Critical Conditions – Transcontinental Gas Pipeline Company - TX0134060

OUTFALL 001 is **MENU 3 (Discharge is to directly to a perennial freshwater ditch, stream or river.)** The outfall is located in Victoria County, Texas and discharges to directly to the Guadalupe River **(perennial, classified segment 1803)**. Average flow is 3.2 million gallons per day (MGD) = 4.95 cubic feet per second (cfs).

Critical Flows:
USGS Gage 08176500 on Guadalupe River at Victoria, TX was used as a representative gage for Outfall 002.
Contributing Area (CA) = 5198.93 square miles (sq mi)
7Q2 = 546.57 cubic feet per second (cfs)
Harmonic Mean (HM) = 637.87 cubic feet per second (cfs)

For Outfall 002, the catchment area (CA) is 5810.67 square miles.
7Q2 = 546.57 * 5810.67 / 5198.93 = 610.88 cfs
HM = 637.87 * 5810.67 / 5198.93 = 712.93 cfs

Discharge from USGS Gage 08177500 contributes upstream to the overall flow of the Guadalupe River.
7Q2 = 1.63 cfs.
HM = 2.51 cfs

Total adjusted flow is:
7Q2 = 610.88 + 1.63 = **612.51 cfs**
HM = 712.93 + 2.51 = **715.44 cfs**

Critical Conditions:
For Guadalupe River, human health criteria apply at the 10^{-5} risk level for either Public Water Supply and Freshwater Fish Tissue or Freshwater Fish Tissue alone. The critical conditions below are based on an average flow for Outfall 002 of 3.2 MGD (4.95 cfs). Q_{eff} = permitted average effluent flow = 4.95 cfs.

% *effluent*, *Mixing Zone* (MZ) = $\frac{Q_{eff}}{Q_{eff}+7Q2} * 100 = \frac{4.95}{4.95+612.51} * 100 = 0.80\%$;

MZ = 0.80%

% *effluent, Zone of Initial Dilution (ZID)* = $\frac{Q_{eff}}{Q_{eff}+0.25(7Q2)} * 100 = \frac{4.95}{4.95+0.25(612.51)} * 100 = 3.13\%$;

ZID = 3.13%

% *effluent*, *Human Health (*HH) = $\frac{Q_{eff}}{Q_{eff}+HM} * 100 = \frac{4.95}{4.95+715.44} * 100 = 0.69\%$;

HH = 0.69%

OUTFALL 002 is **MENU #4 (Discharge is directly to a lake.)** The outfall discharges to Lake Texana in Victoria County, Texas.
Segment ID: 1604 (classified)
Assessment unit: 1604_01
Segment Name: Lake Texana

Critical Flows:
Not applicable

Critical Conditions:
Discharge is 3.2 MGD (avg.) (< 10 MGD) and lake-width at discharge entry point is 5112 feet (> 200 feet), therefore:

- acute toxic criteria apply at 60%. **(ZID = 60%)**
- chronic toxic criteria apply at 15%. **(MZ = 15%)**, and
- human health criteria apply at 8%. **(HH = 8%)**.

The lake is > 50 acres in surface area, and is therefore assumed to have a sustainable fishery. **Human health criteria apply at the 10^{-5} risk level (either Freshwater Fish Tissue or Public Water Supply and Freshwater Fish Tissue)**.