

Silt calculations for effluent of Intercostal Waterway into St. Joe Bay at 20 ft. River Reading

Ave width of ICW Canal 270 ft of which 20 ft on either side is gradient conservative width 230 ft.

Ave depth of canal is 10 ft Average Depth is actually greater at river reading 20 ft

1 ft width of column

$230 \times 10 \times 1 = 2300 \text{ cu ft}$

Ave speed of current right now on Jan 1st 2019 at high tide is 2.5 mph according to my GPS

$5280 \text{ ft} \times 2.5 = 13200 \text{ ft per hour}$

1 hr = 3600 sec

$13200/3600 = 3.66$

Current speed is 3.66 ft/sec

So every second (2300cu ft x3.66 ft/sec) deposits 8418 cu ft of water

Every hour deposits $8418 \text{ cu ft} \times 3600 \text{ sec} = 30,304,800.00 \text{ cu ft}$ of water into the Bays

According to Design of Gravity Dams, US Dept. of the Interior, BUREC, 1976, Page 29, Section 3-12:
"Horizontal silt pressure is assumed to be equivalent to that of a fluid weighing 85 pounds per cubic foot. Vertical silt pressure is determined as if silt were a soil having a wet density of 120 pounds per cubic foot, the magnitude of pressure varying directly with depth. These values include the effects of water within the silt."

So average weight of silted water is 85 lbs/cu ft, and ave weight of fresh water is 62.43 lbs/cuft

The weight of silt in a cu ft of water is 22.57 lbs

This means that every hour 30,304,800cu ft of fresh water is deposited in our bay and 22.57 lbs silt/ cu ft water = $683,979,336.00 \text{ lbs of silt}/2000\text{lbs} = 341,989 \text{ TONS}$ of silt are deposited in our bay!!

There are 7.48 gallons of water in one cubic foot of water.

Each hour deposits 226,679,904 gallons of freshwater into St. Joe Bay

Each 24 hour period is depositing FIVE BILLION FOUR HUNDRED AND FORTY MILLION THREE HUNDRED AND SEVENTEEN THOUSAND GALLONS OF FRESHWATER into St. Joe Bay!!

Each 24 hour period is depositing EIGHT MILLION TWO HUNDRED SEVEN THOUSAND SEVEN HUNDRED FIFTY FOUR TONS of silt into St. Joe Bay!! This is tons, not pounds!!