



"Pace.Wilber"
 <Pace.Wilber@noaa.gov>
 03/25/2009 01:59 PM

To Rebecca Fox/R4/USEPA/US@EPA, Palmer
 Hough/DC/USEPA/US@EPA, Tom
 Welborn/R4/USEPA/US@EPA, Jennifer
 cc
 bcc

Subject Re: Fw: PCS lines

History: This message has been replied to.

Hello EPA.

We are not giving up on the NMFS areas previously identified. It is just easier for me to adjust the NMFS areas to the NGO line to the yield the federal agency line than it is for me to do it all at once, and I want to make sure the NGO line is correct. Mike Wicker says he's seen a different NGO line than the one presented Tuesday (see slide 2 of attached). We need to decide which NGO line we will use. We can do acres once the lines are set. I don't have a stream file, so I can't do stream lengths.

Pace

Fox.Rebecca@epamail.epa.gov wrote:

> Hi Pace. Forwarding Palmer's and my messages to you. are you able to
 > get total acreage and wetland/stream impacts from your maps?

>
 > Becky Fox
 > Wetland Regulatory Section
 > USEPA
 > Phone: 828-497-3531
 > Email: fox.rebecca@epa.gov
 > ----- Forwarded by Rebecca Fox/R4/USEPA/US on 03/25/2009 01:41 PM -----

>
 > Rebecca
 > Fox/R4/USEPA/US
 >
 > 03/25/2009 01:38 Palmer Hough/DC/USEPA/US To
 > PM cc
 > Tom Welborn/R4/USEPA/US@EPA
 > Subject
 > Re: Fw: PCS lines(Document link:
 > Rebecca Fox)

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 >
 > I did not tell Pace to not include those areas -- that was his decision
 > --maybe he believes since they will be getting their other 5 areas with
 > the suggested avoidance not to worry about these. we will need to talk
 > to FWS and NMFS about these 2 areas. i have a dr's appt so have to
 > leave and will not be back until late this afternoon. I will send pace

> a message to see if he can get us total acreage and wetland/stream
> impacts. b

>
> Becky Fox
> Wetland Regulatory Section
> USEPA
> Phone: 828-497-3531
> Email: fox.rebecca@epa.gov

>
>
> Palmer
> Hough/DC/USEPA/U
> S
> 03/25/2009 01:32
> PM
> Rebecca Fox/R4/USEPA/US@EPA To
> Tom Welborn/R4/USEPA/US@EPA cc
> Re: Fw: PCS lines(Document link: Subject
> Rebecca Fox)

> Becky:
>
> these look good. are we giving up the NMFS areas? if so we should be
> clear that the agencies have "conceded these upon further deliberation."
> otherwise, we will be sending mixed messages about those areas b/c the
> paper matches provided yesterday suggest that we want them.

>
> how soon can we get total acreage and total wetland impact acreage
> figures for the Fed Agency alternative?

> -P

>
> _____
> Palmer F. Hough
> US Environmental Protection Agency
> Wetlands Division
> Room 7231, Mail Code 4502T
> 1200 Pennsylvania Avenue, NW
> Washington, DC 20460
> Office: 202-566-1374
> Cell: 202-657-3114
> FAX: 202-566-1375
> E-mail: hough.palmer@epa.gov

>
> Street/Courier Address
> USEPA
> Palmer Hough
> EPA West -- Room 7231-L
> Mail Code 4502T
> 1301 Constitution Avenue, NW
> Washington, DC 20460
>

>
> |----->
> | From: |
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>

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> | Rebecca Fox/R4/USEPA/US
|
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> |----->
> | To: |
> |----->
>

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> | Tom Welborn/R4/USEPA/US@EPA, Palmer Hough/DC/USEPA/US@EPA
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> |----->
> | Date: |
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> | 03/25/2009 01:05 PM
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> |----->
> | Subject: |
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> | Fw: PCS lines
|
>

>
>
>
>

> forwarding ncpc maps pace prepared. he is working on bonnerton right
> now. b

> Becky Fox
> Wetland Regulatory Section
> USEPA
> Phone: 828-497-3531
> Email: fox.rebecca@epa.gov

> ----- Forwarded by Rebecca Fox/R4/USEPA/US on 03/25/2009 12:59 PM -----
>

> "Pace.Wilber"
> <Pace.Wilber@noa

> a.gov> To
> Rebecca Fox/R4/USEPA/US@EPA, Mike
> 03/25/2009 12:36 Wicker <Mike_Wicker@fws.gov>, Ron
> PM Sechler <ron.sechler@noaa.gov>,
> Jennifer Derby/R4/USEPA/US@EPA
> cc
> Subject
> PCS lines

> Hello everyone.
> Attached Power Point is my attempt to capture the "Agency Line" from the
> meeting yesterday into a GIS. So far, I've just done NCPC, but I'm
> doing Bonnerton as you read this. Please let me know if you think the
> line correctly captures the Agency Line shown yesterday.
> And feel free to distribute to others within your agency.

> Pace

> --

> -----

> Pace Wilber, Ph.D.
> Atlantic Branch Chief, Charleston (F/SER47)
> Southeast Regional Office, NOAA Fisheries
> PO Box 12559
> Charleston, SC 29422-2559
> 843-953-7200
> FAX 843-953-7205
> pace.wilber@noaa.gov
> <http://sero.nmfs.noaa.gov/dhc/habitat.htm>

> [attachment "PCS_AgencyLines_DRFAT.ppt" deleted by Palmer
> Hough/DC/USEPA/US]

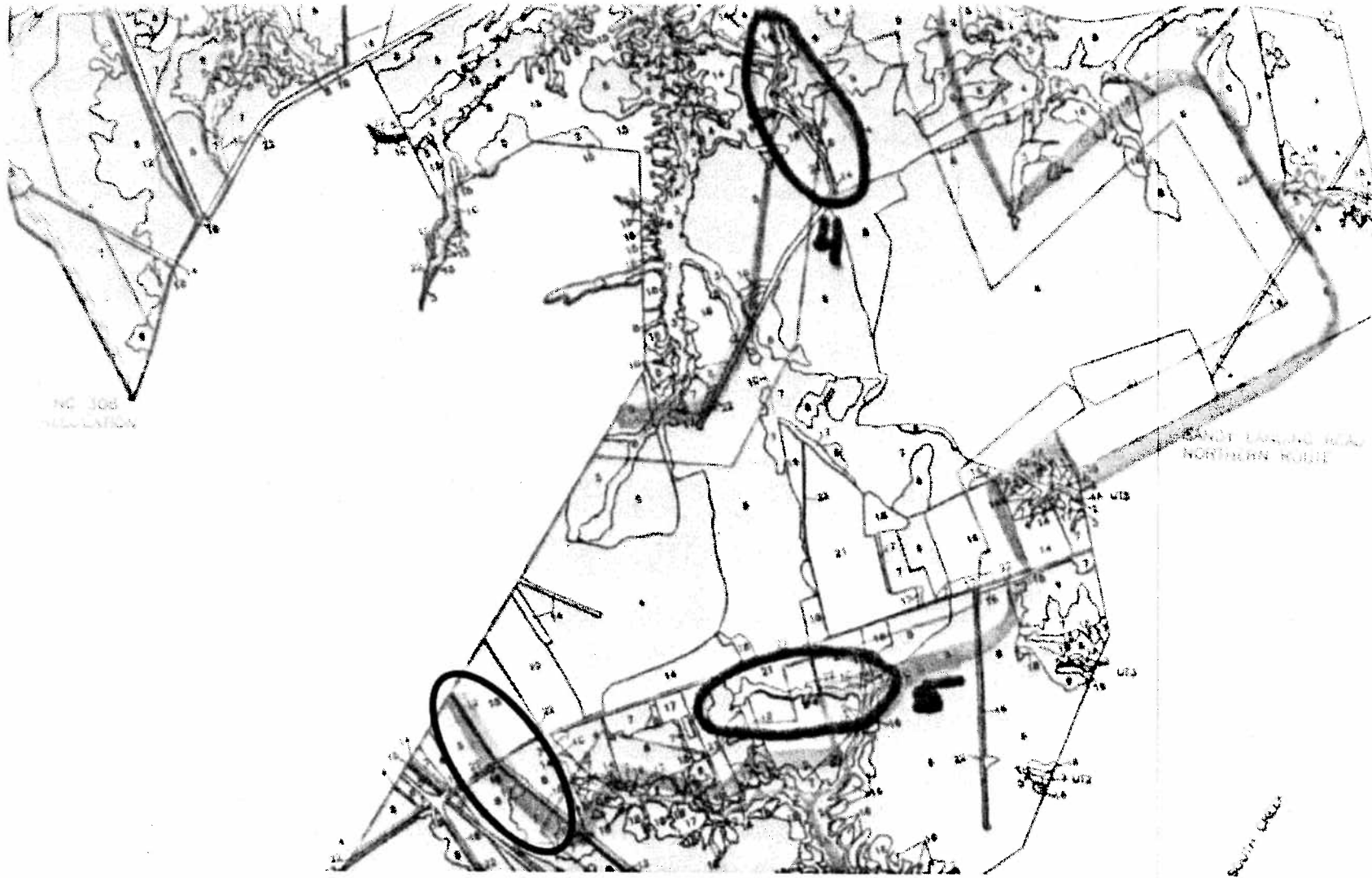
> --

> -----

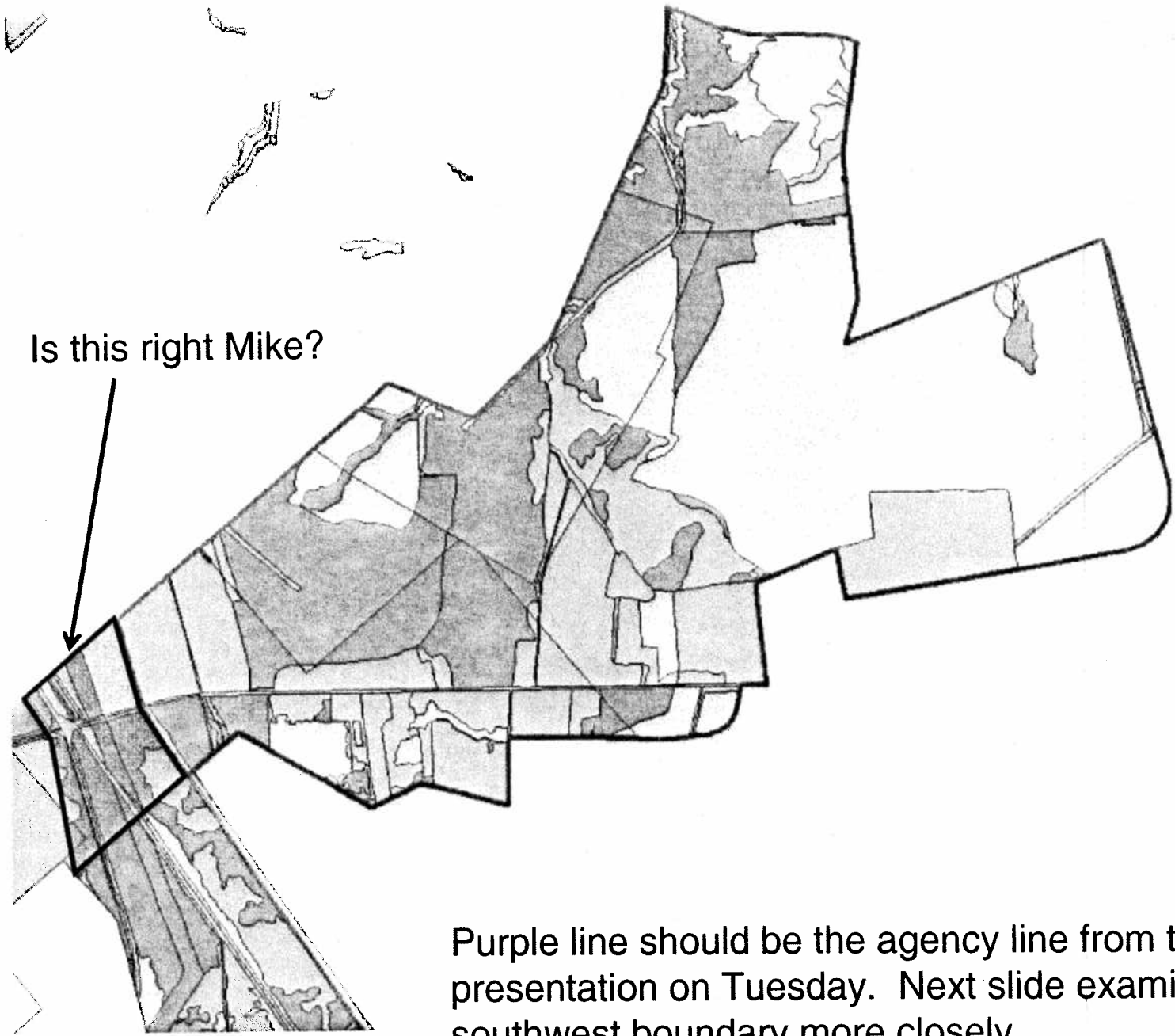
Pace Wilber, Ph.D.
Atlantic Branch Chief, Charleston (F/SER47)
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843-953-7200
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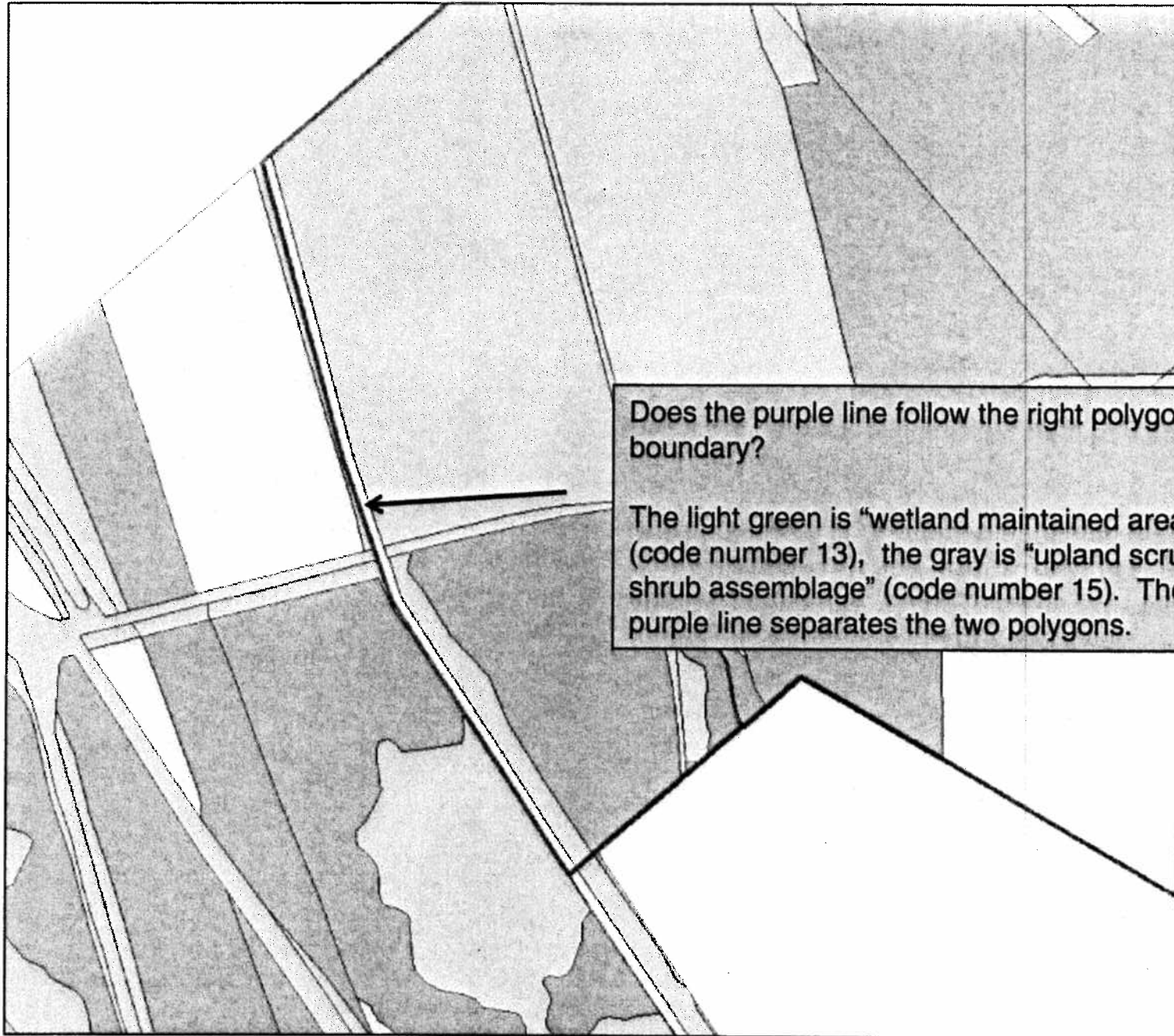


For simplicity, let's ignore the NMFS areas (labeled 4 and 5) for now. As far as I can tell, the heavy purple line follows a lighter purple/pink line that marks the Alternative L boundary. If that is true, then the only difference at NCPC is in the southwestern boundary (see red ellipse).



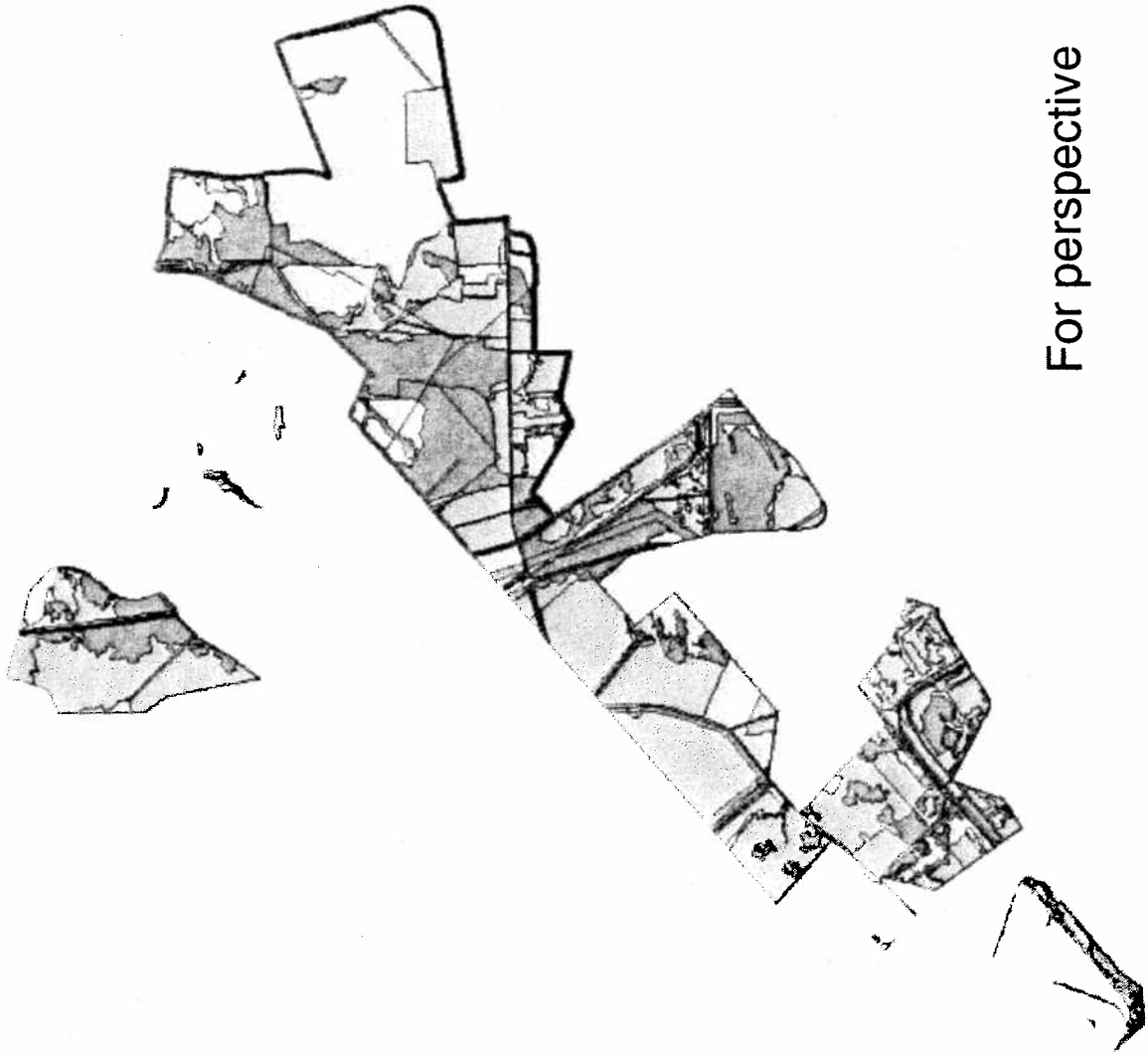
Is this right Mike?

Purple line should be the agency line from the presentation on Tuesday. Next slide examine the southwest boundary more closely.



Does the purple line follow the right polygon boundary?

The light green is "wetland maintained area" (code number 13), the gray is "upland scrub-shrub assemblage" (code number 15). The purple line separates the two polygons.



For perspective



Palmer
Hough/DC/USEPA/US
03/30/2009 08:46 PM

To Jim Giattina/R4/USEPA/US@EPA
cc arthur.l.middleton@usace.army.mil, Brian
Frazer/DC/USEPA/US@EPA,
david.m.lekson@usace.army.mil,
bcc

Subject Re: Follow-up to March 24 Meeting re PCS

Folks:

As promised, attached are the reclamation provisions (Item #2 in the email below from Jim Giattina).

Thanks, Palmer



Additional Reclamation Measures_3-30-09_v2.doc

Palmer F. Hough
US Environmental Protection Agency
Wetlands Division
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1200 Pennsylvania Avenue, NW
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USEPA
Palmer Hough
EPA West -- Room 7231-L
Mail Code 4502T
1301 Constitution Avenue, NW
Washington, DC 20460

Jim Giattina

Ken, Tom W, Arthur, David, Ross, Jeff, Tom R, a...

03/27/2009 07:49:55 PM

From: Jim Giattina/R4/USEPA/US
To: arthur.l.middleton@usace.army.mil, william.t.walker@usace.army.mil,
samuel.k.jolly@usace.army.mil, david.m.lekson@usace.army.mil, pete_benjamin@fws.gov,
mike_wicker@fws.gov, ron.sechler@noaa.gov, pace.wilber@noaa.gov,
rsmith@pcsphosphate.com, jfurness@pcsphosphate.com, tjregan@potashcorp.com,
ghouse@brookspierce.com
Cc: Stan Meiburg/R4/USEPA/US@EPA, Tom Welborn/R4/USEPA/US@EPA, Brian
Frazer/DC/USEPA/US@EPA, Jennifer Derby/R4/USEPA/US@EPA, Philip
Mancusi-Ungaro/R4/USEPA/US@EPA, Palmer Hough/DC/USEPA/US@EPA, Rebecca
Fox/R4/USEPA/US@EPA, Scott Gordon/R4/USEPA/US@EPA
Date: 03/27/2009 07:49 PM
Subject: Follow-up to March 24 Meeting re PCS

Ken, Tom W, Arthur, David, Ross, Jeff, Tom R, and George:

We want to thank everyone again for participating in Tuesday's meeting. We found the discussions very productive. A number of action items were identified at the end of the meeting. I would like to capture that

list, identify the lead for each action, and provide you with the status of actions which EPA/NMFS/FWS are responsible for. According to my notes, we identified the following four actions:

- 1) EPA in coordination with FWS and NMFS will provide GIS coverages identifying the proposed "EPA/FWS/NMFS" mining boundaries for the NCPC and Bonnerton tracts presented yesterday (the boundary for S33 continues to be the boundary certified by the State). We will forward this information to you on Monday 3/30.
- 2) FWS will provide language describing the reclamation provisions discussed on 3/24. We will forward this information to you on Monday 3/30.
- 3) NMFS will provide the language describing the monitoring provisions discussed on 3/24. We will forward this information to you on Monday 3/30.
- 4) Once it receives the GIS coverages, PCS will evaluate the economic viability of the EPA/FWS/NMFS alternative and share its results with the agencies.

In addition to expanded impact avoidance and improved reclamation and monitoring provisions, the EPA/FWS/NMFS alternative also includes measures to ensure that avoided aquatic resources are provided long-term protections from future mining with the appropriate binding real estate instrument. As discussed on 3/24, we suggest the use of conservation easements. As noted on 3/24, we are also open to discussion regarding compensatory mitigation credit for the protection of these avoided areas. We welcome your recommendations regarding the appropriate level of compensation credit for the preservation, enhancement, and/or restoration of avoided aquatic resources.

At the 3/24 meeting PCS requested that the agencies continue to pursue formal elevation of the Corps' proposed permit for the alternative known as "Modified Alternative L" that was certified by the State. Although not discussed on 3/24, we would like to organize a site visit for agency officials who would be involved in the review of this elevated permit decision. We would like to know your availability on April 27 and the morning of April 28.

Please let me know if I you have any changes to the action item list and indicate your availability for a site visit. Again thank you for participating in yesterday's meeting.

Thanks, Jim

Additional Measures to Improve PCS Reclamation Areas

EPA, FWS and NMFS recommend the following measures to minimize the impact of the mining project on avoided aquatic resources by improving the quality of the reclamation area. It should be noted that these improvements would be in addition to the already agreed-upon 3-foot site cap needed to address the cadmium risk assessment recommendations. PCS's reclamation plan shall describe the process that it will use to implement these reclamation efforts, set measurable success criteria, establish a process to measure those criteria, and create a mechanism for releasing those results to our agencies and the public annually. Reclamation under the plan must be completed and released within 15 years of initial land clearing for mine expansion.

1) We recommend that a topsoil cover be added to the reclaimed areas utilizing, to the extent appropriate and practicable, the topsoil removed prior to site mining. Reuse of on-site topsoil takes advantage of the soil structure, organic matter, nutrients, and seed sources available in that material (i.e. the A Horizon) which is removed as mining operations advance. There is support for such an approach in the published literature (Farmer and Blue 1978; Schuman and Power 1981) and addition of topsoil to phosphate reclamation sites in Florida has yielded positive environmental results. Adding approximately one foot of topsoil on average (no less than six inches) would allow the site to recover at a greatly accelerated pace in contrast to not having topsoil and would make the reclaimed area suitable for a broader array of tree species. While we recognize that adequate amounts of topsoil will likely not be available to re-cover the entire reclamation area because of losses during removal and site preparation, reasonable targets for the percent of the reclamation site amended with topsoil should be established.

2) We recommend that upland portions of the reclamation area be replanted, to the extent appropriate and practicable, in longleaf pine (*Pinus palustris*) and wetland areas be replanted in bald cypress (*Taxodium distichum*) and/or Atlantic white cedar (*Chamaecyparis thyoides*) if Atlantic white cedar is shown to do well on the reclamation sites. All three of these species will grow on low fertility sites and longleaf pine and bald cypress are long lived species that despite slow growth rates can be expected to live long enough to eventually establish moderate stand coverage even on sterile sites and will produce decay resistant litter that over the very long term will rebuild soil. All of these species provide wildlife habitat and all occur naturally in monotypic stands. Reasonable targets for the percent of the reclamation site replanted with these species should be established.

3) We recommend that reclamation efforts in riparian areas receive priority treatment, particularly for those riparian areas adjacent to streams that will be connected to existing surface waters. PCS's reclamation plan must include an explanation of site development that will minimize erosion, eliminate contaminant transportation from the clay/gypsum blend through the stream channel, and facilitate the development of a mature vegetated riparian buffer.



"Pace.Wilber"
<Pace.Wilber@noaa.gov>
03/31/2009 09:21 AM

To Jim Giattina/R4/USEPA/US@EPA
cc arthur.l.middleton@usace.army.mil,
william.t.walker@usace.army.mil,
samuel.k.jolly@usace.army.mil,
bcc

Subject Re: Follow-up to March 24 Meeting re PCS

Apologies to all . . . referenced attachment is now attached.

Pace.Wilber wrote:

> Hello everyone.

>

> Draft monitoring language is attached.

>

> Pace

>

> Giattina.Jim@epamail.epa.gov wrote:

>> Ken, Tom W, Arthur, David, Ross, Jeff, Tom R, and George:

>>

>> We want to thank everyone again for participating in Tuesday's meeting.

>> We found the discussions very productive. A number of action items were

>> identified at the end of the meeting. I would like to capture that

>> list, identify the lead for each action, and provide you with the status

>> of actions which EPA/NMFS/FWS are responsible for. According to my

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>> and Bonnerton tracts presented yesterday (the boundary for S33 continues

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>> viability of the EPA/FWS/NMFS alternative and share its results with the

>> agencies.

>>

>> In addition to expanded impact avoidance and improved reclamation and

>> monitoring provisions, the EPA/FWS/NMFS alternative also includes

>> measures to ensure that avoided aquatic resources are provided long-term

>> protections from future mining with the appropriate binding real estate

>> instrument. As discussed on 3/24, we suggest the use of conservation

>> easements. As noted on 3/24, we are also open to discussion regarding

>> compensatory mitigation credit for the protection of these avoided

>> areas. We welcome your recommendations regarding the appropriate level

>> of compensation credit for the preservation, enhancement, and/or

>> restoration of avoided aquatic resources.

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>> formal elevation of the Corps' proposed permit for the alternative known

>> as "Modified Alternative L" that was certified by the State. Although

>> not discussed on 3/24, we would like to organize a site visit for agency
>> officials who would be involved in the review of this elevated permit
>> decision. We would like to know your availability on April 27 and the
>> morning of April 28.

>>
>> Please let me know if I you have any changes to the action item list and
>> indicate your availably for a site visit. Again thank you for
>> participating in yesterday's meeting.

>>
>> Thanks, Jim

>>
>>
>>
>

--

Pace Wilber, Ph.D.
Atlantic Branch Chief, Charleston (F/SER47)
Southeast Regional Office, NOAA Fisheries
PO Box 12559
Charleston, SC 29422-2559

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FAX 843-953-7205
pace.wilber@noaa.gov

<http://sero.nmfs.noaa.gov/dhc/habitat.htm>

Recommendations for the Monitoring of Impacts to Primary Nursery Areas

Background

Throughout reviews of the proposal by PCS to expand its mine into the NCPC, Bonneron, and S33 tracts, resource agencies expressed concerns over direct and indirect impacts to creeks that function as nursery areas for estuarine and marine fauna. South Creek, which borders the NCPC tract, is designated by the State of North Carolina as a Special Secondary Nursery Area, and the NC Division of Marine Fisheries has jurisdiction over this aspect of South Creek. Three creeks that discharge into South Creek from the NCPC tract, Tooley, Jacobs, and Jacks Creeks, and one creek that borders the Bonneron tract, Porters Creek, are designated as Inland Primary Nursery Areas (PNAs) and are under the jurisdiction of the NC Wildlife Resources Commission. At the federal level under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), these creeks are Habitat Areas of Particular Concern, which is the highest level of protection afforded by the Magnuson-Stevens Act, and wetlands that serve as headwaters of those creeks are essential fish habitat (EFH) under the Magnuson-Stevens Act.

While the footprint of the proposed mine does not extend into the PNAs, the resource agencies are concerned that the extensive mining of wetlands that serve as the headwaters of these creeks may impair the function of these PNAs. Accordingly, a monitoring program coupled with an adaptive management process is proposed to gauge the impacts to the PNAs from the mining so that appropriate adjustments can be made to mine operations. By "appropriate adjustments," we simply mean compliance reviews common for permits that authorize projects of this size and duration, and recognition of the inevitable uncertainties at the time of permitting about how large projects affect the landscape, and vice versa. Similar monitoring should be part of the mitigation and reclamation activities so that the expected benefits from these activities can be evaluated. The monitoring program and adaptive management process described below are viewed as consistent with the recently issued water quality certification to the extent that the water quality certification describes the monitoring. PCS has six months to flesh out the monitoring program required by the water quality certification. We expect a single monitoring and adaptive management program would meet the requirements of state and federal authorizations.

Proposed Permit Conditions

Monitoring of Affected Creeks and Streams

PCS shall develop and implement a plan of study to address the effects of a reduction in headwater wetlands on the utilization of Porters Creek, Tooley Creek, Jacobs Creek, Drinkwater Creek, and Jacks Creek as nursery areas by resident fish and appropriate invertebrate species and on all other creeks and streams whose headwaters are reduced 10% or more by mine expansion. This plan shall be submitted to NMFS, US FWS, NCWRC, NCDMF, NCDWQ, NCDLR for review and approval prior to initiation of land clearing activities in the headwater wetlands of PNAs within the NCPC tract. PCS shall make the plan publicly available for comment at the time it submits the plan to the reviewing agencies and shall provide individual notice of the plan to those persons that request notice. The plan shall identify reference creeks (at least four – the usefulness of Muddy Creek as a reference creek should be reevaluated, not assumed); sampling stations, schedules, and methods; laboratory methods; data management and analysis; and quality control and quality assurance procedures.

Monitoring under the plan shall begin 10 years before land clearing is anticipated. For those streams with impacts expected to occur within the first 10 years of the mine expansion, monitoring shall begin as soon as possible following plan approval. Monitoring shall continue for 30 years following completed reclamation (to match North Carolina's solid waste monitoring requirements).

At a minimum, the plan shall address the following issues and include the following data collection:

1. Has mining altered the amount or timing of water flows within the creeks?
 - Continuous water level recorders to measure flow
 - Rain gauges to measure local water input
 - Groundwater wells to measure input to the creeks
 - Continuous salinity monitoring
 - Periodic DO monitoring (continuously monitored for several days at strategic times of year)

2. Has mining altered the geomorphic or vegetative character of the creeks?
 - Aerial photography to determine creek position, length, width, sinuosity (annual)
 - Cross section of creeks at key locations (annual)
 - Sediment characteristics (texture, organic content, and contaminants) (annual)
 - Vegetation (percent cover by species) along the creek to determine zonation changes and invasions (spring and fall)
 - Sediment chlorophylls or organic content in vegetation zone (spring and fall)
 - Determination of location of flocculation zones with each creek (spring and fall)
 - Erosion of overburden cap that forms the streambed banks in any reconnected stream system (spring and fall)

3. Has mining altered the forage base of the creeks?
 - Benthic cores to sample macroinfauna (spring and fall)
 - Benthic grabs focused upon bivalves, such as *Rangia* sp. (spring and fall)
 - Net samples for grass shrimp, blue crabs, and small forage fish (such as *Fundulus* spp.); sampling gears would be chosen to reflect ontogenetic shifts in creek usage (monthly)

4. Has mining altered the use of the creeks by managed fish?
 - Life-stage specific sampling based on time year, sampling gears would be chosen to reflect ontogenetic shifts in creek usage. (monthly or seasonally)

5. Do creek sediments include contaminants at levels that could impact fish or invertebrates?
 - Creeks would be sampled for metals, including cadmium, mercury, silver, copper, and arsenic (annual)
 - Availability and uptake by appropriate aquatic species (e.g., *Rangia* sp., blue crabs) should be measured using appropriate bioassay techniques (annual)
 - Effect on heavy metal concentrations in bottom sediments of connecting reclaimed areas to downstream creeks (e.g. Whitehurst Creek) (annual)

Groundwater Monitoring

- Groundwater monitoring wells should be placed in reclamation areas and peripheral areas. Number and location of wells shall be determined in consultation with the North Carolina Department of Environment and Natural Resources (Department).
- Groundwater monitoring should commence with weekly samples for a period of 5 years to generate an acceptable baseline. After 5 years, monthly monitoring is acceptable.
- Monitoring must continue for 30 years post reclamation. The post-reclamation time period can be lengthened by the Department.
- If elevated levels of heavy metals are detected, monitoring should continue to be conducted weekly.
- At a minimum, heavy metals, including cadmium, arsenic, and chromium should be analyzed. Other parameters may be added per the discretion of the Department.
- PCS shall develop a remediation strategy for heavy metal contamination of groundwater and tributaries that drain or are adjacent to mined areas. That strategy must be made available for public review and comment before approval by the Department.

Monitoring of Reclaimed Areas

PCS's monitoring plan must include specific conditions that measure the viability of capping and top soil cover approaches. Those conditions must include measurable standards and regular inspection intervals. The plan should further include an evaluation of the following characteristics:

- Physical conformation (to measure the rates of settling and erosion, the resulting changes in conformation)
- Patterns in overall water balance and groundwater levels
- Soil profile development and quality (especially looking for toxicants)
- Vegetative community development patterns
- Animal use patterns, along with some body burden testing for resident animals as sentinels for cadmium movement.

Adaptive Management

PCS shall establish an independent panel of scientists and engineers to annually evaluate whether direct and indirect impacts from mining and benefits from the compensatory mitigation are in accordance with expectations at the time of permitting. The panel shall meet during January or February of each calendar year and shall review data collected through the previous calendar year. By March 31, the panel shall provide the Wilmington District and PCS with recommended changes to the mining and mitigation that are necessary to bring the project into alignment with expectations. Every fifth year, the panel shall review the monitoring methods, sampling locations, parameters analyzed, and other elements of monitoring protocol to determine if modifications to the plan are appropriate. The Wilmington District will consider this information and comments from resource agencies to determine if corrective actions or permit modifications are needed. If the panel concludes and the Wilmington District agrees that the mine expansion has caused significant adverse environmental impacts that are not offset by mitigation, then corrective action shall be taken. All data, reports, and presentations reviewed by the panel shall be placed and maintained on a publically accessible internet site.



Mike_Wicker@fws.gov
03/31/2009 09:23 AM

To Palmer Hough/DC/USEPA/US@EPA
cc Rebecca Fox/R4/USEPA/US@EPA, "Pace.Wilber"
<Pace.Wilber@noaa.gov>, Pete_Benjamin@fws.gov
bcc

Subject Re: Follow-up to March 24 Meeting re PCS

History:  This message has been replied to.

(See attached file: Additional Reclamation Measures_3-30-09_v2.doc)

We reviewed these reclamation measures and are fine with the changes (which are actually an improvement).

Date: 3-30-09

Additional Measures to Improve PCS Reclamation Areas

EPA, FWS and NMFS recommend the following measures to minimize the impact of the mining project on avoided aquatic resources by improving the quality of the reclamation area. It should be noted that these improvements would be in addition to the already agreed-upon 3-foot site cap needed to address the cadmium risk assessment recommendations. PCS's reclamation plan shall describe the process that it will use to implement these reclamation efforts, set measurable success criteria, establish a process to measure those criteria, and create a mechanism for releasing those results to our agencies and the public annually. Reclamation under the plan must be completed and released within 15 years of initial land clearing for mine expansion.

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2) We recommend that upland portions of the reclamation area be replanted, to the extent appropriate and practicable, in longleaf pine (*Pinus palustris*) and wetland areas be replanted in bald cypress (*Taxodium distichum*) and/or Atlantic white cedar (*Chamaecyparis thyoides*) if Atlantic white cedar is shown to do well on the reclamation sites. All three of these species will grow on low fertility sites and longleaf pine and bald cypress are long lived species that despite slow growth rates can be expected to live long enough to eventually establish moderate stand coverage even on sterile sites and will produce decay resistant litter that over the very long term will rebuild soil. All of these species provide wildlife habitat and all occur naturally in monotypic stands. Reasonable targets for the percent of the reclamation site replanted with these species should be established.

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"Heather"
<riverkeeper@ptrf.org>
03/31/2009 09:35 AM

To Rebecca Fox/R4/USEPA/US@EPA
cc
bcc
Subject message this morning

History: This message has been forwarded.

Hi Becky,

Just one clarification on my message I left you this morning. Did want to condition our position that if any boundary lines change North of 33, our flexibility related to S33 is no longer applicable. We would need to re-evaluate all the boundaries before making any decisions (if changes are made). But again, we still believe that SCR on S33 would be practicable, and the small addition of mining area does not justify the added impacts. Cypress and Broomfield are great potential restoration sites. We feel that the company would be hard pressed to demonstrate that mod. Alt. L is practicable while SCR is not.

Be happy to chat this morning if you need clarification.

Heather Jacobs Deck
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"Pace.Wilber"
<Pace.Wilber@noaa.gov>
03/31/2009 10:21 AM

To Mike_Wicker@fws.gov
cc Palmer Hough/DC/USEPA/US@EPA, Rebecca
Fox/R4/USEPA/US@EPA, Pete_Benjamin@fws.gov
bcc

Subject Re: PCS Elevation: Draft Impacts Discussion for your
expedited review

History: This message has been replied to and forwarded.

Hi everyone.

I've added a few comments, mostly to the same section that Mike focused upon. Under the gun today we don't have time to fully discuss each agency's perspective . . . but it seems we all agree there is uncertainty in how APEC will be affected by the mine and mitigation, we vary on how to cope with that uncertainty.

Pace

Mike_Wicker@fws.gov wrote:

Just a few comments on page #3 relating to disruption of estuarine productivity and the benthic community. Feel free to use or reject. I thought the discussion was very good.

(See attached file: PCS impact discussion, USFWS Comments on page #3.doc)

In answer to your question as to a joint elevation. We want to use the same concerns which may have the same impact as a joint elevation (at least we think it would) but are reluctant to promise that we can get our document or a joint letter signed as quickly as you can (since you are ahead of us). It is our experience that our administration waits to the last minute to sign documents and we do not want to hold you up. We do plan on elevating and will be right behind you (just a few days later since we are on a different schedule).. We believe having a common message with EPA and NMFS and the NGO'S will be very helpful to us and hopefully to the environment and we are committed to having a common content as yours (except for agency specific boilerplate).

So we are planning on a very similar elevation package but a separate elevation package for now.

Thanks for all your good work

--

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<http://sero.nmfs.noaa.gov/dhc/habitat.htm>

IV. Substantial and Unacceptable Impacts

40 CFR 230.10(c): Significant Degradation

EPA is concerned that compliance with requirements of Section 230.10(c) of the Guidelines has not been demonstrated. Section 230.10(c) requires that no discharge of dredged or fill material shall be permitted which will cause or contribute to significant degradation of waters of the United States. The Guidelines explicitly require evaluation of all direct, secondary, (i.e., indirect), and cumulative impacts reasonably associated with the proposed discharge in determining compliance with Section 230.10(c). In accordance with the Guidelines, determining significant degradation requires specific consideration of effects on such functions and values as wildlife habitat, aquatic system diversity, stability and productivity, recreation, aesthetic and economic values.

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Of the 15,100 acre project area, the proposed mine advance would impact approximately 11,454 total acres and result in direct impacts to approximately 3,953 acres of wetlands, 19 acres of open waters and 25,727 linear feet of streams. This represents the single largest wetland impact ever authorized under the Clean Water Act in NC and represents a significant loss of wetlands, streams and other waters of the United States within the nationally significant Albemarle Pamlico Estuary Complex.

As previously noted, all of the site's wetlands perform important ecological functions that support the Albemarle Pamlico Estuary such as temporary storage of surface water, nutrient cycling, organic carbon export, pollutant filtering/removal, and maintenance of biologically diverse plant and animal habitat. Also as previously noted, all of the site's stream resources perform important ecological functions that support the Albemarle Pamlico Estuary such as the transport of water, nutrients and sediment downstream, pollutant processing and removal, and maintenance of biologically diverse plant and animal habitat. We recognize that not all of the approximately 3,953 acres of wetlands and 25,727 linear feet of streams that would be impacted by the proposed project perform all of these respective functions to the same degree (because of their position in the landscape and/or their level of prior disturbance), however, the complete loss of this entire suite of wetland and stream functions on this scale raises serious ecological concerns.

The habitat functions provided by wetlands and streams that would be lost are particularly important in light of the ecological and economic value of the Albemarle Pamlico Estuary's commercial and recreational fishery/shellfish resources. Also, the state has designated the entire Tar - Pamlico River Basin as Nutrient Sensitive Waters because of problems associated with excessive levels of nutrients in the river such as harmful algal blooms, low oxygen levels, increased fish kills, and other symptoms of stress and diseases in the aquatic biota. The state developed a strategy to reduce nutrient inputs from around the basin to the estuary that is yielding improvements to water quality. Nonetheless, we are very concerned that loss of the water quality enhancement functions provided by the approximately 3,953 acres of wetlands and 25,727 linear feet of streams that would be completely eliminated by the proposed project could

exacerbate existing water quality problems in the Tar – Pamlico River and hamper the state's ongoing efforts to improve the river's water quality.

Direct Impacts to Nationally Significant Natural Heritage Area

EPA is particularly concerned with the proposed project's direct impacts to the wetland area on the Bonnerton tract that has been designated by the NC Natural Heritage Program as a Nationally Significant Natural Heritage Area. As previously noted, the 271 acre nonriverine WHF found on the Bonnerton tract is an extremely unique and rare community type, one that has experienced a rate of loss higher than all other community types in the state. The fact that the Bonnerton tract's Significant Natural Heritage Area has been classified as nationally significant means the Natural Heritage Program has determined it to be one of the five best examples of this community type in the nation.

Comment [p1]: Spell out?

As previously noted, some of the indicators of quality in a nonriverine WHF are canopy maturity, canopy age structure, extent and connection to other natural communities. Historically, nonriverine WHFs naturally occurred in large patches and it is believed that some aspects of their ecosystem function are dependent on this large extent. The proposed project would directly impact approximately 97 acres¹ of this ecologically valuable and rare wetland system and would allow mining through the middle of the 271 acre area, bisecting it into two separate and smaller pieces, an eastern and a western piece. This large reduction in size and the fragmentation of the tract into two separate pieces undermines some of the key ecological characteristics which make it ecologically valuable and "nationally significant." Although the NCDWQ's CWA Section 401 Water Quality Certification requires the mined out area between the eastern and western pieces to be restored after mining, we believe it will be extremely difficult, based on the current state of the science, to restore this area to its prior condition after mining and this will have a significant detrimental impact to the integrity of this rare and threatened biological community. In addition to reducing the size of the area and fragmenting it into two pieces, the large scale disturbances associated with allowing phosphate mining through the middle of the area (land clearing, groundwater extraction, pit excavation, road and support infrastructure construction, etc) will further lower the ecological value of the remaining eastern and western pieces of the area.

Given the unique and valuable nature of this nationally significant resource, it is EPA's determination that the direct impacts of mining the 271 acre Significant Natural Heritage Area on the Bonnerton tract does not comply with Subparts C-F of the Guidelines, specifically Subpart C – Impacts on physical characteristics of the aquatic ecosystem, Subpart D – Impacts on the biological characteristic of the aquatic ecosystem, Subpart E – Impacts to special aquatic sites and Subpart F – Effects on human use characteristics (SNHA designation).

Indirect Impacts to Tidal Creeks/Primary Nursery Areas

EPA is also particularly concerned with the proposed project's indirect impacts to the project area's nine tidal creeks, four of which have been classified by the NC Wildlife Resource Commission as Primary Nursery Areas. Although the proposed project would not directly

¹ Based on the February 24, 2009, Notice of Intent letter from the Wilmington District Corps, page 6.

impact the perennial reaches of the four Primary Nursery Areas, the headwater drainages of the project site's tidal creeks, including those designated as Primary Nursery Areas, would be reduced by approximately 70 percent. Our concerns regarding the proposed drainage basin reductions are amplified on the NCPC tract since its watersheds have already lost approximately 1,268 acres of wetlands as part of the Applicant's 1997 mining permit.

Eliminating the headwater streams and wetlands and significantly reducing the drainage areas of the project site's Primary Nursery Areas and other tidal creeks would:

- Reduce flow from ground water and surface water runoff to the tidal creeks, thereby decreasing fresh water input and increasing their salinity through estuarine tidal influences.
- Reduce flow from ground water and increased variability in surface water flows to the tidal creeks, thereby increasing the frequency and magnitude of short-term salinity fluctuations.
- Reduce filtration of nutrients and other contaminants previously accomplished by the site's streams and wetlands, increasing sedimentation and turbidity in tidal creeks.
- Reduce productivity of native fish and shellfish in the downstream estuary by disrupting the estuarine food web (caused by a reduction of organic materials critical for biological activity in the surface water drainage).
- Shift downstream estuarine productivity from the benthic community which is dominated by sensitive submerged aquatic vegetation and benthic invertebrate species to tolerant phytoplankton species (exacerbate ongoing environmental stress and create an open niche for problem invasive plant and animal species that are adapted to degraded environments to colonize the estuary).

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Comment [p2]: This might happen, but I'd expect the creeks to become more flashy ... more prone to extreme, short-term fluctuations in salinity rather than an overall increase. See alternative bullet.

Comment [p3]: This might happen, but I'd expect the creeks to become more flashy ... more prone to extreme, short-term fluctuations in salinity rather than an overall increase. See alternative bullet.

Deleted: and reducing the introduction of organic materials critical for biological activity in the tidal creeks.

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We believe the disruption of these processes and functions in the drainage basin will significantly impact the site's tidal creeks and impair the ability of these systems to function as Primary Nursery Areas.

Comment [p4]: These could happen, but it is not certain that they would happen. Gauging an appropriate response to uncertain outcomes the problems we are all having.

Estuarine animals exist in a community assemblage and the influence of a factor, such as salinity on one species may be extended either directly or indirectly to affect other species. The cumulative effects of even small changes in an estuary may have a total systemic effect on the marine resources and the economic activities that depend on them. We believe the potential effect of Drainage Basin Reduction (DBR) on the production of marine fisheries resources is significant.

Besides its effect on fish production, DBR will likely result in increased sedimentation and turbidity, which are significant contributors to declines in populations of aquatic organisms. The direct effects of sedimentation and turbidity at various trophic levels are mortality, reduced physiologic functions and avoidance. Sedimentation can clog the gills of fish, reducing respiratory abilities. This stress may reduce tolerance levels to disease and toxicants and to changes in dissolved oxygen concentrations and salinity, compromising the health of local fisheries resources. Decreases in primary production are associated with increases in sedimentation and turbidity and produce negative cumulative effects through depleted food availability to zooplankton, insects, freshwater mollusks and fish. Decreases in available food at various trophic levels also results in depressed rates of growth, reproduction and recruitment. These effects lead to alterations in community density, diversity and structure.

Mining will directly affect the rate at which water is routed through the watershed. DBR will reduce contiguous sheet flow and as the mine expansion progresses there is an ever increasing trend of diverting surface water drainage which once promoted estuarine productivity into National Pollutant Discharge Elimination System (NPDES) channels, pipes and outfalls. This redirection of surface flows contributes to estuarine degradation because it removes natural watershed drainage patterns that 1) promote infiltration and trapping of sediments and other pollutants, and 2) provide a beneficial diffuse source of water to the estuary and subsequently decreases the buffering capacity of the system. These changes will likely increase the amount of sediment, nutrients and toxics entering the system. Nitrogen and phosphorus can accelerate eutrophication resulting in algal blooms, reduced water clarity, shifts in algal and fish populations and fish kills. Currently South Creek, which is stressed with water quality problems including algal blooms and increases in suspended solids, is designated as a Nutrient Sensitive Water (NSW) by the state, as is the entire Tar-Pamlico River Basin. We believe the reduction of the South Creek's buffering capacity associated with the large scale removal of wetlands and streams from the watersheds draining to the creek will likely exacerbate its existing water quality problems by removing the system's nutrient uptake capability. Hypoxic conditions caused by excess nutrients can result in reduced commercial and recreational fisheries production.

We believe proposed mining operations will negatively impact estuarine trophic structure through disruption of substrate inputs crucial to primary producers; reduction of energy sources that fuel estuarine productivity; and degradation of the nutrient sequestration capacity of the estuarine system. Estuary productivity is dependent on the complex interactions among the various components of the aquatic food web; with epiphytes (attached to wetland macrophytes) and submerged aquatic vegetation (SAV) forming the foundation of the estuarine food web. SAV populations have recently declined by as much as 50 percent, possibly because of anthropogenic impacts. As a result, detritus supplied by wetland macrophytes has become more important as an epiphytic substrate. While phytoplankton are also important for productivity, the role of wetland plants and SAV detritus is of greater importance to the overall stability of shallow aquatic food webs. It is our opinion that the proposed mining operations will negatively impact both types of epiphytic substrates.

Also of importance to estuarine food webs is the gradual and episodic release of Dissolved Organic Matter (DOM) from the contributing basins and wetlands immediately adjacent to the Albemarle Pamlico Estuary Complex. This energy source fuels bacterial communities that, through mineralization, provide inorganic nitrogen, phosphorous and carbon, supporting productivity. In addition, DOM supported bacteria are an important component of the "microbial loop." This part of aquatic food webs links DOM (of autochthonous and/or allochthonous origin) to higher trophic levels, via bacteria-protist-metazoan-zooplankton interactions. The impacts associated with the proposed project would decrease the quantity and quality of allochthonous DOM supplied to the estuary because of the close proximity of PCS's proposed mining operations.

Most of the drainage basin wetlands that would be subjected to impacts are wet forests, including bottomland hardwood forests. These areas are subjected to repeated periods of inundation and desiccation. This is important from a biogeochemical perspective as it allows for the accumulation of particulate organic matter and its subsequent processing (dissolution and

mineralization). This leads to episodic exports of dissolved organic materials to the estuary. Wetlands impacted by the proposed project also retain nutrient loads carried by high flow events, which are later sequestered into forest biomass. Such systems are also important for denitrification. These areas also provide refugia and nursery habitat for aquatic organisms during high flow periods.

The applicant provided a December 2007 report prepared for PCS by Entrix, on "*Potential Effects of Watershed Reduction on Tidal Creeks – An Assessment*". We believe that while the report clarifies currently known characteristics of the South Creek tributaries, it does not support the conclusion that current and future DBRs from mining activities would have no significant effect on downstream ecosystems. Data collected by NC Wildlife Resource Commission in November 2006 to determine species present in Jacks, Jacobs and South Creeks does not support that fish production originates from downstream estuarine environments. The report does not address freshwater species nor did it establish a connection between biota and previous mining impacts in the area including watershed reduction and ground water draw down. The report used "baseline" data for Jacks Creek collected after the watershed had already been reduced by almost 20 percent. Small reductions in watershed area may have large biotic impacts and therefore it is problematic using this data as a baseline to determine DBR impacts. This report also makes a troubling extrapolation that since past smaller DBRs did not adversely impact the tidal creeks, the much larger DBRs associated with the proposed project (i.e., 70 to 80 percent DBRs) also would not adversely impact the tidal creeks. However, data does not exist to draw this conclusion.

The Entrix report and the Corps' February 24, 2009, Notice of Intent letter both present the success of the PA II man-made marsh on the PCS project area to hypothesize that the DBRs will not cause significant loss of habitat value and nursery functions of the tidal creeks. The West (2000) study evaluating PA II is frequently cited in these discussions and is used by the Entrix report to argue broad scale functional equivalency of PA II to local tidal creeks. We do not believe it is valid to use the West study to make these inferences. The study's objective was to assess how well PA II could provide suitable habitat for fish, benthic and plant species and not to evaluate the effects of DBR on these populations. The data was collected from the lower reaches of the stream channel and did not fully assess the upper channel's biota. These results support the potential for species repopulation in the lower reaches of the creeks but do not support the proposition that DBR will not impact the upper channel's biota. The report does not provide data on the functional equivalence of factors, such as stream substrate, biogeochemical processes, wetland plants, etc. and in fact, there was no evidence of accretion of natural sediment structure (woody detrital covering, large peat component, etc) or organic carbon in the 10 years of the study. We believe the data presented does not overcome the large body of scientific information showing that mining through the headwaters of estuarine streams and their riverine habitat will have a significant negative impact on the functioning and structure of the creeks impacted by the proposed mining activities. There is, however, a large amount of scientific data supporting the importance of headwater streams and wetlands on downstream water quality.

Summary

In summary, the proposed project would eliminate critical ecological functions provided by approximately 3,953 acres of wetlands and 25,727 linear feet of streams within the nationally significant Albemarle Pamlico Estuary. Wetland functions include temporary storage of surface water, nutrient cycling, organic carbon export, pollutant filtering/removal, and maintenance of biologically diverse plant and animal habitat. Stream functions include transport of water, nutrients and sediment downstream, pollutant processing and removal, and maintenance of biologically diverse plant and animal habitat. Of particular concern are the proposed projects:

- Direct impacts to portions of a nonriverine hardwood wetland forest that has been designated as a Nationally Significant Natural Heritage Area by the NC Natural Heritage Program, and
- Indirect impacts to the site's tidal creeks, four of which have been designated as Primary Nursery Areas by the NC Wildlife Resources Commission, associated with the 70 percent reduction in the drainage basins for these creeks.

EPA believes that impacts to these ecological functions at the scale associated with this project will result in significant degradation [40 CFR 230.10(c)] of the Nation's waters. Further, as discussed below, we do not believe the proposed compensatory mitigation would reduce these adverse impacts to an acceptable level.



Mike_Wicker@fws.gov
03/31/2009 10:49 AM

To Rebecca Fox/R4/USEPA/US@EPA
cc Palmer Hough/DC/USEPA/US@EPA,
pace.wilber.noaalgov@epamail.epa.gov,
Pete_Benjamin@fws.gov

bcc

Subject Re: ARNI section

The Albemarle Pamlico Estuary Complex is the largest lagoonal estuary **and the second largest estuarine complex in the in the United States and is itself alone an aquatic resource of national importance (ARNI)**. see track change in file

Estuarine waters occur along three sides of the proposed mining site and support a wide range of fishery resources, including commercially or recreationally important species such as striped bass (*Morone saxatilis*), atlantic shad (*Alosa sapidissima*), atlantic herring (*Clupea harengus*), summer flounder (*Paralichthys dentatus*), blue crab (*Callinectes sapidus*), shrimp (*Caridea*) and oysters (*Ostreidae*). The estuary also provides important habitat for anadromous fish, including the endangered shortnose sturgeon (*Acipenser brevirostrum*). Nursery areas located in the creeks and embayments of the estuarine system, such as those found on the project site, are important to over 75 species of fish and shellfish (Association of National Estuary Programs, 2009)). . **The Albemarle Pamlico Estuarine Complex is dependent on primary nursery areas as early life history habitat for many of its aquatic biota and the disruption of those areas will result in degradation of the estuary.** see track changes

(See attached file: PCS ARNI SECTION ELEVATION PACKAGE.doc)

III. Aquatic Resources of National Importance

The 15,100 acre project area is located adjacent to the Pamlico River which is part of the nationally significant Albemarle Pamlico Estuary Complex (see Figure 2). The project area contains 6,293 acres of wetlands and 115,843 linear feet of streams that support the Albemarle Pamlico Estuary and collectively constitute aquatic resources of national importance (ARNI). The Albemarle Pamlico Estuary Complex is the largest lagoonal estuary and the second largest estuarine complex in the United States and is itself alone an aquatic resource of national importance (ARNI). The fringe marshes, creeks, and beds of submerged aquatic vegetation in the Albemarle Pamlico Estuary Complex provide essential nursery habitat for most commercial and recreational fish and shellfish in the North Carolina coastal area (Street et al., 2005) and important habitat for waterfowl¹, shorebirds and other migratory birds. The importance of wetlands to coastal fish is not unique to North Carolina. Over 95 percent of the finfish and shellfish species commercially harvested in the United States are wetland-dependent (Feierabend and Zelazny, 1987). More than 70 percent of the commercially or recreationally valuable fish species of the Atlantic seaboard rely on the Albemarle-Pamlico system for some portion of their life cycle and more than 90 percent of the fish caught in NC depend on the estuary as a nursery habitat (Association of National Estuary Programs, 2009). The Albemarle Pamlico Estuary Complex supports an important recreationally-based economy.

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Comment [c1]: Not sure we should use this report since stats are not specific to A-P estuary system

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As discussed earlier, the project site consists of three distinct tracts, NCPC, Bonnerton and S33. The NCPC tract is adjacent to the Pamlico River and South Creek. Seventy-one percent of this tract is designated as wetlands and contains six tidal creeks, including three inland Primary Nursery Areas. The Bonnerton tract is adjacent to the Pamlico River and Durham Creek. Seventy-six percent of this tract is designated as wetlands and it contains the headwater drainage to one inland Primary Nursery Area. The Bonnerton tract also contains an approximately 271 acre nonriverine hardwood forested wetland that has been designated as a Nationally Significant Natural Heritage Area. The S33 tract is farther inland than either the NCPC or Bonnerton tracts and contains the headwaters of two creeks which ultimately drain into South Creek. Approximately 20 percent of the S33 tract is delineated as wetland.

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The FEIS classifies the site's wetlands into ten categories: brackish marsh complex, bottomland hardwood forest, herbaceous assemblage, shrub-scrub assemblage, hardwood forest, mixed pine-hardwood forest, pine forest, pocosin-bay forest, sand ridge forest, and pine plantation. All of the site's wetlands perform important ecological functions that support the Albemarle Pamlico Estuary such as temporary storage of surface water, nutrient cycling, organic carbon export, pollutant filtering/removal, and maintenance of biologically diverse plant and animal habitat. The FEIS classifies the site's stream resources into intermittent streams, perennial streams and public trust areas (i.e., navigable/canoable creeks in coastal counties). All of the site's stream resources perform important ecological functions that support the Albemarle Pamlico Estuary such as the transport of water, nutrients and sediment downstream, pollutant processing and removal, and maintenance of biologically diverse plant and animal habitat. Of particular ecological importance are the wetland areas on the Bonnerton tract designated as a Nationally Significant Natural Heritage Area and the tidal creeks on the NCPC and Bonnerton tracts, four of which have been identified as Primary Nursery Areas.

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¹ See FWS waterfowl survey website: <http://www.fws.gov/birddata/databases/mwi/mwidb.html>

Nationally Significant Natural Heritage Area

The Bonnerton tract contains an approximately 271 acre wetland acre that has been designated by the NC Natural Heritage Program as a Nationally Significant Natural Heritage Area. The Natural Heritage Program designates areas in the state which it has determined to be important for conservation of the state's biodiversity as Significant Natural Heritage Areas. These areas can be classified as significant by the Natural Heritage Program at the county, regional, state or national level. The fact that the Bonnerton tract's Significant Natural Heritage Area has been classified as nationally significant means the Natural Heritage Program has determined it to be one of the five best examples of this community type in the nation. The 271 acre nonriverine Wet Hardwood Forest (WHF) community type found on the Bonnerton tract is considered to be among the most threatened and endangered of NC's natural communities.

Nonriverine WHF communities are dominated by some of the same trees as wetland bottomland hardwood forests, and especially by several oak species, including swamp chestnut oak (*Quercus michauxii*), laurel oak (*Quercus laurifolia*), cherrybark oak (*Quercus pagoda*) and water oak (*Quercus nigra*). The nonriverine WHF is habitat for many species, including black bear (*Ursus americanus*) and wild turkey (*Meleagris gallopavo*). The multi-layered structure characteristic of mature WHFs supports high densities and diversities of neotropical migrant birds such as wood thrush (*Hylocichla mustelina*), Swainson's warbler (*Limnothlypis swainsonii*), worm-eating warbler (*Helmitheros vermivorus*), prothonotary warbler (*Protonotaria citrea*), hooded warbler (*Wilsonia citrina*) and white-breasted nuthatch (*Sitta pusilla*).

Some of the indicators of quality in a WHF are canopy maturity, canopy age structure, extent and connection to other natural communities. Historically nonriverine WHFs naturally occurred in large patches and it is believed that some aspects of their ecosystem function are dependent on this large extent. The Natural Heritage Program also finds that the rate of loss of this community type is greater than all other community types in the state.

Tidal Creeks/Primary Nursery Areas

There are nine tidal creeks on the project site: Jacks Creek, Jacobs Creek, Drinkwater Creek, Tooley Creek, Huddy Gut, Huddles Cut, Porter Creek, Bailey Creek and Whitehurst Creek. All nine of these tidal creeks perform similarly critical biological support functions and have thus been a focus of concern throughout our review of the proposed project. Four of these tidal creeks, Jacks Creek, Jacobs Creek, Tooley Creek and Porter Creek, have been specifically designated as Primary Nursery Areas by the NC Wildlife Resources Commission. Primary Nursery Areas are defined as those areas inhabited by the embryonic, larval or juvenile life stages of marine or estuarine fish or crustacean species due to favorable physical, chemical or biological factors. The purpose of inland Primary Nursery Areas are to establish and protect those fragile inland waters which support embryonic, larval or juvenile populations of these species. The critical input to and function of Primary Nursery Areas are not contained just within the public trust waters but includes the headwater drainages. Wetlands that surround or serve as headwaters for estuarine creeks are essential for the creeks to serve as Primary Nursery Areas.

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Estuarine waters occur along three sides of the proposed mining site and support a wide range of fishery resources, including commercially or recreationally important species such as striped bass (*Morone saxatilis*), atlantic shad (*Alosa sapidissima*), atlantic herring (*Clupea harengus*), summer flounder (*Paralichthys dentatus*), blue crab (*Callinectes sapidus*), shrimp (*Caridea*) and oysters (*Ostreidae*). The estuary also provides important habitat for anadromous fish, including the endangered shortnose sturgeon (*Acipenser brevirostrum*). Nursery areas located in the creeks and embayments of the estuarine system, such as those found on the project site, are important to over 75 species of fish and shellfish (Association of National Estuary Programs, 2009). The Albemarle Pamlico Estuarine Complex is dependent on primary nursery areas as early life history habitat for many of its aquatic biota and the disruption of those areas will result in degradation of the estuary.

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"Pace.Wilber"
<Pace.Wilber@noaa.gov>
03/31/2009 10:52 AM

To Palmer Hough/DC/USEPA/US@EPA
cc Mike_Wicker@fws.gov, Rebecca Fox/R4/USEPA/US@EPA
bcc
Subject Re: PCS Elevation: draft ARNI section for your review

A few comments attached

Hough.Palmer@epamail.epa.gov wrote:

Mike/Pace:

Attached for your review is the draft discussion making our ARNI argument. We would appreciate any comments etc you have on this section as well.

-Palmer

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--

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III. Aquatic Resources of National Importance

The 15,100 acre project area is located adjacent to the Pamlico River which is part of the nationally significant Albemarle Pamlico Estuary Complex (see Figure 2). The project area contains 6,293 acres of wetlands and 115,843 linear feet of streams that support the Albemarle Pamlico Estuary and collectively constitute aquatic resources of national importance (ARNI). The Albemarle Pamlico Estuary Complex is the largest lagoonal estuary in the country. The fringe marshes, creeks, and beds of submerged aquatic vegetation in the Albemarle Pamlico Estuary Complex provide essential nursery habitat for most commercial and recreational fish and shellfish in the North Carolina coastal area (Street et al., 2005) and important habitat for waterfowl¹, shorebirds and other migratory birds. The importance of wetlands to coastal fish is not unique to North Carolina. Over 95 percent of the finfish and shellfish species commercially harvested in the United States are wetland-dependent (Feierabend and Zelazny, 1987). More than 70 percent of the commercially or recreationally valuable fish species of the Atlantic seaboard rely on the Albemarle-Pamlico system for some portion of their life cycle and more than 90 percent of the fish caught in NC depend on the estuary as a nursery habitat (Association of National Estuary Programs, 2009).

As discussed earlier, the project site consists of three distinct tracts, NCPC, Bonnerton and S33. The NCPC tract is adjacent to the Pamlico River and South Creek. Seventy-one percent of this tract is designated as wetlands and contains six tidal creeks, including three inland Primary Nursery Areas. The Bonnerton tract is adjacent to the Pamlico River, Durham Creek, and Porter Creek. Seventy-six percent of this tract is designated as wetlands and it contains the headwater drainage to one inland Primary Nursery Area (Porter Creek). The Bonnerton tract also contains an approximately 271 acre nonriverine hardwood forested wetland that has been designated as a Nationally Significant Natural Heritage Area. The S33 tract is farther inland than either the NCPC or Bonnerton tracts and contains the headwaters of two creeks (Broomfield Swamp and Cypress Run) that, drain into South Creek. Approximately 20 percent of the S33 tract is delineated as wetland.

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The FEIS classifies the site's wetlands into ten categories: brackish marsh complex, bottomland hardwood forest, herbaceous assemblage, shrub-scrub assemblage, hardwood forest, mixed pine-hardwood forest, pine forest, pocosin-bay forest, sand ridge forest, and pine plantation. All of the site's wetlands perform important ecological functions that support the Albemarle Pamlico Estuary such as temporary storage of surface water, nutrient cycling, organic carbon export, pollutant filtering/removal, and maintenance of biologically diverse plant and animal habitat. The FEIS classifies the site's stream resources into intermittent streams, perennial streams and public trust areas (i.e., navigable/canoeable creeks in coastal counties). All of the site's stream resources perform important ecological functions that support the Albemarle Pamlico Estuary such as the transport of water, nutrients and sediment downstream, pollutant processing and removal, and maintenance of biologically diverse plant and animal habitat. Of particular ecological importance are the wetland areas on the Bonnerton tract designated as a Nationally Significant Natural Heritage Area and the tidal creeks on the NCPC and Bonnerton tracts, four of which have been identified as Primary Nursery Areas.

¹ See FWS waterfowl survey website: <http://www.fws.gov/birddata/databases/mwi/mwidb.html>

Nationally Significant Natural Heritage Area

The Bonnerton tract contains an approximately 271 acre wetland acre that has been designated by the NC Natural Heritage Program as a Nationally Significant Natural Heritage Area. The Natural Heritage Program designates areas in the state which it has determined to be important for conservation of the state's biodiversity as Significant Natural Heritage Areas. These areas can be classified as significant by the Natural Heritage Program at the county, regional, state or national level. The fact that the Bonnerton tract's Significant Natural Heritage Area has been classified as nationally significant means the Natural Heritage Program has determined it to be one of the five best examples of this community type in the nation. The 271 acre nonriverine Wet Hardwood Forest (WHF) community type found on the Bonnerton tract is considered to be among the most threatened and endangered of NC's natural communities.

Nonriverine WHF communities are dominated by some of the same trees as wetland bottomland hardwood forests, and especially by several oak species, including swamp chestnut oak (*Quercus michauxii*), laurel oak (*Quercus laurifolia*), cherrybark oak (*Quercus pagoda*) and water oak (*Quercus nigra*). The nonriverine WHF is habitat for many species, including black bear (*Ursus americanus*) and wild turkey (*Meleagris gallopavo*). The multi-layered structure characteristic of mature WHFs supports high densities and diversities of neotropical migrant birds such as wood thrush (*Hylocichla mustelina*), Swainson's warbler (*Limothlypsis swainsonii*), worm-eating warbler (*Helmitheros vermivorus*), prothonotary warbler (*Protonotaria citrea*), hooded warbler (*Wilsonia citrina*) and white-breasted nuthatch (*Sitta pusilla*)

Some of the indicators of quality in a WHF are canopy maturity, canopy age structure, extent and connection to other natural communities. Historically nonriverine WHFs naturally occurred in large patches and it is believed that some aspects of their ecosystem function are dependent on this large extent. The Natural Heritage Program also finds that the rate of loss of this community type is greater than all other community types in the state.

Tidal Creeks/Primary Nursery Areas

There are nine tidal creeks on the project site: Jacks Creek, Jacobs Creek, Drinkwater Creek, Tooley Creek, Huddy Gut, Huddles Cut, Porter Creek, Bailey Creek and Whitehurst Creek. All nine of these tidal creeks perform similarly critical biological support functions and have thus been a focus of concern throughout our review of the proposed project. Four of these tidal creeks, Jacks Creek, Jacobs Creek, Tooley Creek and Porter Creek, have been specifically designated as Primary Nursery Areas by the NC Wildlife Resources Commission. Primary Nursery Areas are defined as those areas inhabited by the embryonic, larval or juvenile life stages of marine or estuarine fish or crustacean species due to favorable physical, chemical or biological factors. The purpose of inland Primary Nursery Areas are to establish and protect those fragile inland waters which support embryonic, larval or juvenile populations of these species. The critical input to and function of Primary Nursery Areas are not contained just within the public trust waters but includes the headwater drainages. Wetlands that surround or serve as headwaters for estuarine creeks are essential for the creeks to serve as Primary Nursery Areas.

Comment [p1]: May want to ass
Durham Creek, Sibyl Creek, Broomfield
Swamp and Cypress Run. ... this is all
scale dependent

Estuarine waters occur along three sides of the proposed mining site and support a wide range of fishery resources, including commercially or recreationally important species such as striped bass (*Morone saxatilis*), American shad (*Alosa sapidissima*), atlantic herring (*Clupea harengus*), summer flounder (*Paralichthys dentatus*), red drum (*Sciaenops ocellatus*), blue crab (*Callinectes sapidus*), shrimp (*Penaeidae*) and oysters (*Crassostrea virginica*). The estuary also provides important habitat for anadromous fish, including the endangered shortnose sturgeon (*Acipenser brevirostrum*). Nursery areas located in the creeks and embayments of the estuarine system, such as those found on the project site, are important to over 75 species of fish and shellfish (Association of National Estuary Programs, 2009).

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Comment [p2]: I'd delete. The COE's section 7 evaluation for the project concluded "no effect." Technically, NMFS does not concur with "no effect" determinations, but we have not taken any steps to contest that determination for this project.



Mike_Wicker@fws.gov
03/31/2009 11:02 AM

To Rebecca Fox/R4/USEPA/US@EPA
cc "Pace.Wilber" <Pace.Wilber@noaa.gov>,
Pete_Benjamin@fws.gov
bcc
Subject Re: impacts section, additional comment

Indirect impacts to the site's tidal creeks, four of which have been designated as Primary Nursery Areas by the NC Wildlife Resources Commission, associated with the 70 percent reduction in the drainage basins for these creeks **which are part of the Albemarle Pamlico Estuarine Complex.**

(See attached file: PCS impact discussion, USFWS revised.doc)

Fox.Rebecca@epamail.epa.gov

Fox.Rebecca@epamail.epa.gov

03/31/2009 10:06 AM

Tomike_wicker@fws.gov

cc

Subjectimpacts section

Mike,

If you want to and have time, if you would like to make some changes as to AP estuary being an ARNI in impacts section also, that would be great. P and I are running around like the ole proverbial chicks with their heads cut off... b

Becky Fox
Wetland Regulatory Section
USEPA
Phone: 828-497-3531
Email: fox.rebecca@epa.gov

IV. Substantial and Unacceptable Impacts

40 CFR 230.10(c): Significant Degradation

EPA is concerned that compliance with requirements of Section 230.10(c) of the Guidelines has not been demonstrated. Section 230.10(c) requires that no discharge of dredged or fill material shall be permitted which will cause or contribute to significant degradation of waters of the United States. The Guidelines explicitly require evaluation of all direct, secondary, (i.e., indirect), and cumulative impacts reasonably associated with the proposed discharge in determining compliance with Section 230.10(c). In accordance with the Guidelines, determining significant degradation requires specific consideration of effects on such functions and values as wildlife habitat, aquatic system diversity, stability and productivity, recreation, aesthetic and economic values.

Of the 15,100 acre project area, the proposed mine advance would impact approximately 11,454 total acres and result in direct impacts to approximately 3,953 acres of wetlands, 19 acres of open waters and 25,727 linear feet of streams. This represents the single largest wetland impact ever authorized under the Clean Water Act in NC and represents a significant loss of wetlands, streams and other waters of the United States within the nationally significant Albemarle Pamlico Estuary Complex.

As previously noted, all of the site's wetlands perform important ecological functions that support the Albemarle Pamlico Estuary such as temporary storage of surface water, nutrient cycling, organic carbon export, pollutant filtering/removal, and maintenance of biologically diverse plant and animal habitat. Also as previously noted, all of the site's stream resources perform important ecological functions that support the Albemarle Pamlico Estuary such as the transport of water, nutrients and sediment downstream, pollutant processing and removal, and maintenance of biologically diverse plant and animal habitat. We recognize that not all of the approximately 3,953 acres of wetlands and 25,727 linear feet of streams that would be impacted by the proposed project perform all of these respective functions to the same degree (because of their position in the landscape and/or their level of prior disturbance), however, the complete loss of this entire suite of wetland and stream functions on this scale raises serious ecological concerns.

The habitat functions provided by wetlands and streams that would be lost are particularly important in light of the ecological and economic value of the Albemarle Pamlico Estuary's commercial and recreational fishery/shellfish resources. Also, the state has designated the entire Tar - Pamlico River Basin as Nutrient Sensitive Waters because of problems associated with excessive levels of nutrients in the river such as harmful algal blooms, low oxygen levels, increased fish kills, and other symptoms of stress and diseases in the aquatic biota. The state developed a strategy to reduce nutrient inputs from around the basin to the estuary that is yielding improvements to water quality. Nonetheless, we are very concerned that loss of the water quality enhancement functions provided by the approximately 3,953 acres of wetlands and 25,727 linear feet of streams that would be completely eliminated by the proposed project could

exacerbate existing water quality problems in the Tar – Pamlico River and hamper the state's ongoing efforts to improve the river's water quality.

Direct Impacts to Nationally Significant Natural Heritage Area

EPA is particularly concerned with the proposed project's direct impacts to the wetland area on the Bonnerton tract that has been designated by the NC Natural Heritage Program as a Nationally Significant Natural Heritage Area. As previously noted, the 271 acre nonriverine WHF found on the Bonnerton tract is an extremely unique and rare community type, one that has experienced a rate of loss higher than all other community types in the state. The fact that the Bonnerton tract's Significant Natural Heritage Area has been classified as nationally significant means the Natural Heritage Program has determined it to be one of the five best examples of this community type in the nation.

As previously noted, some of the indicators of quality in a nonriverine WHF are canopy maturity, canopy age structure, extent and connection to other natural communities. Historically, nonriverine WHFs naturally occurred in large patches and it is believed that some aspects of their ecosystem function are dependent on this large extent. The proposed project would directly impact approximately 97 acres¹ of this ecologically valuable and rare wetland system and would allow mining through the middle of the 271 acre area, bisecting it into two separate and smaller pieces, an eastern and a western piece. This large reduction in size and the fragmentation of the tract into two separate pieces undermines some of the key ecological characteristics which make it ecologically valuable and "nationally significant." Although the NCDWQ's CWA Section 401 Water Quality Certification requires the mined out area between the eastern and western pieces to be restored after mining, we believe it will be extremely difficult, based on the current state of the science, to restore this area to its prior condition after mining and this will have a significant detrimental impact to the integrity of this rare and threatened biological community. In addition to reducing the size of the area and fragmenting it into two pieces, the large scale disturbances associated with allowing phosphate mining through the middle of the area (land clearing, groundwater extraction, pit excavation, road and support infrastructure construction, etc) will further lower the ecological value of the remaining eastern and western pieces of the area.

Given the unique and valuable nature of this nationally significant resource, it is EPA's determination that the direct impacts of mining the 271 acre Significant Natural Heritage Area on the Bonnerton tract does not comply with Subparts C-F of the Guidelines, specifically Subpart C – Impacts on physical characteristics of the aquatic ecosystem, Subpart D – Impacts on the biological characteristic of the aquatic ecosystem, Subpart E – Impacts to special aquatic sites and Subpart F – Effects on human use characteristics (SNHA designation).

Indirect Impacts to Tidal Creeks/Primary Nursery Areas

EPA is also particularly concerned with the proposed project's indirect impacts to the project area's nine tidal creeks, four of which have been classified by the NC Wildlife Resource Commission as Primary Nursery Areas. Although the proposed project would not directly

¹ Based on the February 24, 2009, Notice of Intent letter from the Wilmington District Corps, page 6.

impact the perennial reaches of the four Primary Nursery Areas, the headwater drainages of the project site's tidal creeks, including those designated as Primary Nursery Areas, would be reduced by approximately 70 percent. Our concerns regarding the proposed drainage basin reductions are amplified on the NCPC tract since its watersheds have already lost approximately 1,268 acres of wetlands as part of the Applicant's 1997 mining permit.

Eliminating the headwater streams and wetlands and significantly reducing the drainage areas of the project site's Primary Nursery Areas and other tidal creeks would:

- Reduce flow from ground water and surface water runoff to the tidal creeks, thereby decreasing fresh water input and increasing their salinity through estuarine tidal influences.
- Reduce filtration of nutrients and other contaminants previously accomplished by the site's streams and wetlands, increasing sedimentation and turbidity in tidal creeks.
- Reduce productivity of native fish and shellfish in the downstream estuary by disrupting the estuarine food web (caused by a reduction of organic materials critical for biological activity in the surface water drainage).
- Shift downstream estuarine productivity from the benthic community which is dominated by sensitive submerged aquatic vegetation and benthic invertebrate species to tolerant phytoplankton species (exacerbate ongoing environmental stress and create an open niche for problem invasive plant and animal species that are adapted to degraded environments to colonize the estuary).

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We believe the disruption of these processes and functions in the drainage basin will significantly impact the site's tidal creeks and impair the ability of these systems to function as Primary Nursery Areas.

Estuarine animals exist in a community assemblage and the influence of a factor, such as salinity on one species may be extended either directly or indirectly to affect other species. The cumulative effects of even small changes in an estuary may have a total systemic effect on the marine resources and the economic activities that depend on them. We believe the potential effect of Drainage Basin Reduction (DBR) on the production of marine fisheries resources is significant.

Besides its effect on fish production, DBR will likely result in increased sedimentation and turbidity, which are significant contributors to declines in populations of aquatic organisms. The direct effects of sedimentation and turbidity at various trophic levels are mortality, reduced physiologic functions and avoidance. Sedimentation can clog the gills of fish, reducing respiratory abilities. This stress may reduce tolerance levels to disease and toxicants and to changes in dissolved oxygen concentrations and salinity, compromising the health of local fisheries resources. Decreases in primary production are associated with increases in sedimentation and turbidity and produce negative cumulative effects through depleted food availability to zooplankton, insects, freshwater mollusks and fish. Decreases in available food at various trophic levels also results in depressed rates of growth, reproduction and recruitment. These effects lead to alterations in community density, diversity and structure.

Mining will directly affect the rate at which water is routed through the watershed. DBR will reduce contiguous sheet flow and as the mine expansion progresses there is an ever increasing

trend of diverting surface water drainage which once promoted estuarine productivity into National Pollutant Discharge Elimination System (NPDES) channels, pipes and outfalls. This redirection of surface flows contributes to estuarine degradation because it removes natural watershed drainage patterns that 1) promote infiltration and trapping of sediments and other pollutants, and 2) provide a beneficial diffuse source of water to the estuary and subsequently decreases the buffering capacity of the system. These changes will likely increase the amount of sediment, nutrients and toxics entering the system. Nitrogen and phosphorus can accelerate eutrophication resulting in algal blooms, reduced water clarity, shifts in algal and fish populations and fish kills. Currently South Creek, which is stressed with water quality problems including algal blooms and increases in suspended solids, is designated as a Nutrient Sensitive Water (NSW) by the state, as is the entire Tar-Pamlico River Basin. We believe the reduction of the South Creek's buffering capacity associated with the large scale removal of wetlands and streams from the watersheds draining to the creek will likely exacerbate its existing water quality problems by removing the system's nutrient uptake capability. Hypoxic conditions caused by excess nutrients can result in reduced commercial and recreational fisheries production.

We believe proposed mining operations will negatively impact estuarine trophic structure through disruption of substrate inputs crucial to primary producers; reduction of energy sources that fuel estuarine productivity; and degradation of the nutrient sequestration capacity of the estuarine system. Estuary productivity is dependent on the complex interactions among the various components of the aquatic food web; with epiphytes (attached to wetland macrophytes) and submerged aquatic vegetation (SAV) forming the foundation of the estuarine food web. SAV populations have recently declined by as much as 50 percent, possibly because of anthropogenic impacts. As a result, detritus supplied by wetland macrophytes has become more important as an epiphytic substrate. While phytoplankton are also important for productivity, the role of wetland plants and SAV detritus is of greater importance to the overall stability of the shallow aquatic food webs. It is our opinion that the proposed mining operations will negatively impact both types of epiphytic substrates.

Also of importance to estuarine food webs is the gradual and episodic release of Dissolved Organic Matter (DOM) from the contributing basins and wetlands immediately adjacent to the Albemarle Pamlico Estuary Complex. This energy source fuels bacterial communities that, through mineralization, provide inorganic nitrogen, phosphorous and carbon, supporting productivity. In addition, DOM supported bacteria are an important component of the "microbial loop." This part of aquatic food webs links DOM (of autochthonous and/or allochthonous origin) to higher trophic levels, via bacteria-protist-metazoan-zooplankton interactions. The impacts associated with the proposed project would decrease the quantity and quality of allochthonous DOM supplied to the estuary because of the close proximity of PCS's proposed mining operations.

Most of the drainage basin wetlands that would be subjected to impacts are wet forests, including bottomland hardwood forests. These areas are subjected to repeated periods of inundation and desiccation. This is important from a biogeochemical perspective as it allows for the accumulation of particulate organic matter and its subsequent processing (dissolution and mineralization). This leads to episodic exports of dissolved organic materials to the estuary. Wetlands impacted by the proposed project also retain nutrient loads carried by high flow events, which are later sequestered into forest biomass. Such systems are also important for

denitrification. These areas also provide refugia and nursery habitat for aquatic organisms during high flow periods.

The applicant provided a December 2007 report prepared for PCS by Entrix, on "*Potential Effects of Watershed Reduction on Tidal Creeks – An Assessment*". We believe that while the report clarifies currently known characteristics of the South Creek tributaries, it does not support the conclusion that current and future DBRs from mining activities would have no significant effect on downstream ecosystems. Data collected by NC Wildlife Resource Commission in November 2006 to determine species present in Jacks, Jacobs and South Creeks does not support that fish production originates from downstream estuarine environments. The report does not address freshwater species nor did it establish a connection between biota and previous mining impacts in the area including watershed reduction and ground water draw down. The report used "baseline" data for Jacks Creek collected after the watershed had already been reduced by almost 20 percent. Small reductions in watershed area may have large biotic impacts and therefore it is problematic using this data as a baseline to determine DBR impacts. This report also makes a troubling extrapolation that since past smaller DBRs did not adversely impact the tidal creeks, the much larger DBRs associated with the proposed project (i.e., 70 to 80 percent DBRs) also would not adversely impact the tidal creeks. However, data does not exist to draw this conclusion.

The Entrix report and the Corps' February 24, 2009, Notice of Intent letter both present the success of the PA II man-made marsh on the PCS project area to hypothesize that the DBRs will not cause significant loss of habitat value and nursery functions of the tidal creeks. The West (2000) study evaluating PA II is frequently cited in these discussions and is used by the Entrix report to argue broad scale functional equivalency of PA II to local tidal creeks. We do not believe it is valid to use the West study to make these inferences. The study's objective was to assess how well PA II could provide suitable habitat for fish, benthic and plant species and not to evaluate the effects of DBR on these populations. The data was collected from the lower reaches of the stream channel and did not fully assess the upper channel's biota. These results support the potential for species repopulation in the lower reaches of the creeks but do not support the proposition that DBR will not impact the upper channel's biota. The report does not provide data on the functional equivalence of factors, such as stream substrate, biogeochemical processes, wetland plants, etc. and in fact, there was no evidence of accretion of natural sediment structure (woody detrital covering, large peat component, etc) or organic carbon in the 10 years of the study. We believe the data presented does not overcome the large body of scientific information showing that mining through the headwaters of estuarine streams and their riverine habitat will have a significant negative impact on the functioning and structure of the creeks impacted by the proposed mining activities. There is, however, a large amount of scientific data supporting the importance of headwater streams and wetlands on downstream water quality.

Summary

In summary, the proposed project would eliminate critical ecological functions provided by approximately 3,953 acres of wetlands and 25,727 linear feet of streams within the nationally significant Albemarle Pamlico Estuary. Wetland functions include temporary storage of surface water, nutrient cycling, organic carbon export, pollutant filtering/removal, and maintenance of

biologically diverse plant and animal habitat. Stream functions include transport of water, nutrients and sediment downstream, pollutant processing and removal, and maintenance of biologically diverse plant and animal habitat. Of particular concern are the proposed projects:

- Direct impacts to portions of a nonriverine hardwood wetland forest that has been designated as a Nationally Significant Natural Heritage Area by the NC Natural Heritage Program, and
- Indirect impacts to the site's tidal creeks, four of which have been designated as Primary Nursery Areas by the NC Wildlife Resources Commission, associated with the 70 percent reduction in the drainage basins for these creeks which are part of the Albemarle Pamlico Estuarine Complex.

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EPA believes that impacts to these ecological functions at the scale associated with this project will result in significant degradation [40 CFR 230.10(c)] of the Nation's waters. Further, as discussed below, we do not believe the proposed compensatory mitigation would reduce these adverse impacts to an acceptable level.



"Pace.Wilber"
<Pace.Wilber@noaa.gov>
03/31/2009 11:09 AM

To Rebecca Fox/R4/USEPA/US@EPA
cc Palmer Hough/DC/USEPA/US@EPA
bcc

Subject Re: PCS Elevation: Draft Impacts Discussion for your expedited review

We usually don't mix ARNI and EFH much because the MOA that establishes the ARNI list for the southeast focuses on state managed species, not federally managed species, and only federally managed species have EFH. This rule of thumb is not 100% correct (shrimp are the rime exception). Here is what we passed to the COE back in Januray, you may want to adapt and add . . .

"The Bonnerton and NCPC tracts include tidally influenced forested wetlands, creeks, and salt marsh designated as EFH by the South Atlantic Fishery Management Council and Mid Atlantic Fishery Management Council for federally managed fishery species, including penaeid shrimp, gray snapper, summer flounder, and bluefish. A subset of the areas designated as EFH is recognized by the North Carolina Wildlife Resources Commission (NCWRC) as inland Primary Nursery Areas (PNAs), and this state designation also makes these areas federally designated Habitat Area of Particular Concern (HAPC), the subset of EFH that warrants the highest protection under the Magnuson-Stevens Act. The PNAs within the project area are Tooley Creek, Jacobs Creek, Jacks Creek, and Porter Creek.

As acknowledged in past correspondence from both of our offices, the upper limits of PNAs has not been delineated in the field. In the absence of this delineation, the Wilmington District focuses on the North Carolina State Statute that defines PNAs, and the District concludes that the upper limit of the PNAs equates to the boundary between perennial and intermittent flows within the creeks named as PNAs. Alternative L for the proposed mine expansion avoids direct impacts to PNAs under this definition. While NMFS believes that substantial ecological services are provided to fishery resources from the portions of the creeks that have intermittent flows and their headwater wetlands, we accept the Wilmington District's interpretation of the relevant North Carolina State Statute as reasonable and that as a result of close coordination between the applicant, resource agencies, and Wilmington District, direct impacts to HAPCs are no longer proposed."

This is a stretch, but an argument can be made that by reducing the habitat used by the prey of federally managed species, you are reducing the value of EFH away from the project site (by reducing the amount food within that EFH).

Pace

Fox.Rebecca@epamail.epa.gov wrote:

> Thanks Pace! I know you have a tight schedule but was wondering if you
> wanted to add any EFH language, etc to the ARNI section? You had
> mentioned that earlier. b
>
> Becky Fox
> Wetland Regulatory Section
> USEPA

> since we are on a different schedule).. We believe having a common
> message with EPA and NMFS and the NGO'S will be very helpful to us
> and hopefully to the environment and we are committed to having a
> common content as yours (except for agency specific boilerplate).

> So we are planning on a very similar elevation package but a
> separate elevation package for now.

> Thanks for all your good work

> --

> -----
> Pace Wilber, Ph.D.
> Atlantic Branch Chief, Charleston (F/SER47)
> Southeast Regional Office, NOAA Fisheries
> PO Box 12559
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> pace.wilber@noaa.gov

> <http://sero.nmfs.noaa.gov/dhc/habitat.htm>

> [attachment "PCS impact discussion, USFWS Comments on page #3NMFS.doc"
> deleted by Rebecca Fox/R4/USEPA/US]

> --

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Mike_Wicker@fws.gov
03/31/2009 11:50 AM

To "Pace.Wilber" <Pace.Wilber@noaa.gov>
cc Rebecca Fox/R4/USEPA/US@EPA,
Pete_Benjamin@fws.gov
bcc

Subject see track changes on attached file monitoring

History:  This message has been replied to and forwarded.

A few comments on monitoring section. Most important is the addition of chromium and zinc under #5 and addition of ---sediment toxicity testing (addresses biological effects of accumulated pollutants, including the mix of pollutants)

(See attached file: pcs monitoring nmfs section elevation package.doc)

Recommendations for the Monitoring of Impacts to Primary Nursery Areas

Background

Throughout reviews of the proposal by PCS to expand its mine into the NCPC, Bonnerton, and S33 tracts, resource agencies expressed concerns over direct and indirect impacts to creeks that function as nursery areas for estuarine and marine fauna. South Creek, which borders the NCPC tract, is designated by the State of North Carolina as a Special Secondary Nursery Area, and the NC Division of Marine Fisheries has jurisdiction over this aspect of South Creek. Three creeks that discharge into South Creek from the NCPC tract, Tooley, Jacobs, and Jacks Creeks, and one creek that borders the Bonnerton tract, Porters Creek, are designated as Inland Primary Nursery Areas (PNAs) and are under the jurisdiction of the NC Wildlife Resources Commission. At the federal level under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), these creeks are Habitat Areas of Particular Concern, which is the highest level of protection afforded by the Magnuson-Stevens Act, and wetlands that serve as headwaters of those creeks are essential fish habitat (EFH) under the Magnuson-Stevens Act.

While the footprint of the proposed mine does not extend into the PNAs, the resource agencies are concerned that the extensive mining of wetlands that serve as the headwaters of these creeks may impair the function of these PNAs. Accordingly, a monitoring program coupled with an adaptive management process is proposed to gauge the impacts to the PNAs from the mining so that appropriate adjustments can be made to mine operations. By "appropriate adjustments," we simply mean compliance reviews common for permits that authorize projects of this size and duration, and recognition of the inevitable uncertainties at the time of permitting about how large projects affect the landscape, and vice versa. Similar monitoring should be part of the mitigation and reclamation activities so that the expected benefits from these activities can be evaluated. The monitoring program and adaptive management process described below are viewed as consistent with the recently issued water quality certification to the extent that the water quality certification describes the monitoring. PCS has six months to flesh out the monitoring program required by the water quality certification. We expect a single monitoring and adaptive management program would meet the requirements of state and federal authorizations.

Proposed Permit Conditions

Monitoring of Affected Creeks and Streams

PCS shall develop and implement a plan of study to address the effects of a reduction in headwater wetlands on the utilization of Porters Creek, Tooley Creek, Jacobs Creek, Drinkwater Creek, and Jacks Creek as nursery areas by resident fish and appropriate invertebrate species and on all other creeks and streams whose headwaters are reduced 10% or more by mine expansion. This plan shall be submitted to NMFS, US FWS, NCWRC, NCDMF, NCDWQ, NCDLR for review and approval prior to initiation of land clearing activities in the headwater wetlands of PNAs within the NCPC tract. PCS shall make the plan publicly available for comment at the time it submits the plan to the reviewing agencies and shall provide individual notice of the plan to those persons that request notice. The plan shall identify reference creeks (at least four – the usefulness of Muddy Creek as a reference creek should be reevaluated, not assumed); sampling stations, schedules, and methods; laboratory methods; data management and analysis; and quality control and quality assurance procedures.

Monitoring under the plan shall begin 10 years before land clearing is anticipated. For those streams with impacts expected to occur within the first 10 years of the mine expansion, monitoring shall begin as soon as possible following plan approval. Monitoring shall continue for 30 years following completed reclamation (to match North Carolina's solid waste monitoring requirements). Post impact monitoring may be discontinued anytime after 10 years if ecological conditions are similar (based on judgement of the resource agencies) to pre-impact.

At a minimum, the plan shall address the following issues and include the following data collection:

1. Has mining altered the amount or timing of water flows within the creeks?

- Continuous water level recorders to measure flow
- Rain gauges to measure local water input
- Groundwater wells to measure input to the creeks
- Continuous salinity monitoring
- Periodic DO monitoring (continuously monitored for several days at strategic times of year)

2. Has mining altered the geomorphic or vegetative character of the creeks?

- Aerial photography to determine creek position, length, width, sinuosity (annual)
- Cross section of creeks at key locations (annual)
- Sediment characteristics (texture, organic content, and potential site related contaminants, eg. heavy metals, sediment(s)) (annual)
- Vegetation (percent cover by species) along the creek to determine zonation changes and invasions (spring and fall)
- Sediment chlorophylls or organic content in vegetation zone (spring and fall)
- Determination of location of flocculation zones with each creek (spring and fall)
- Erosion of overburden cap that forms the streambed banks in any reconnected stream system (spring and fall)

3. Has mining altered the forage base of the creeks?

- Benthic cores to sample macroinfauna (spring and fall)
- Benthic grabs focused upon bivalves, such as *Rangia* sp. (spring and fall)
- Net samples for grass shrimp, blue crabs, and small forage fish (such as *Fundulus* spp.); sampling gears would be chosen to reflect ontogenetic shifts in creek usage (monthly)

4. Has mining altered the use of the creeks by managed fish?

- Life-stage specific sampling based on time year, sampling gears would be chosen to reflect ontogenetic shifts in creek usage. (monthly or seasonally)

5. Do creek sediments include contaminants at levels that could impact fish or invertebrates?

- Creeks would be sampled for metals, including cadmium, ~~chromium~~, and arsenic and zinc (annual)
- Availability and uptake by appropriate aquatic species (e.g., *Rangia* sp., blue crabs) should be measured using appropriate bioassay techniques (annual)
- Effect on heavy metal concentrations in bottom sediments of connecting reclaimed areas to downstream creeks (e.g. Whitehurst Creek) (annual)
- sediment toxicity testing (addresses biological effects of accumulated pollutants, including the mix of pollutants

Deleted: mercury, silver, copper,

Groundwater Monitoring

- Groundwater monitoring wells should be placed in reclamation areas and peripheral areas. Number and location of wells shall be determined in consultation with the North Carolina Department of Environment and Natural Resources (Department).
- Groundwater monitoring should commence with weekly samples for a period of 5 years to generate an acceptable baseline. After 5 years, monthly monitoring is acceptable.
- Monitoring must continue for 30 years post reclamation. The post-reclamation time period can be lengthened by the Department.
- If elevated levels of heavy metals are detected, monitoring should continue to be conducted weekly.
- At a minimum, heavy metals, including cadmium, arsenic, and chromium should be analyzed. Other parameters may be added per the discretion of the Department.

--PCS shall develop a remediation strategy for heavy metal contamination of groundwater and tributaries that drain or are adjacent to mined areas. That strategy must be made available for public review and comment before approval by the Department.

Monitoring of Reclaimed Areas

PCS's monitoring plan must include specific conditions that measure the viability of capping and top soil cover approaches. Those conditions must include measurable standards and regular inspection intervals. The plan should further include an evaluation of the following characteristics:

- Physical conformation (to measure the rates of settling and erosion, the resulting changes in conformation)
- Patterns in overall water balance and groundwater levels
- Soil profile development and quality (especially looking for toxicants)
- Vegetative community development patterns
- Animal use patterns, along with some body burden testing for resident animals as sentinels for cadmium movement.

Adaptive Management

PCS shall establish an independent panel of scientists and engineers to annually evaluate whether direct and indirect impacts from mining and benefits from the compensatory mitigation are in accordance with expectations at the time of permitting. The panel shall meet during January or February of each calendar year and shall review data collected through the previous calendar year. By March 31, the panel shall provide the Wilmington District and PCS with recommended changes to the mining and mitigation that are necessary to bring the project into alignment with expectations. Every fifth year, the panel shall review the monitoring methods, sampling locations, parameters analyzed, and other elements of monitoring protocol to determine if modifications to the plan are appropriate. The Wilmington District will consider this information and comments from resource agencies to determine if corrective actions or permit modifications are needed. If the panel concludes and the Wilmington District agrees that the mine expansion has caused significant adverse environmental impacts that are not offset by mitigation, then corrective action shall be taken. All data, reports, and presentations reviewed by the panel shall be placed and maintained on a publically accessible internet site.



Palmer
Hough/DC/USEPA/US
03/31/2009 12:38 PM

To Wilber Pace <Pace.Wilber@noaa.gov>, Rebecca
Fox/R4/USEPA/US@EPA, Mike_Wicker
<Mike_Wicker@fws.gov>

cc

bcc

Subject approx impact from new alternative

pace;

in the GIS files that you sent our yesterday, what is the approximate total wetland impact associated with our new alternative.

in the table you sent last over the weekend the total was approx 2,759.

i know these numbers are very rough but i need to give an approximation of the impacts of our new alternative.

thanks, palmer

Palmer F. Hough
US Environmental Protection Agency
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"Pace.Wilber"
<Pace.Wilber@noaa.gov>
03/31/2009 01:45 PM

To Palmer Hough/DC/USEPA/US@EPA
cc Rebecca Fox/R4/USEPA/US@EPA, Mike_Wicker
<Mike_Wicker@fws.gov>
bcc

Subject Re: approx impact from new alternative

History:  This message has been replied to and forwarded.

Hi- Palmer.

Attached Excel file has a tab "Summary31March" with the figures that represent the version of the ncpc line sent to PCS Monday. As noted earlier, there are glitches in the data that I hope to resolve with CZR later today. Note the total for NCPC goes up because the area added by the "NGO polygon" is greater than the area subtracted by the "NMFS polygons." Please let me know if you have questions.

Pace

Hough.Palmer@epamail.epa.gov wrote:

> pace;
>
> in the GIS files that you sent our yesterday, what is the approximate
> total wetland impact associated with our new alternative.
>
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> of the impacts of our new alternative.
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> thanks, palmer

>
> _____
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<http://sero.nmfs.noaa.gov/dhc/habitat.htm>