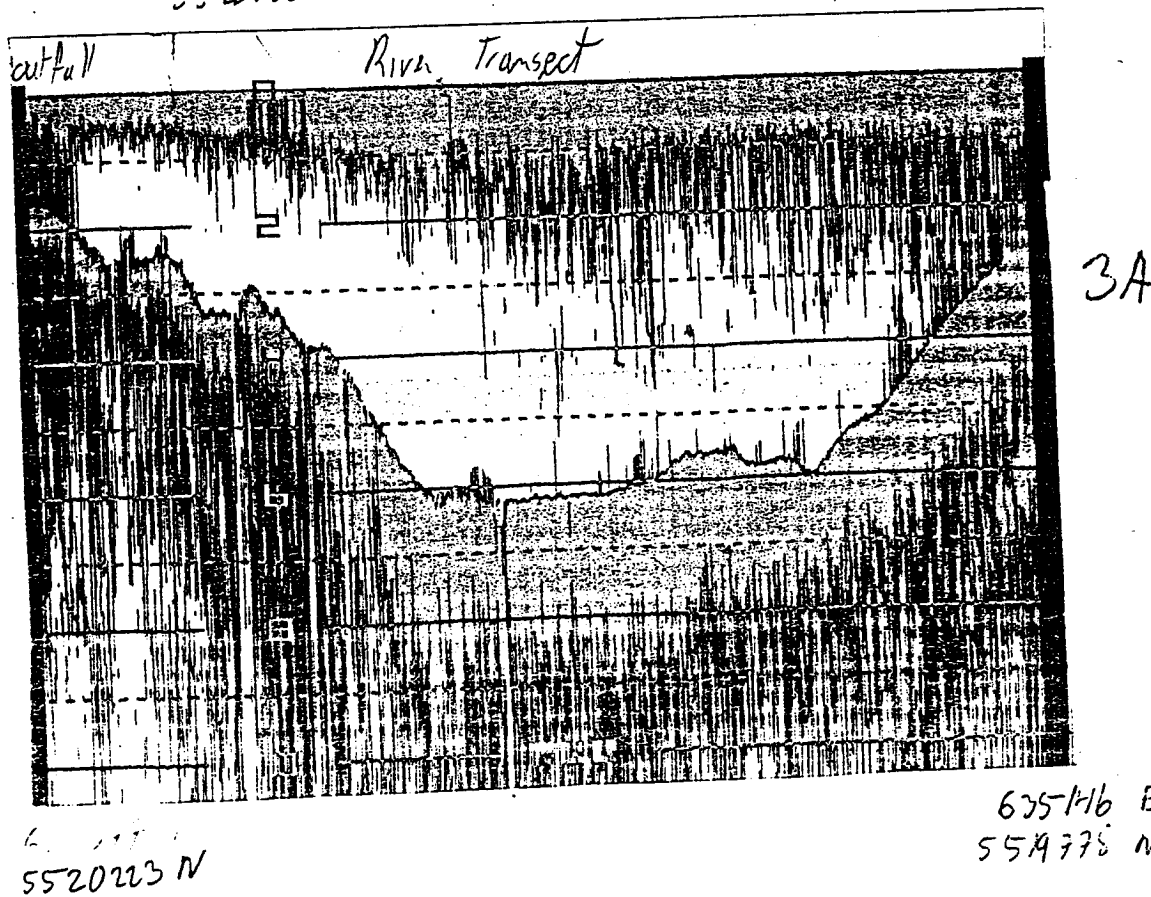
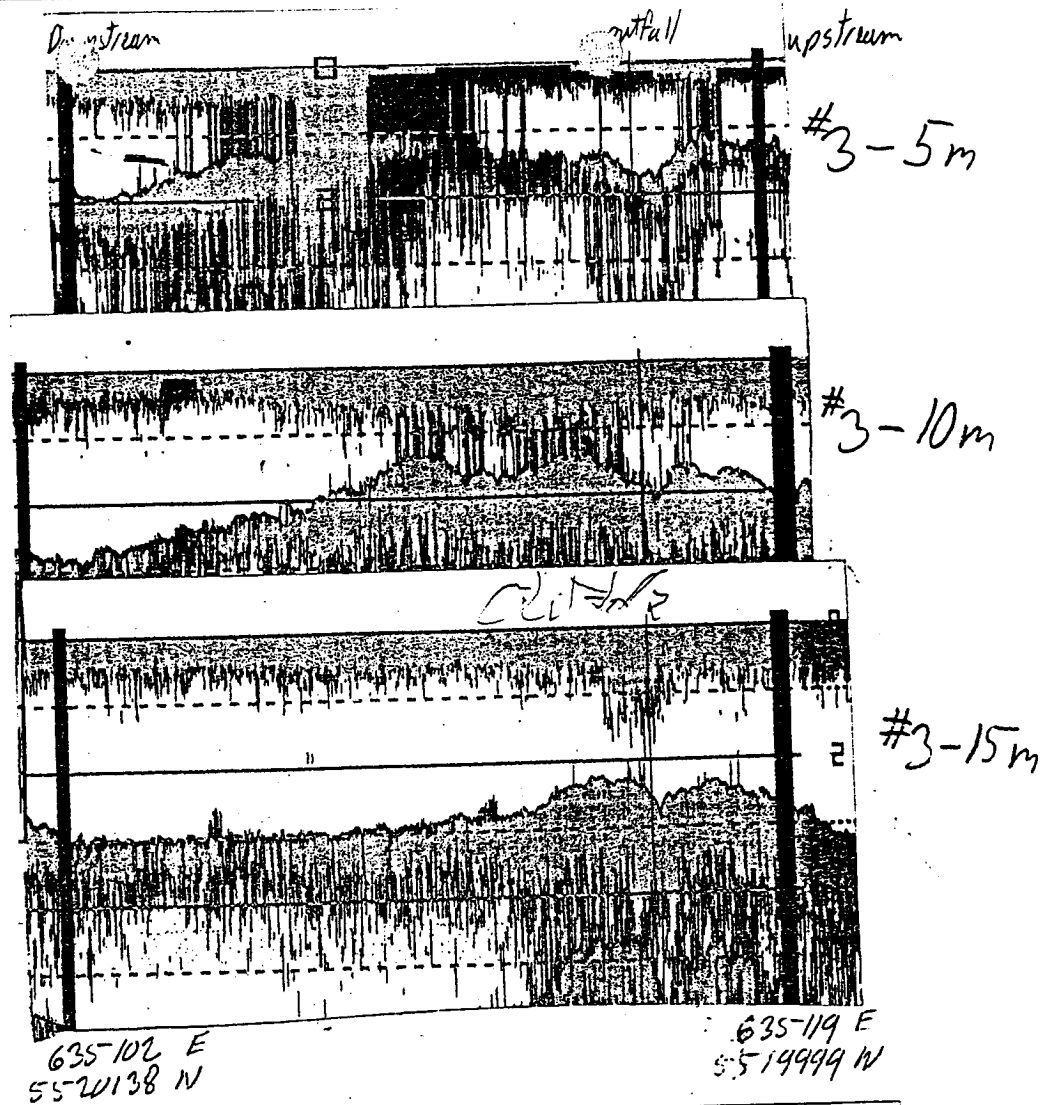
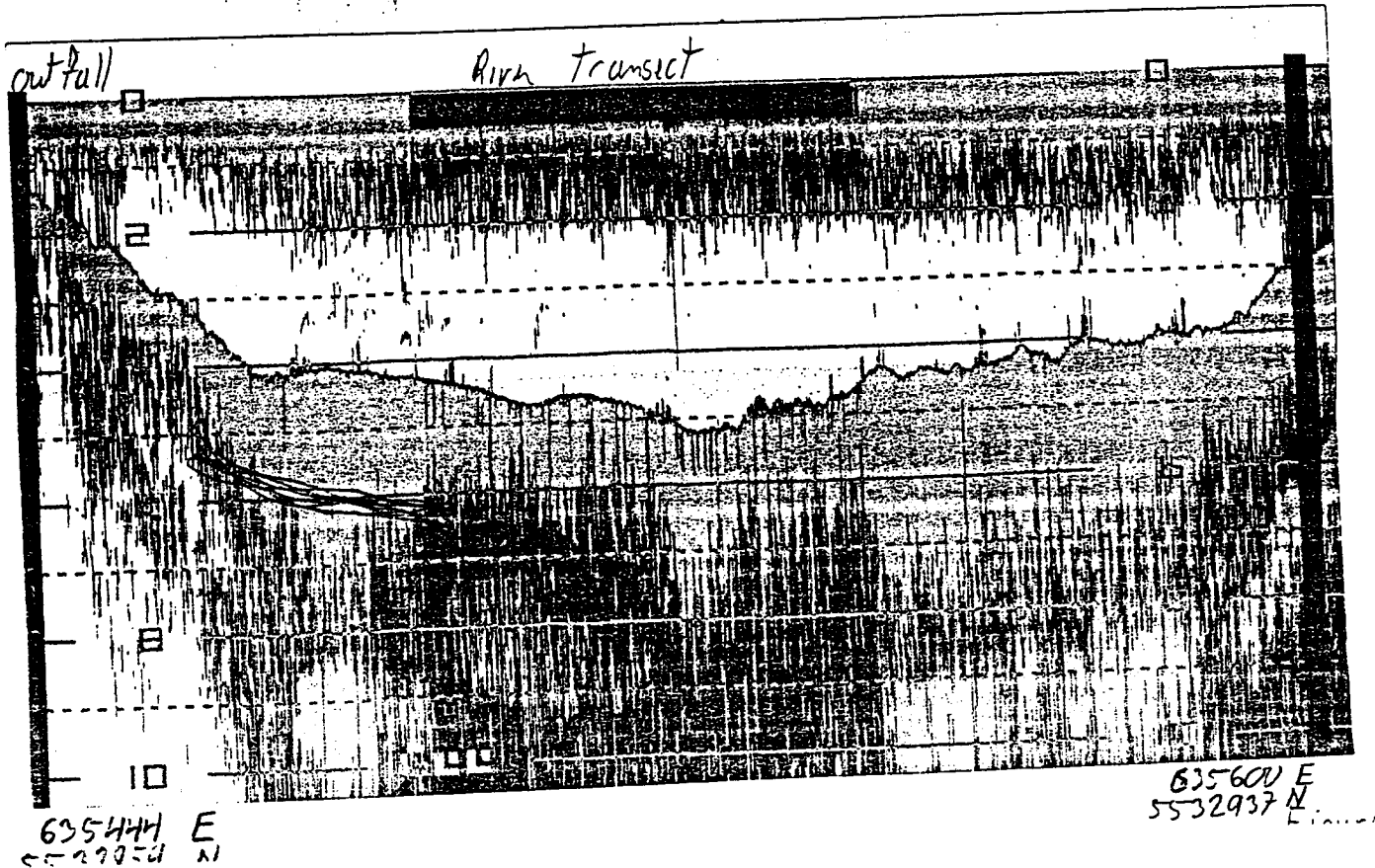
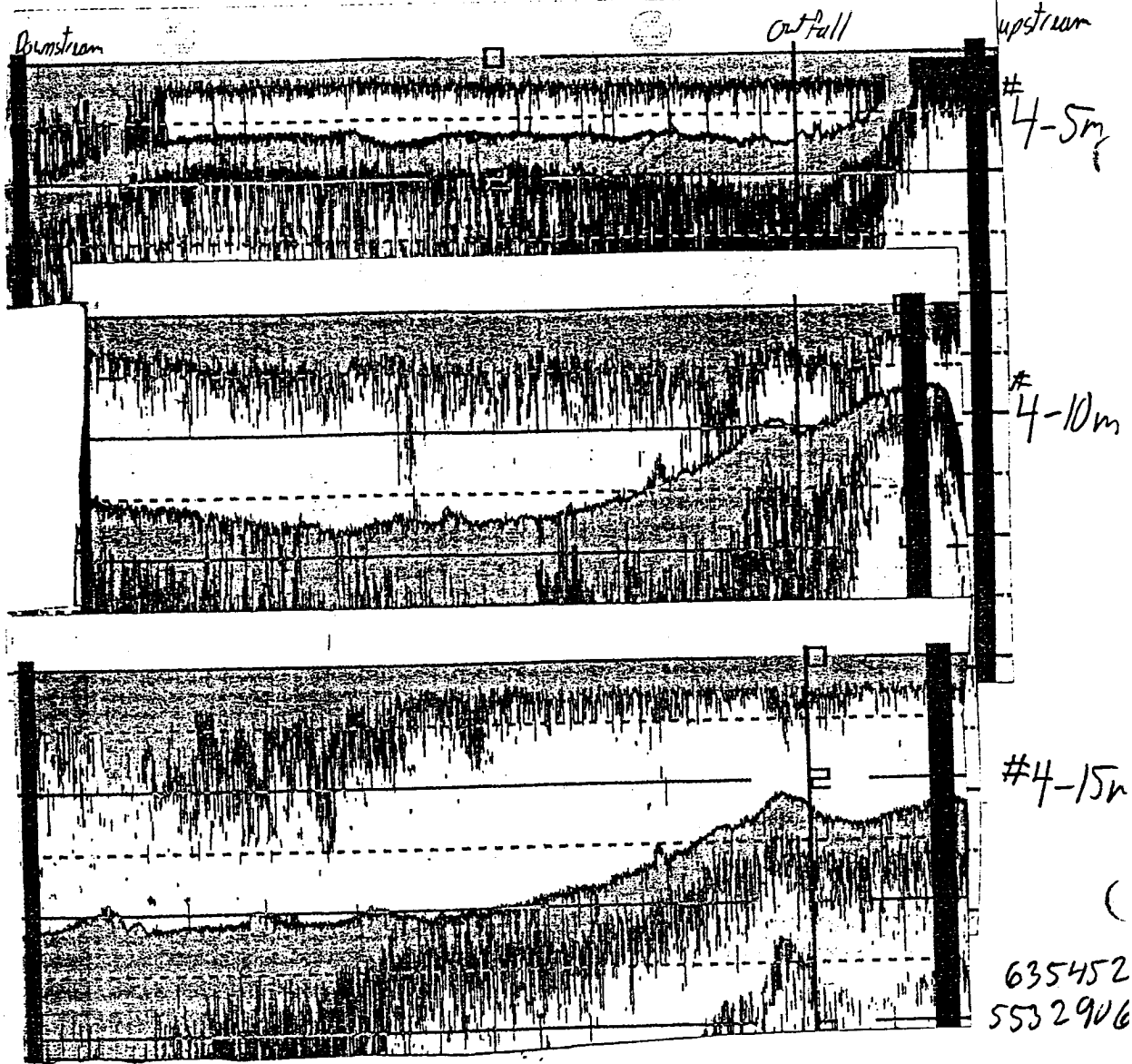


Figure 4

Jefferson
Outfall

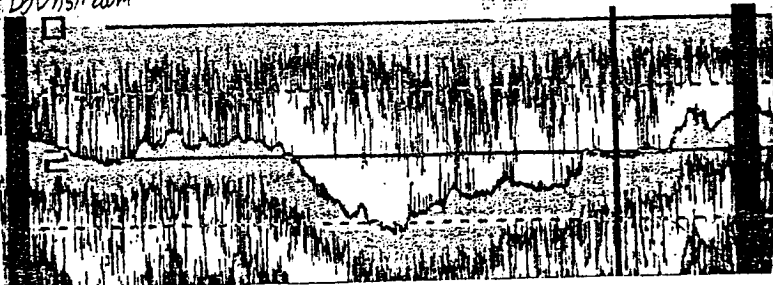


Munroe
outfall

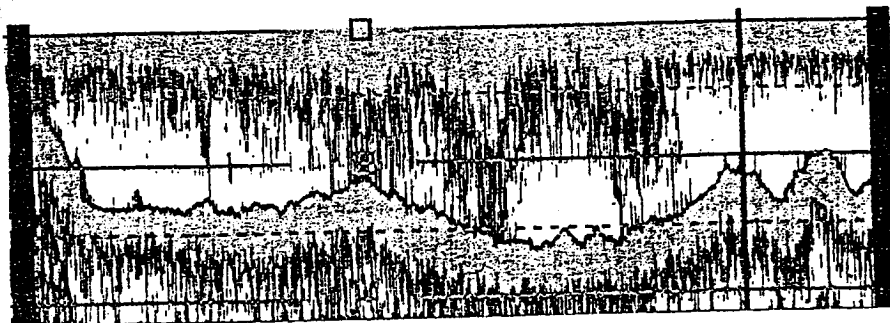
Downstream

outfall

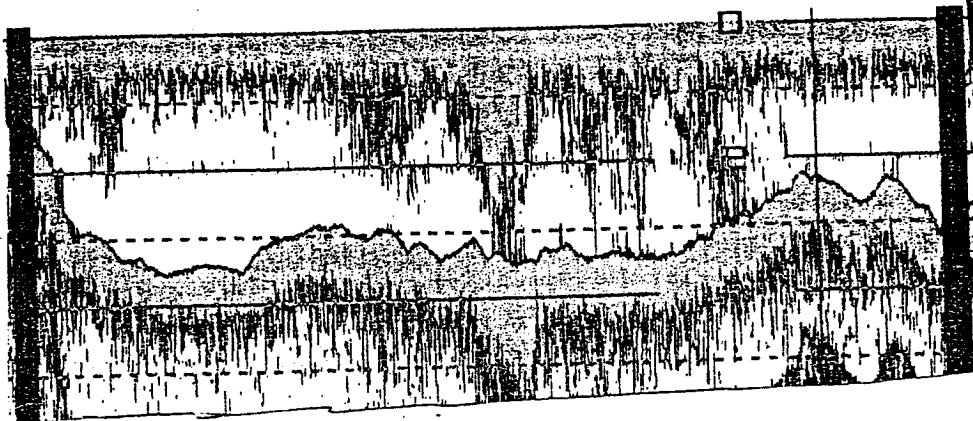
upstream



#5-5m



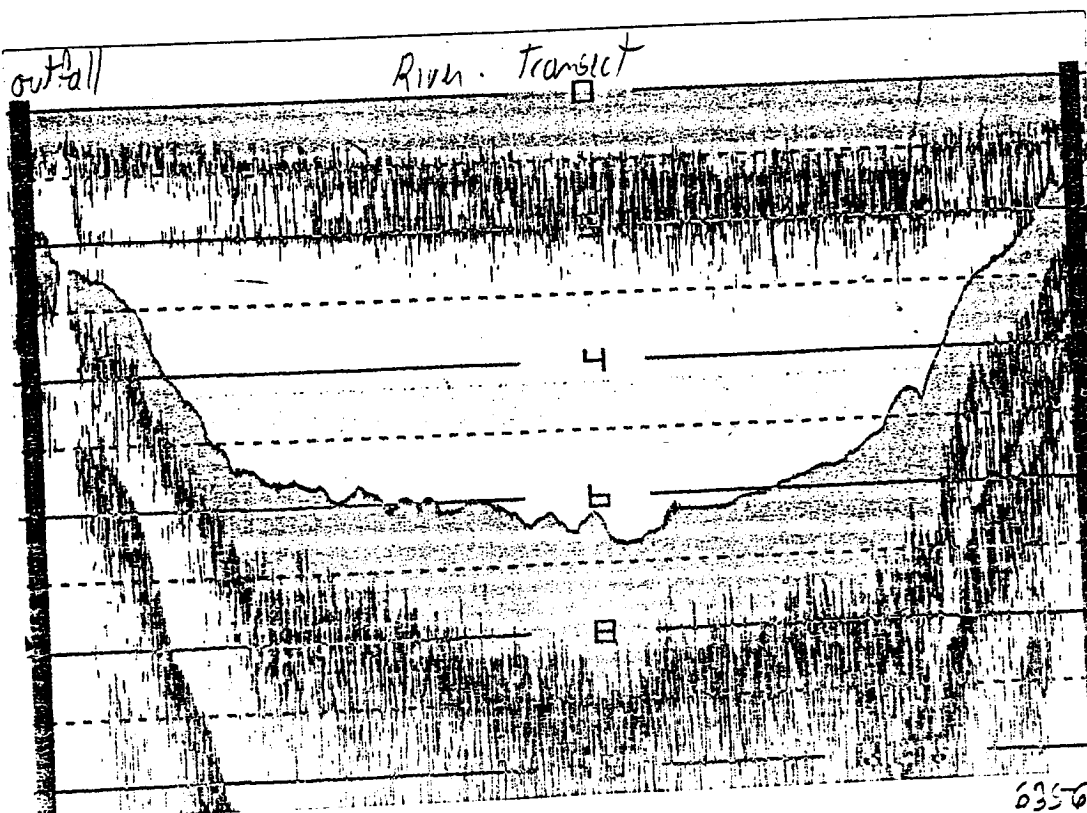
#5-10m



#5-15m

635575 E
5531745 N

635640 E
5531862 N



outfall

River Transect

5A

635666 E
5531782 N

635614 E
553268 N

Figure 4

St. Johns
Outfall

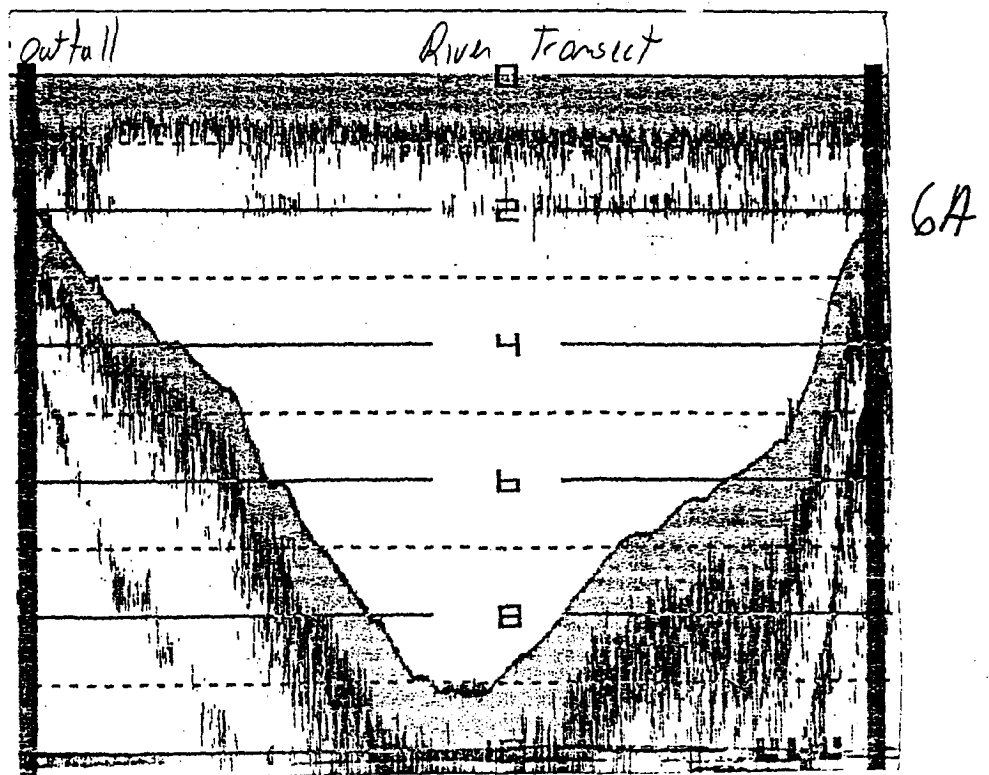
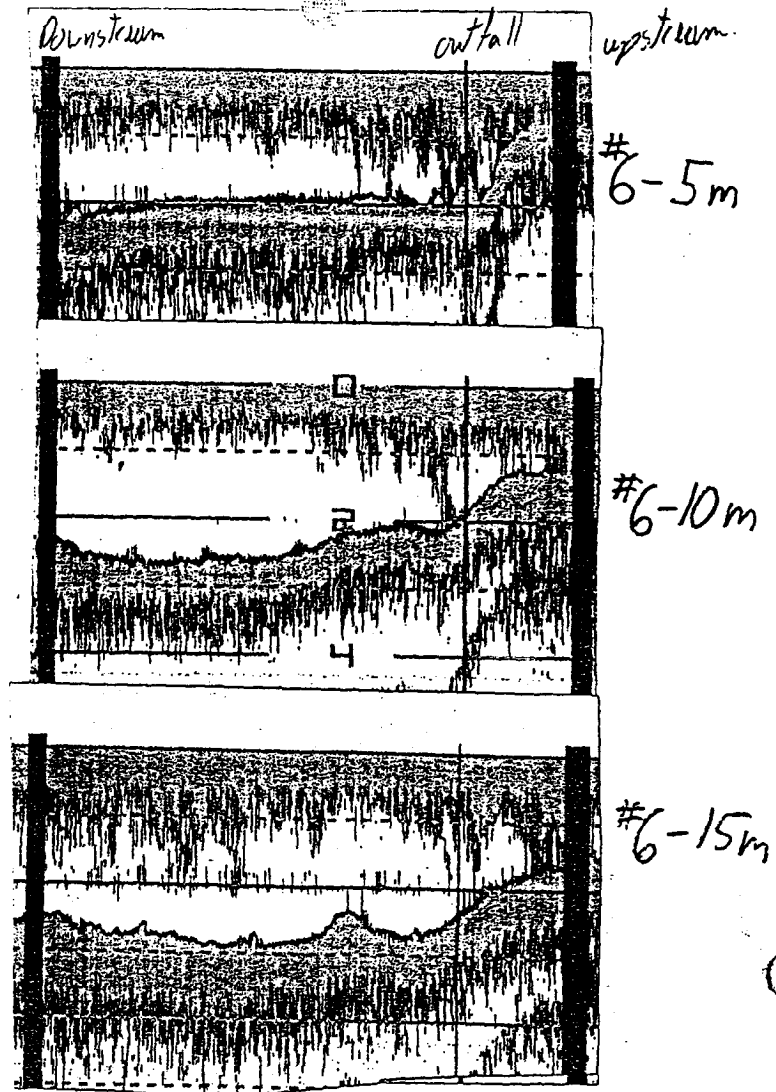


Figure 3