



BP Exploration & Production Inc.
501 Westlake Park Boulevard
Houston, Texas 77079

April 11, 2011

VIA EMAIL AND U.S. MAIL

Cynthia K. Dohner
Regional Director, FWS Southeast Region
Fish and Wildlife Service
1875 Century Boulevard
Atlanta, Georgia 30345

Re: Use of Ultraviolet Light in Avian NRDA Field Studies

Dear Ms. Dohner:

During the course of implementing several of the cooperative natural resource damage assessment (NRDA) studies for avian resources, the Trustees have examined both avian nests and captured birds using ultraviolet (UV) light, and have recorded instances where fluorescence under UV light has been observed. It is our understanding that this methodology is being used to assess the exposure of these birds to oil from the Deepwater Horizon spill. As has been conveyed to the Trustees throughout the avian NRDA, BP believes that this methodology is not appropriate in this context. Specifically, there are at least four potential problems with the use of UV light as a field measure of exposure to oil, and in this case to MC252 oil.

First, fluorescence alone is not a valid indicator of oil in this context. A wide variety of materials could fluoresce under UV light, including plant oils, microbially-produced oils, spilled detergents, bioluminescent organisms, photosynthetic organisms, some excretory products such as uric acid and feces, and oils secreted naturally by birds.¹ These substances may cause interference, exhibit co-fluorescence, or generate false positive detections of “oil” during analysis. In fact, as recorded on cooperative field data sheets, a substantial number of birds captured in reference areas on the Atlantic bight exhibited fluorescence. (*See, e.g., Attachment 1*).

Second, BP questions whether the data concerning fluorescence have been collected in a scientifically reliable manner. Despite repeated requests dating from at least mid-October, 2010² from BP’s technical representatives, the Trustees have not provided us with validated, written standard operating procedures (SOPs) for the use of UV lamps in the field,³ and it is unclear

¹ See Glud, R.N. 2008. Oxygen dynamic of marine sediments. *Marine Biology Research* 4:243-89; Rabinowitz, H.M. 1949. A correlation of fluorescence of human urine with benign and malignant growth. *Cancer Research* 9:672-676.

² See Attachment 2.

³ On March 2, 2011, the Trustees provided BP with an SOP for UV photography only.

whether defensible standard procedure exists. Quality control for detection of fluorescence requires consistent and careful implementation. For instance, the target source of fluorescence should be precisely characterized, the extent of fluorescence determined using a consistent scale and UV lamps must be properly calibrated. In addition, considering the extensive handling of the bird to use the UV technique, it is unclear whether field personnel took necessary precautions to prevent cross-contamination from capture equipment, personal protective equipment, and tarps used to shade the viewing area.

Third, even under field conditions that would enable observers to use UV light to identify the potential presence of oil on birds, this method, to the best of our knowledge, has not been calibrated to distinguish MC-252 oil from other sources of petroleum hydrocarbons in the general spill area.⁴ Natural seeps are commonplace in the Gulf of Mexico, and fluorescence may reflect exposure to seep oil rather than oil from the Spill. Moreover, many birds frequent and may even be captured near marinas, roadside ditches, refueling locations or parking lots, or other sites where they might be expected to encounter petroleum products, automobiles, farm equipment, etc.

Finally, exposure to the UV in the field may be harmful to birds. The toxicity of any oil present may be intensified by exposure to UV radiation from sunlight.⁵ UV light can also be damaging to the eyes and, according to some studies, may be implicated in both cataracts and lesions of the ocular surface.⁶ In addition, extra handling time associated with the use of UV light and photography of any fluorescence increases the potential for stress and injury to the animal.

Certain written documents used in NRDA studies conducted cooperatively by BP and the Trustees have included language suggesting that fluorescence under UV light is equivalent to oiling. (See, e.g., Attachment 3). Such documents should not be construed to suggest that BP agrees with this approach. As discussed above, BP believes that the use of UV light as part of a NRDA field data collection effort is not necessarily a scientifically valid approach.

BP encourages the Trustees to evaluate critically the utility and safety of the UV approach. At a minimum, we request development of a UV SOP. This will allow the BP

⁴ Naval Facilities Engineering Command. 2000. Near-real time UV fluorescence technique for characterization of PAHs in marine sediment. TechData Sheet: NFESC TDS-2075-ENV. February 2000. Washington, DC.

⁵ Barron, M.G. and L. Ka'ahue. 2001. Potential for photoenhanced toxicity of spilled oil in Prince William Sound and Gulf of Alaska waters. *Marine Pollution Bulletin* 43(1-6):86-92; Huang, Xiao-D., D.G. Dixon, and B.M. Greenberg. 2009. Impacts of UV radiation and photomodification on the toxicity of PAHs to the higher plant *Lemna gibba* (duckweed). *Environmental Toxicology* 12(6):1067-77; Pelletier, M.C., R.M. Burgess, K.T. Ho, A. Kuhn, R.A. McKinney, S.A. Ryba. 2009. Phototoxicity of individual polycyclic aromatic hydrocarbons and petroleum to marine invertebrate larvae and juveniles. *Environmental Chemistry* 16(10):2190-99.

⁶ Di Girolamo, N., M. Coroneo, and D. Wakefield. 2005. Epidermal growth factor receptor signaling is partially responsible for the increased matrix metalloproteinase-1 expression in ocular epithelial cells after UVB radiation. *American Journal of Pathology* 167(2):489-503; Nolan, T. M., N. Di Girolamo, N.H. Sachdev, T. Hampartzoumian, M.T. Coroneo, and D. Wakefield. 2003. The role of ultraviolet irradiation and heparin-binding epidermal growth factor-like growth factor in the pathogenesis of pterygium. *American Journal of Pathology* 162(2):56774; Pitts, D.G., and T.J. Tredici. 1971. The effects of ultraviolet on the eye. *American Industrial Hygiene Association Journal* 32(4):235-246; Taylor, H.R. 1989. Ultraviolet radiation and the eye: an epidemiologic study. *Transactions of the American Ophthalmological Society* 87:802-53.

technical team to evaluate field procedures for consistency with safety, animal treatment, and technical guidelines. In addition, we request a discussion on the overall use of this methodology and the relevance of the data collected to date.

Sincerely,

Handwritten signature of Robin Bullock in black ink, with a stylized 'L' at the end of the name.

Robin Bullock
NRD Director

Cc via email: Administrative Record
Troy Baker (NOAA)
Dr. Nick Tew (Geological Survey of Alabama)
M. Barnett Lawley (Alabama Department of Conservation and Natural Resources)
Lee Edmiston (Florida Department of Environmental Quality)
Garret Graves (Louisiana Coastal Protection and Resource Authority)
Roland Guidry (Louisiana Oil Spill Coordinator's Office)
Peggy Hatch (Louisiana Department of Environmental Quality)
Robert Barham (Louisiana Department of Wildlife and Fisheries)
Bob Harper (Louisiana Department of Natural Resources)
Trudy D. Fisher (Mississippi Department of Environmental Quality)
Don Pitts (on behalf of Texas Trustees)
Harriet M. Deal (DOI)
Charles McKinley (DOI)
John Carlucci (DOI)
Stephanie Willis (NOAA)
M.E. Rolle (NOAA)
Craig R. O'Connor (NOAA)
Will Gunter (AL DCNR)
Bennett Bearden (GSA)
Stephanie Morris (LOSCO)
Drue Banta (LA CP&R)
Lisa Ouzts (MS DEQ)
Christa McLintock (on behalf of Texas Trustees)
Larry Morgan (FDEP)
Brian Israel (Arnold & Porter LLP)
Jean Martin (BP Legal)
Chris Herlugson (BP)
Larry Malnor (BP)

MSC 252 UNIVERSAL AVIAN CAPTURE FORM

Project (check one): CWB Rehab SMB(Rail) SMB(SESP) Form Type (check one): Initial Recap Rehab Final

Date: 11/8/10 Evidence Seizure Tag # (for final form type) NA
Crew Member/Sampler(s): Emma G Emily P John G Mike H Kat B Laura D

Capture Site: Breach Inlet Latitude: 32.77686
State: SC ACP Grid: Longitude: -79.8118

Site Characteristics (circle, CWB only): Nesting area Foraging area Loafing area Classification: Reference or Impacted Habitat (CLRA/SESP only): NA
Spartina Juncus Phragmites

Collection Type/Capture Method: Noose Trap Collection/ Capture Time: 1550 EP Process Time/ Begin: 1504 End: 1730 Release Time: 1735

Species: BLSK Disp/Fate: Released Dead Euth. Rehab Age: A Sex: M

Recap Band Size: Y (N) 4 Band#: 1034-00020 Color bands Left: NA Right: NA Weight (g) (bag+bird): 465 Keel (0-5): NA Fat (0-4): NA (bag): -105 bird: = 360

VHF freq: 169.845 PTT/GPS ID#: N/A VHF working in field: N Weight (harness+transmitter): 10.3 Activation time: 17:01

Visible Oil Assessment: None Trace Light Mod. Heavy (circle) 0% <5% 6-20% 21-40% >40% UV Light Oil Assessment: None Trace Light Mod. Heavy (circle) 0% <5% 6-20% 21-40% >40% Circle if oil present on (Use the UV light. If not available, then use visual inspection): Bill Head Neck Breast Back Wings Belly Vent Tail Legs Notes (color, thickness): Some wear showing light orange on right wing Oil at capture site: Y (N)

Measurements (mm, NA if not collected) Culmen(exposed): NA Bill width: NA Culmen(nares-tip): 74.7 Bill depth: 30.6 Tarsus: 37.8 Head+Bill: 39.8 Wing (unflattened): 368 Middle Toe: NA Wing (flat): NA Tail: NA

Field Sample Collection (enter 0 or quantity obtained)

	Qty		Qty	Size	Qty	Amt.
Blood Smear Slides	3	Body Feathers for PAH	6	Fecal Sample	NA	0 NA
Heinz Body Slides	2	Additional Oiled Feathers	0	Green Vacutainer	0	0 0
Heparinized HCT Tube	1.5	Second Secondaries	2	Red Vacutainer	NA	NA NA
Other HCT Tube	0	Tail Coverts	2	EDTA Microvette	NA	25ul NA
Genetics Filter	1	Retrices (SESP)	NA	Other	0	0 0

Photo info Camera# 13 Photo#s 100-5332 to 100-5336

Comments: Flew upon release given 0.4 cc sugar water

Document Chain of Custody: Form recorded by (BRI only): Print Name Emily Pollow Signature E Pollow Date 11/8/10 ENTRIX Representative: Print Name Sabrina Hisey Signature Sabrina Hisey Date 11-8-10 QA/QC by: Print Name Signature Date Database Entry by: Print Name Signature Date

Proposed Agenda Items

ENTRIX/USFWS Meeting

Sandhill Crane National Wildlife Refuge 1100 – 1600CDT, October 13, 2010

1. Pelagic Survey discussion
 - Review of study to date
 - Response from FWS to stand down cruises until a time when FWS and BP agree to resume study.
 - Only floating Sargassum beds cruises?
2. Osprey Rapid Assessment Plan
 - Reviewed by Entrix; response provided to FWS
3. Waterfowl Plan
 - Under Review by Entrix
4. Colonial Waterbird
 - Response from FWS on request to stop Oiling Rate study upon review of data
 - Reference area selection
 - Status of transmitters – ENTRIX drafting letter to confirm payment
 - Use of Royal Tern transmitters on skimmers
 - Use of ACP grids for oiling rate study
5. Secretive Marsh Birds
 - Update of seaside sparrow tracking
6. Status of FWS UV protocol/study
7. Aerial Surveys
 - Data transfers
 - SOP for large datasets
8. Non-Breeding Shorebirds
 - Response from FWS to refocus to core areas and implementation update
 - Status of LA addendum
9. Open water waterbird Plan
 - Status of carcass recovery
10. Beached Bird Survey
 - Status of Searcher Efficiency Study/Data transfer?

MSC 252 UNIVERSAL AVIAN CAPTURE FORM

Project (check one): CWB Rehab SMB(Rail) SMB(SESP)

Form Type (check one): Initial Recap Rehab Final

Date: 12/10 Evidence Seizure Tag # (for final form type) NA
 Crew Member/Sampler(s): AZ, AP, MP, MB, SW

Capture Site: South Bayou Dulac Latitude: 29.45518
 State: LA ACP Grid: LAC03 Longitude: -89.83426

Site Characteristics (circle, CWB only): Nesting area Loafing area Foraging area
 Classification: Reference or Impacted
 Habitat (CLRA/SESP only): Spartina Juncus Phragmites

Collection Type/ Capture Method: airboat Collection/ Capture Time: 2330 Process Time Begin: 2308 End: 2344 Release Time: 2350

Species: CLRA Rehab Disp/Fate: Released Dead Euth.
 Age: ADY Sex: UNK

Recap	Band Size	Band#, Unbanded ID or Case Number	Color bands Left	Color bands Right	Weight (g)	Keel (0-5):
<input checked="" type="checkbox"/> N	5	1095-4245	AD	35	(bag+bird): <u>368</u>	<u>NA</u>
			NA	NA	(bag): <u>10</u>	Fat (0-4): <u>NA</u>
					bird: <u>348</u>	

VHF freq: 167.649
 PTT/GPS ID#: NA VHF working in field: Y N
 Weight (harness+transmitter): 6.8+1.5 Activation time: 0700

Visible Oil Assessment: None Trace Light Mod. Heavy
 (circle) 0% <5% 6-20% 21-40% >40%
 UV Light Oil Assessment: None Trace Light Mod. Heavy
 (circle) 0% <5% 6-20% 21-40% >40%
 Circle if oil present on (Use the UV light. If not available, then use visual inspection):
 Bill Head Neck Breast Back Wings Belly Vent Tail Legs
 Notes (color, thickness): visible on legs
 Oil at capture site Y N

Measurements (mm, NA if not collected)
 Culmen(exposed): 65.9 Bill width: NA
 Culmen(nares-tip): NA Bill depth: NA
 Tarsus: 53.9 Head+Bill: NA
 Wing (unflattened): 151 Middle Toe: 37.4
 Wing (flat): 152 Tail: 66

Field Sample Collection (enter 0 or quantity obtained)							
	Qty		Qty		Size	Qty	Amt.
Blood Smear Slides	4	Body Feathers for PAH	333b	Fecal Sample	NA	NA	NA
Heinz Body Slides	0	Additional Oiled Feathers	yes	Green Vacutainer	0	-	-
Heparinized HCT Tube	1	Second Secondaries	2	Red Vacutainer	0	-	-
Other HCT Tube	0	Tail Coverts	2	EDTA Microvette	NA	NA	-
Genetics Filter	2	Retrices (SESP)	NA	Other	0	-	-

Photo info Camera# 5 Photo#s 100-7831 to 7845

Comments: Best frequency 167.649 Exam feathers pulled from back

Document Chain of Custody:
 Form recorded by (BRI only): Print Name Alishia Zyer Signature [Signature] Date 012/10
 ENTRIX Representative: Print Name _____ Signature _____ Date _____
 QA/QC by: Print Name _____ Signature _____ Date _____
 Database Entry by: Print Name _____ Signature _____ Date _____