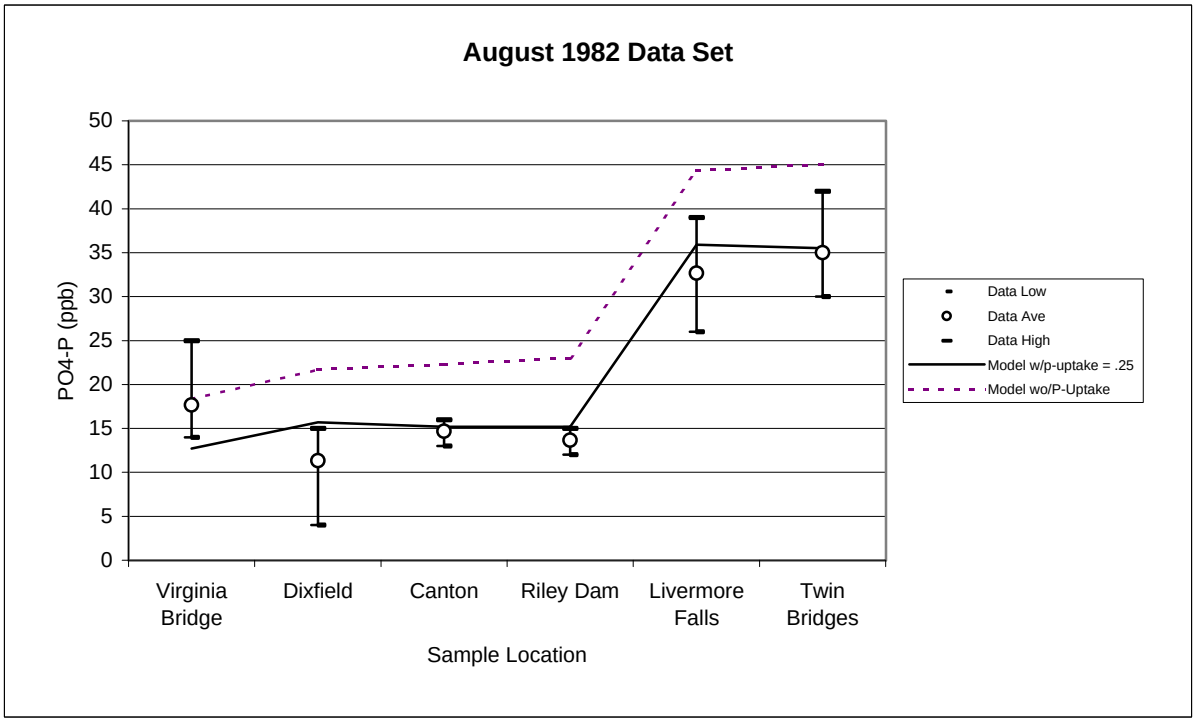
Figure 21 - Calibration of Upper Androscoggin River PO4-P Uptake Rate



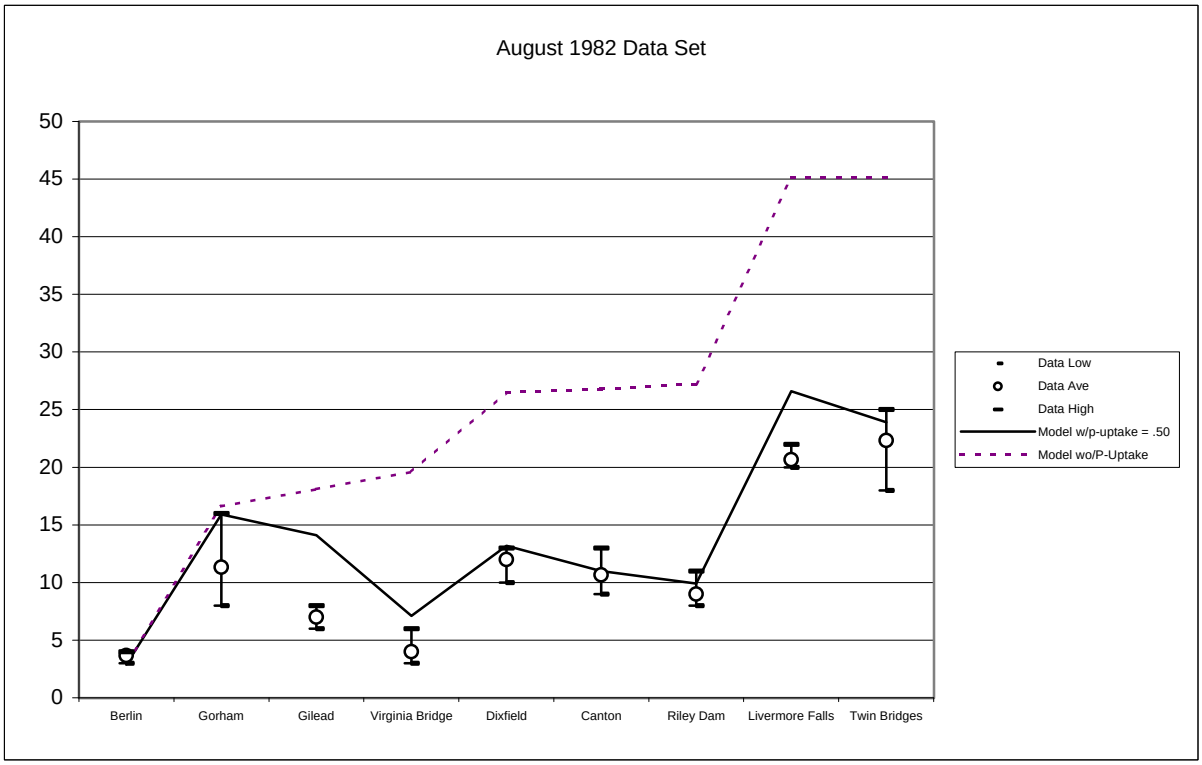


Figure 22
TSS Calibration Summer 1989
Kr = .10 /day

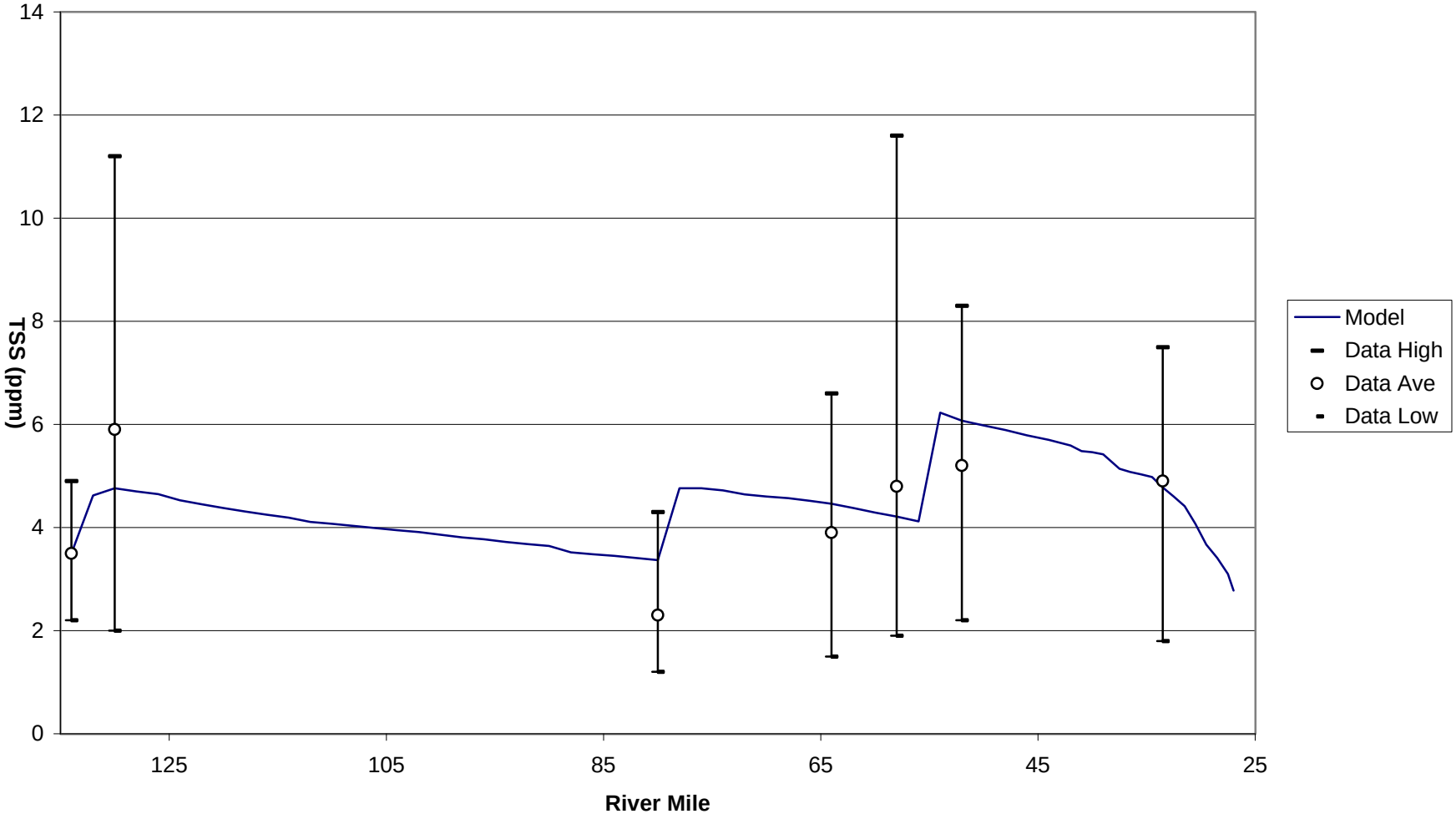


Figure 23

Origin of Sediment Oxygen Demand in Gulf Island Pond
By Source

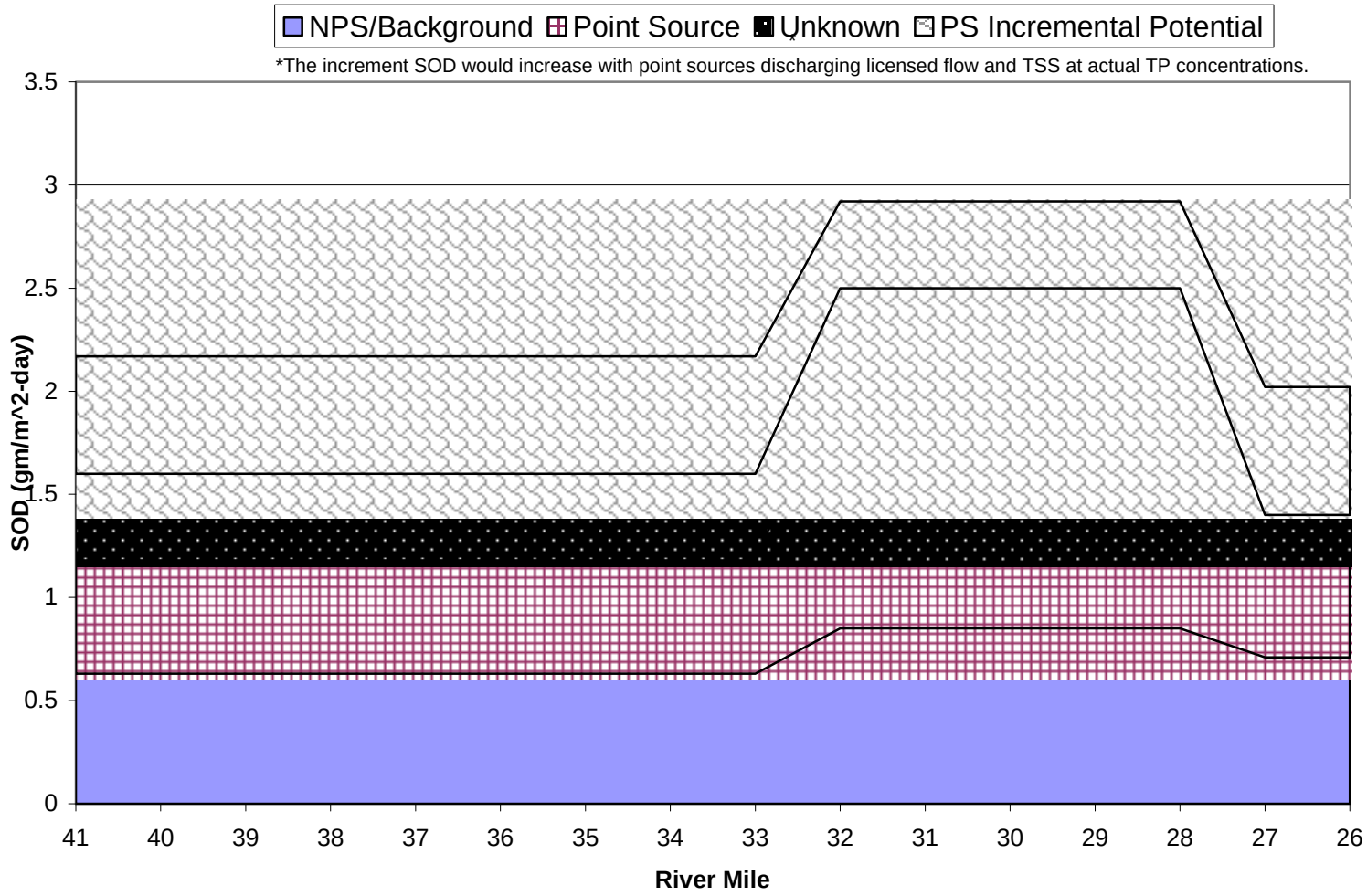


Figure 24
Origin of Sediment Oxygen Demand in Gulf Island Pond
By Pollutant Parameters

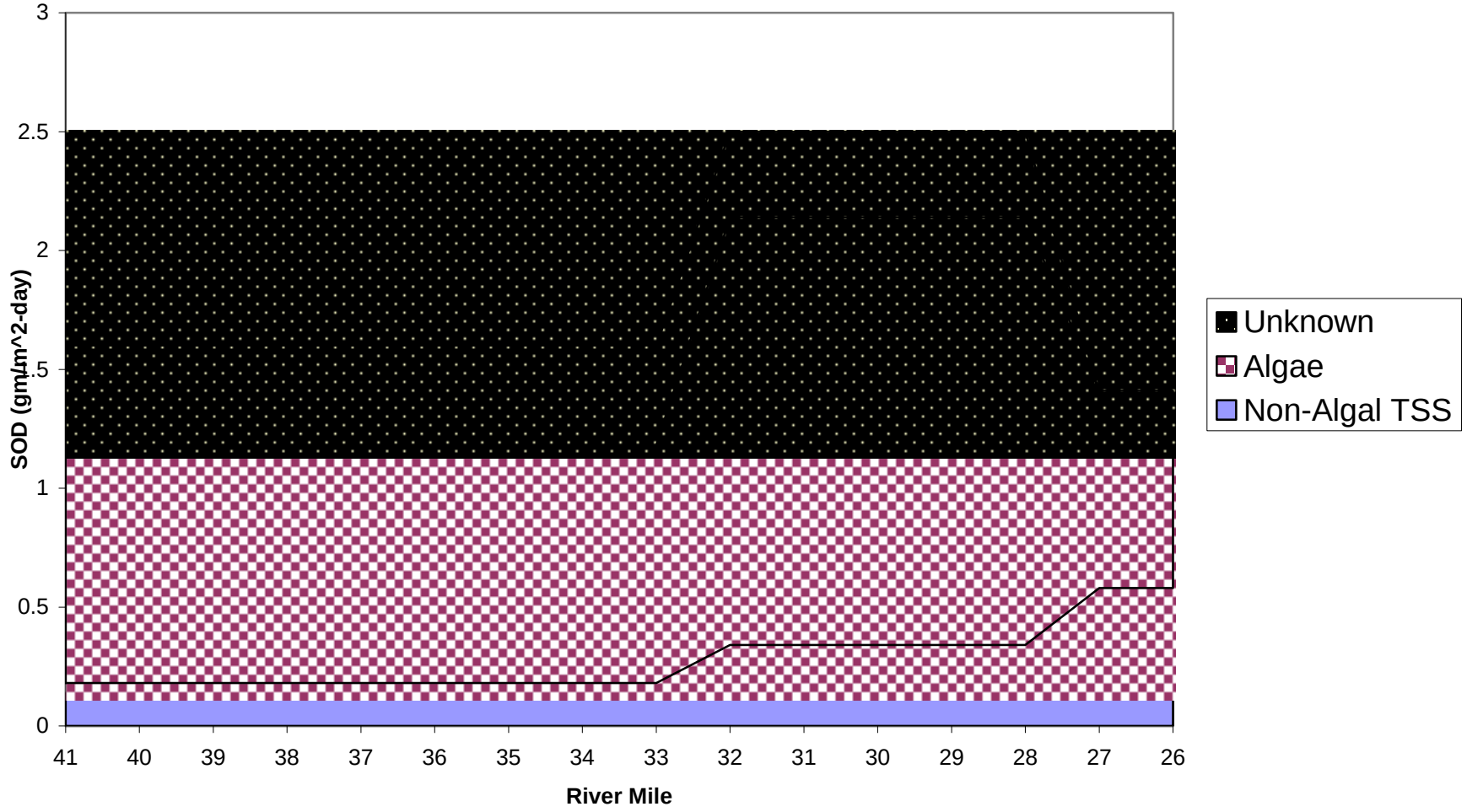


Figure 25
Sediment Oxygen Demand Used in Model Prediction Runs

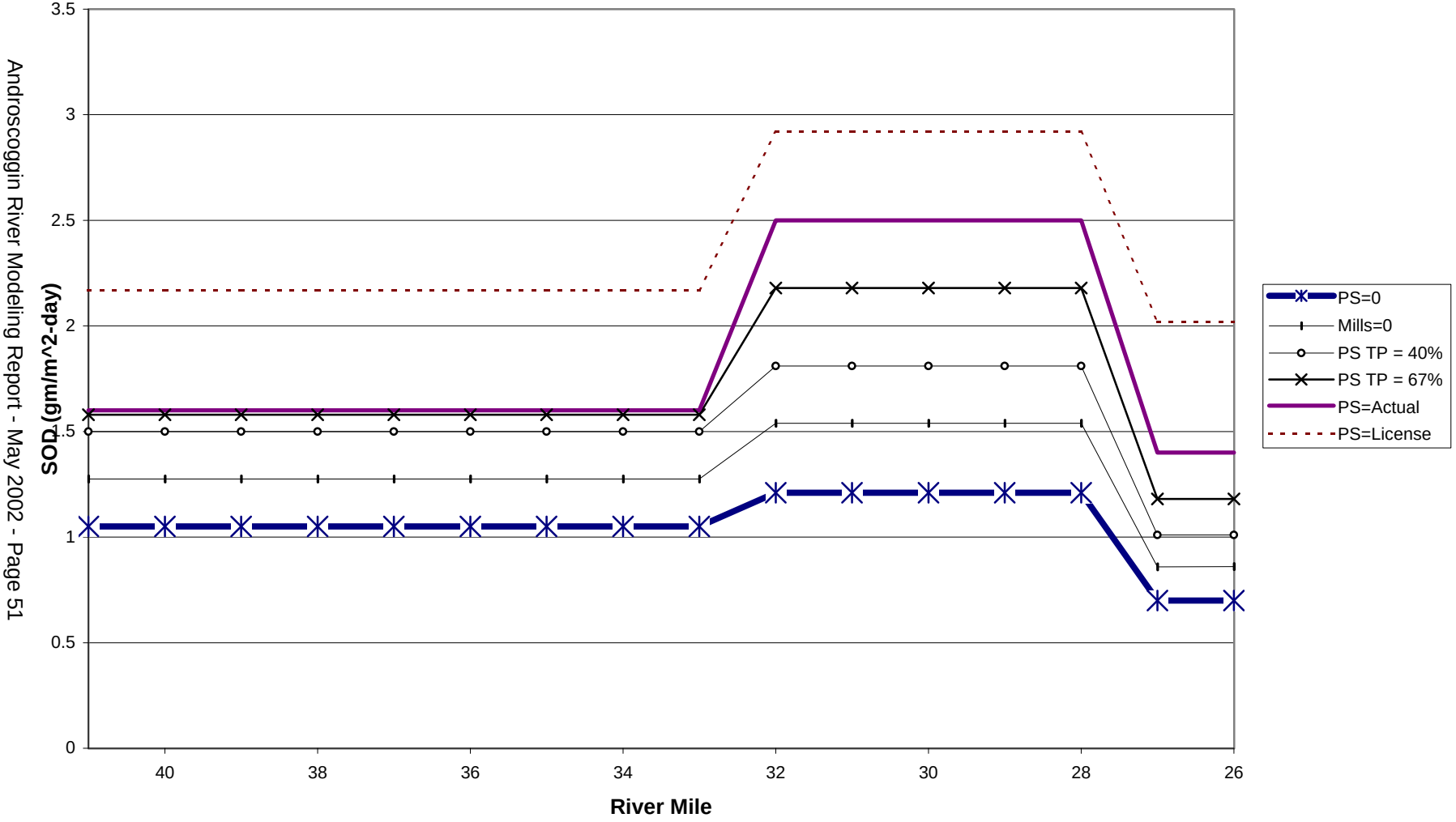


Figure 26 - Diurnal Dissolved Oxygen Vs Chlorophyll A Regression

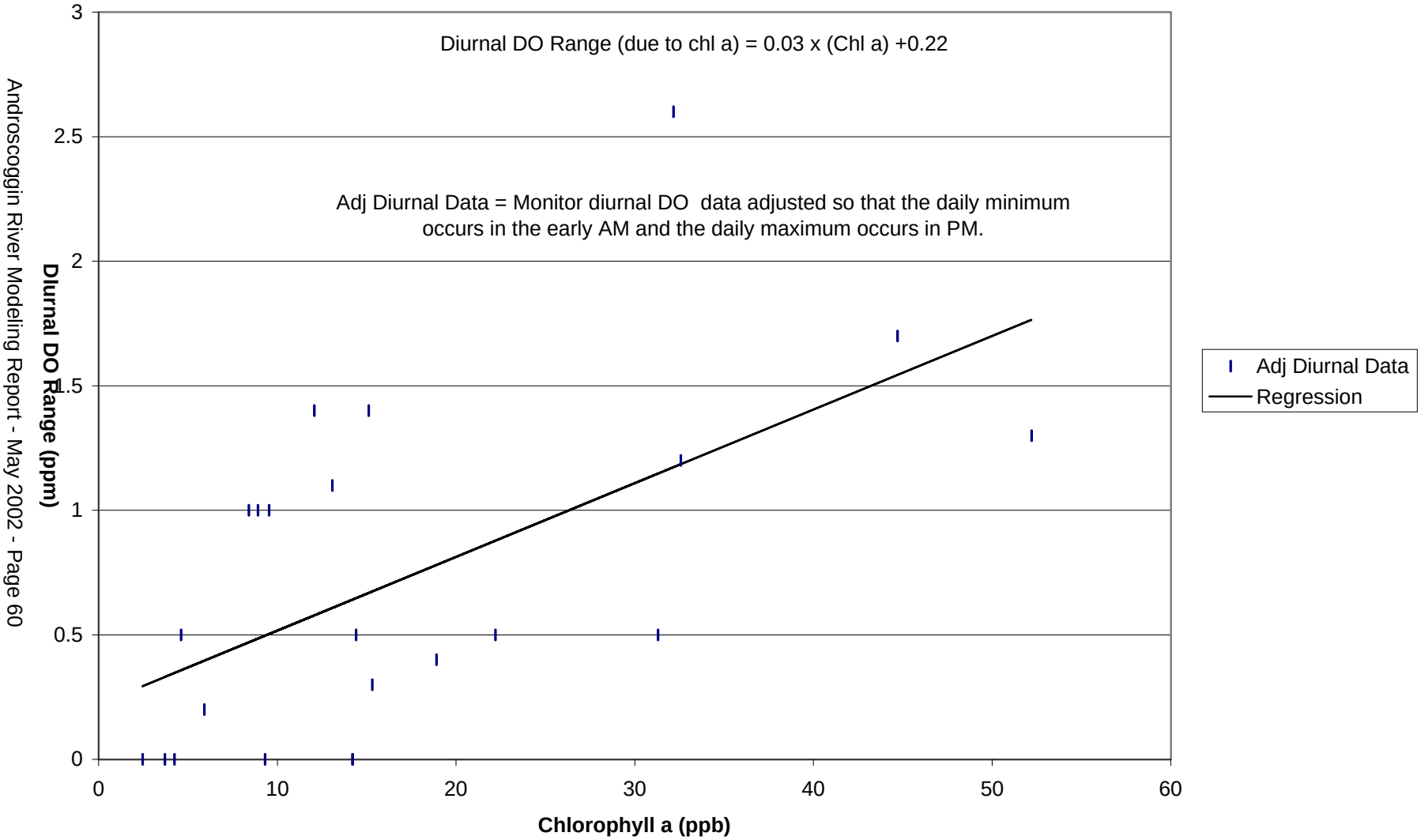
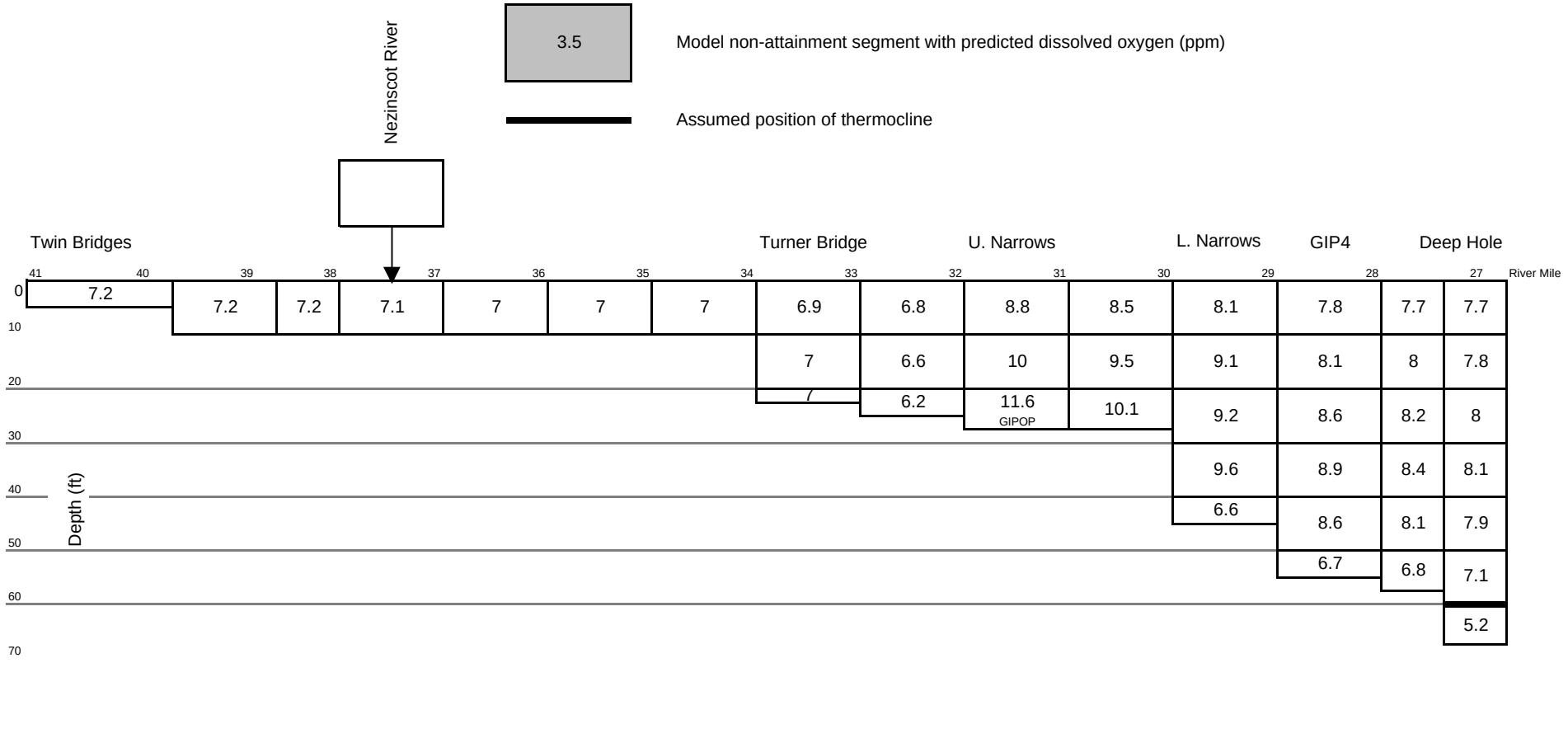


Figure 27 - Model Prediction of Minimum Dissolved Oxygen Non-Attainment in Gulf Island Pond

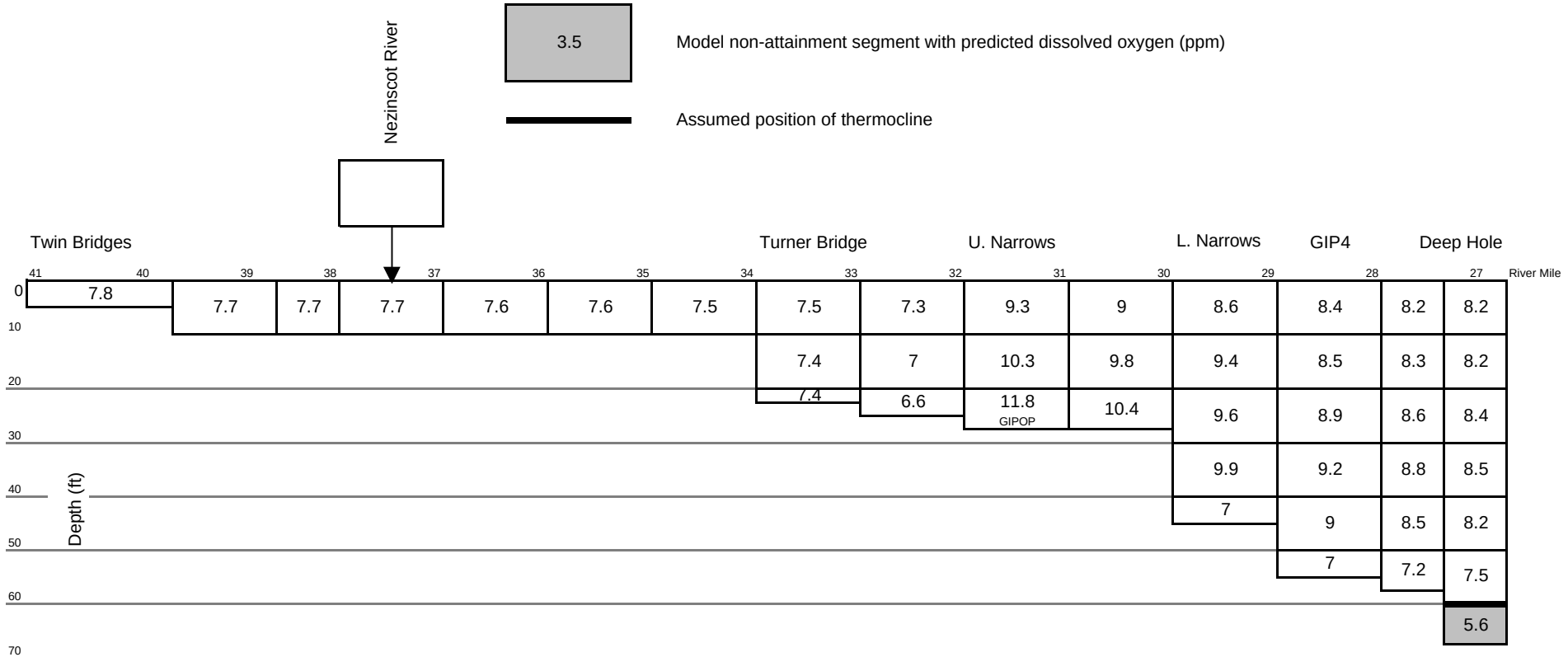
Run 0a - Point Sources at Zero Discharge with GIPOP



The entire volume of Gulf Island Pond meets minimum Class C dissolved oxygen criteria (5 ppm).

Figure 28 - Model Prediction of 30-Day Average Dissolved Oxygen Non-Attainment in Gulf Island Pond

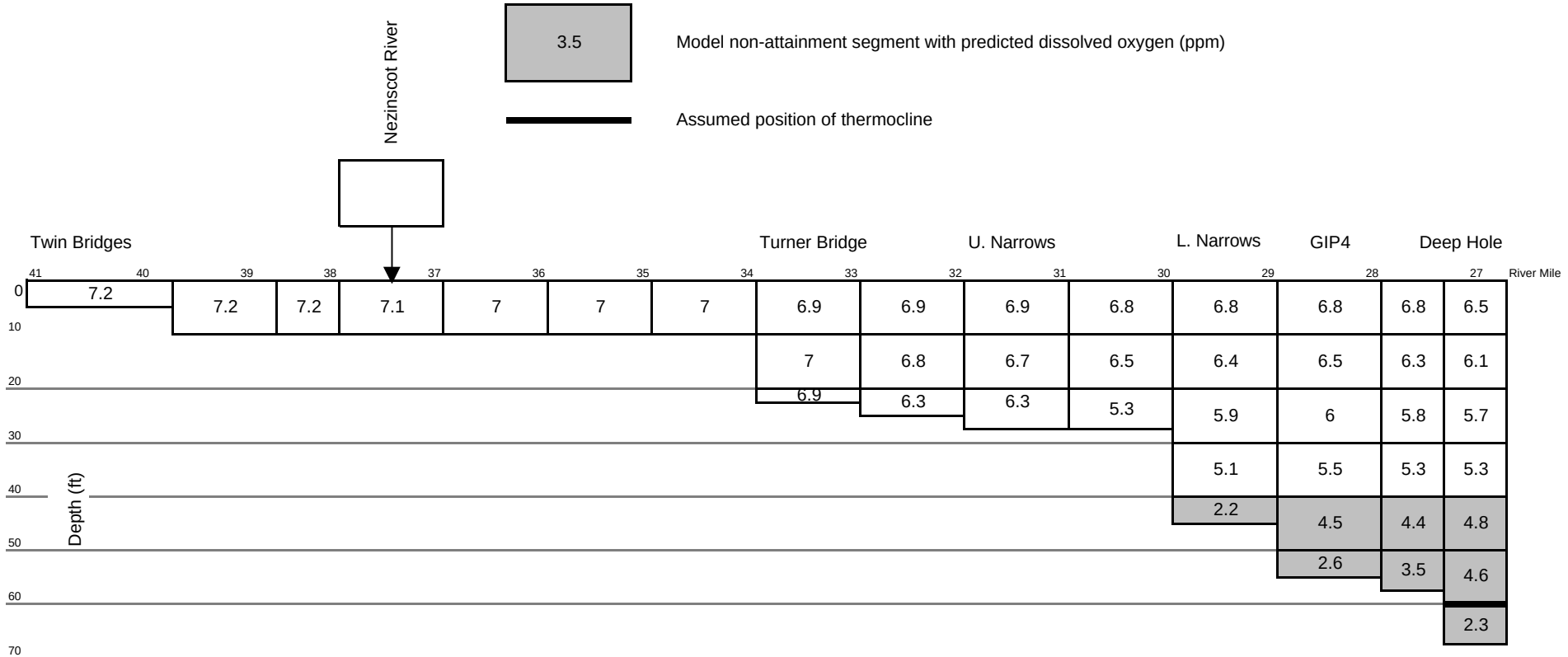
Run 0a - Point Sources at Zero Discharge with GIPOP



1% of the volume of Gulf Island Pond does not meet the monthly mean Class C dissolved oxygen criteria (6.5 ppm).

Figure 29 - Model Prediction of Minimum Dissolved Oxygen Non-Attainment in Gulf Island Pond

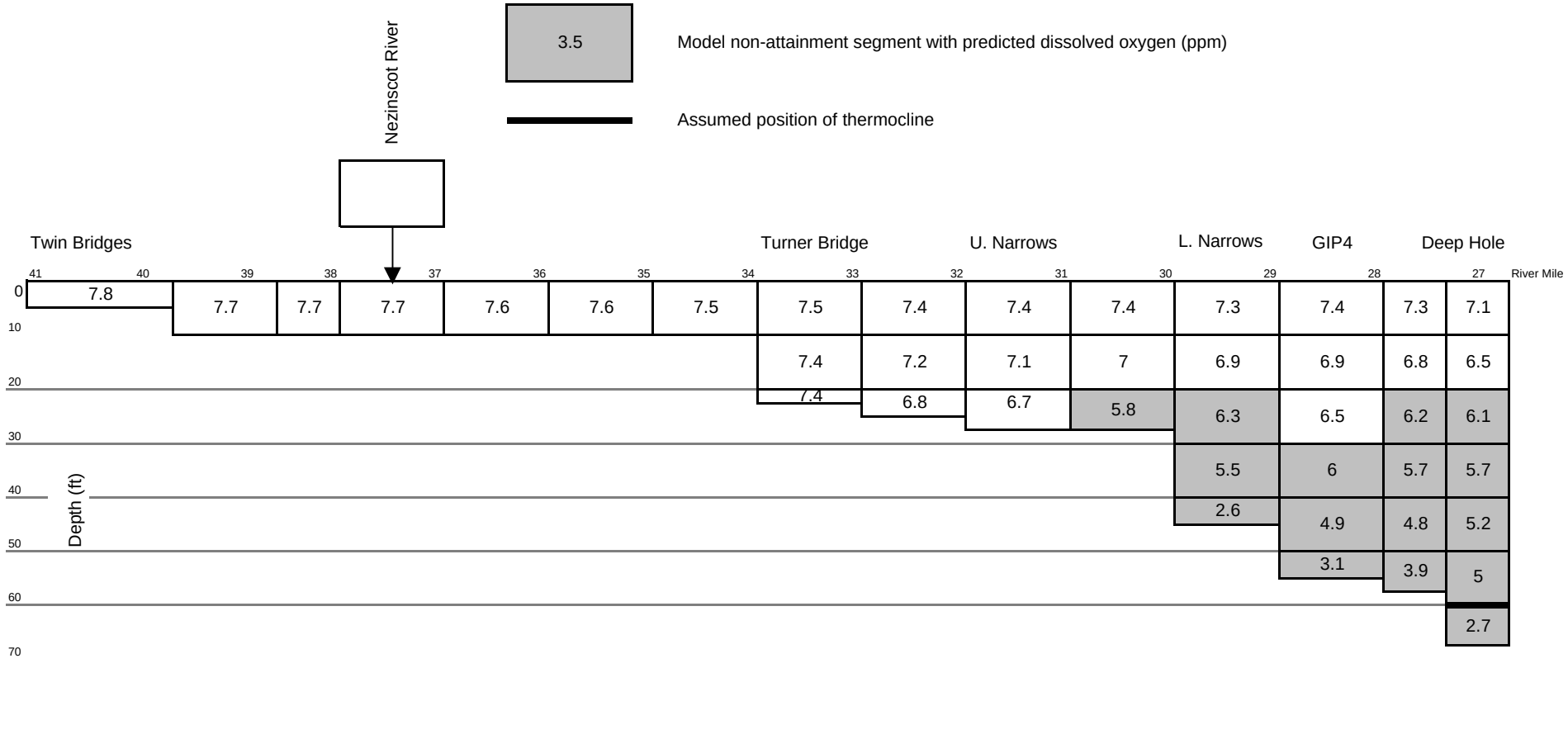
Run 0b - Point Sources at Zero Discharge without GIPOP



10% of the volume of Gulf Island Pond does not meet minimum Class C dissolved oxygen criteria (5 ppm).

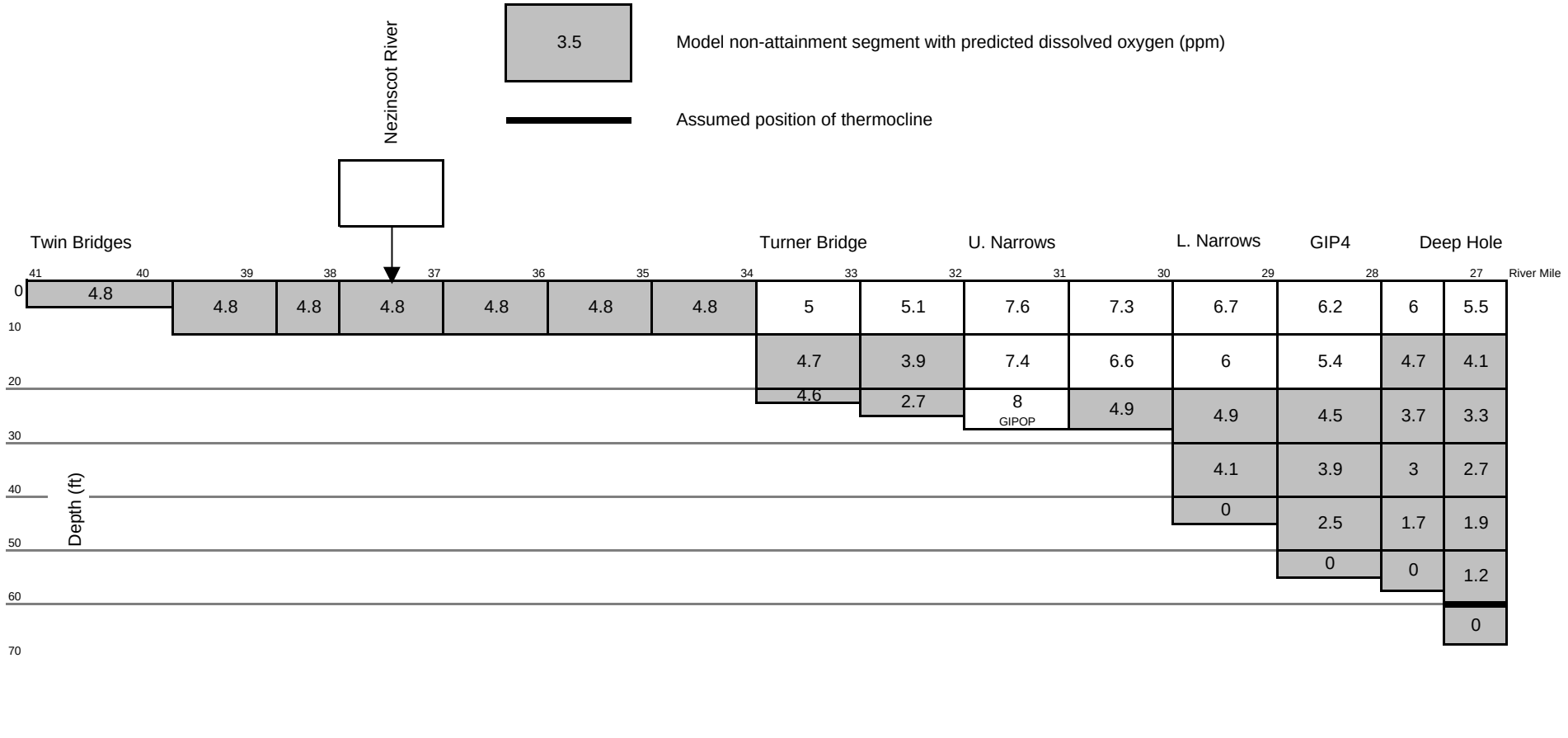
Figure 30 - Model Prediction of 30-Day Average Dissolved Oxygen Non-Attainment in Gulf Island Pond

Run 0b - Point Sources at Zero Discharge without GIPOP



29% of the volume of Gulf Island Pond does not meet the monthly mean Class C dissolved oxygen criteria (6.5 ppm).

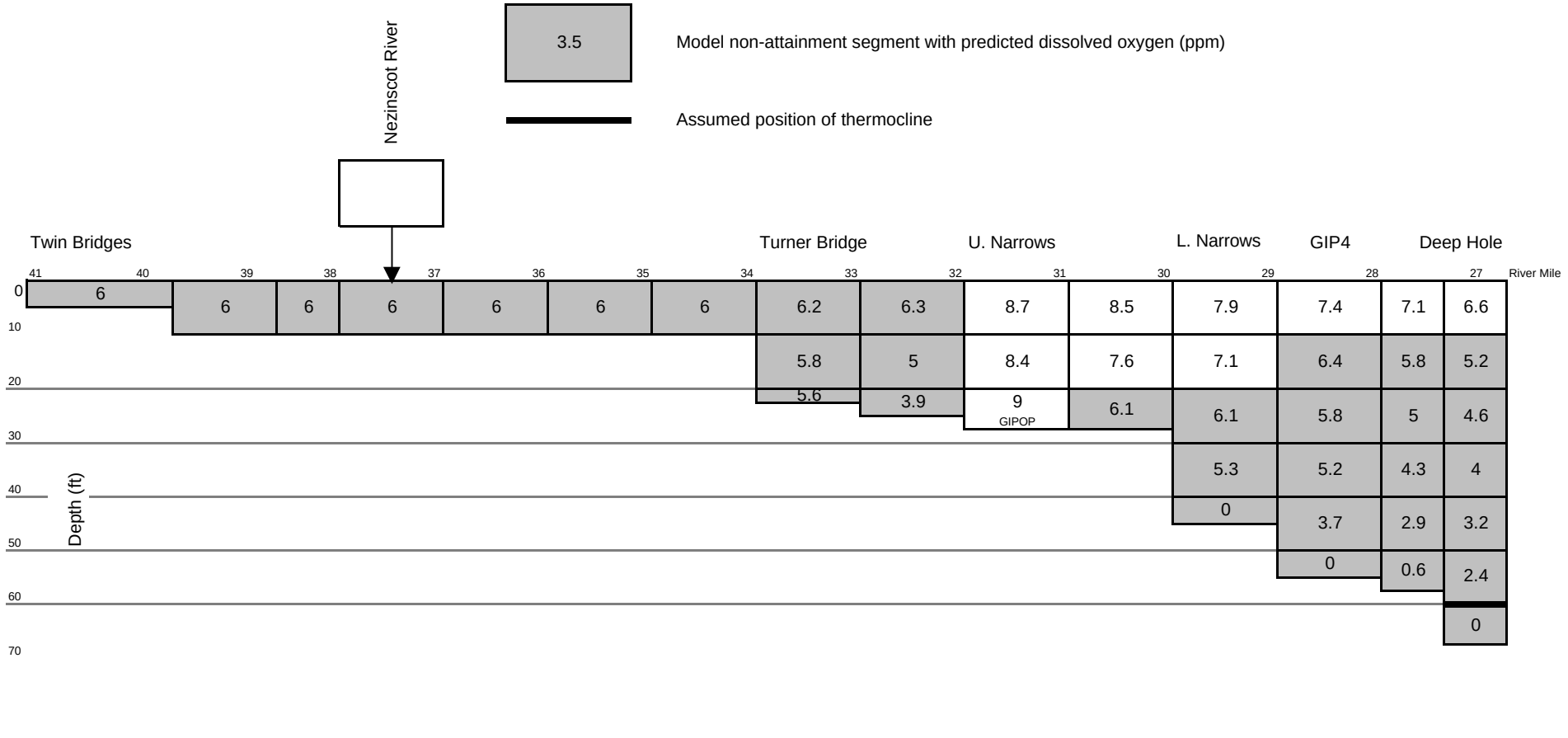
Figure 31 - Model Prediction of Mimimum Dissolved Oxygen Non-Attainment in Gulf Island Pond
Run 1a - Current Licensed Loading of Point Sources with GIPOP



55% of the volume of Gulf Island Pond does not meet minimum Class C dissolved oxygen criteria (5 ppm).

Figure 32 - Model Prediction of 30-Day Average Dissolved Oxygen Non-Attainment in Gulf Island Pond

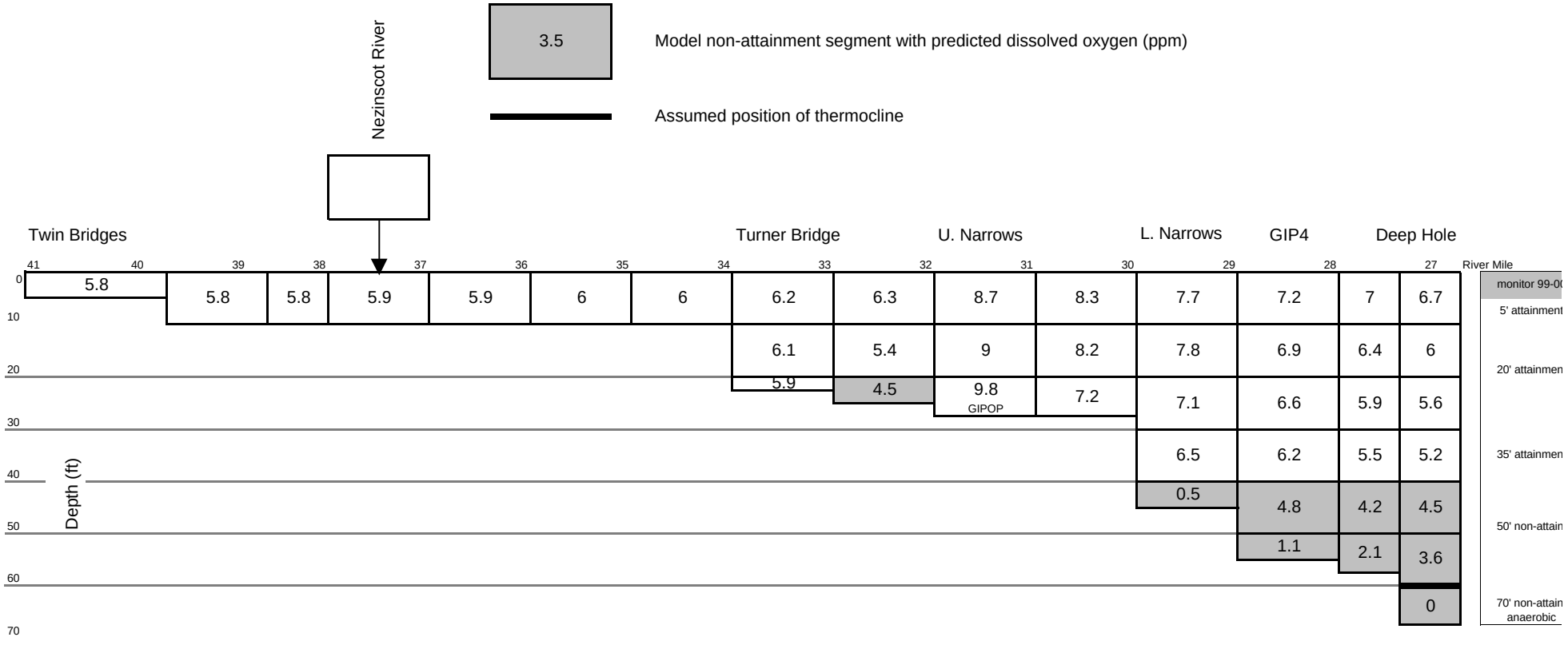
Run 1a - Current Licensed Loading of Point Sources with GIPOP



72% of the volume of Gulf Island Pond does not meet the monthly mean Class C dissolved oxygen criteria (6.5 ppm).

Figure 33 - Model Prediction of Mimimum Dissolved Oxygen Non-Attainment in Gulf Island Pond

Run 2a - Point Sources at Actual Discharge Levels with GIPOP



11% of the volume of Gulf Island Pond does not meet minimum Class C dissolved oxygen criteria (5 ppm).

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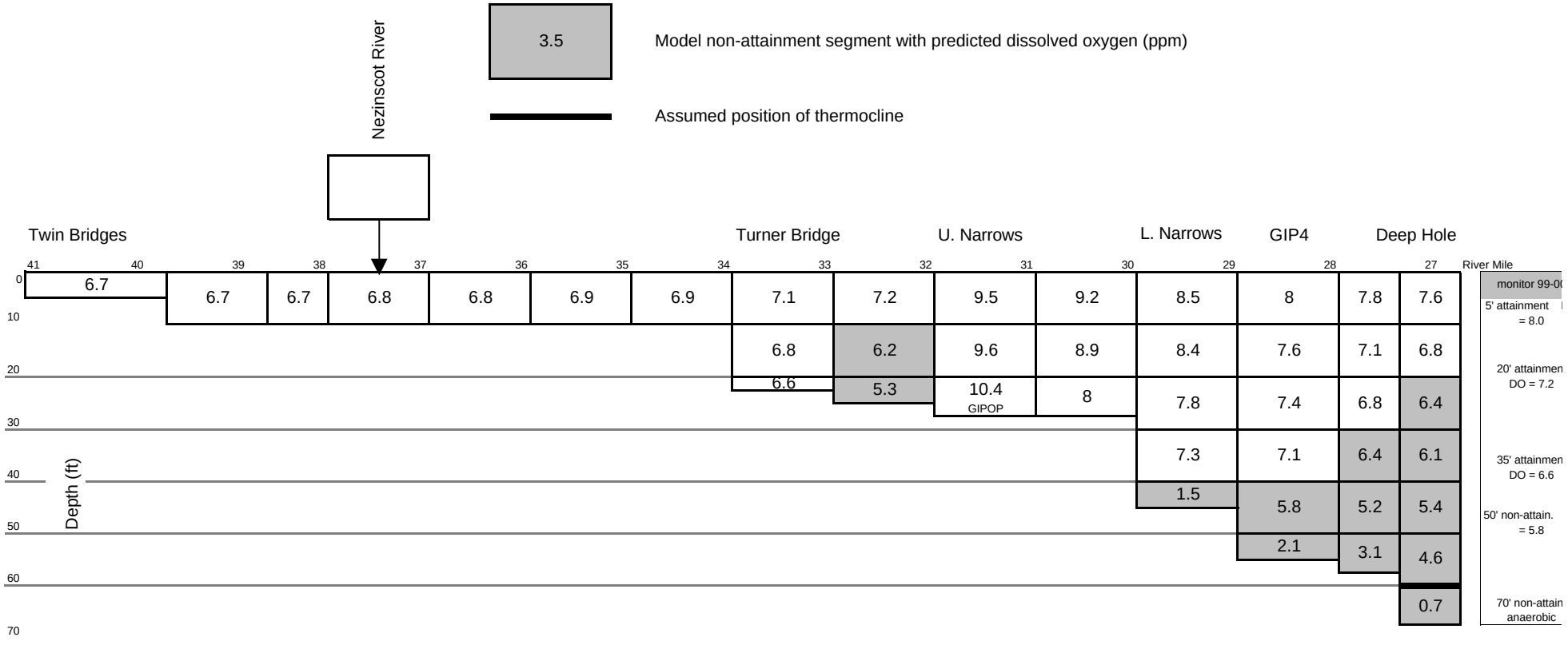
Figure 34 - Model Prediction of 30-Day Dissolved Oxygen Non-Attainment in Gulf Island Pond

Run 2a - Point Sources at Actual Discharge Levels with GIPOP



20% of the volume of Gulf Island Pond does not meet monthly average Class C dissolved oxygen criteria of 6.5 ppm

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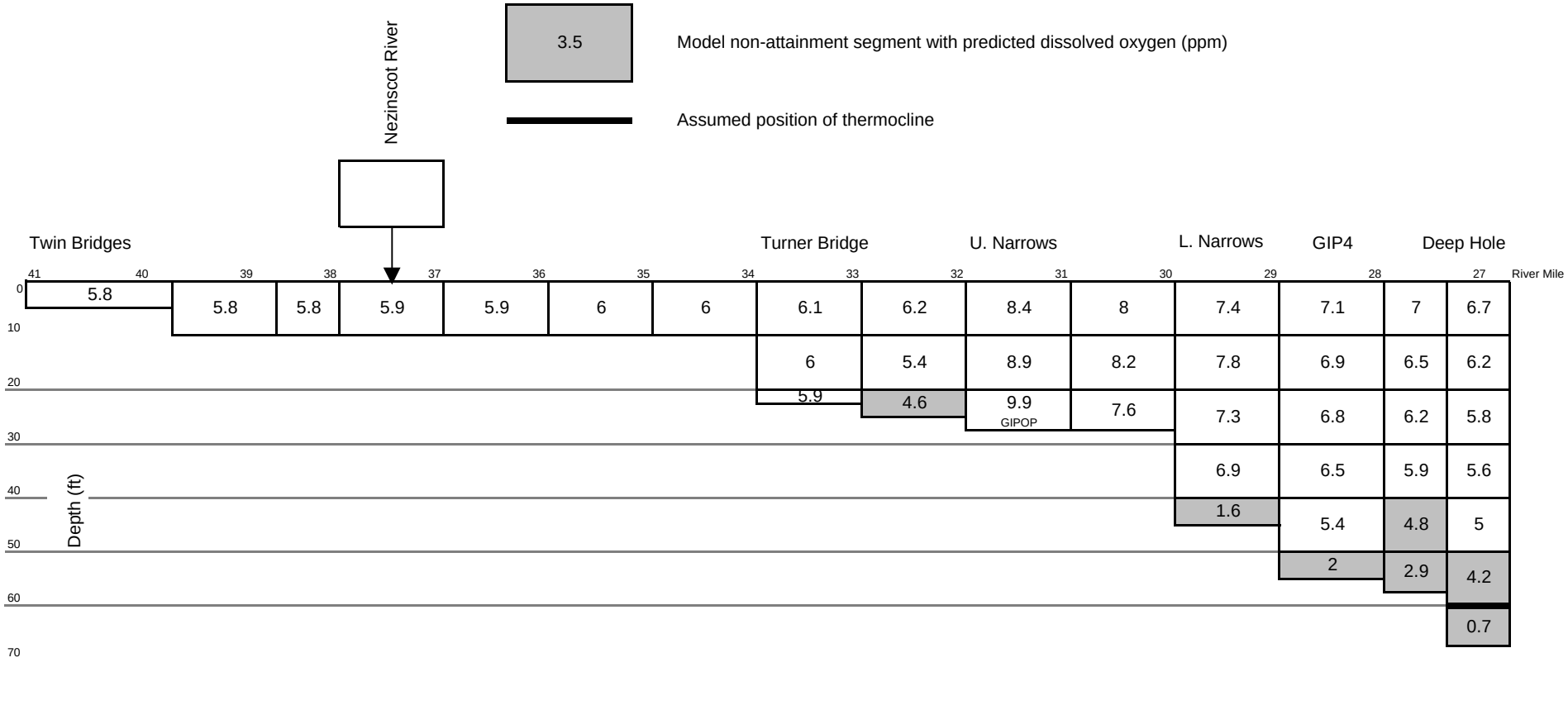
Figure 35 - Model Prediction of Mimimum Dissolved Oxygen Non-Attainment in Gulf Island Pond

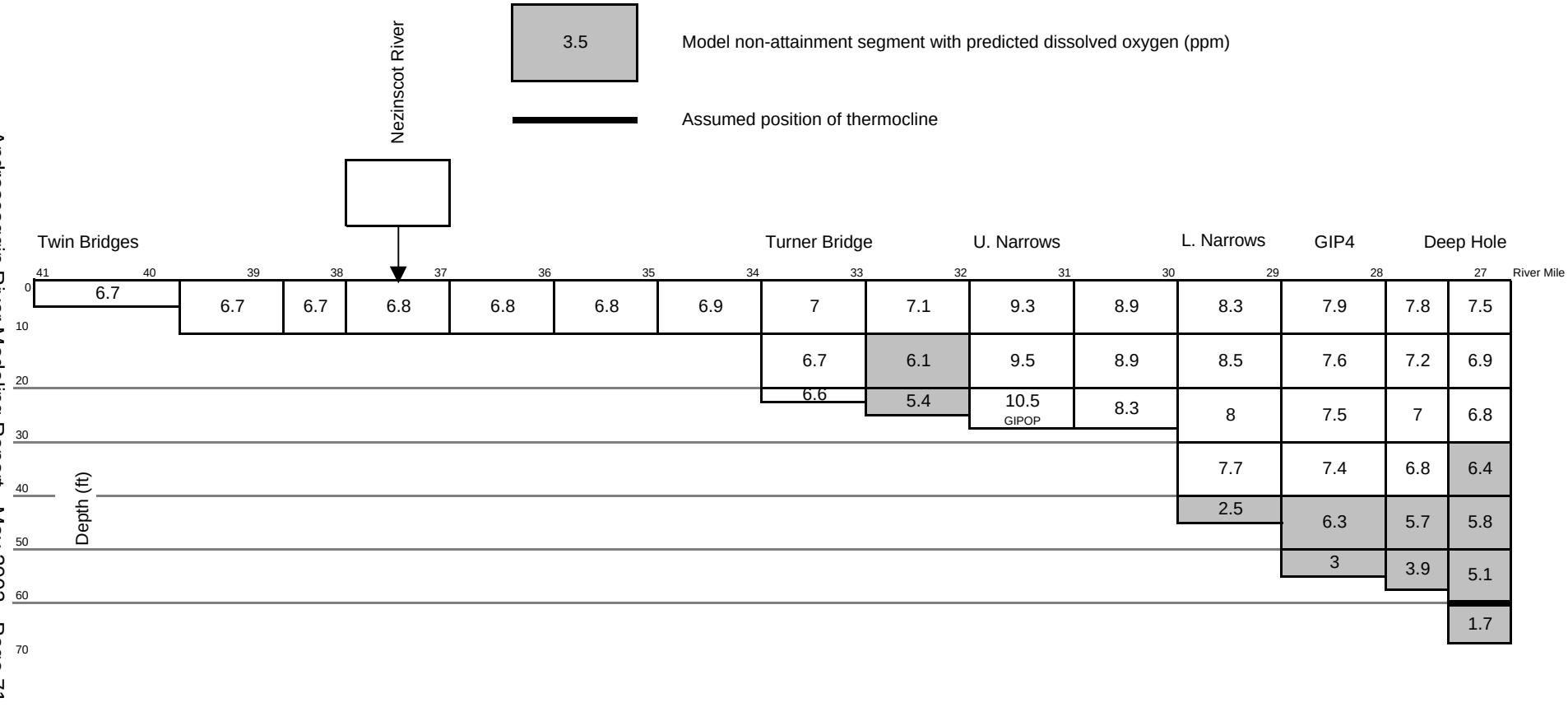
Run 3a - Point Sources BOD/TSS at Actual Discharge Levels & Point Source TP at 2/3 Current Levels with GIPOP



7% of the volume of Gulf Island Pond does not meet minimum Class C dissolved oxygen criteria (5 ppm).

Figure 36 - Model Prediction of 30-Day Average Dissolved Oxygen Non-Attainment in Gulf Island Pond

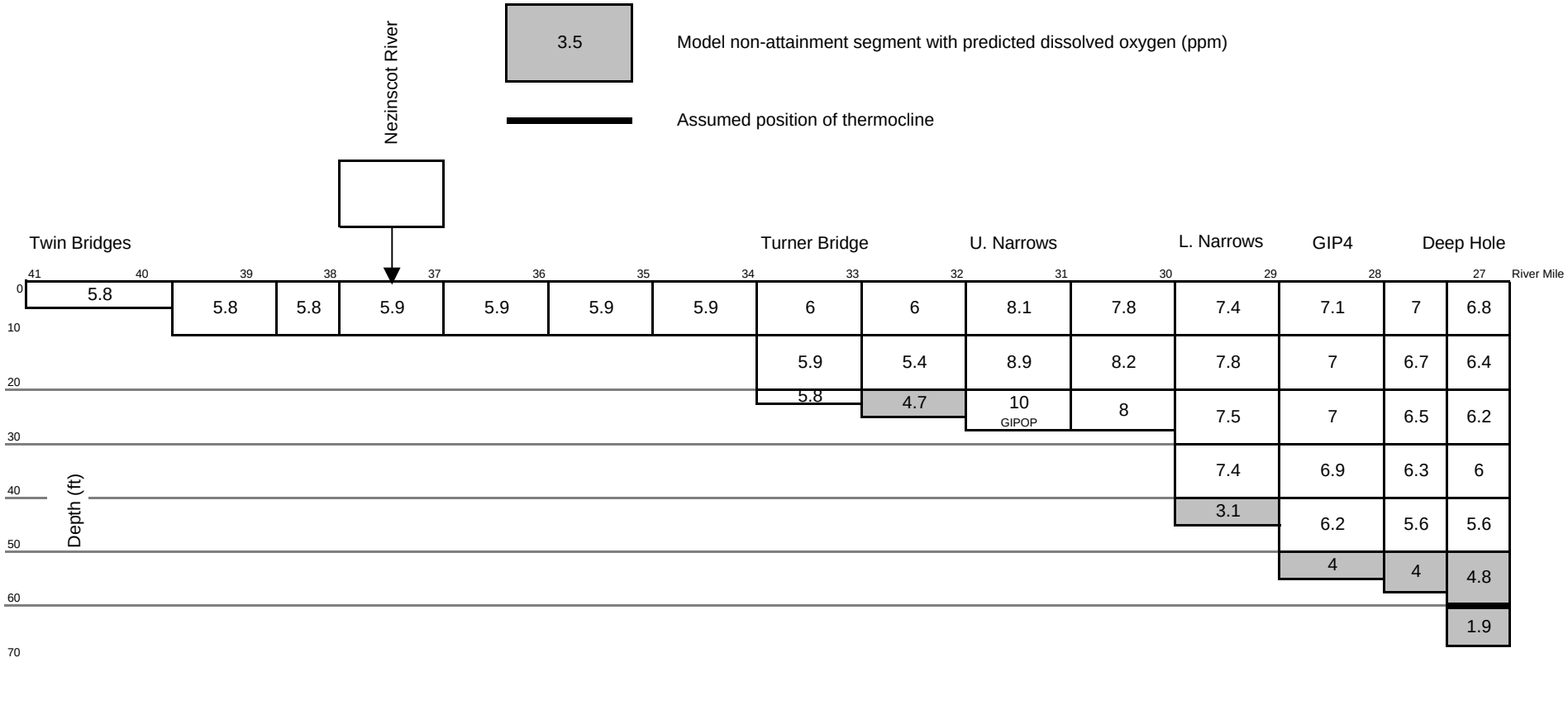
Run 3a - Point Sources BOD/TSS at Actual Discharge Levels & Point Source TP at 2/3 Current Levels with GIPOP



15% of the volume of Gulf Island Pond does not meet the monthly mean Class C dissolved oxygen criteria (6.5 ppm).

Figure 37 - Model Prediction of Mimimum Dissolved Oxygen Non-Attainment in Gulf Island Pond

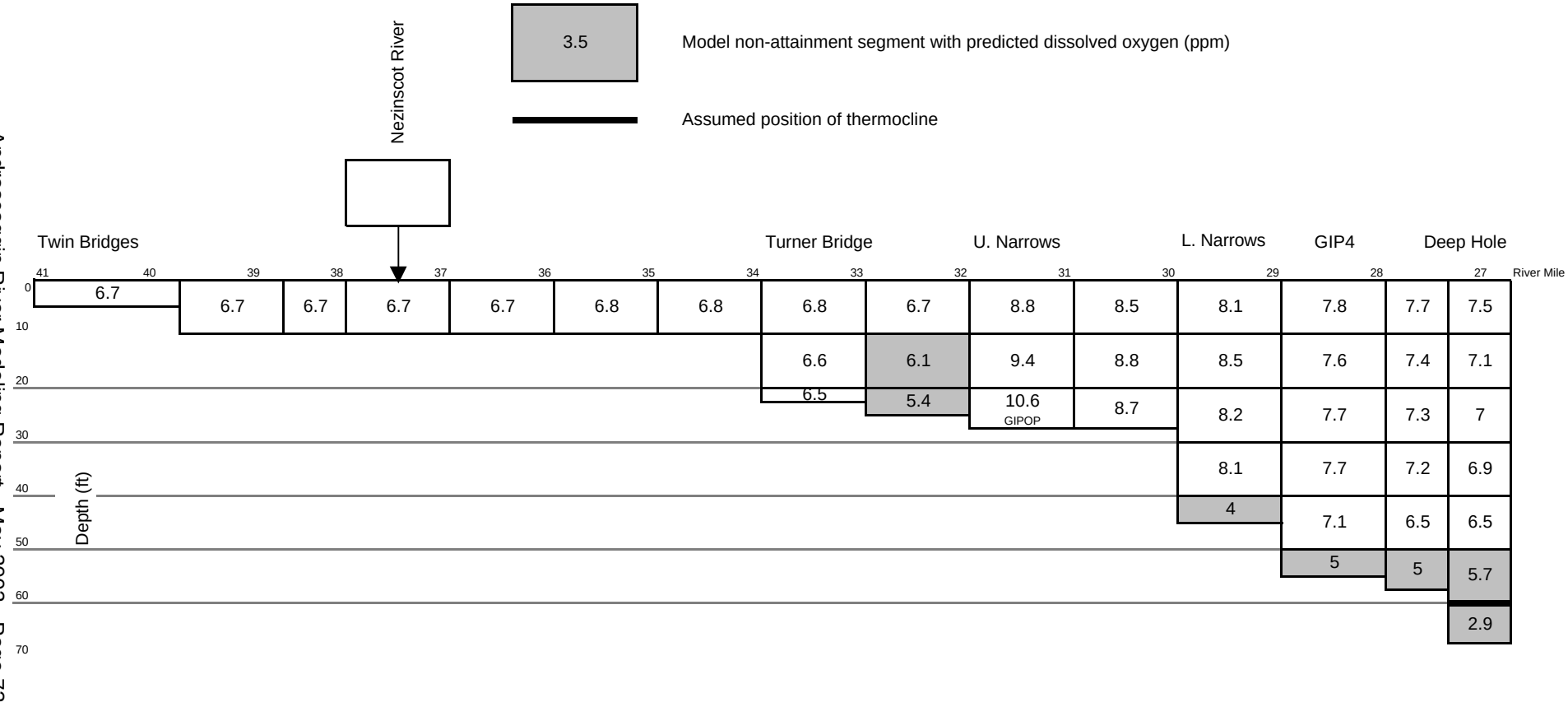
Run 4a - Point Sources BOD/TSS at Actual Discharge Levels & Point Source TP at 40% Current Levels with GIPOP



6% of the volume of Gulf Island Pond does not meet minimum Class C dissolved oxygen criteria (5 ppm).

Figure 38 - Model Prediction of 30-Day Average Dissolved Oxygen Non-Attainment in Gulf Island Pond

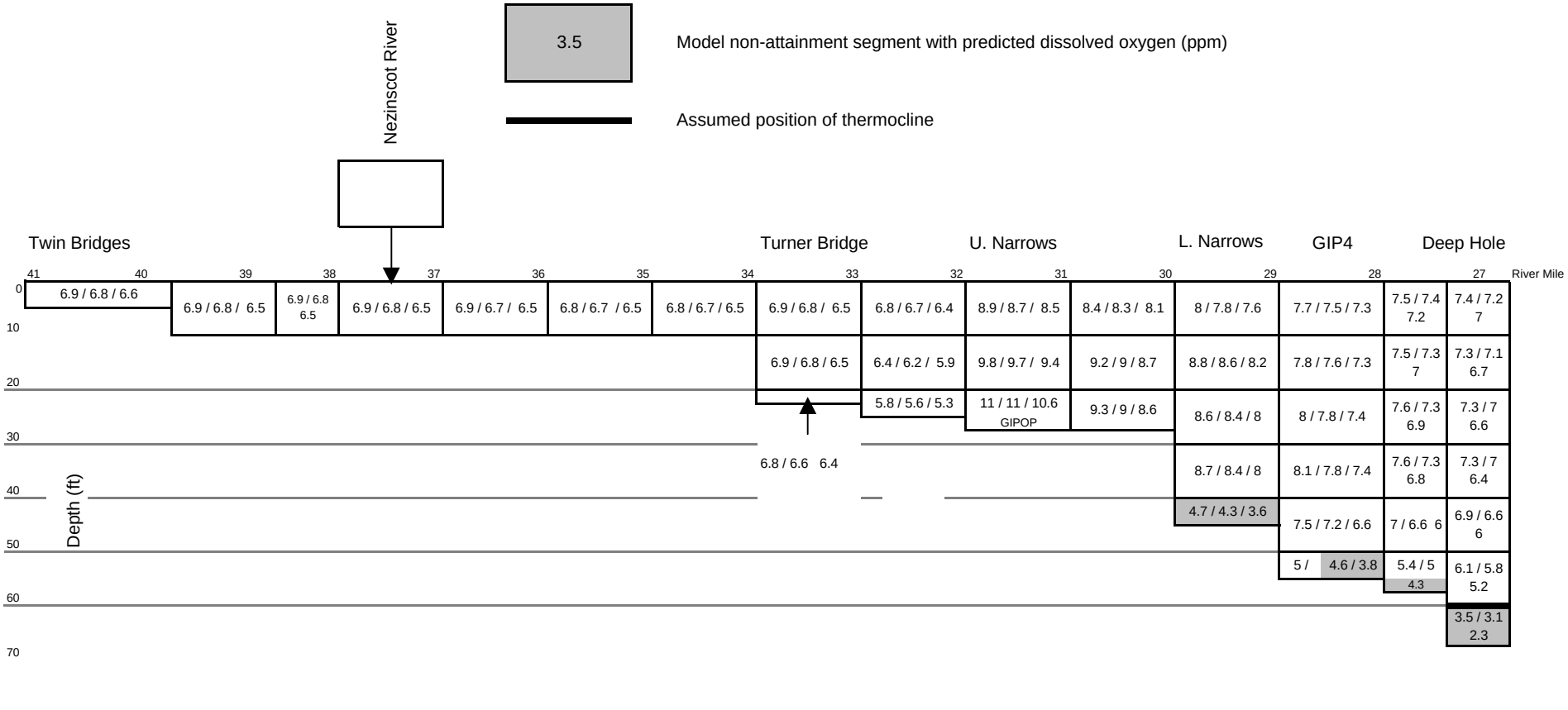
Run 4a - Point Sources BOD/TSS at Actual Discharge Levels & Point Source TP at 40% Current Levels with GIPOP



9% of the volume of Gulf Island Pond does not meet the monthly mean Class C dissolved oxygen criteria (6.5 ppm).

Figure 39 - Model Prediction of Mimimum Dissolved Oxygen Non-Attainment in Gulf Island Pond

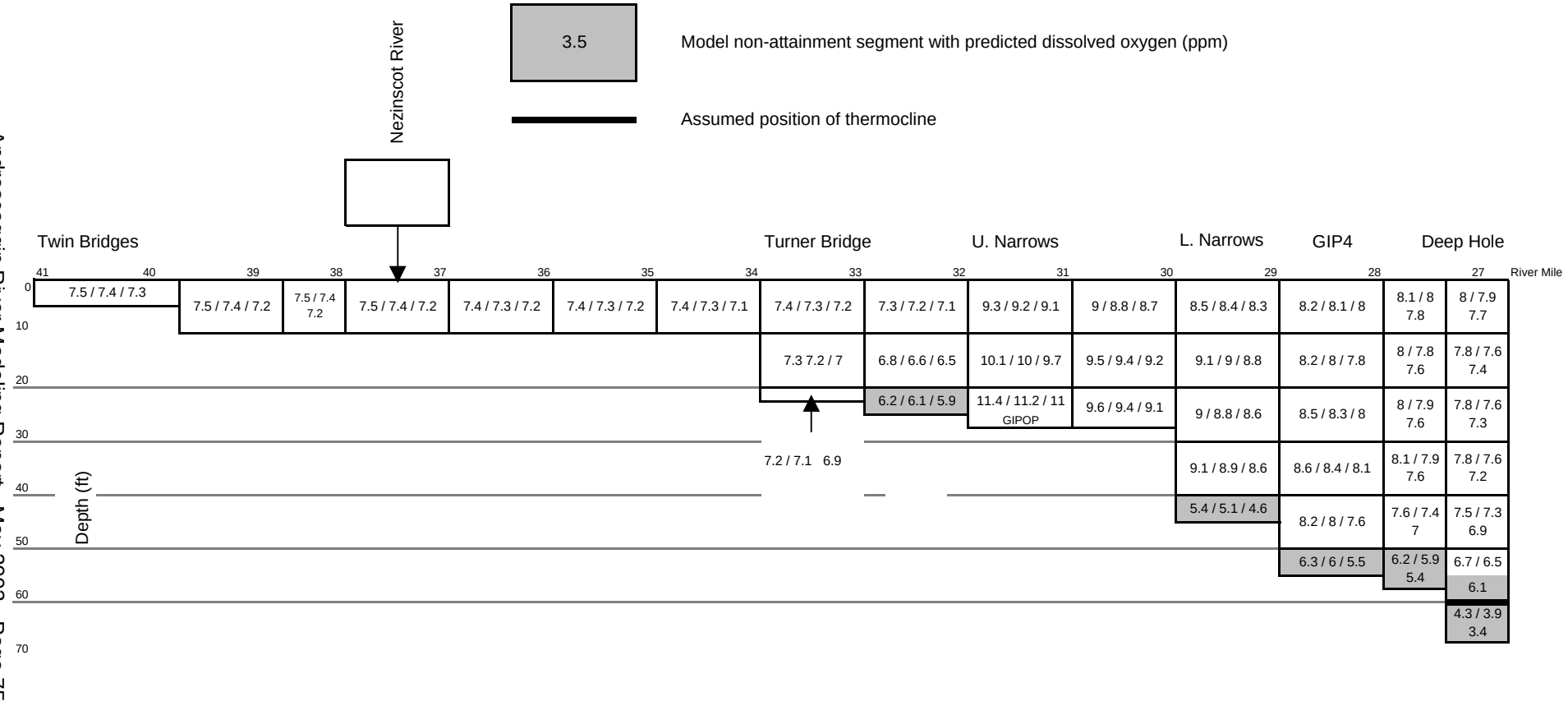
Runs 5a,b,c - Point Sources BOD/TSS at 10% / 25% / 50% of Actual Discharge Levels & Point Source TP at 40% Current Levels with GIPOP



For 10%, 25%, and 50% of actual BOD and TSS discharge levels, respectively ; 1%, 2%, and 4% of the volume of Gulf Island Pond does not meet minimum Class C dissolved oxygen criteria (5 ppm).

Figure 40 - Model Prediction of 30-Day Average Dissolved Oxygen Non-Attainment in Gulf Island Pond

Runs 5a,b,c - Point Sources BOD/TSS at 10% / 25% / 50% of Actual Discharge Levels & Point Source TP at 40% Current Levels with GIPOP



For 10%, 25%, and 50% of actual BOD and TSS discharge levels, respectively ; 4%, 4%, and 6% of the volume of Gulf Island Pond does not meet the monthly mean Class C dissolved oxygen criteria (6.5 ppm).

Figure 41
Gulf Island Pond Predicted Chlorophyll a

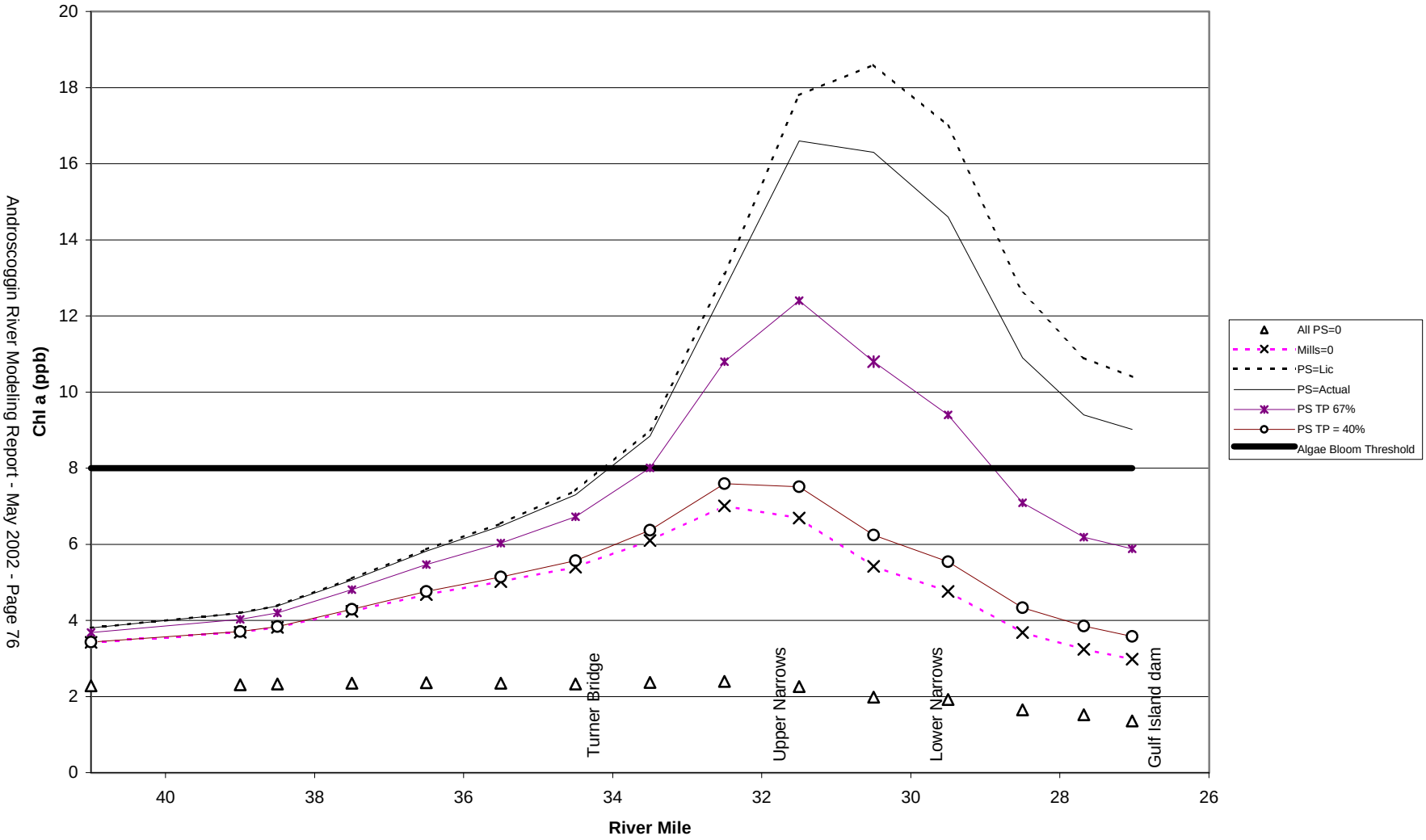
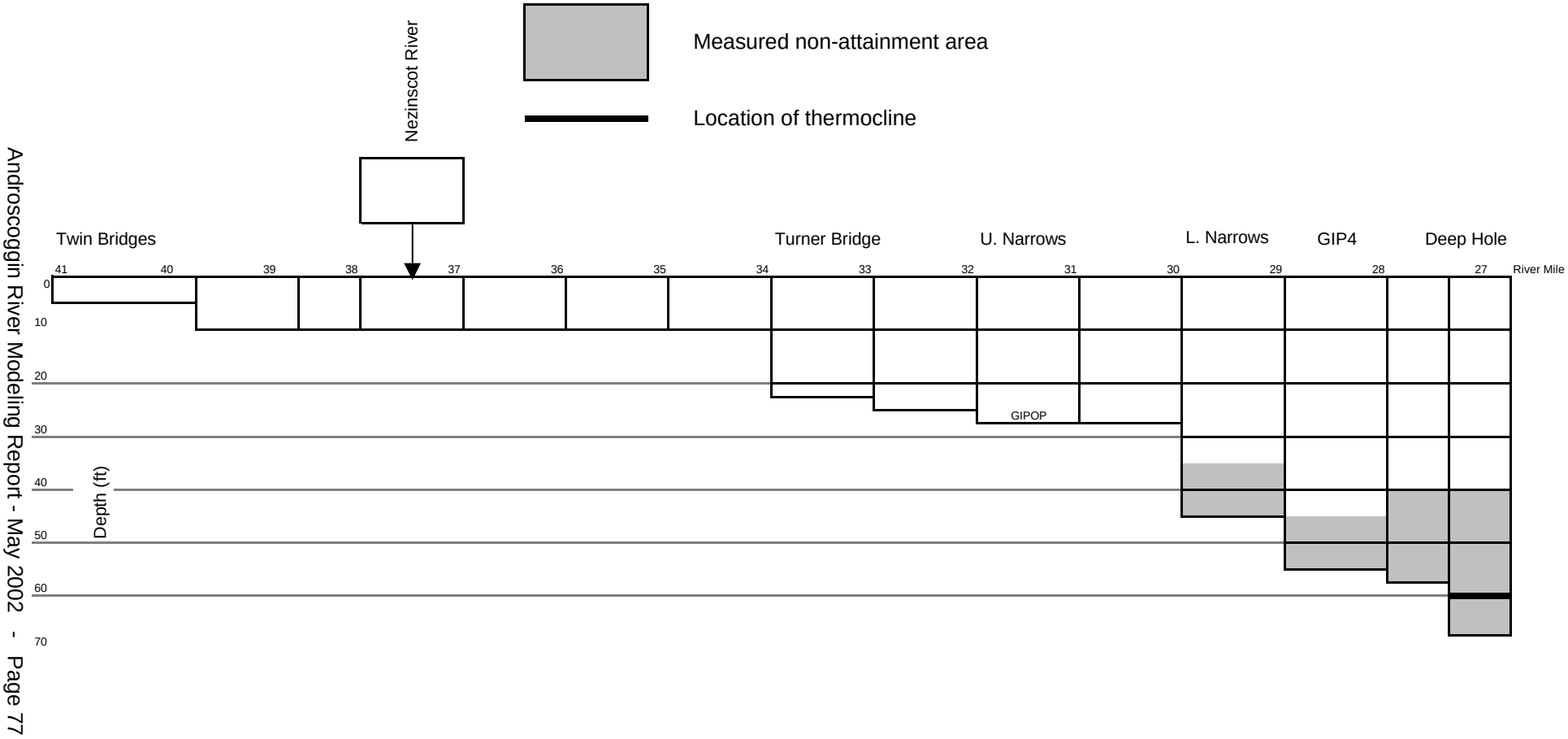


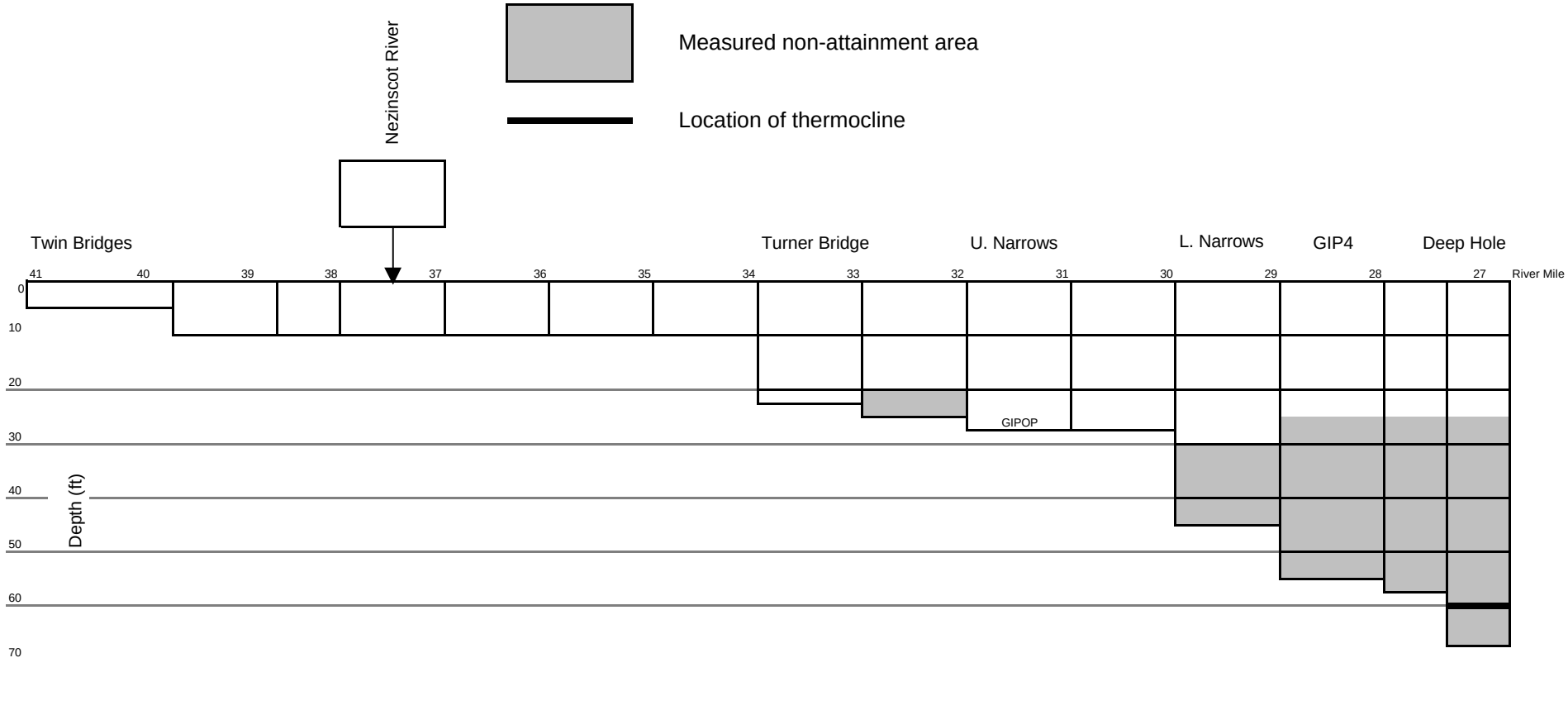
Figure 42 - Measured Non-Attainment of Minimum Dissolved Oxygen in Gulf Island Pond
July 6, 1999



Non-Attainment Volume = 10%

Hypolimnetic Volume < 1%

Figure 43 Measured Monthly Average Non-Attainment of Dissolved Oxygen in Gulf Island Pond
July 1999



Non-Attainment Volume = 23%

Hypolimnetic Volume < 1%

Figure 44
Component Analysis of Dissolved Oxygen Impact
At Various Depths from Lower Narrows to Gulf Island Dam

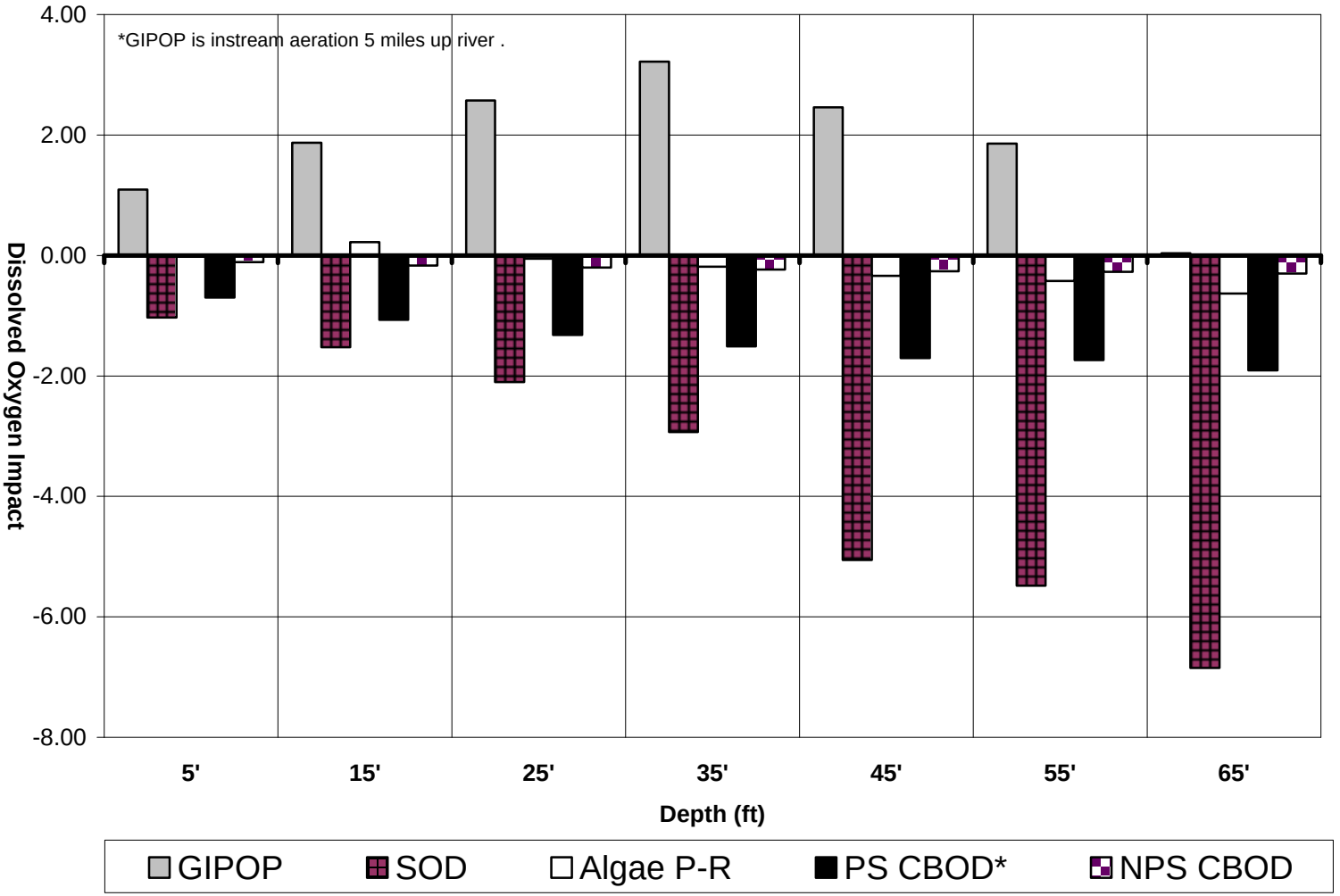


Figure 45
Component Analysis as % of Impact
Average Lower Narrows to Gulf Island Dam

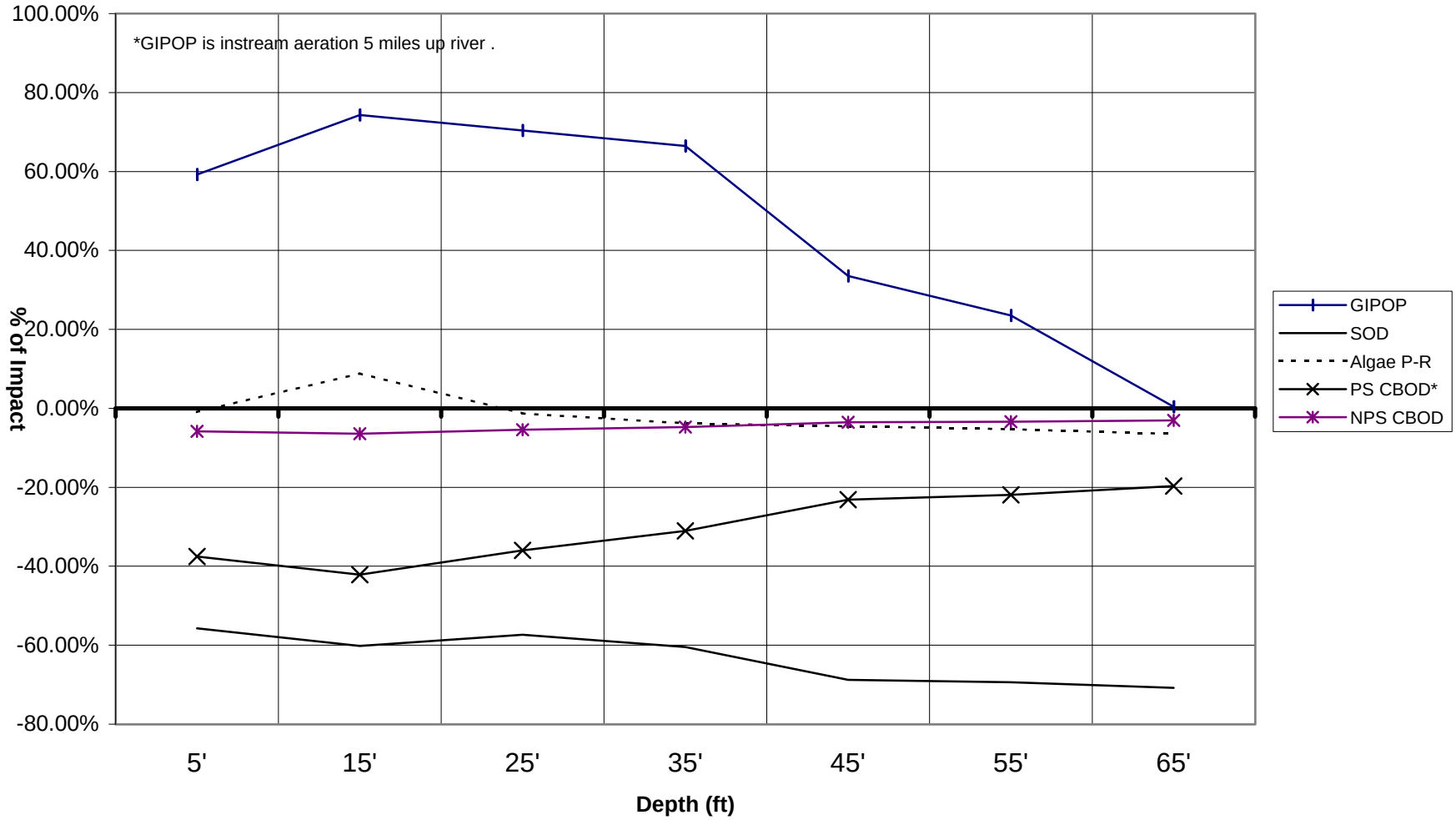
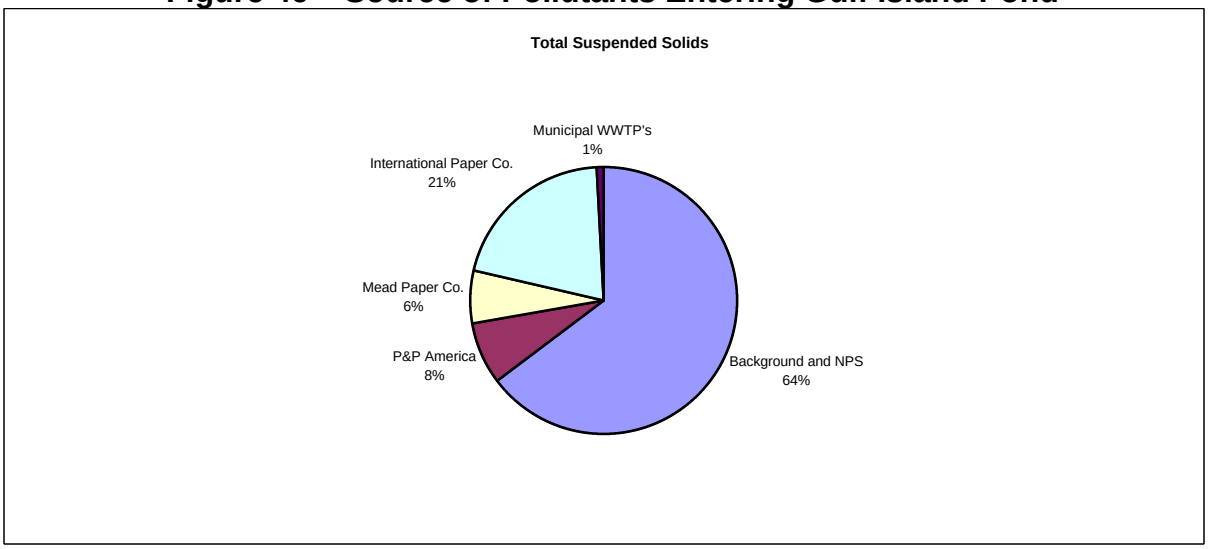
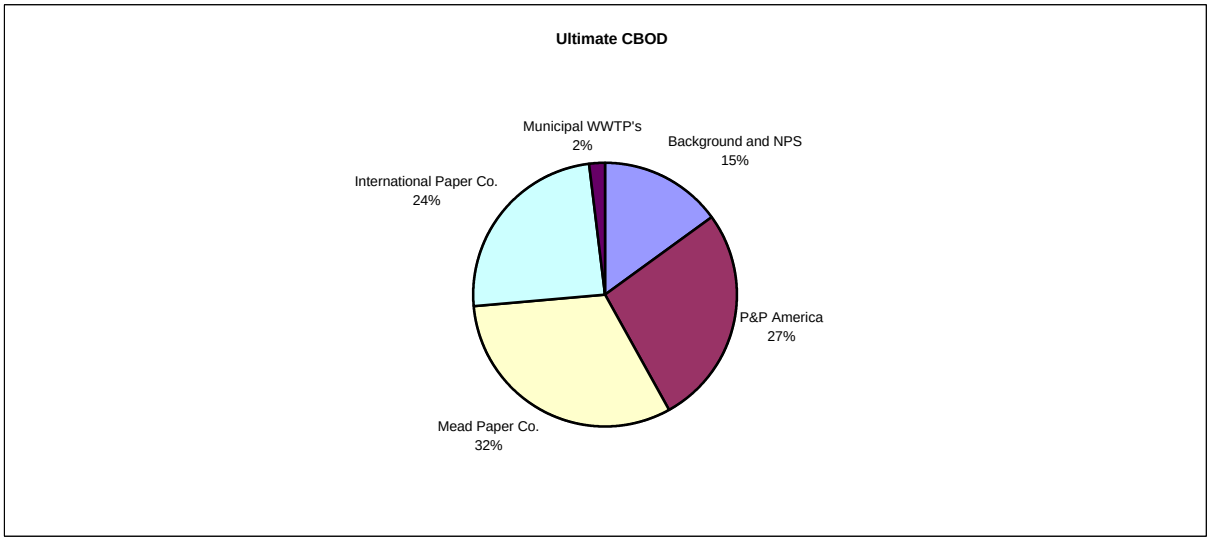


Figure 46 Source of Pollutants Entering Gulf Island Pond





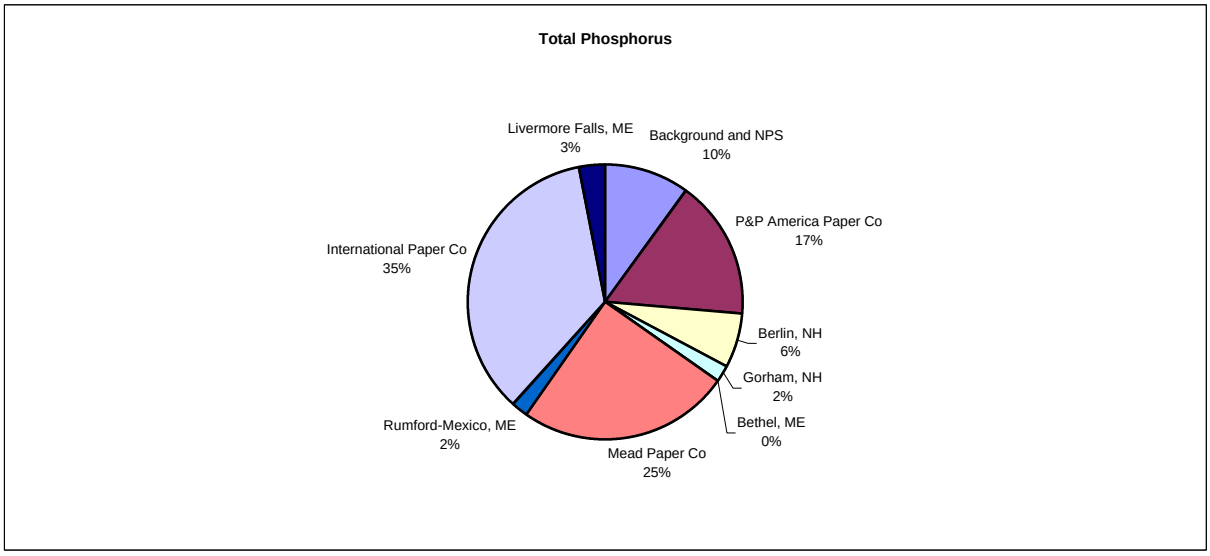
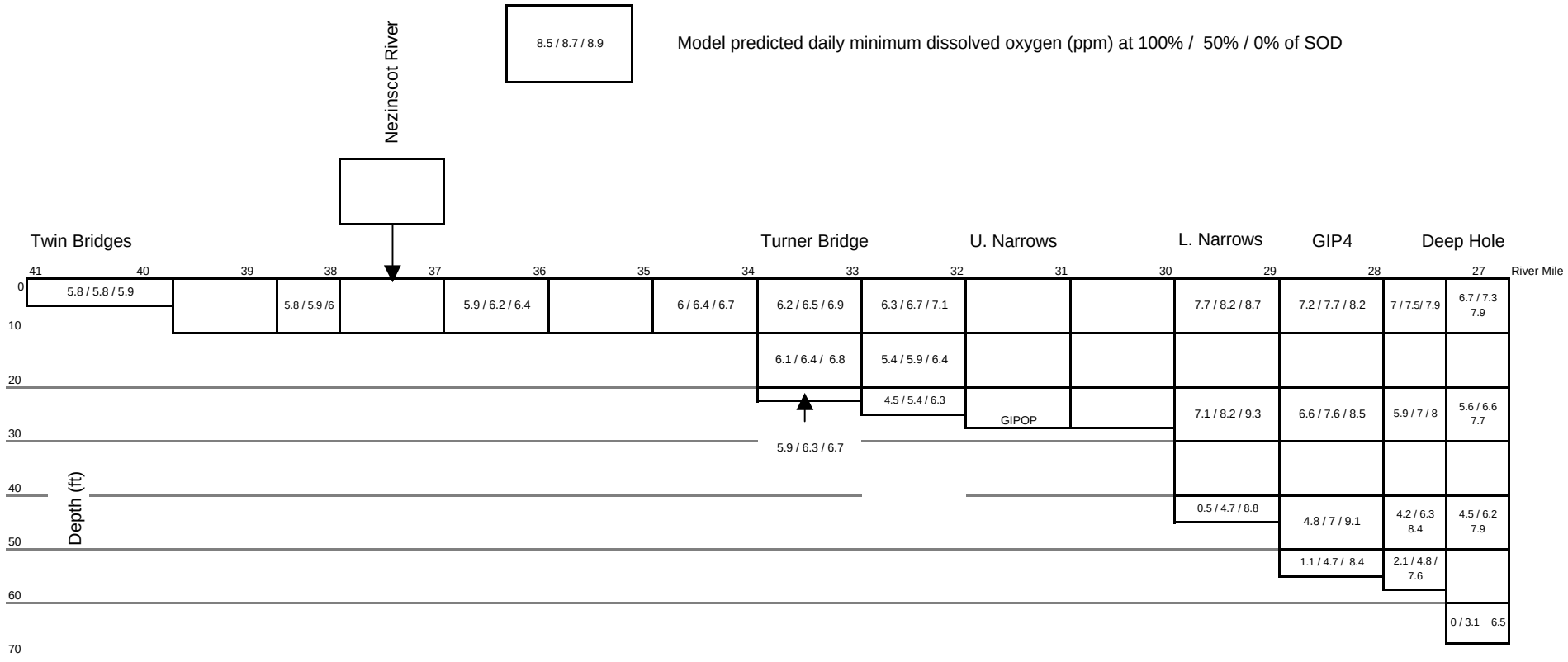


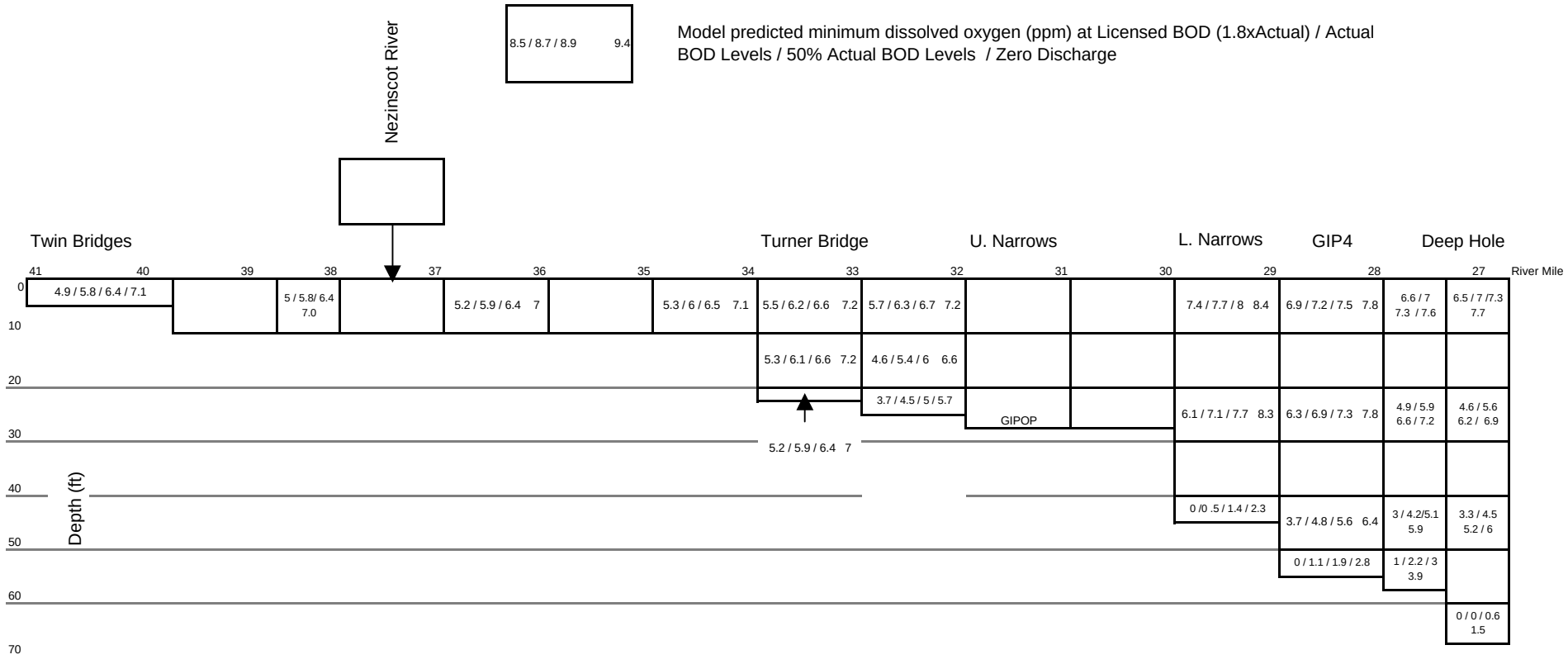
Figure 47 Sediment Oxygen Demand Sensitivity Analysis

Point Sources at Actual Discharge Levels with GIPOP at Full Capacity



The predicted dissolved oxygen in the deeper portions of Gulf Island Pond is very sensitive to changes in the sediment oxygen demand rate.

Figure 48 Paper Mill BOD Sensitivity Analysis
GIPOP at Full Capacity



The predicted model dissolved oxygen is less sensitive to reductions of mill BOD than reductions of sediment oxygen demand.

Figure 49 GIPOP Sensitivity Analysis

Point Sources at Actual Discharge Levels