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Kozloff, Keith

From: Herman.Chris@epamail.epa.gov  
 Sent: Tuesday, August 19, 2003 3:02 PM  
 To: keith.kozloff@do.treas.gov; rick.williamson@exim.gov  
 Cc: Cotter.Patrick@epamail.epa.gov; Hill-Macon.Cam@epamail.epa.gov  
 Subject: Camisea Pipeline EIA--storms; toxicity.

Keith and Rick--

As they are useful, I am forwarding Dr. Brian Melzian's comments on yesterday's draft about potential effects of storm waves and toxicity of potential released materials. I will revise and circulate this note to reflect Dr. Melzian's and other comments.

Other comments have noted that physical effects (smothering, suffocation) of diesel/gasoline spills on aquatic systems can be immediately catastrophic--making their toxicity a relatively academic issue; and the need to distinguish better between naphtha and naphthalene.

It seems that the description of what will be in the pipelines changes from document to document.

If you meet with Plus Petrol, could you ask

--whether (contrary to the EIA) the pipeline is to be trenched the entire distance to the terminal? to what depth? --whether any wave spectra study has been done, including during the winter? --what is the latest version of what product (diesel, jet fuel, gasoline, naphtha, propane, butane--or all the above or others depending on market conditions) will be exported?

Thanks.

Chris  
 ----- Forwarded by Chris Herman/DC/USEPA/US on 08/19/2003 02:49 PM -----

Chris	Brian Melzian	To: Patrick Cotter/DC/USEPA/US@EPA,
EIA	08/19/2003 02:26 PM	Herman/DC/USEPA/US@EPA cc: Subject: Some Comments >> Camisea Pipeline

Pat and Chris:

Unfortunately, I need to work on some other very important and time-sensitive projects, but please see my comments in bold found below. Good Luck with all of this; and when are we going to Peru? : - )

Brian  
 NHEERL  
 Atlantic Ecology Division  
 (401) 782-3188

----- Forwarded by Brian Melzian/NAR/USEPA/US on 08/19/03 01:23 PM -----

Brian	Chris Herman Sent by: Chris	To: Patrick Cotter/DC/USEPA/US@EPA,
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Herman

james.mahoney@exim.gov

08/18/03 06:45 PM

Melzian/NAR/USEPA/US@EPA  
cc: keith.kozloff@do.treas.gov,

Subject: Camisea Pipeline EIA

Based on discussions with EPA colleagues, I have been reviewing the PlusPetrol ERM EIA report "Alternative Subsea Piping" with respect to two questions--pipeline whip risk and characterization of leaks resulting from pipeline rupture.

This note is a "draft" subject to correction and revision on technical matters--all errors are mine--intended to flag some possible concerns.

I would welcome comments/reactions.

#### Risk of Pipeline Whip

NOTE THAT WAVES GENERALLY "TOUCH BOTTOM" AT APPROXIMATELY 1/2 THEIR WAVE LENGTH. HENCE, A WAVE ONLY 7 METERS IN LENGTH (MEASURED FROM CREST TO CREST) WILL IMPACT THE BOTTOM. BY THE WAY, YOU CAN DETERMINE THE TYPES OF WAVES THAT HAVE IMPACTED THE COAST BY SIMPLY MEASURING THE "GRAIN SIZE DISTRIBUTION" OF THE SEDIMENTS WHERE THE PIPELINE WILL BE BURIED.

IF THE SEDIMENTS ARE FINE AND MUDDY; THEIR PROBABLY WILL NOT BE MUCH DISTURBANCE BY THE WAVES (AT LEAST MOST OF THE TIME); BECAUSE THESE WAVES WILL USUALLY BE SMALL; AND THE OCEAN CURRENTS ARE WEAK. IF THE SEDIMENTS ARE COARSE SAND OR GRAVEL, THERE WILL BE MUCH WAVE AND LONGSHORE CURRENT ACTION OVER TIME.

AS YOU MAY KNOW, THE PACIFIC OCEAN OFTEN GENERATES WAVES WHICH ARE MUCH LONGER THAN 7 METERS; ESPECIALLY IN THE WINTER. HENCE, PERHAPS SOMEONE SHOULD DEPLOY A SURFACE BUOY TO MEASURE THE "WAVE SPECTRA" OVER TIME?

SOMEONE COULD MEASURE THE ONSHORE-OFFSHORE MOVEMENT OF THESE SEDIMENTS BY SIMPLY POUNDING LARGE METAL RODS INTO THE SEDIMENTS AT VARIOUS INTERVALS PERPENDICULAR FROM THE BEACH. AFTER THIS IS DONE, THE SCUBA DIVERS (Pat?) COULD THEN GO OUT AND SEE HOW MUCH SEDIMENTS (AS MEASURED BY VERTICAL CHANGES NEAR THE RODS) ARE MOVED OVER TIME. THIS IS A FAIRLY STANDARD PRACTICE USED TO MEASURE THE EROSION AND ACCRETION OF BEACH SEDIMENTS.

According to the report (Chapter 1, page 2), the pipeline, approximately 4000 meters long, will lie on the sea bed after a sea water depth of 3.5 meters has been reached, ie., about three quarters of its length. Up to that point, it will be buried to a depth of two meters "to protect them from the waves".

This raises the question, "what waves?"--normal waves or storm-produced waves? Given the configuration of the Pacific coast, it would appear that this design might protect the pipeline from "normal" waves but could well expose the pipeline to wave action and pipeline whip during storm events. The report does not appear to address this latter source of rupture risk.

The report's brief discussion of pipeline rupture is limited to rupture due to a ship's anchor or an "important earthquake". Unlike other sealoading facilities, the report does not claim that the pipeline has been designed to minimize risk of spill due to "third parties damages, earthquakes and tsunamis".

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#### Impacts of Rupture.

The report's brief discussion of the effects of pipeline rupture is limited to fire and explosion, on the assumption that the 'worst' result of a spill would be an ignitable vapor cloud formed by butane/propane or an ignitable diesel 'lake'. On a brief review, the potential for a pipeline-based fire to ignite the platform or a tanker--a horrendous scenario-- is not discussed, except to say that the "objective of the response action would be to "control any migration of the ignited product" (chapter 4, page 27).

The EIA does not discuss the environmental impacts of rupture-induced fire or explosion or pollution of coasts and beaches; it does not even mention the possibility of aquatic ecosystem impacts, in the Reserve or elsewhere. THIS COULD BE A MAJOR PROBLEM It simply-- and in a wholly conclusory fashion--states that "the assessment of impacts which might derive, on a potential basis, from these contingencies have been assessed as slight on the rest of the resources analyzed". (chapter 5, p. 32).

It claims that the maximum volume spilled would be 5400 barrels propane/butane, 4100 barrels gasoline, 700 barrels diesel (Chapter 4, page 26). IF THIS IS A REMOTE AREA; AND NO ONE IS AROUND TO IMMEDIATELY RESPOND, THESE TYPES OF SPILLS COULD END UP BEING MUCH LARGER (WORSE). EVEN THOUGH THESE AMOUNTS ARE NOT AS LARGE AS WHAT WOULD OCCUR FROM AN OIL TANKER SPILL, THEY ARE STILL QUITE LARGE This sounds low given the initial 113 m3/hour, subsequent 350 m3/hour production capacity of the plant. The butane and propane pipes are both 20 inch diameter (insulated), while the gasoline pipe is 24 inch and the diesel pipe is 10 inch diameter. Only the 20 inch pipes will have fiber optic cable (to monitor damage to the insulation). The report's estimate is based on activation of a blockage valve (1 kilo. on shore) within 30 seconds by pressure loss sensors and on trapping half of the product within the pipe.

The basis for the assessment that impacts would be "slight" is unclear. It appears to assume that the "contingencies" plan is completely effective to prevent incidents or reduce the effect of a fire/explosion to a minimal level. (chapter 5, p. 32). Yet the relevant chapter (Chapter 6) makes clear that the purpose of the contingency planning is to optimize response and to minimize damage, i.e., that it assumes a 'contingency' and does not address prevention. The Chapter does not of course actually contain a contingency plan.

The report seems to consistently understate or relativize the environmental impacts of a spill of propane/butane, gasoline (jet fuel?) and diesel. IF THIS IS TRUE; AND BASED ON THE OIL TOXICITY INFORMATION THAT I SENT TO YOU FOLKS; THIS MAY BE A MAJOR WEAKNESS OF THE EIA.

Propane/butane. While these would as the report notes ordinarily gasify, there is potential--not described in the report--for these toxic compounds not to be immediately released but instead to be dissolved by storm processes into the water column. YES, BUT THESE COMPOUNDS SHOULD BREAK DOWN RAPIDLY; AND OR RAPIDLY VOLATILIZE. BY THE WAY, ARE THERE ANY LARGE BIRD AND MARINE MAMMAL COLONIES CLOSE TO WHERE THIS PIPELINE WILL BE INSTALLED? IF YES, BE CAREFUL!

Gasoline/Jet Fuel?. Effects of a spill of gasoline/jet fuel from the gasoline pipeline are not discussed in the report. According to technical experts, while these would volatilize in 1-2 days, they contain high concentrations of toxic (soluble) compounds which result in "localized severe impact to water column and intertidal resources". ANY SPILL OF THESE PETROLEUM PRODUCTS COULD DEVASTATE THE LOCAL MARINE ENVIRONMENT; AND PERHAPS OTHER AREAS UPSTREAM (Upshore) OR DOWNSTREAM (Downshore) FROM THE SPILL. THE POTENTIAL TOXICITY OF THESE PRODUCTS SHOULD NOT BE UNDERESTIMATED; ESPECIALLY IF THEY END UP IN THE SEDIMENTS; OR IF THEY IMPACT NEARBY WETLANDS, MANGROVE FOREST, ETC. THESE PETROLEUM COMPOUNDS ARE ALSO ACUTELY TOXIC TO MANY (MOST) JUVENILE AND LARVAL FORMS OF MARINE LIFE.

Naphtha. According to the report, naphtha is "hardly soluble in water and relatively volatile" (chapter 6, p. 34). According to technical experts, however, naphthalenes are the most water soluble of the higher polyaromatic hydrocarbons and, notwithstanding relatively low solubility, have "moderate acute toxicity" and moderate potential for bioaccumulation and chronic toxicity. "These medium-weight components pose the greatest environmental risks to organisms because the compounds are more persistent, they are biologically available, and the PAHs have high toxicities". AGREED; AND AROMATIC COMPOUND WHICH CONTAIN MORE THAN ONE BENZENE RING (e.g., NAPHTHALENE) TEND TO BIOCONCENTRATE MORE READILY THAN SINGLE RING COMPOUNDS. BENZOAPYRENE, A SUSPECTED CARCINOGEN, IS ALSO MULTI-RING COMPOUND FOUND IN ALMOST ALL PETROLEUM OILS.

Diesel. According to the report, diesel "has insignificant solubility in water" NOT TOTALLY TRUE; SINCE UNDER THE PROPER CONDITIONS, IT CAN READILY "ACCOMMODATE" INTO THE WATER COLUMN and "volatility relatively low compared with naphtha or gasoline". TRUE, BUT IT IS STILL VERY VOLATILE! The report recognizes that diesel leakage "represents a major risk concerning water and environment impact to the littoral when compared with propane, butane and naphtha leakage" requiring removal. AGREED (chapter 6, page 35, italics added) This characterization of solubility/toxicity and comparative risk seems at best incomplete. According to technical experts, diesel is moderately volatile and contains moderate concentrations of toxic soluble compounds, "will 'oil" intertidal resources with long-term contamination potential", and "has potential for subtidal impacts". DIESEL IS VERY SIMILAR TO No. 2 FUEL OIL; AND BOTH CAN BE EXTREMELY TOXIC TO MARINE ORGANISMS; WHETHER THEY ARE FOUND IN THE WATER COLUMN, BOTTOM SEDIMENTS, ROCKY INTERTIDAL AREAS, SALT MARSHES, OR ANY OTHER PORTION OF THE MARINE ENVIRONMENT.

(bdm: 8/19/03: 1425)