B EPA 343

Kozloff, Keith

From: Herman.Chris@epamail.epa.gov
Sent: Wednesday, July 16, 2003 5:51 PM
To: Keith.Kozloff@do.treas.gov
Cc: frick.walter@epamail.epa.gov; Scott.Jeff@epamail.epa.gov
Subject: Review of Camisea current/spill modelling

Keith--

This forwards comments by Walter Frick, an EPA spill modelling specialist, on the MIKE21current/spill modelling for Pisco and Paracas Bays done by ESM on behalf of PlusPetrol.

Earlier I forwarded FYI his detailed comments on the text of the report. Rather than work up a more formal paper, this forwards his analysis in the form of responses to some policy-relevant propositions. I've inserted a bracketed phrase below where needed for clarity.

In summary: a threshold problem is that the reliability of the model in the study area is unverified, permitting little confidence that the current modelling results accurately describe the effects of a platform or pipeline leak in the bay; that documented site-specific conditions could result in spill movement into the bay; that verification of the 2-D model is needed, as a first step, to identify its strengths and weaknesses as used here, given that a 3-D model, while much more appropriate, could be difficult to develop and run successfully.

Hope this is helpful. Please call (564-6463) if questions. Best regards.

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Model verification important to demonstrate that the model is reasonably accurate

Yes, that's a main goal. The [2-d MIKE21] model may be useful for limited purposes, however, the available data suggests that the model does not seem to capture the variability in water movement in the vicinity of the terminal. But, with the uncertainties surrounding the Valeport current meter measurements, it's hard to tell. I am not certain they properly reported low current speed values and the details of the mooring configuration may be introducing variability that is not actually there. With inadequate mooring instruments can "pump", exhibiting forced behavior that ends up affecting the measured signal.

The model is not verified against existing data, i.e., calibrated or verified to show that the model can predict known conditions. Existing conditions appear to show significantly more uniform distribution than the model predicts.

Right. Since they didn't do a complete verification, I did some checking myself. My figure in the Appendix (Fig. A.1-1) is a limited verification effort. Of course, my estimates of speed and direction are obtained by zooming the figures in the report and making manual measurements and calculations to determine model velocities at the terminal in the various scenarios. They should be able to do it much better. Hopefully at least the general approach is valid. If it is, the point is that the red circles represent model predictions for corresponding representative conditions. If the model looked really promising, these circles would appear more in the portions of the their figure with data points in them. Instead, the predictions are not spread out and many fall in the empty, low-speed area. Of course, I suspect that they omitted to point out that there would be data points in center if the propeller didn't stick at low current velocities. Anyway, the results do not conform to my impression of a highly successful model.

The model is not verified against the floatables data, i.e., does not show that the model can predict the 'flotables' results.