

Hudson River PCBs Site EPA's Phase 1 Evaluation

Discussion of Productivity Standard
Application

February 18, 2010



Phase 1 Productivity Standard & Volume Achieved

Phase 1 Standard: 200,000 CY Minimum Vol.
 265,000 CY Target Vol.

Volume Dredged: 273,600 CY (EPA Est.)
 282,900 (GE Est.)

Target Maximum Monthly Production 89,000 CY
Actual Maximum Monthly Production: ~78,000 CY



Phase 2 Productivity Requirements*

<u>Year</u>	<u>Required Volume</u>	<u>Target Volume</u>
1 through 4	475,300 CY/Year	528,100 CY/Year
5	475,300 CY	264,100 CY

Avg. Daily Rate** 3378 CY 3745 CY

Avg. Monthly Rate*** 86,420 CY 96,020 CY

* Based on 2,650,000 CY total volume for Phases 1 and 2

** Based on 6-day week (141 actual days dredging)

*** Based on 5.5 month dredging season (May 1 – Oct. 15)



Dredging Equipment

Mechanical Dredges:

- 5 with 5-CY Bucket on Cat 385 Excavators
- 1 with 2-CY Bucket on Cat 345 Excavator
- 6 with 1-CY Bucket on Cat 320 Excavators



Dredging Equipment

Scows:

- 18 Large Hopper Scows (~195' X 35' X 12')
- 7 Mini-Hopper Scows (~26' X 18.5' X 2')
- 1 Supermini-Hopper Scow (~52' X 18.5' X 2')

Tugs:

- 13 @ 600 hp
- 4 @ 400 hp
- 3 Carpenter Barges



Loading a Mini-Scow



Large Hopper Scow



Major Factors Affecting Productivity During Phase 1

- Scow Unavailability Due to Scow Unloading Capacity at Dewatering Site
- Presence of Slab Wood Debris in Sediment
- Limited Capacity of Mini-Scows
- Underestimated DoC
- Fine Grading to Meet Cut Line Tolerances



Scow Unloading

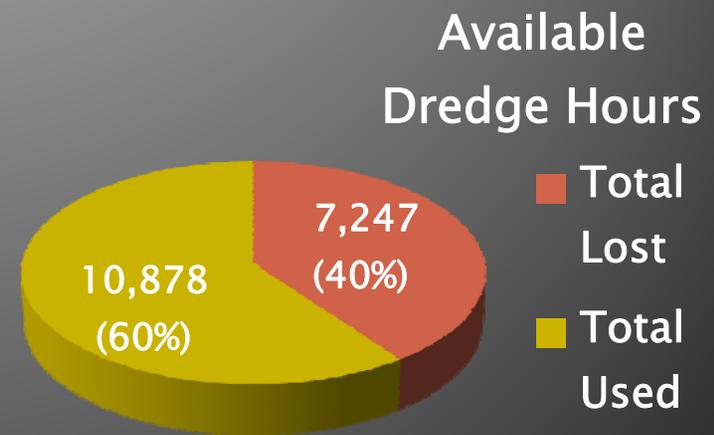
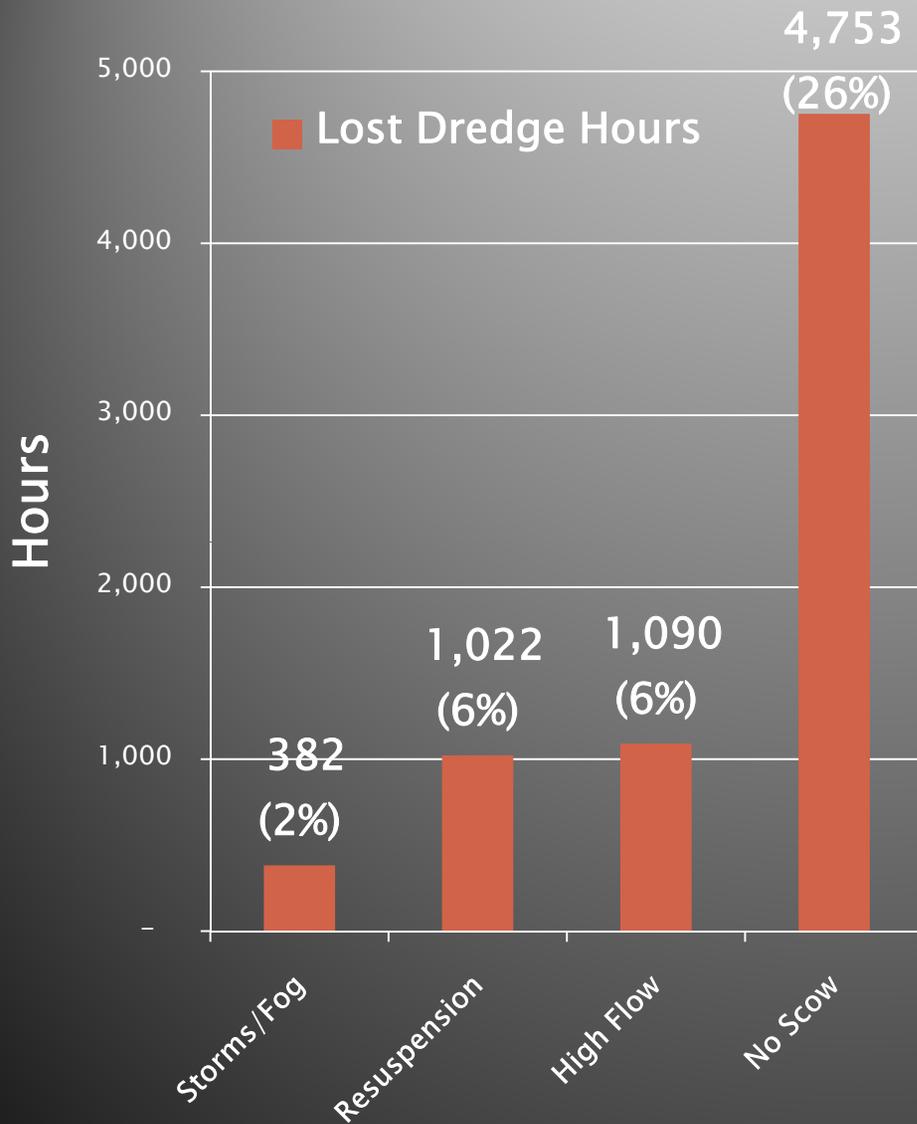


Scow Unloading Capacity

- Unloader Operated 7 Days/Week
- Max. Volume Unloaded: 17,921 CY/Week
- Avg. Volume Required for Phase 2:
22,000 CY/Week
- Max. Volume Required for Phase 2:
~25,000 CY/Week



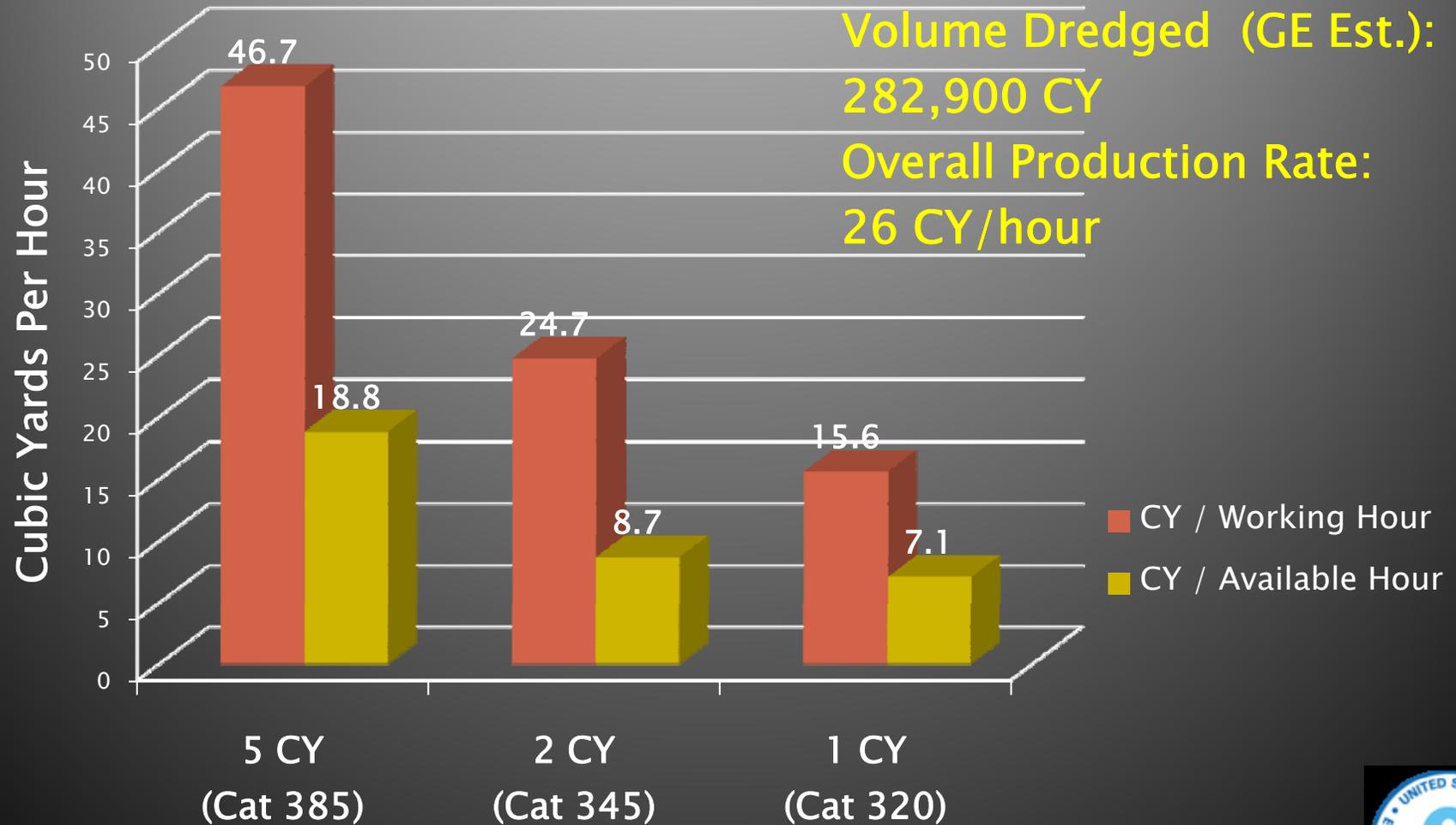
Lost Dredging Time



**Total Available Hours
18,125**



Average Dredge Production Rates



Effect of Inadequate Unloading Capacity

- Target Production Rate: **89,000 CY/month**
- Actual Max. Production: **78,000 CY/month**
- Time Lost Awaiting Empty Scows: 1400 hours (same period)
- Production Lost Awaiting Empty Scows:
1400 hours X 26 CY/hour = 36,400 CY
- $78,000 \text{ CY} + 36,400 \text{ CY} = \mathbf{114,400 \text{ CY}}$



Slab Wood Debris in Sediment



Debris in Sediment



Impacts of Underestimated DoC and Fine Grading

Underestimated DoC:

- Additional Dredge Passes
- Time Lost in Mapping, Sampling, And Designing New Cut Lines
- CUs Open Longer

Fine Grading:

- Reduced Production Rate

(Both factors increased resuspension losses)



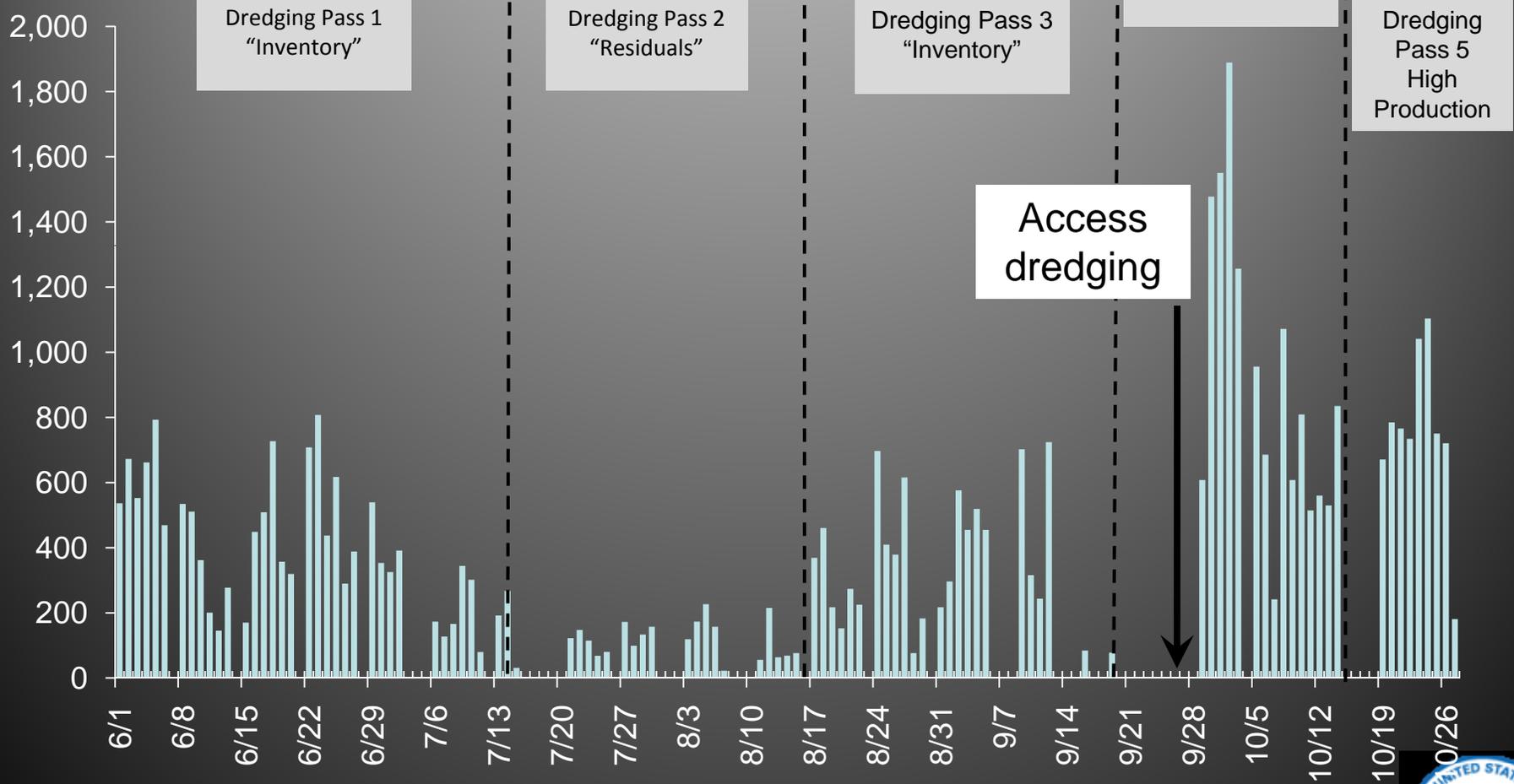
Generalizable Aspects of CU-1

- Multiple dredging passes due to underestimated DoC
- Productivity dropped off at the end of many weeks due to scow unavailability (unloading)
- Fine grading reduced productivity
- More passes meant multiple CU reviews (mapping, sampling, etc.)
- Improvement in productivity experienced with access dredging



CU-1 Daily Dredged Volume (CY)

Dredged Volume
(CY)



Phase 2 Productivity Standard Can be Met by:

- Addressing uncertainty in DoC to minimize passes
- Improving scow unloading capacity
- Minimizing fine grading
- Conducting access dredging where needed

