

MEMORANDUM FOR RECORD:

SUBJECT: W912PM-04-B-0009, FY05 Maintenance Dredging, Morehead City Harbor (Ocean Bar) Carteret County, NC / Wilmington Harbor Ocean Bar Brunswick County, NC - Sea Turtle Compliance Inspection Trip Report (Wilmington Harbor outer bar).

1. On 22 March at 1300 a meeting was held at the Wilmington District office to discuss historical aspects of the development of the turtle deflecting draghead and its relationship to the Corps of Engineers hopper dredge inspection checklist. Phil Bates of the Jacksonville District conducted the meeting with representatives from the Wilmington District (Doug Piatkowski, Rolando Serrano, Dennis Lynch, Jim Mullins, Dan Livingston, and Ken Penland) in attendance. The "COE Sea Turtle Inspection Checklist for Hopper Dredges" was thoroughly reviewed and discussed. Submittal requirements and other aspects of the Wilmington Harbor contract, as they relate to the inspection protocol, were discussed prior to performing the dredge inspection training on board the Bayport on 23 March. The meeting ended at 1500.

2. On 23 March, Mr. Phil Bates of the Jacksonville District and representatives from the Wilmington district office (Rolando Serrano, Doug Piatkowski, Ken Penland, Joe Wade, Murray Degan, and Dan Livingston) met with representatives from Manson Construction (Marcus Robin – field engineer and crew boat operator) at the Southport, NC Marina. Rolando Serrano performed a safety briefing at the dock prior to boarding the dredge Bayport at approximately 1000. Once on-board the dredge, we briefed the captain, dragtender, CQC, and turtle observer of our intentions in performing the sea turtle compliance inspection. The purpose of the field visit was to inspect the dredge according to the COE Sea Turtle Inspection Checklist, developed by Phil Bates of CESAJ, prior to commencement of dredging. The inspection protocol guides the inspectors through requirements that must be carefully checked so that the Corps Districts are in compliance with the Regional Biological Opinion requirements as well as SAD hopper dredge requirements. Coastwise consulting observers on board were Andrew Jackson and Tu Tran.

3. Mr. Phil Bates and Wilmington District representatives performed a walkthrough of the dredge in accordance with paragraph 3a-n of the inspection protocol. The contractor was compliant with all components in the protocol with the exception of a few deficiencies:

a.) Andrew Jackson discussed the current state of dredging operation in regards to wood debris. As of 28 March the dredge is operating with 100% inflow screening and 25% overflow screening on the aft weir skimmer. Screening was removed from the skimmer because of buildup of floating wood debris within the hopper. This wood was clogging the skimmer and causing overflow problems; thus, the screening was removed. Though the inflow screens are operating at 100% screening efficiency, the dragtender has to work with the turtle observers to rotate between forward and aft inflow boxes. As the forward or aft starboard and port boxes fill up with debris the dragtender will switch the pumps and have the observer check the plugged

baskets. Once cleared by the observer, the dragtender releases and raises the screening and clears the basket. This cycle is repeated between the forward and aft baskets throughout each load. Though the observers are performing visual inspections of the baskets to the best of their ability, they are not able to perform 100% observer coverage of the screened material due to the buildup of mud, water, and wood debris in the box. After discussions with Andrew Jackson (turtle observer), under the existing conditions of wood debris the observers are getting <50% coverage of the screened material for turtle parts. Considering that the water temperature is rising, a variance was received to dredge outside of the turtle window (through 30 April), and overflow screens cannot be kept on, the issue of woody debris clogging the baskets is of considerable concern. The captain was made aware of these screening concerns and discussions of screening modifications for the skimmer were discussed. Inflow and overflow screen designs to manage debris buildup on contractor hopper dredges need to be developed over the long-term. Over the short-term, potential solutions may include blasting the clogged boxes with a high-powered water source (ie. fire hose or water jets in the hopper). Potentially this may allow some drainage of the boxes in order to provide more effective observer coverage of the screened material. Also, considering that observer coverage of the inflow screening is not 100%, it may be possible to achieve 100% overflow screening by rotating the fore and aft weir skimmers throughout each load and when heading out to the dump, a high powered water source can be used to clean off debris from the screens.

b.) According to the Terms and Conditions of the 1995 and 1997 Regional Biological Opinion for hopper dredging of channels and borrow areas in the southeastern United States provided by NMFS, there are no hopper dredge window for North Carolina; however, there is a South Atlantic Division (SAD) imposed window of 1 December to 31 March. In an email dated 21 March, the Wilmington District was granted a variance from SAD to hopper dredge outside of the South Atlantic Division (SAD) imposed hopper-dredging window. However, according to the 1995 and 1997 RBO, there are observer requirements from 1 April to 30 November with 100% inflow screening and 100% observer coverage of the screened material. Overflow is recommended but not required if 100% inflow screening is implemented. If 100% inflow screening is not possible, inflow screening can be reduced with 100% overflow coverage. As of 28 March, 100% inflow screening is being maintained for this dredging contract; however, 100% observer coverage is not possible due to the large quantities of woody debris discussed earlier in this report. Furthermore, only 25% overflow coverage can be maintained due to clogging from woody debris. Since a variance request has been granted for work outside of the SAD window, the dredging of Wilmington Harbor ocean bar will continue through 30 April. The 1997 RBO does not impose a window for hopper dredging in North Carolina and a variance request is only required from SAD; however, in the month April observer and screening requirements are required through the Terms and Conditions of the NMFS 1997 RBO. Considering that the screening and observer requirements cannot be adhered to in the month of April due to woody debris buildup, a variance request may be needed from NMFS unless modifications can be made to the equipment in order to effectively screen according to requirements of the RBO (see bottom of paragraph (a.) for recommendations).

c.) Measurements were taken of the forward adjustable attachment points of the deflector in order to confirm that approach angle calculations and subsequent forward attachment distances for given depths are consistent with the calculations provided in the contractor's

submittal. The measured distance between the center points of both pins on the forward draghead attachment point was 7.5". According to the contractor submittal, for a depth range of 40'-50' and subsequent approach angle range of 23°-28° the distance at the forward attachment point should be between 17" and 28". The depth range for this project is 40-50'; therefore, the attachment distance is off from the submittal by about 10"-21". The contractor should provide a new submittal for this project that describes explains these discrepancies and if necessary should correct the distance at the forward attachment point so that the correct plowing depths can be maintained under given approach angles.

4. A paint test was performed on the inboard portions of both the starboard and port deflectors in order to assure that the deflectors were plowing at least 6". After one full load (~45 minutes) the dragheads were raised and confirmations were made that at least 6" of the paint had worn off.

5. Once the physical inspection of equipment was complete the dragtender was observed during operation. Particular points of interest during operation were starting/stopping, slurry density and velocity, lower dragarm angle, plugging of the draghead, draghead elevation, etc. The calculated approach angle for the project depth provided in the submittal needs to be converted to the "digangle" (gimble angle) reading on the meter used by the dragtender. These angle conversions need to be provided in a new submittal with Wilmington Harbor project depths and approach angles. The contractor stated that software was being developed to allow the dragtender to read the approach angle directly at the dragtenders station. This software may be completed and installed before the end of this project. We discussed with the dragtender how essential it is to be sure the draghead is on the bottom and plowing at all times in order to reduce sea turtle takes. Mr. Marcus Robin will provide the Corps, via disc or email, with Silent Inspector data (Draghead elevation, slurry density and velocity, pump RPM, etc.) at 30-second increments.

6. New observer sheets were provided to Andrew Jackson for future use. Andrew indicated that the forms they are using are exactly the same with a few minor exceptions. Concerns were raised in regards to not receiving the load data sheets and having no information indicating that screening by observers was less than 100%. Andrew indicated that he would document in the daily reports the screening effectiveness for specific loads and reaches. This information will be valuable in future risk assessments for hopper dredging the Wilmington Harbor outer bar and clarifying the reality of dredging in the Wilmington Harbor outer bar.

7. COE Sea Turtle Inspection Checklist for Hopper Dredges, scanned copies of the TED drawing and calculated approach angles, and sea surface water temperatures for 29 March are enclosed as well as representative photographs taken by Mr. Doug Piatkowski, which are attached for informational purposes.

8. If there are any questions, contact Doug Piatkowski at 910-251-4908.

COE SEA TURTLE INSPECTION CHECKLIST FOR HOPPER DREDGES

For

COE Projects or COE/Army Permitted Project

1. Read contract plans and specs and/or all applicable permits (Dept. of the Army Permit, State Permits) to determine the contract or permit requirements for the protection of endangered sea turtles (each District specs or permit may be different).
2. Read the Biological Opinion and any COE Division Protocol if available.
3. Develop a list of inspection requirements:
 - a. Leading edge angle (90 degrees or less).
 - b. Approach angle or leading edge plowing depth (6 inches or more).
 - c. Aft rigid attachment of deflector to the drag head (hinged or trunnion).
 - d. Forward deflector attachment point (adjustable pinned or cable/chain with stop).
 - e. Opening between drag head and deflector (4"X 4" max).
 - f. Is screening of dredged material required?
 - g. Are inflow screens or overflow screens or both required?
 - h. Are inflow basket screen openings 4"X 4" max and is 100% of the dredged material being screened.
 - i. Lighting of inflow and overflow screens and proper access for cleaning (must meet EM 385-1-1).
 - j. Structural design of deflector (per approved deflector submittal).
 - k. Dredge operational requirements (starting /stopping dredge pump, draghead plugging, razing draghead, turning the dredge).
 - l. Is dredging data recording (drag elevation, slurry density & velocity) required by specs or permit? If so is it being collected?
 - m. Is turtle trawling required by specs or permit? If so is it being performed?
 - n. Turtle observers requirements (12 or 24 hours req.)
4. Review turtle deflector submittal (do not allow dredging to start until submittal is approved):
 - a. Structural soundness
 - b. Leading edge angle (90 degrees or less).
 - c. Approach angles for dredging depths.
 - d. 4"X 4" opening between deflector and draghead.
5. Assure the CQC performs pre-dredging inspection:
 - a. CQC is required to review and inspect all items in paragraph 3a-n.
6. QA should perform dredging operation inspection:
 - a. Review and inspect all items in paragraph 3a-n.

- b. Require the contractor to perform paint test to assure deflector is plowing at least 6” into the dredge material (over penetration of the deflector will reduce production and increase fuel consumption of the dredge).
- c. Ride the dredge though at least one dredging cycle (dredging, to the dump, and back to the dredge site).
- d. Watch the drag tender to assure he is operating the dredging equipment in accordance with the plans and specs (starting/stopping dredge pump, lower dragarm angle, swell compensator, slurry specific gravity, plugging of the draghead, ship crabbing).
- e. Lockout tagout procedure for cleaning the inflow and overflow screens (must meet EM 385-1-1).
- f. Talk to turtle observers to assure they are aware of contract and permit requirements and are performing inspection of screens and deflectors and reporting any maintenance required to the dredge personnel. Assure that correct turtle observer forms are being used and filled out properly.
- g. Talk to Dredge Captain about maintaining the screens and deflectors.
- h. All pre-dredge/post-dredge and follow up inspections should be noted in the CQC Daily Reports.

COMMENTS:___See memorandum for record dated 24 March, 2005.

COE Inspector:

Name: Doug Piatkowski, Philip Bates, and Rolando Serrano

Office Symbol_____Date of Inspection: 23 March 2005



Switching forward and aft boxes during pumping due to plugging of boxes with woody debris



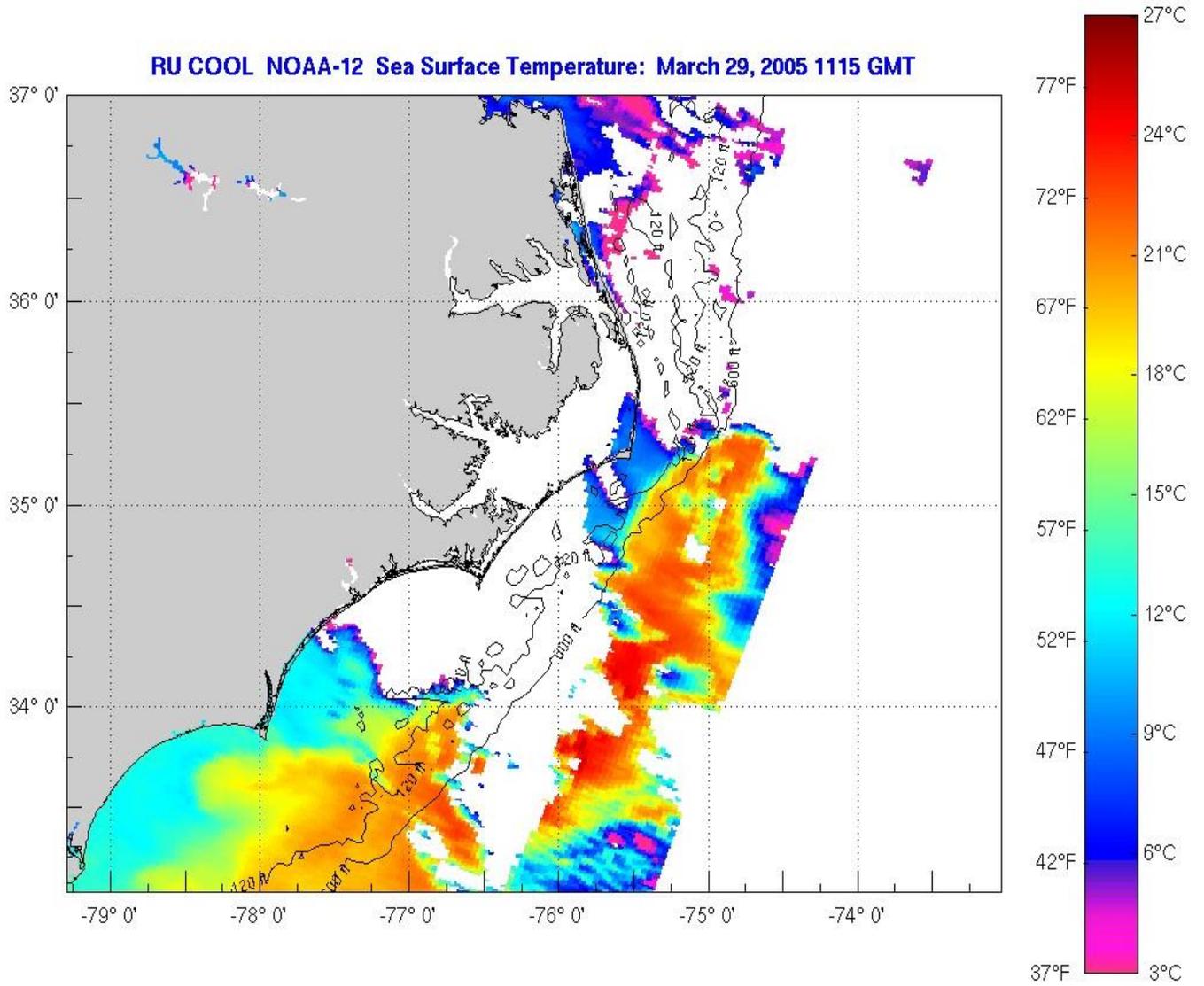
Aft starboard box filled with woody debris



Observer checking aft starboard box after pumping



Aft weir skimmer with only 25% overflow screening



The sea surface temperature for the project area on 29 March. Water temperature is about 56° F. Sea turtle presence is generally correlated with about 57° F sea surface water temperature.

ENDANGERED SPECIES OBSERVER PROGRAM
DAILY REPORT

DATE: 03/23/05

Project Name: Baldhead Shoal Channel USACE District: Wilmington
Dredge Name: Bayport Dredge Firm: Manson
Contract # W912PM-02-C-0002 Maintenance New Work

Load #: 27 - 32 Areas worked (stations, etc): Stn: 120^{rod} - 223^{rod}
Location, Lat/Long: N 33° 50' 438" x W 78° 01' 767"

Beaufort Sea State: 0 1 2 3 4 5 6 7 8 9 10 11 12

AIR TEMP: 54-62 °C Wind Direction and Speed WSW (10-20 KT)

WATER TEMP: Surface 52 °C Column (mid-depth) _____ °C Bottom _____ °C

Condition of deflector: Good Condition of screening: Good

Were there incidents involving endangered or protected species? YES NO

Which species? (complete incident form(s)) _____

Comments (type of material, biological specimens, unusual circumstances, etc): _____

Material: silt, mud, clay
Samples: wood, shell, dog fish
No incidents involving endangered or protected species.
Inflow boxes still being ground throughout load to clear of wood.
Sample rate < 50%
USACE paint test TED - OK.

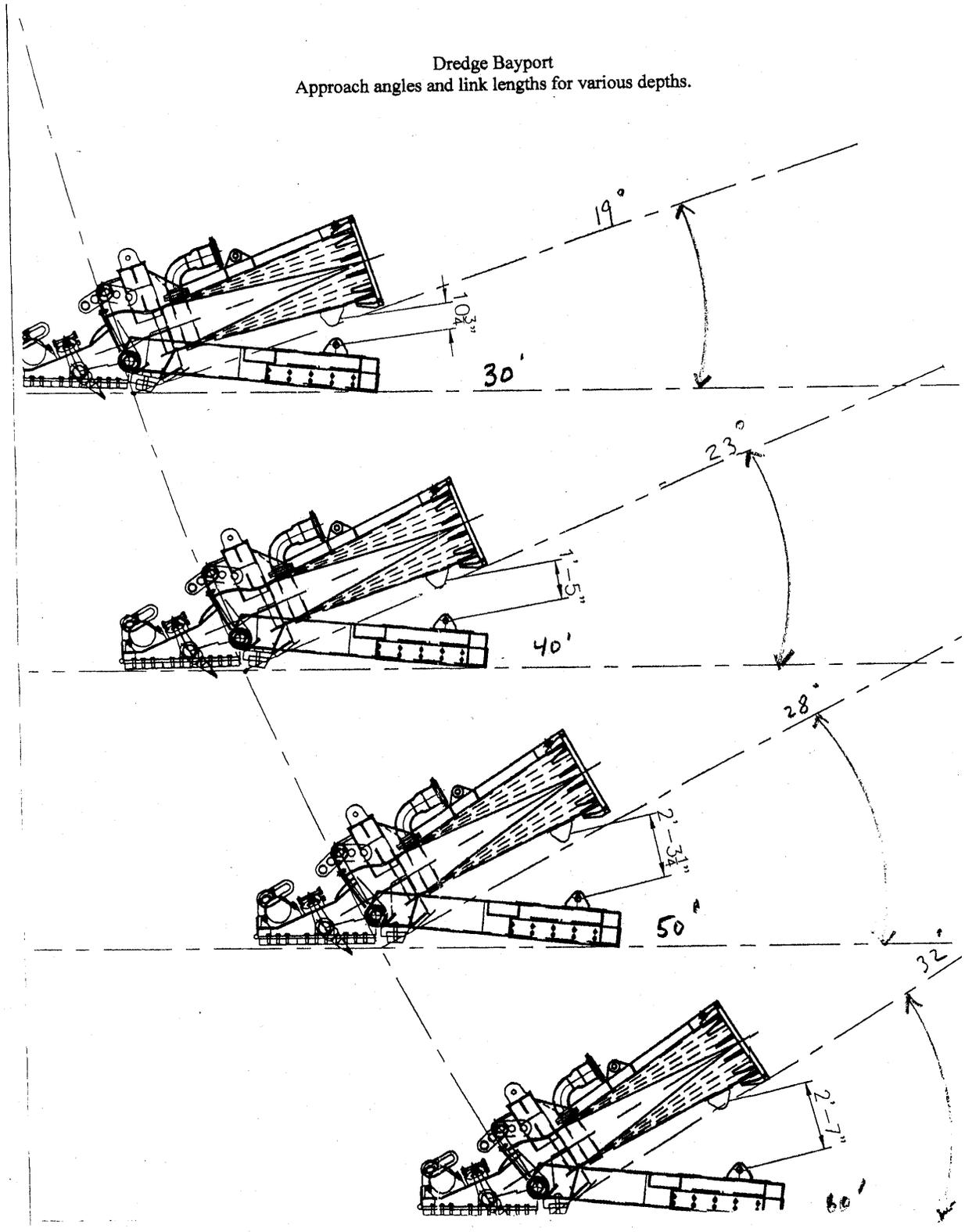
BRIDGE WATCH SUMMARY

| Time | Species | # Sightings/# Animals | Location/Comments |
|------|---------|-----------------------|-------------------|
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| | | | |
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Observers Names Andrew Jackson / Tin Tran
Observer Firm Coastwise Consulting

Example of endangered species observer program daily reports indicating screening deficiency

Dredge Bayport
Approach angles and link lengths for various depths.

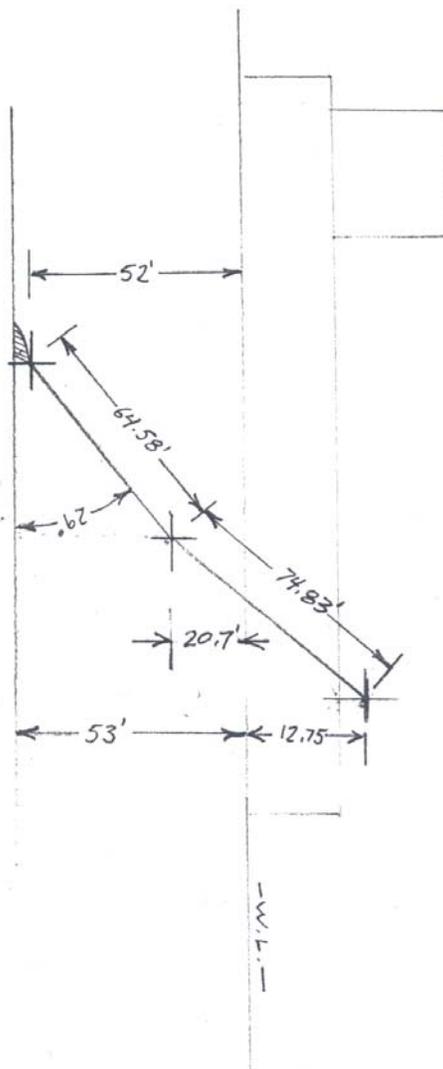


Approach angle calculations and forward attachment point distance requirements for 6" plowing

M/V BAYPURI

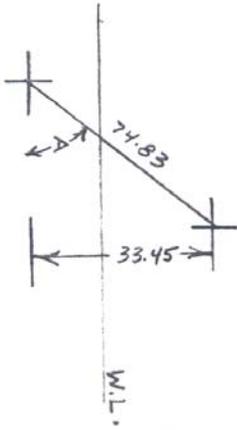
REQUIRED 29° APPROACH ANGLE FOR 6" PLOW DEPTH

LINKS



$$\text{PUMP HEIGHT} = \sin 29^\circ \times 64.58 = 31.31'$$

$$52 - 31.31 = 20.7'$$



$$\sin A = \frac{33.45}{74.83}$$

$$26.55^\circ$$

$$29 - 26.55 = -2.5^\circ \text{ DIS ANGLE AT GRADE}$$

Approach angle conversion to "digangle" (gimble angle)