



Rainey, David I

From: Suttles, Doug J
Sent: Friday, May 21, 2010 5:13 PM
To: Morrison, Richard; Fryar, Robert T; Rainey, David I; Button, Robert J; Utsler, Mike J; Seilhan, Keith A; McCleary, Neil (UNKNOWN BUSINESS PARTNER)
Subject: FW: Flow Rate

FYI

Doug

Doug Suttles
Chief Operating Officer
Exploration & Production
BP

From: Wells, Kent
Sent: Friday, May 21, 2010 10:46 AM
To: Looney, Bernard; Birrell, Gordon Y; Suttles, Doug J; Auchincloss, Murray M; Dudley, Robert
Cc: Wells, Kent; Inglis, Andy G (UPSTREAM); Dupree, James H
Subject: RE: Flow Rate

Here are the numbers filled out in Bernard's frame.

- Since May 17th, the average daily oil rate has been 2100 BOPD and the average daily gas rate has been 12 MMCFD;
- Over the period, the daily oil rate has ranged from 1400 - 3000 BOPD; the average daily gas rate has ranged from 4 - 17 MMCFD;
- In the last 24 hour period (May 20th), the daily oil rate was 2200 BOPD; the daily gas rate was 15 MMCFD.

Note: May 16th we collected for a partial day and therefore has been excluded from above numbers. (fyi 290 BO and 1 MMCF)

Let me know if there are any issues we these numbers. Thanks

Kent Wells
281-366-3340

From: Looney, Bernard
Sent: Friday, May 21, 2010 9:30 AM
To: Birrell, Gordon Y; Wells, Kent; Suttles, Doug J; Auchincloss, Murray M; Dudley, Robert
Subject: Flow Rate

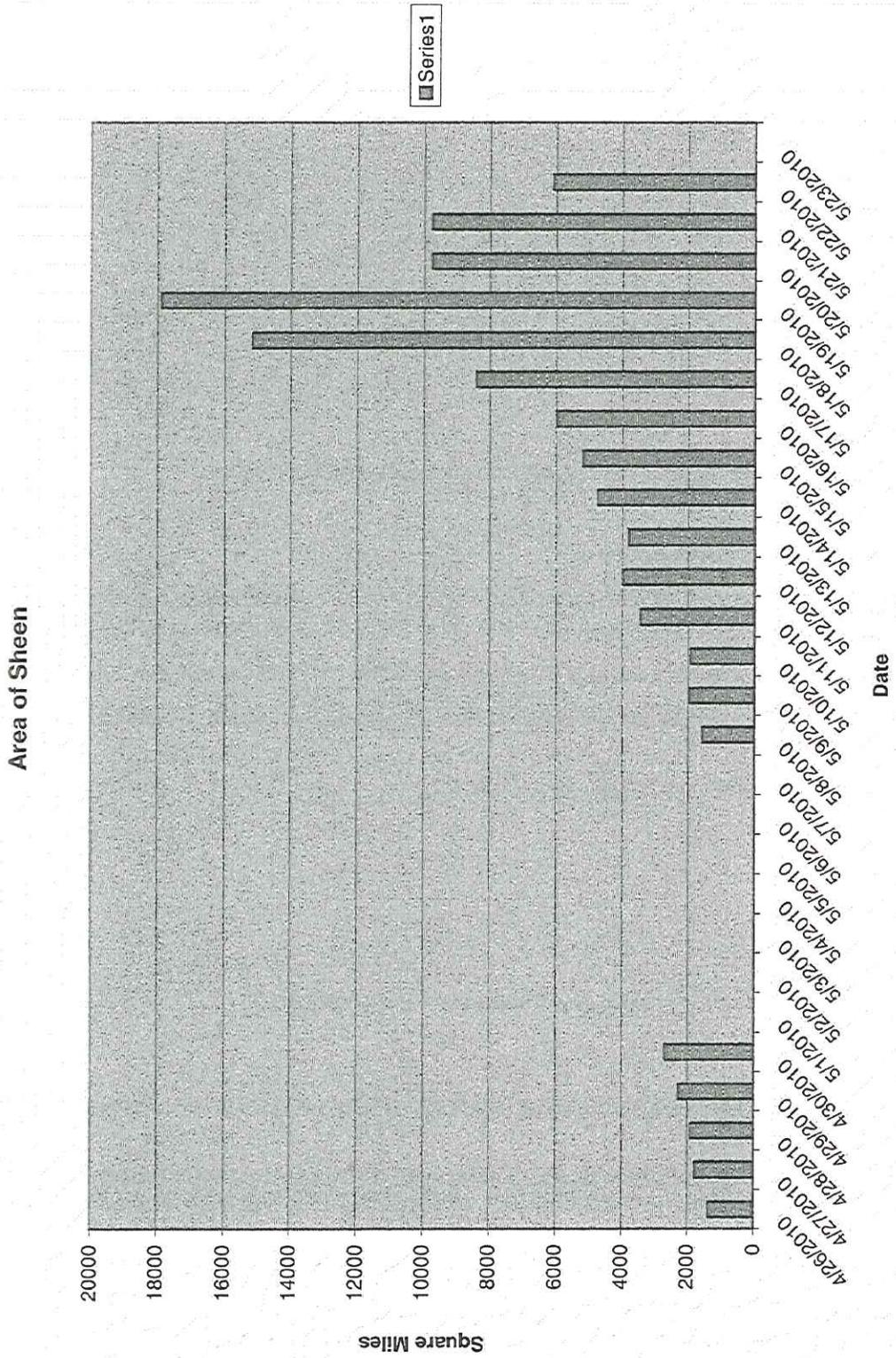
Gents

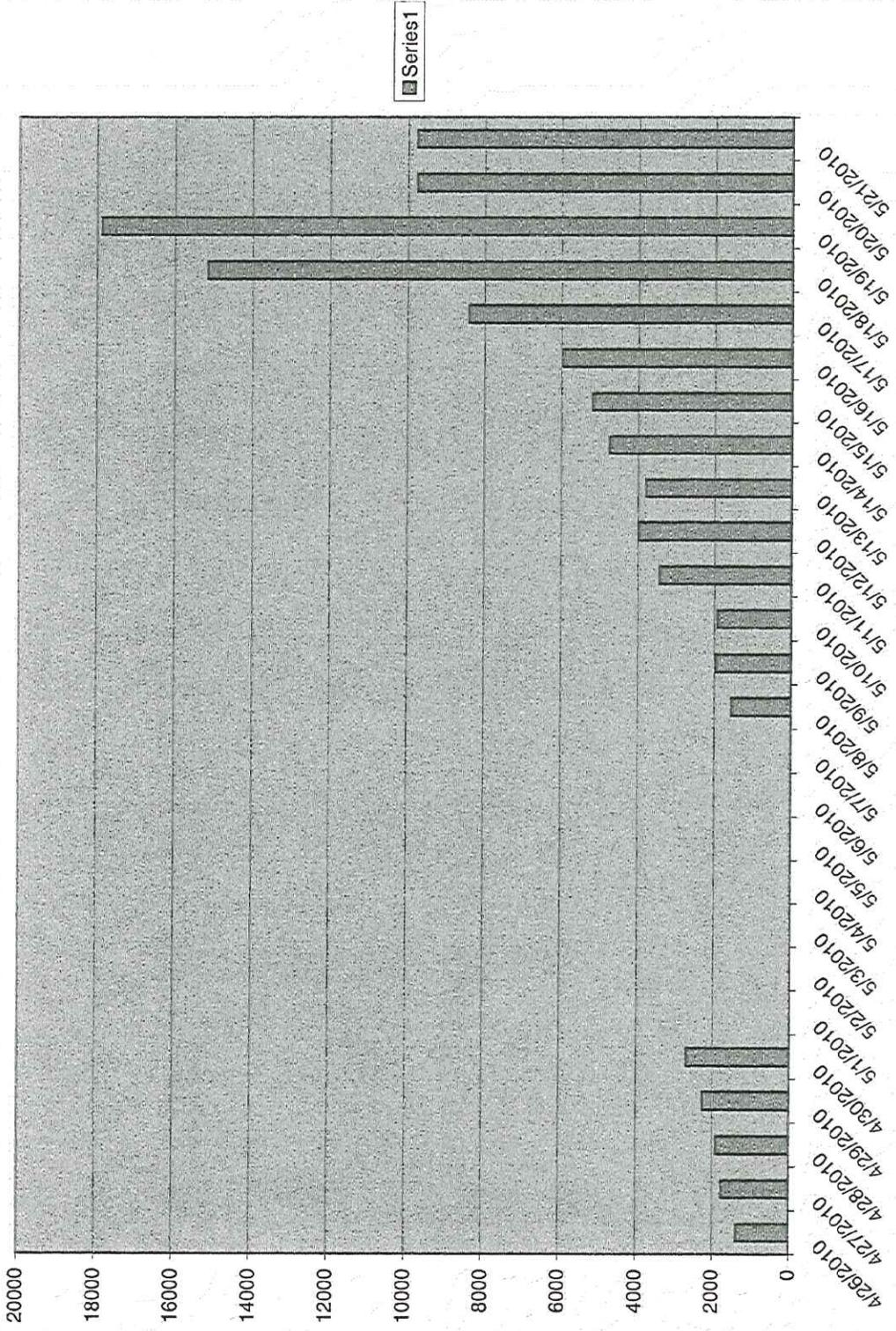
The following is the suggested consistent wording for all future press releases around flow rate. AGI has agreed. Grateful for any immediate feedback.

Once we agree this - Murray will subsequently communicate our plan with London. The rates will be confirmed each day at the 0630 hrs meeting and Murray will communicate this with London through his regular 0800 hrs meeting with them. Trust this works.

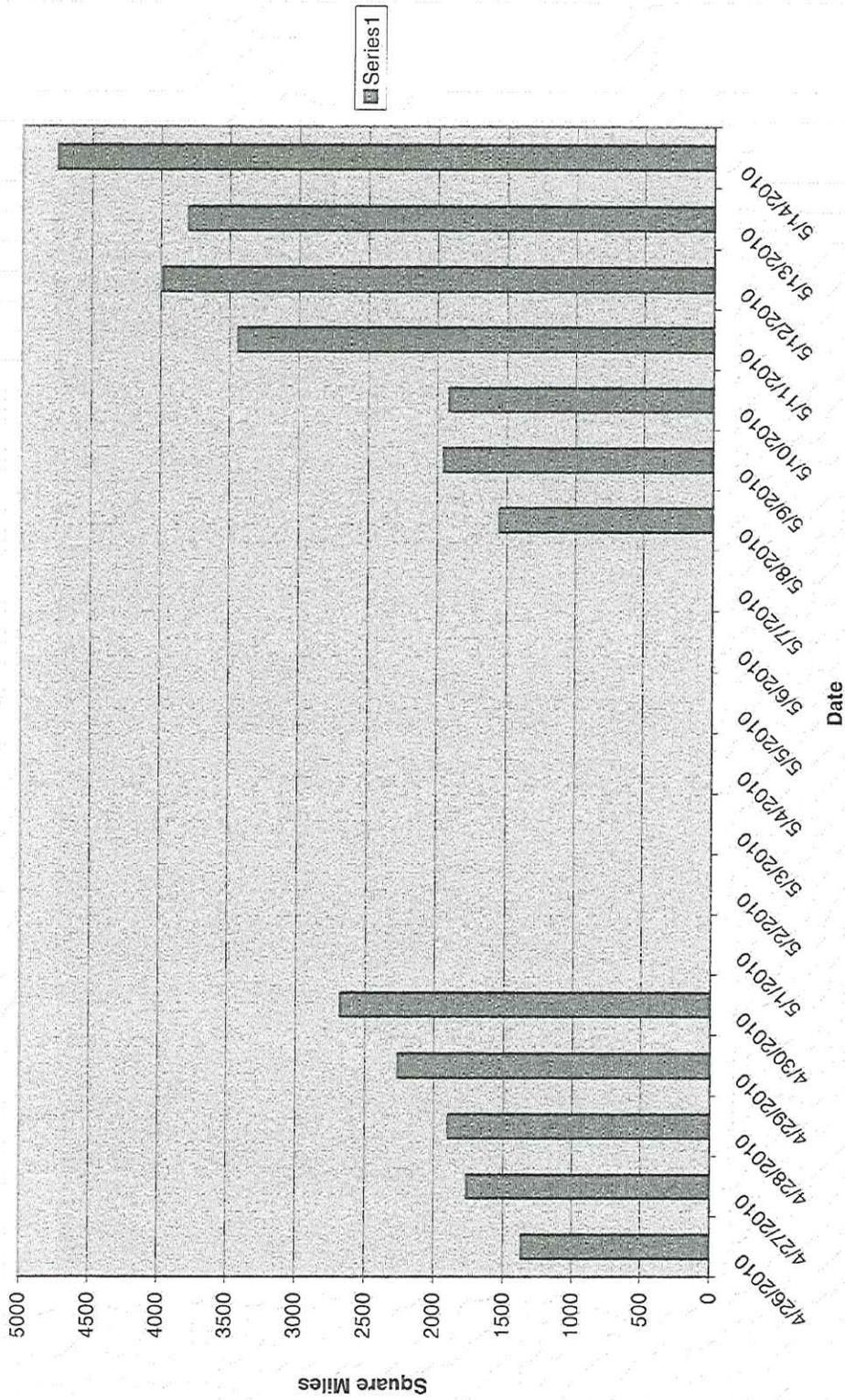
The suggested language:

- Since the beginning, the average daily oil rate has been X and the average daily gas rate has been Y;
- Over the period, the average daily oil rate has ranged from A to B; the average daily gas rate has ranged from C to D;
- In the last 24 hour period, the average oil rate was W; the average gas rate was Z.

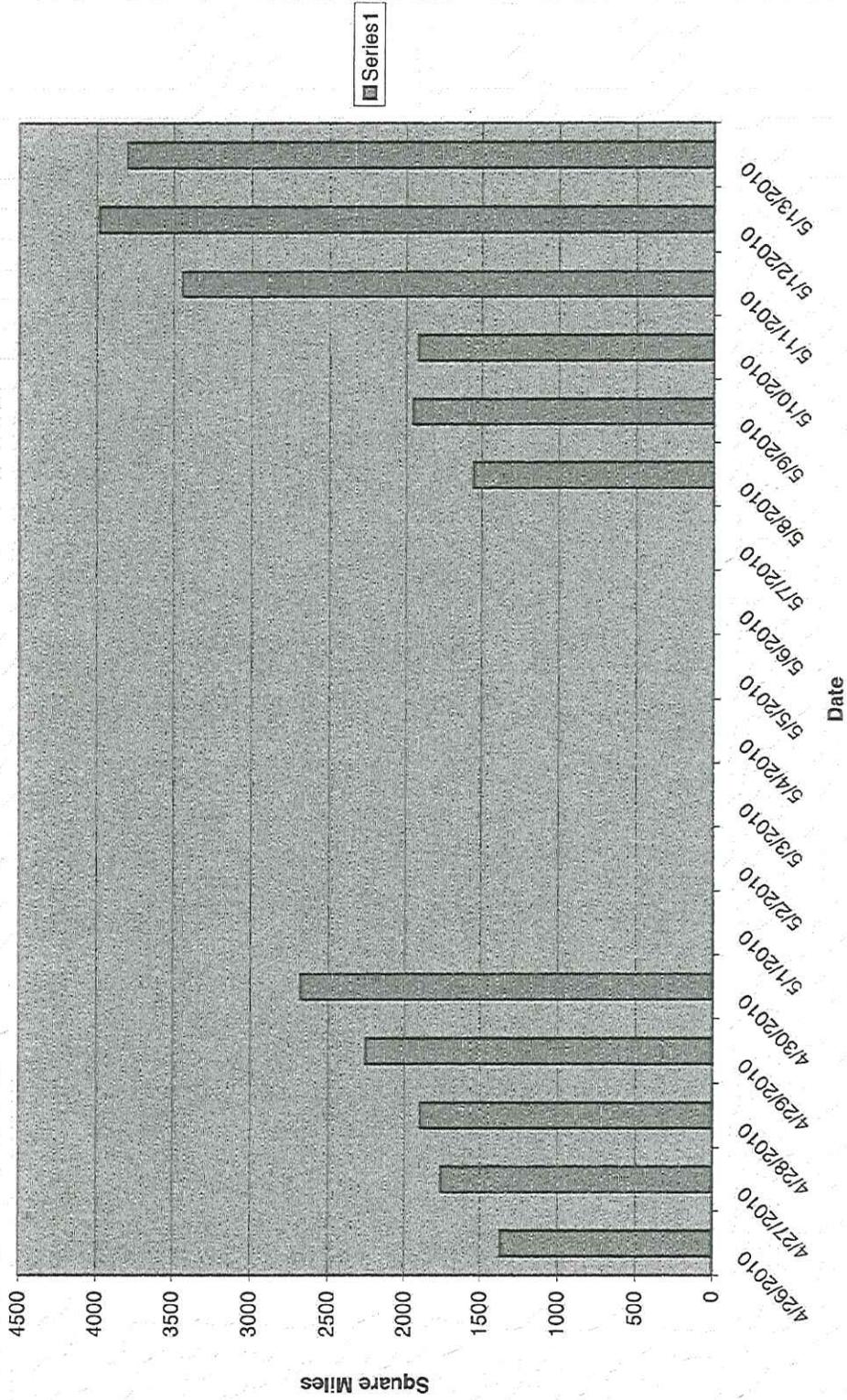


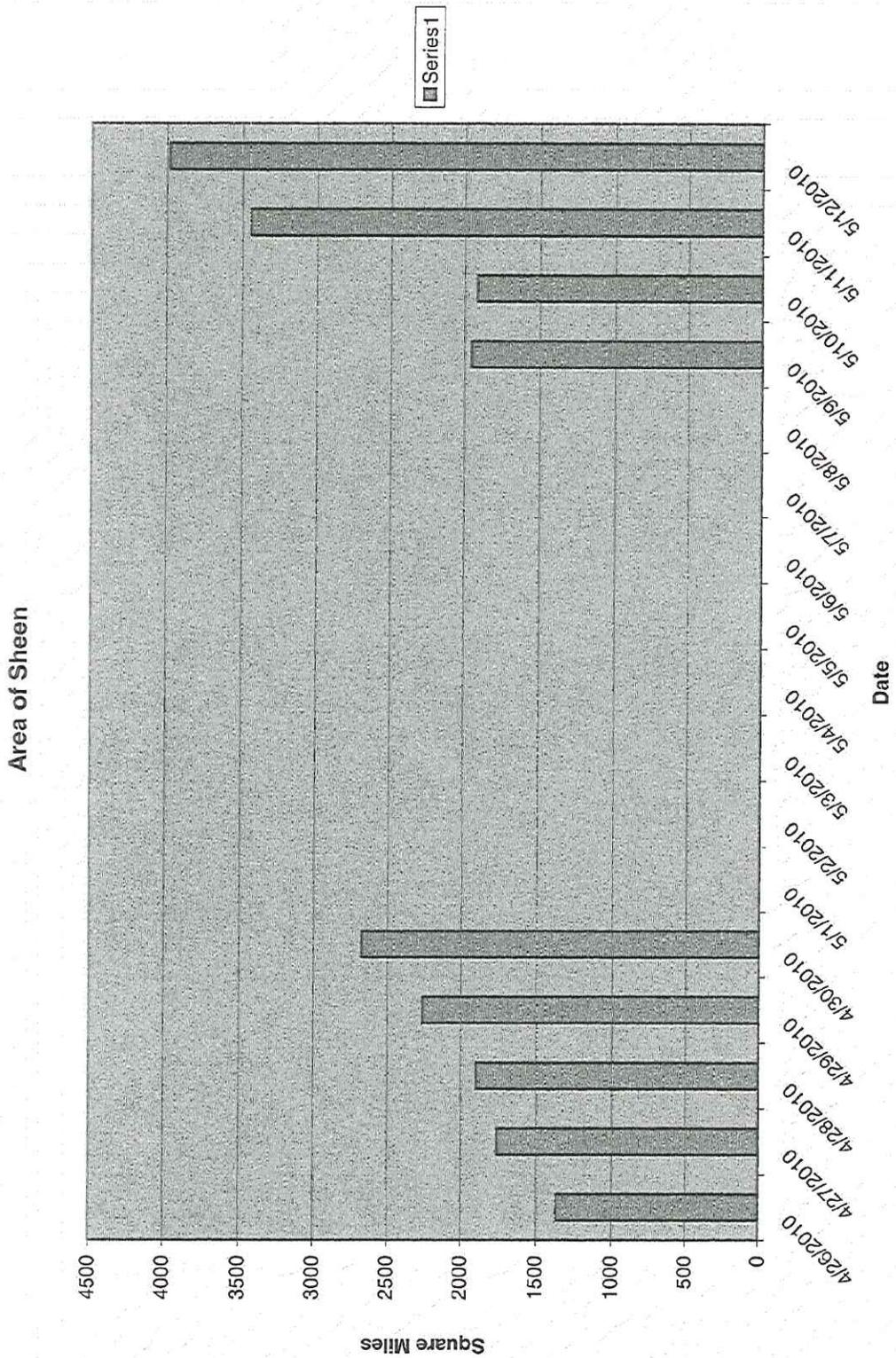


Area of Sheen



Area of Sheen





Rainey, David I

From: Carragher, Peter D
Sent: Saturday, June 19, 2010 8:09 AM
To: Steve Lehmann
Cc: Rainey, David I; Mutschler, Jackie C
Subject: FW: some spill response opinions

Steve BP is supporting SINTEF and are working to get all of the inputs into their model.

I am a bit perplexed there was no BP person from Unified Command on Bill's industry wide note...

Also I see no containment numbers in Bill's note. So is the context, there is a hurricane and containment ceases? Or a long run mass balance form day one?

Regards

Pete Carragher

O +1 281 366 2789
C +1 281 450 0446
H +1 281 531 8304
UK + 44 777 175 8812
PA Gigi Juran +1 281 366 7695 gigi.juran@bp.com

From: Mark Reed [mailto:Mark.Reed@sintef.no]
Sent: Saturday, June 19, 2010 7:19 AM
To: Carragher, Peter D; Page, Paul W
Cc: Tore Aunaas; Ivar Singsaas; Per Johan Brandvik; Per Daling
Subject: RE: some spill response opinions

Peter and Paul,

We have received a request from NOAA to assist them in establishing a mass balance for the spill.

Have you been sending them copies of our reports? Shall we send them a copy of a recent mass balance calculation?

Mark

From: Bill Lehr [mailto:Bill.Lehr@noaa.gov]
Sent: 18. juni 2010 22:09
To: Lambert,Patrick [NCR]; goodmanr@cia.com; Per Daling; Victoria.Broje@shell.com; Alan@spiltec.com; consultant@alunlewis.demon.co.uk; 'jrpayne@sbcglobal.com'; Thomas.S.Coolbaugh@exxonmobil.com; Ed Overton; David Usher; Merv Fingas; Robert Jones; Ian@slross.com
Cc: Steve Lehmann; Mark W Miller
Subject: some spill response opinions

Dear folks who actually know something about spill response,

6/19/2010

We (NOAA/ERD) have been asked to assist the Incident Command prepare a mass balance for daily operations for this spill. Obviously, a spill originating a mile beneath the ocean is not a typical incident. I would like your comments on the suggestions below. Because of the emergency nature of the request, I need a quick turn around for your responses.

Thanks for your help,

Bill Lehr
NOAA/ERD
206 719 1813 (24 hour cell)



MASS BALANCE FOR THE DEEPWATER HORIZON SPILL.

Background:

Spill is leaking at least 35,000 bbl/day of 35 API oil, mixed in with produced gas. The source is one mile underwater in the Gulf of Mexico, average water temperature around 32 C. Sea state has generally been low.

Calculating Oil dispersed into the water column:

The oil and gas leaking out at the Deep Horizon oil spill are all buoyant and, therefore would, neglecting other processes, rise to the surface. However, one cannot neglect other processes. Originally, the escaping plume will be a mixture of gas and oil, with additional gas dissolved within the oil. According to the Clarkson University model CDOG, this plume will maintain its integrity for at most a few hundred meters with a strong positive buoyancy. Several competing processes will interfere with this process. The gas will rise faster than the oil, 'slipping' past the droplets but will also form hydrates with the surrounding water. Water will be entrained into the plume by turbulence that will also contribute to changing droplet size distribution of the oil mixed into the plume. These oil droplets will rise to the surface based upon Stokes law, where, for the smallest droplets, the rise velocity can be approximated by the formula

where μ is the water viscosity, $\Delta\rho$ is density difference between oil and water, d is droplet diameter and g is gravitational acceleration constant. For small enough oil droplet size, the rise velocity is so small that competing processes affect it before it can make it to the surface. These processes include dissolution, biodegradation, and particle-oil interaction. These processes will vary in strength depending upon where the oil droplet is located. Field measurement may help to quantify these processes but, as an arbitrary cut-off value, one can take 70 microns as the minimum droplet size below which that droplet is considered permanently dispersed.

The droplet size distributions in the plume are greatly affected by use of dispersant chemicals that lower the surface tension of the oil and produce smaller droplet sizes. There is extremely little data on the droplet size distribution for oil in the water column for this incident. Some limited data exists from the RV Brook McCall Survey LISST measurements performed by the Bedford Institute of Oceanography. If one, extrapolates their results, and dangerous exercise with a high degree of uncertainty, to the entire spill, then one can conclude that perhaps 30% of the oil

6/19/2010

released during non-dispersant operations were dispersed into the water column and up to 60 % were dispersed for oil in contact with dispersant chemicals. However, since the samples were subsurface, they may be preferentially sampling the droplet distribution formed initially. Moreover, the NOAA model, ADIOS2, suggests that if the spill occurred at the surface, less than 8 % of the oil would disperse. Different reports from the Ixtoc 1 blowout in the Gulf of Mexico in 1979 claim that between 3% to 26% of the oil released from a much shallower depth ended up in the water column or on the bottom.

As an operational estimate, we suggest the following values for natural dispersion for the subsurface oil release:

Minimum: 10%

Maximum: 20%

Best Guess: 15 %

Chemical dispersion

Chemical dispersants lower oil surface tension, resulting in smaller droplet sizes. Traditionally, emulsified oil, because of its high viscosity, is difficult to chemically disperse. Much of the surface oil is emulsified. However, SMART Tier 1 and Tier 2 observations suggest that surface dispersant spray operations are at least partially successful. Current assumptions assume a 3 to 1 effectiveness (three gallons of oil dispersed for every gallon of dispersant applied).

Chemical dispersants added to the plume at the source are certainly more effective than surface spraying. In fact, it is almost a perfect situation for dispersant application; fresh oil, direct contact between dispersant and oil, high turbulent energy. Very preliminary subsurface plume observations and modeling suggest that a 20 to 1 effectiveness number is not unreasonable

Suggested operational estimate:

Surface operations (includes problems with hitting the oil):

3 to 1 effectiveness average.

1 to 1 low,

5 to 1 high

Subsurface operations:

15 to 1 effectiveness average,

10 to 1 low,

20 to 1 high

Evaporation

In the process of rising through the water column and weathering on the sea surface, oil loses many constituents to dissolution and evaporation. Since this oil contains a high fraction of volatile compounds, we expect that a large fraction of the oil is lost to evaporation. We used the pseudo-component evaporation model used in ADIOS2, initialized with data on the oil composition provided by BP, to estimate the fraction of oil possibly lost to evaporation over the period on the order of weeks to months. After the more volatile compounds have evaporated, the remaining oil tends to persist without evaporative change for many months. Our models suggest that as much as 46% of the oil can be lost to evaporation over several weeks on the sea surface.

We measured the composition of weathered oil collected from the sea surface on 16 May using GC/MS, and analyzed the results using the pseudo-component evaporation model. We found that the weathered oil sample had lost 38% of its mass to the combination of evaporation and dissolution. This analysis could be improved with a careful simulated evaporation study on the fresh oil, but we have not yet initiated this study.

As an operational estimate, we suggest the following values for evaporation:

1st day: 37% of the oil that makes it to the surface

2nd day: 4% of surface oil that is less than two days old

6/19/2010

Burning:

Al Allen is conducting the burn operations and reporting the amount burned. He is using 0.07 gpm/sqft for un-emulsified oil and 0.05 for the emulsified oil. He notes that these two burn rates have been used for years and are generally accepted as conservative burn rates. We suggest that we simply accept his reported values.

Skimming:

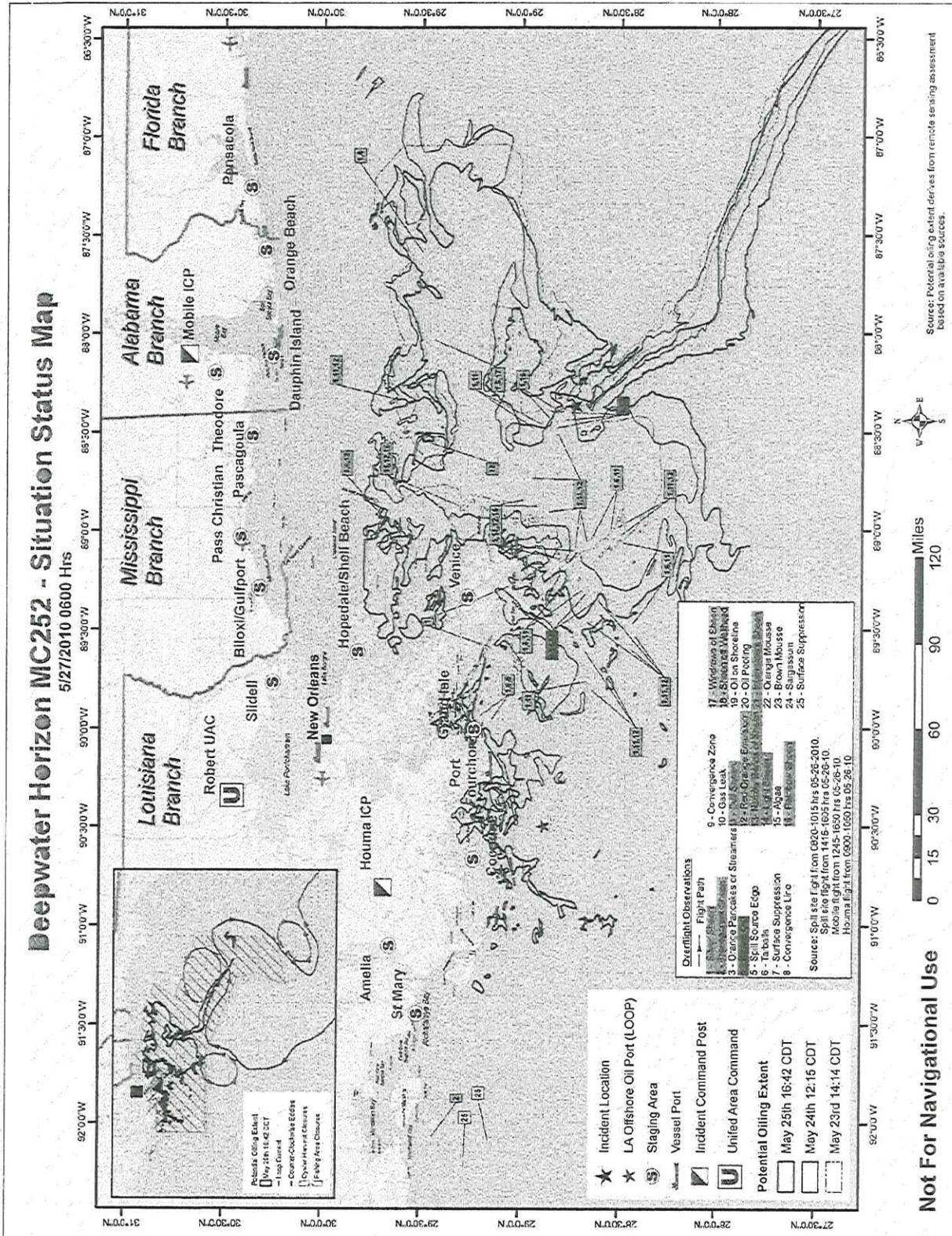
Operations are reporting the volume of oily water rather than the volume of oil. The skimmers are of different types, are operated at different skill levels, and in different states of weathered oil. The results are often then blended in common storage tanks. Rather than estimate oil-water ratios, we suggest simple measurements of the barge oil.

VOLUME Loss Due To Gas Breakout 5000' → SURFACE.

6/19/2010

Deepwater Horizon MC252 - Situation Status Map

5/27/2010 0600 Hrs



Oiling Extent
 May 26h 16:42 CDT
 May 24h 12:15 CDT
 May 23rd 14:14 CDT
 Coastal Checkline Edges
 Coastal Checkline
 Fishing Area Closure

- ★ Incident Location
- ★ LA Offshore Oil Port (LOOP)
- Ⓢ Staging Area
- Ⓢ Vessel Port
- Ⓢ Incident Command Post
- Ⓢ United Area Command
- Potential Oiling Extent
- May 25th 16:42 CDT
- May 24th 12:15 CDT
- May 23rd 14:14 CDT

- Overflight Observations**
- 1 - Flight Path
 - 2 - Oil slick
 - 3 - Oil slick
 - 4 - Oil slick
 - 5 - Spill Source Edge
 - 6 - Isobars
 - 7 - Surface Suppression
 - 8 - Convergence Line
 - 9 - Convergence Zone
 - 10 - Gas Leak
 - 11 - Wreckage of Barge
 - 12 - Shearwater
 - 13 - Shearwater
 - 14 - Oil on Shoreline
 - 15 - Oil Pooling
 - 16 - Oil Pooling
 - 17 - Oil Pooling
 - 18 - Oil Pooling
 - 19 - Oil Pooling
 - 20 - Oil Pooling
 - 21 - Oil Pooling
 - 22 - Orange Mousse
 - 23 - Brown Mousse
 - 24 - Sargassum
 - 25 - Surface Suppressor
- Sources: Spill site flight from 0200-1015 hrs 05-26-2010.
 Mobile flight from 1245-1630 hrs 05-26-2010.
 Houma flight from 0900-1030 hrs 05-26-2010.

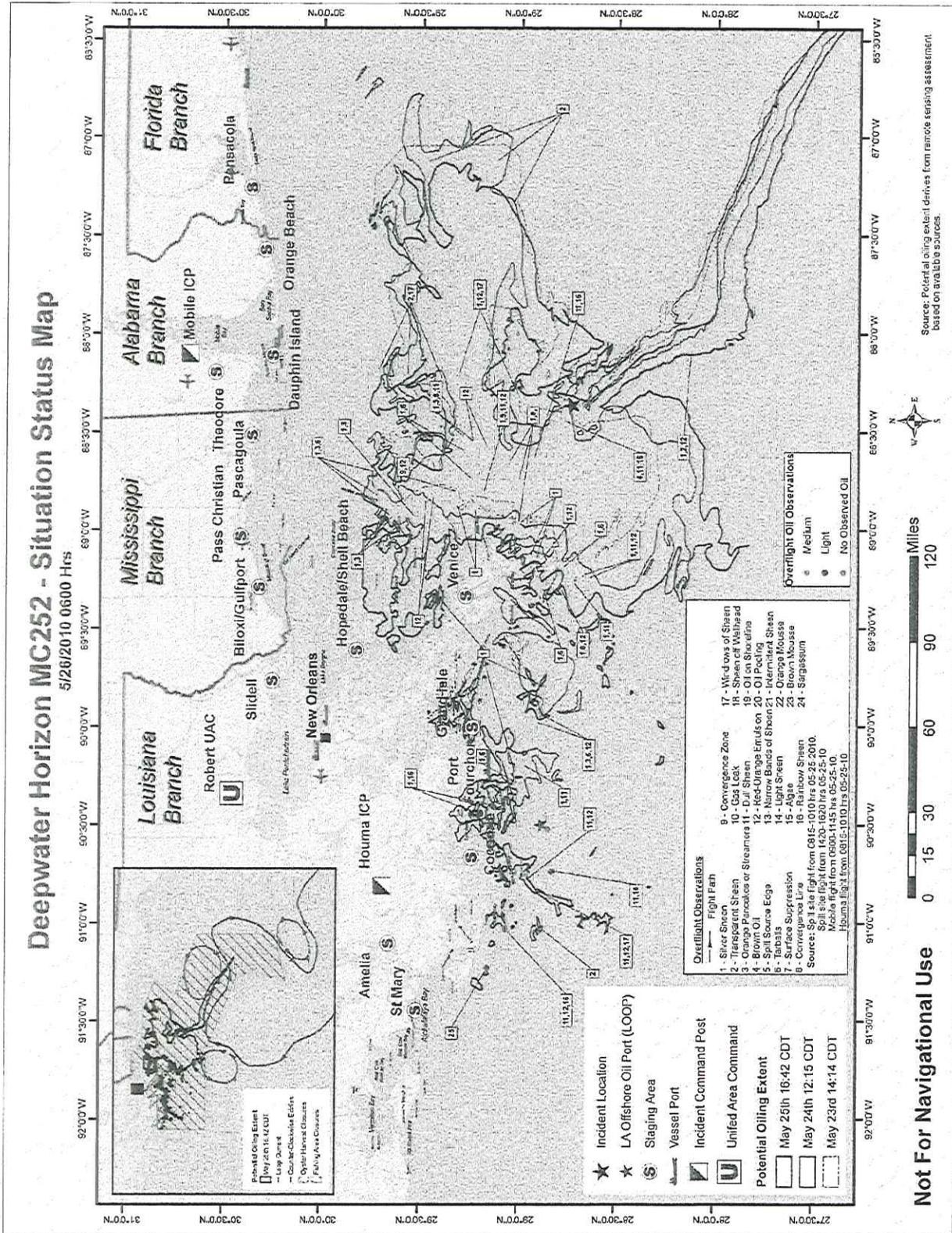
Miles



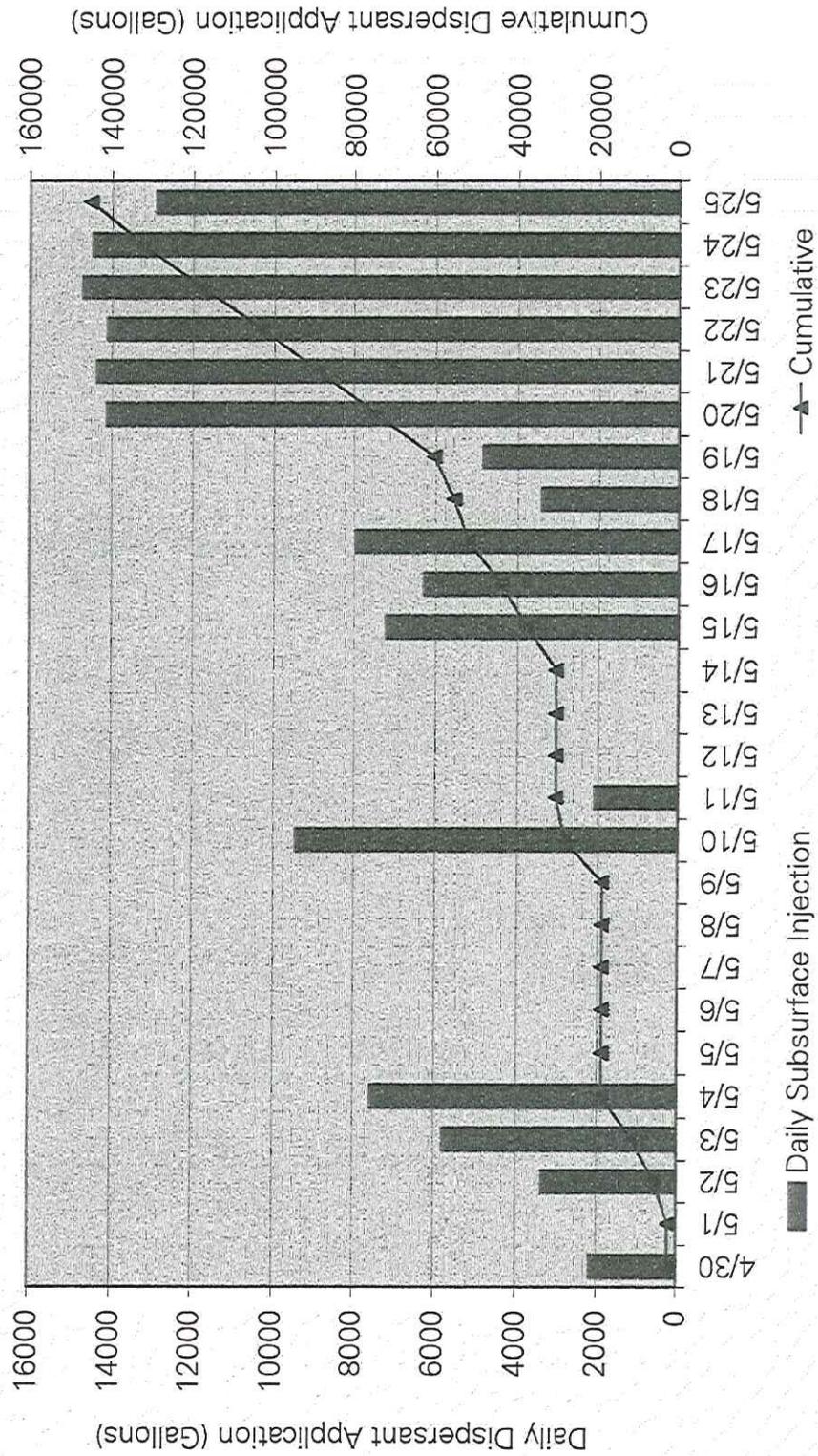
Source: Potential oiling extent derives from remote sensing assessment based on available sources.

Deepwater Horizon MC252 - Situation Status Map

5/26/2010 0600 Hrs

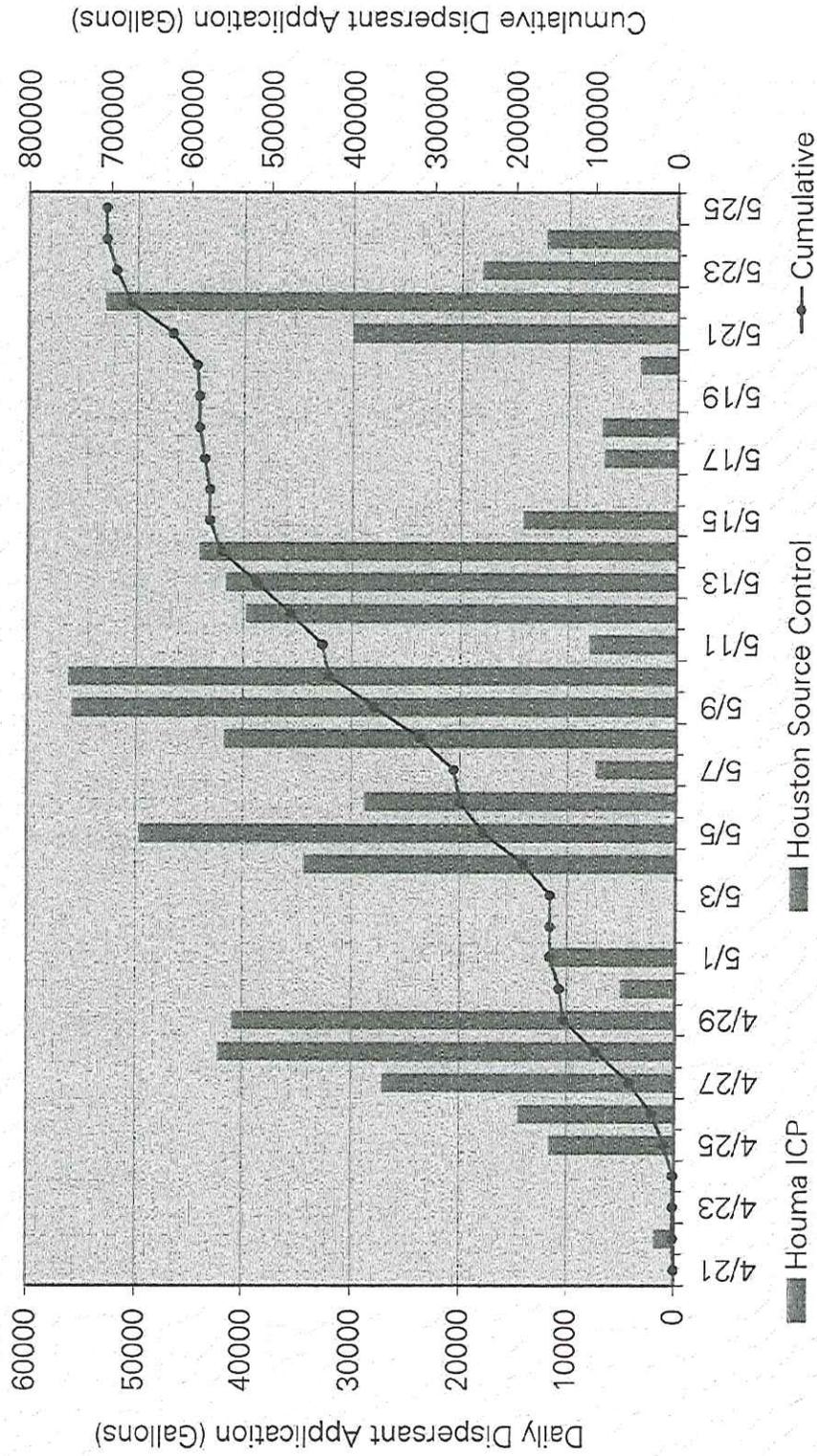


Subsea Dispersant Timeline



* Data as of 5/26 00:00 hrs.

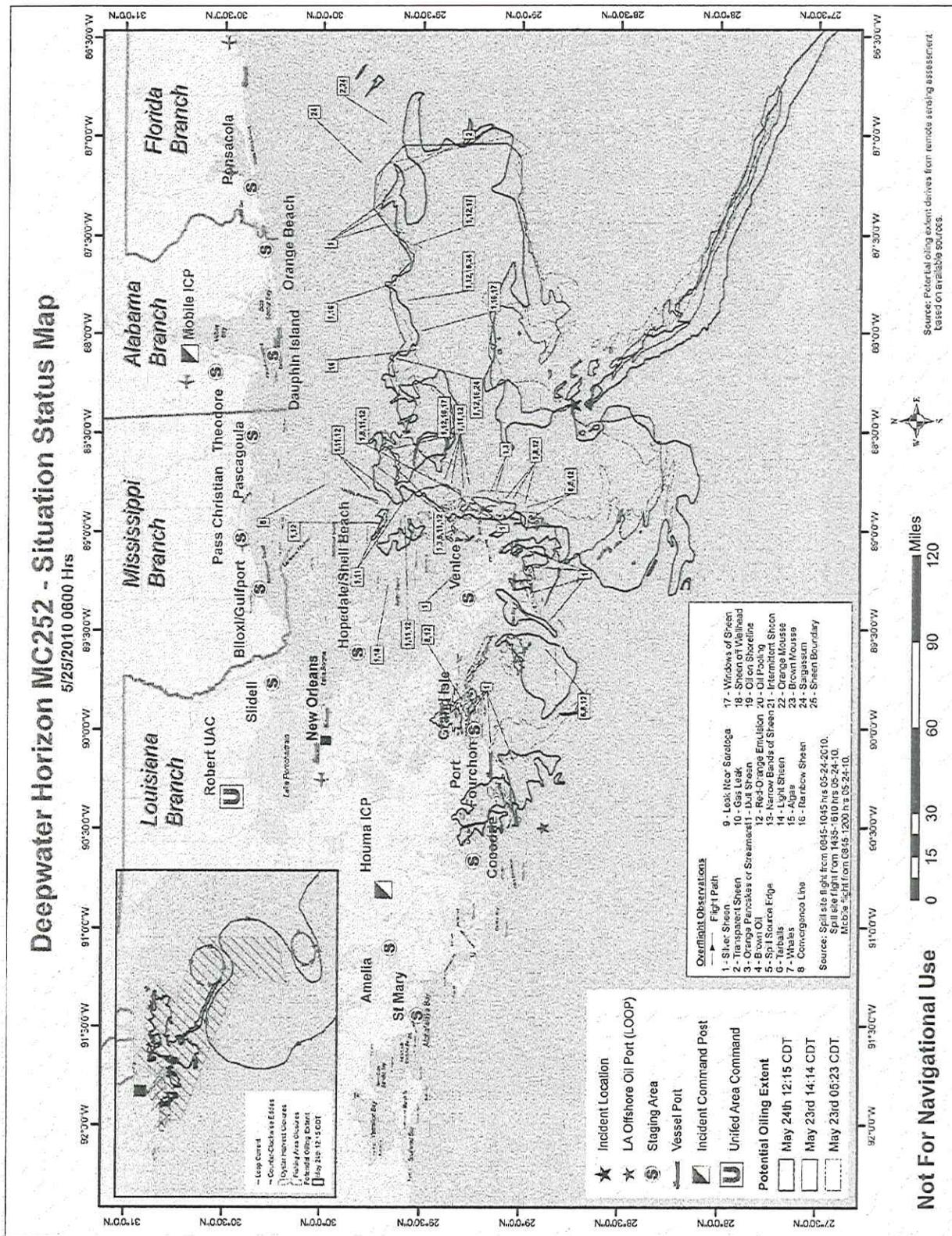
Surface Dispersant Timeline



* Data as of 5/25 22:00 hrs.

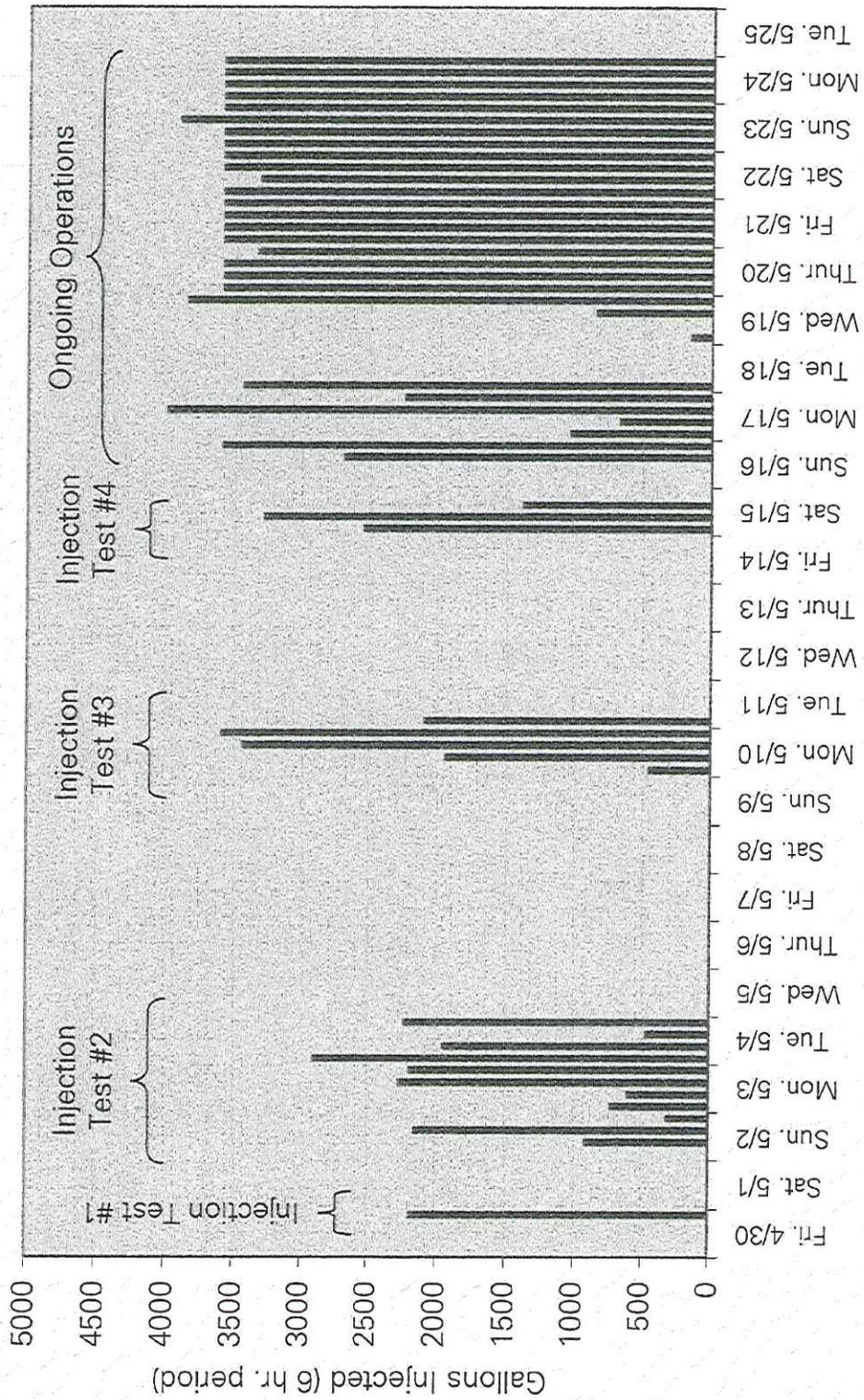
Deepwater Horizon MC252 - Situation Status Map

5/25/2010 0800 Hrs



Source: Potential oiling extent derives from remote sensing assessment based on available sources.

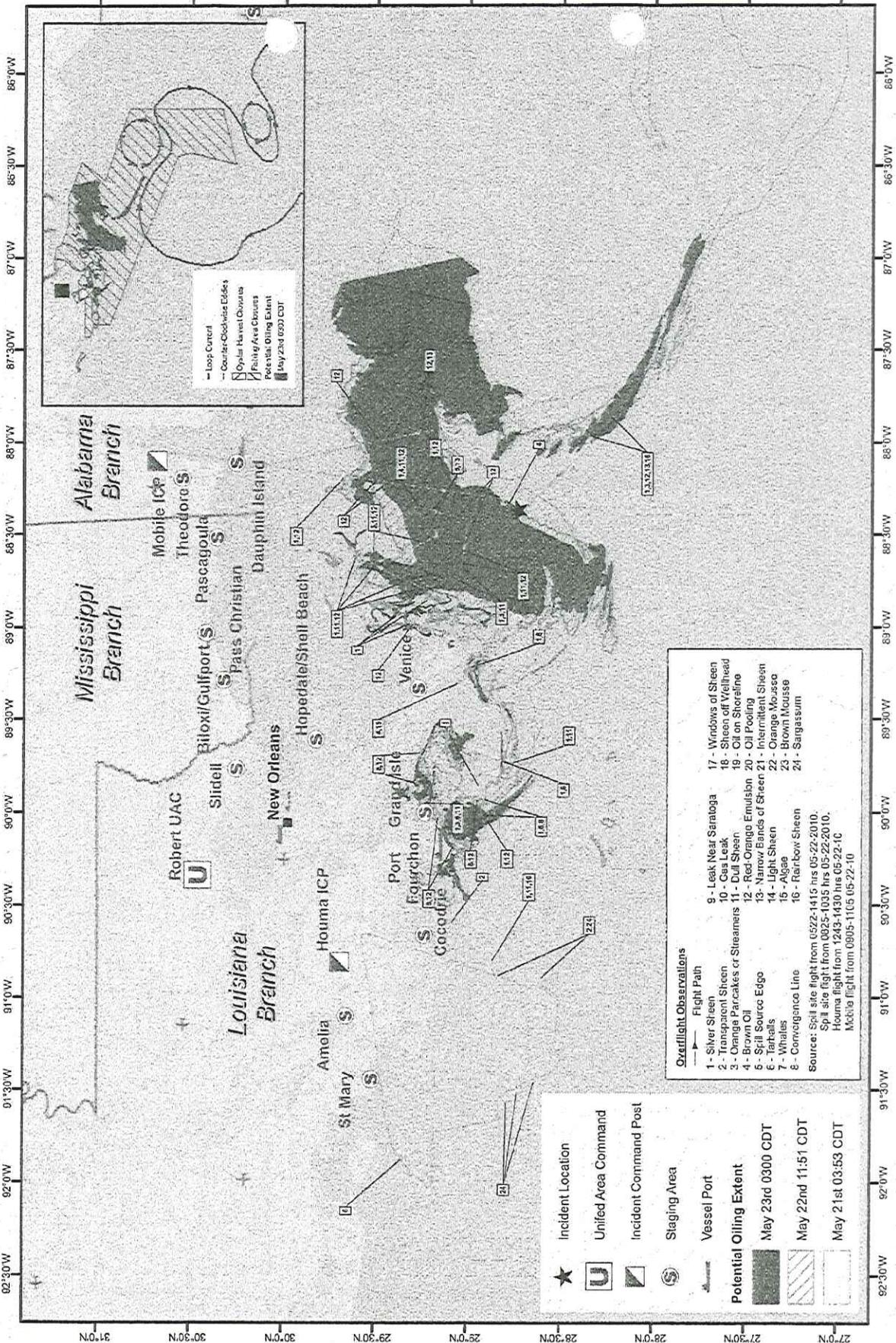
Subsea Dispersant Timeline



* Data as of 5/25 00:00 hrs.

Deepwater Horizon MC252 - Situation Status Map

5/23/2010 0600 Hrs



- Overflight Observations**
- 1 - Silver Sheen
 - 2 - Transparent Sheen
 - 3 - Orange Paracakes or Streamers
 - 4 - Brown Oil
 - 5 - Spill Source Edge
 - 6 - Tarballs
 - 7 - Whales
 - 8 - Convergence Line
 - 9 - Leak Near Saratoga
 - 10 - Gas Leak
 - 11 - Dull Sheen
 - 12 - Red Orange Emulsion
 - 13 - Narrow Bands of Sheen
 - 14 - Light Sheen
 - 15 - Algae
 - 16 - Rainbow Sheen
 - 17 - Windows of Sheen
 - 18 - Sheen off Wellhead
 - 19 - Oil on Shoreline
 - 20 - Oil Pooling
 - 21 - Irritant Sheen
 - 22 - Orange Mousse
 - 23 - Brown Mousse
 - 24 - Sargassum
- Source: Spill site flight from 0522-1415 hrs 05-22-2010.
 Spill site flight from 0825-1035 hrs 05-22-2010.
 Houma flight from 1243-1430 hrs 05-22-10.
 Mobile flight from 0805-1105 05-22-10

- ★ Incident Location
 - U Unified Area Command
 - Incident Command Post
 - Staging Area
 - Vessel Port
- Potential Oiling Extent**
- May 23rd 0300 CDT
 - May 22nd 11:51 CDT
 - May 21st 03:53 CDT

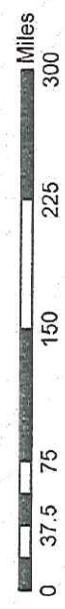
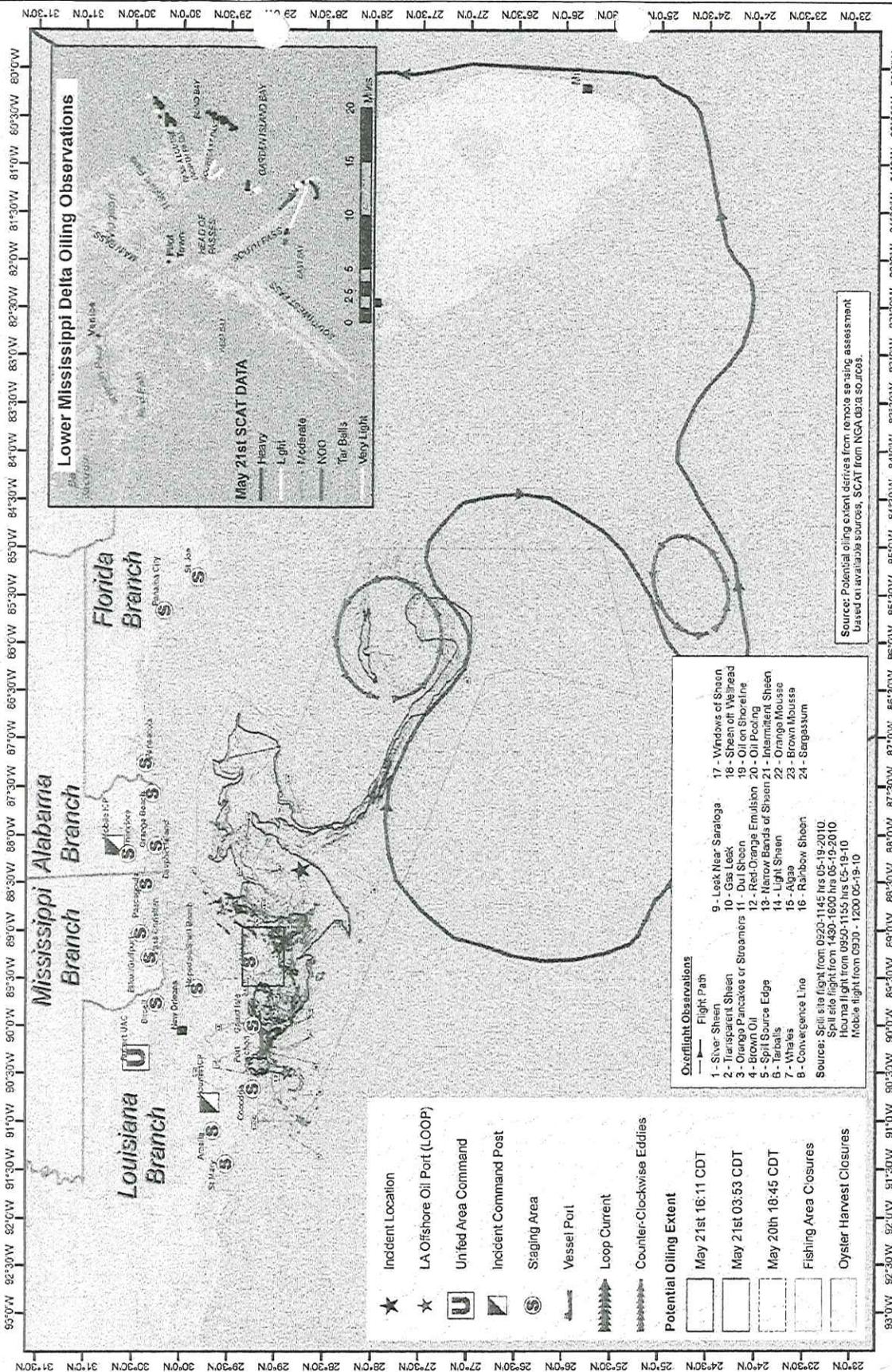
Source: Potential oiling extent derives from remote sensing assessment based on available sources.



Not For Navigational Use

Deepwater Horizon MC252 - Situation Status Map

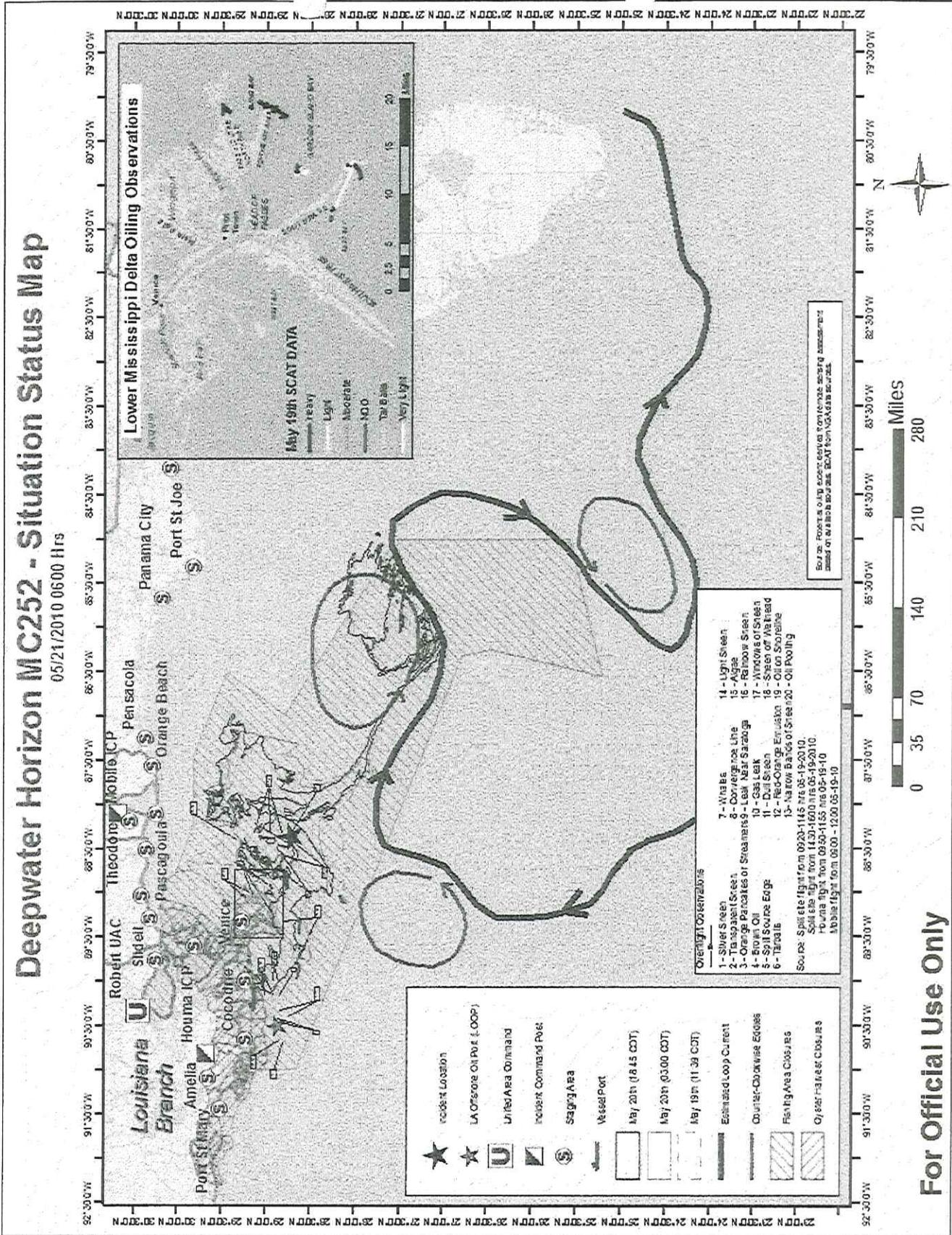
5/22/2010 0600 Hrs



For Official Use Only

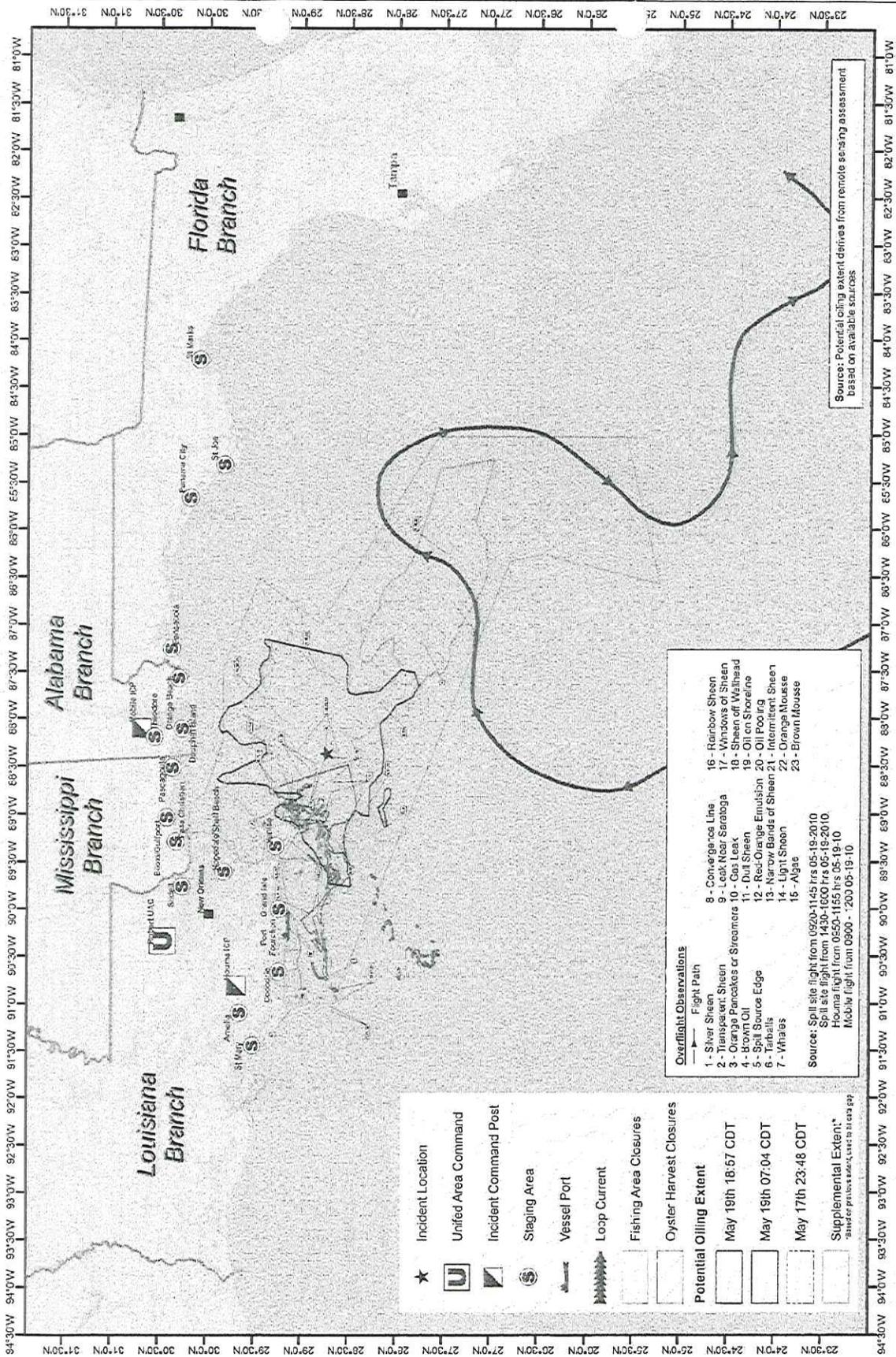
Deepwater Horizon MC252 - Situation Status Map

05/21/2010 0600 Hrs



Deepwater Horizon Incident - Situation Status Map

5/20/2010 0600 Hrs



- ★ Incident Location
- U United Area Command
- Incident Command Post
- Staging Area
- Vessel Port
- Loop Current
- Fishing Area Closures
- Oyster Harvest Closures
- Potential Oiling Extent
- May 18th 18:57 CDT
- May 19th 07:04 CDT
- May 17th 23:48 CDT
- Supplemental Extent*

- Overflight Observations**
- 1 - Silver Sheen
 - 2 - Translucent Sheen
 - 3 - Orange Pancakes or Streamers
 - 4 - Brown Oil
 - 5 - Spill Source Edge
 - 6 - Tarballs
 - 7 - Whales
 - 8 - Convergence Line
 - 9 - Leak Near Saratoga
 - 10 - Gas Leak
 - 11 - Dirt Sheen
 - 12 - Red-Orange Emulsion
 - 13 - Narrow Bands of Sheen
 - 14 - Light Sheen
 - 15 - Algae
 - 16 - Rainbow Sheen
 - 17 - Whirls of Sheen
 - 18 - Sheen off Wellhead
 - 19 - Oil on Shoreline
 - 20 - Oil Pooling
 - 21 - Intermittent Sheen
 - 22 - Orange Mousse
 - 23 - Brown Mousse
- Source: Spill site flight from 0520-1145 hrs 05-18-2010
 Spill site flight from 1430-1600 hrs 05-18-2010
 Helium flight from 0550-1155 hrs 05-19-10
 Mobile flight from 0900 - 1200 05-19-10

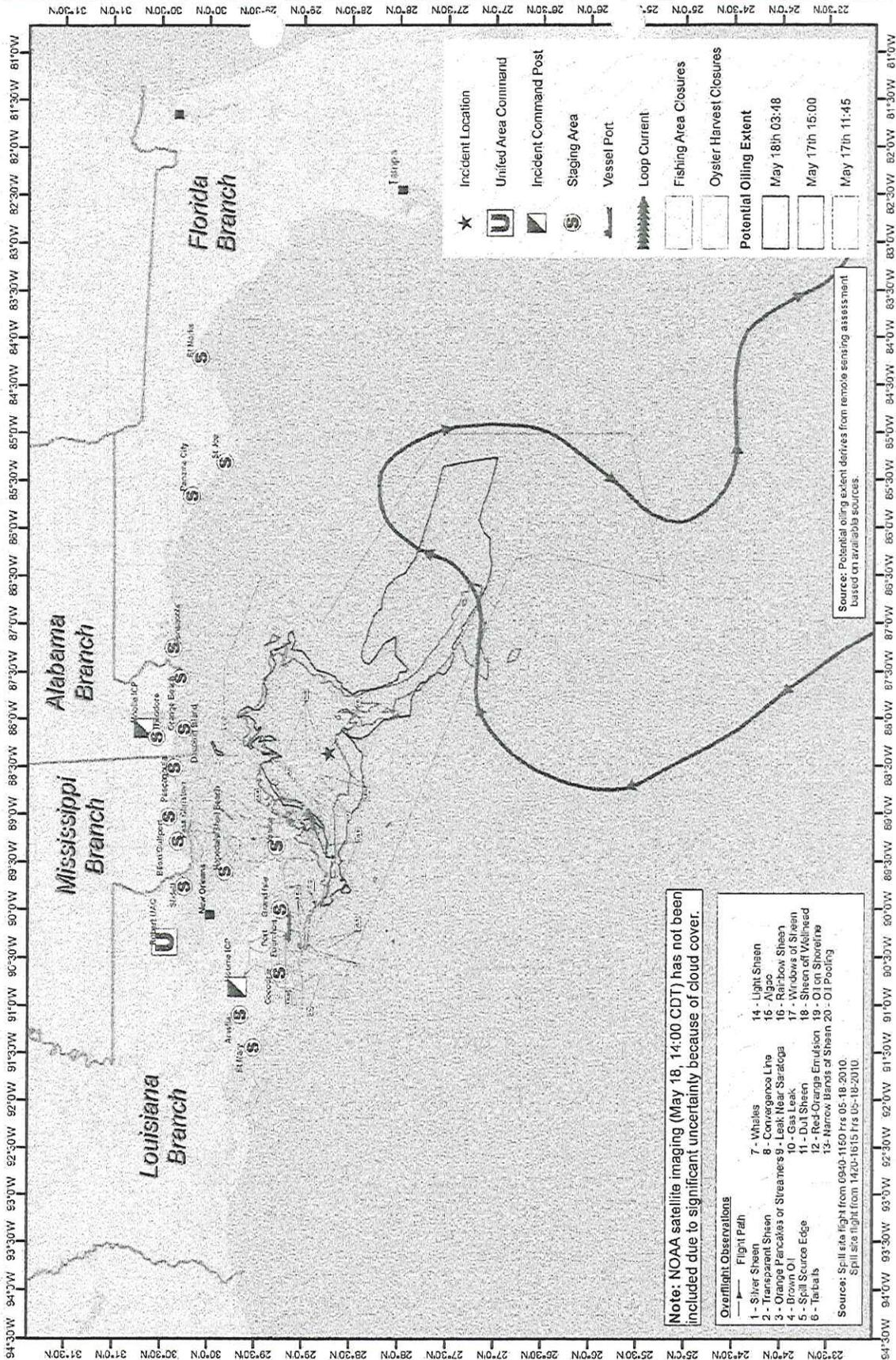
Source: Potential oiling extent derives from remote sensing assessment based on available sources



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Deepwater Horizon Incident - Situation Status Map

5/19/2010 0600 Hrs



★	Incident Location
U	United Area Command
S	Incident Command Post
S	Staging Area
⚓	Vessel Port
→	Loop Current
▭	Fishing Area Closures
▭	Oyster Harvest Closures
Potential Oiling Extent	
▭	May 18th 03:48
▭	May 17th 15:00
▭	May 17th 11:45

Note: NOAA satellite imaging (May 18, 14:00 CDT) has not been included due to significant uncertainty because of cloud cover.

- Overflight Observations**
- 1 - Silver Sheen
 - 2 - Transparent Sheen
 - 3 - Orange Patches or Streams
 - 4 - Brown Oil
 - 5 - Spill Source Edge
 - 6 - Tablets
 - 7 - Whales
 - 8 - Convergence Line
 - 9 - Leak Near Saratoga
 - 10 - Gas Leak
 - 11 - Dual Sheen
 - 12 - Red-Orange Emulsion
 - 13 - Narrow Bands of Sheen
 - 14 - Light Sheen
 - 15 - Algae
 - 16 - Rainbow Sheen
 - 17 - Windows of Sheen
 - 18 - Sheen off Wellhead
 - 19 - Oil on Shoreline
 - 20 - Oil Pooling
- Source: Spill site flight from 0940-1160 Hrs 05-18-2010.
Spill site flight from 1420-1615 Hrs 05-18-2010.

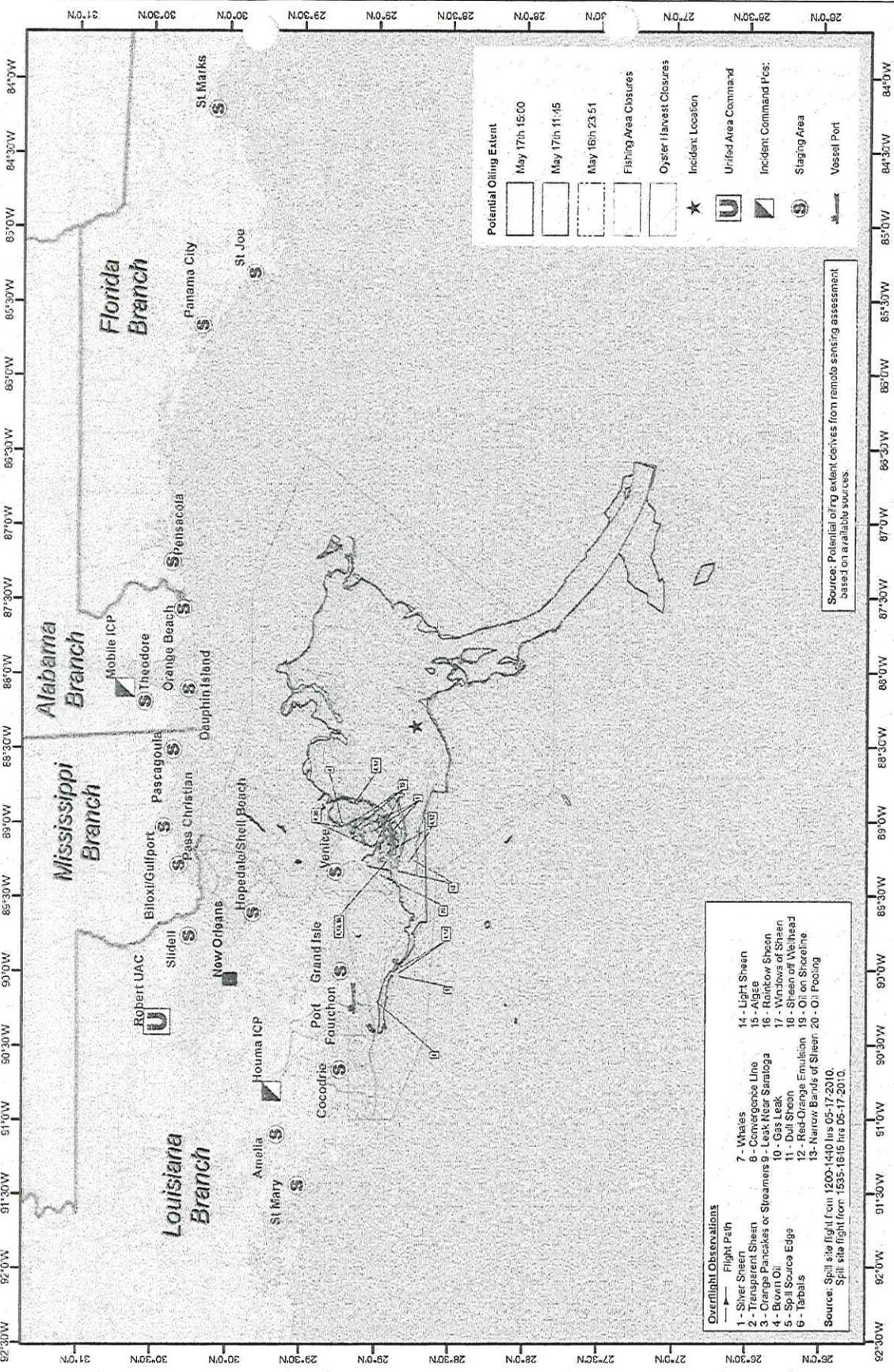
Source: Potential oiling extent derives from remote sensing assessment based on available sources.



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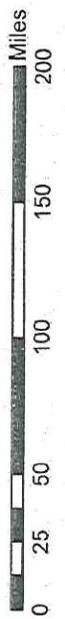
Deepwater Horizon Incident - Situation Status Map

5/18/2010 0600 Hrs



- Overflight Observations**
- 1 - Silver Sheen
 - 2 - Transparent Sheen
 - 3 - Orange Pancakes or Streamers
 - 4 - Brown Oil
 - 5 - Spill Source Edges
 - 6 - Tabalis
 - 7 - Whales
 - 8 - Convergence Line
 - 9 - Leak Near Saratoga
 - 10 - Gas Leak
 - 11 - Dull Sheen
 - 12 - Red/Orange Emulsion
 - 13 - Narrow Bands of Sheen
 - 14 - Light Sheen
 - 15 - Algae
 - 16 - Rainbow Sheen
 - 17 - Windows of Sheen
 - 18 - Sheen off Wellhead
 - 19 - Oil on Shoreline
 - 20 - Oil Pooling
- Source: Spill site flight from 1200-1410 hrs 05-17-2010.
Spill site flight from 1535-1615 hrs 05-17-2010.

Source: Potential oiling extent derives from remote sensing assessment based on available sources.



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Oil on Water Estimate - Low

	sq mi	Cover Factor	gal/sq mi	gals	bbbls
Sheen	5256	0.5	50	131400	3129
Dull oil	597	0.2	666	79520.4	1893
Dark oil	120	0.15	3330	59940	1477

Total oil on water 270650.4 6149

x 2 to compensate for evap and disp 12898

recovered 15838

chemically dispersed 16500

burned 5821

Total emitted 51057

Barrels emitted per day 1891

Oil on Water Estimate - Best Guess

	sq mi	Cover Factor	gal/sq mi	gals	bbbls
Sheen	5256	0.66	333	1155164	27504
Dull oil	597	0.35	1332	278321.4	6627
Dark oil	120	0.25	6660	109800	4757

Total oil on water 1033285 38888

x 2 to compensate for evap and disp 77775

recovered 31676

chemically dispersed 33000

burned 11642

Total emitted 164093

Barrels emitted per day 5707

Oil on Water Estimate - High

	sq mi	Cover Factor	gal/sq mi	gals	bbbls
Sheen	5256	0.75	666	2625372	62609
Dull oil	597	0.5	3330	991005	23667
Dark oil	120	0.35	13320	559440	13320

Total oil on water 4178817 99498

x 2 to compensate for evap and disp 198991

recovered 63362

chemically dispersed 66000

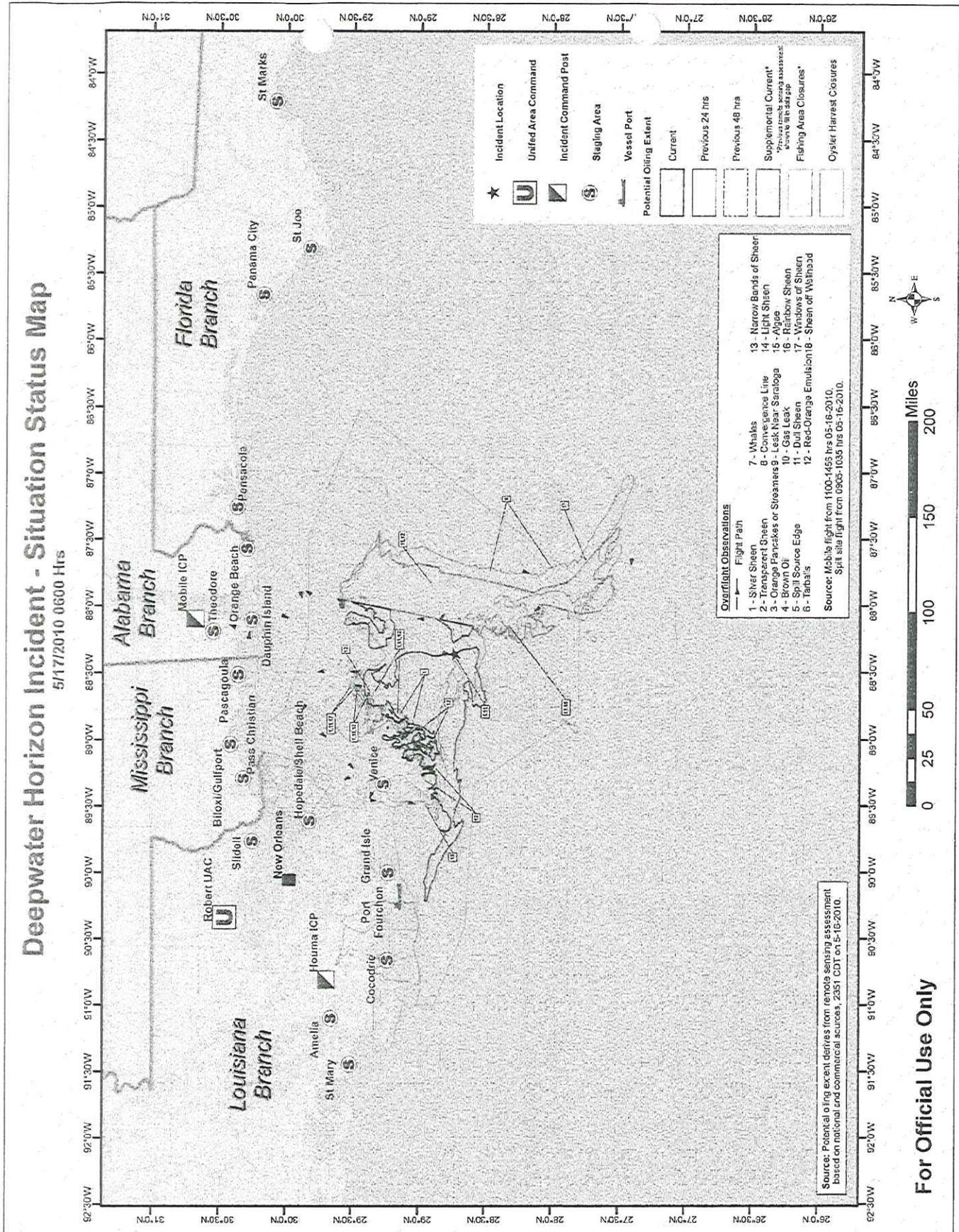
burned 23284

Total emitted 351627

Barrels emitted per day 13023

Deepwater Horizon Incident - Situation Status Map

5/17/2010 0600 Hrs



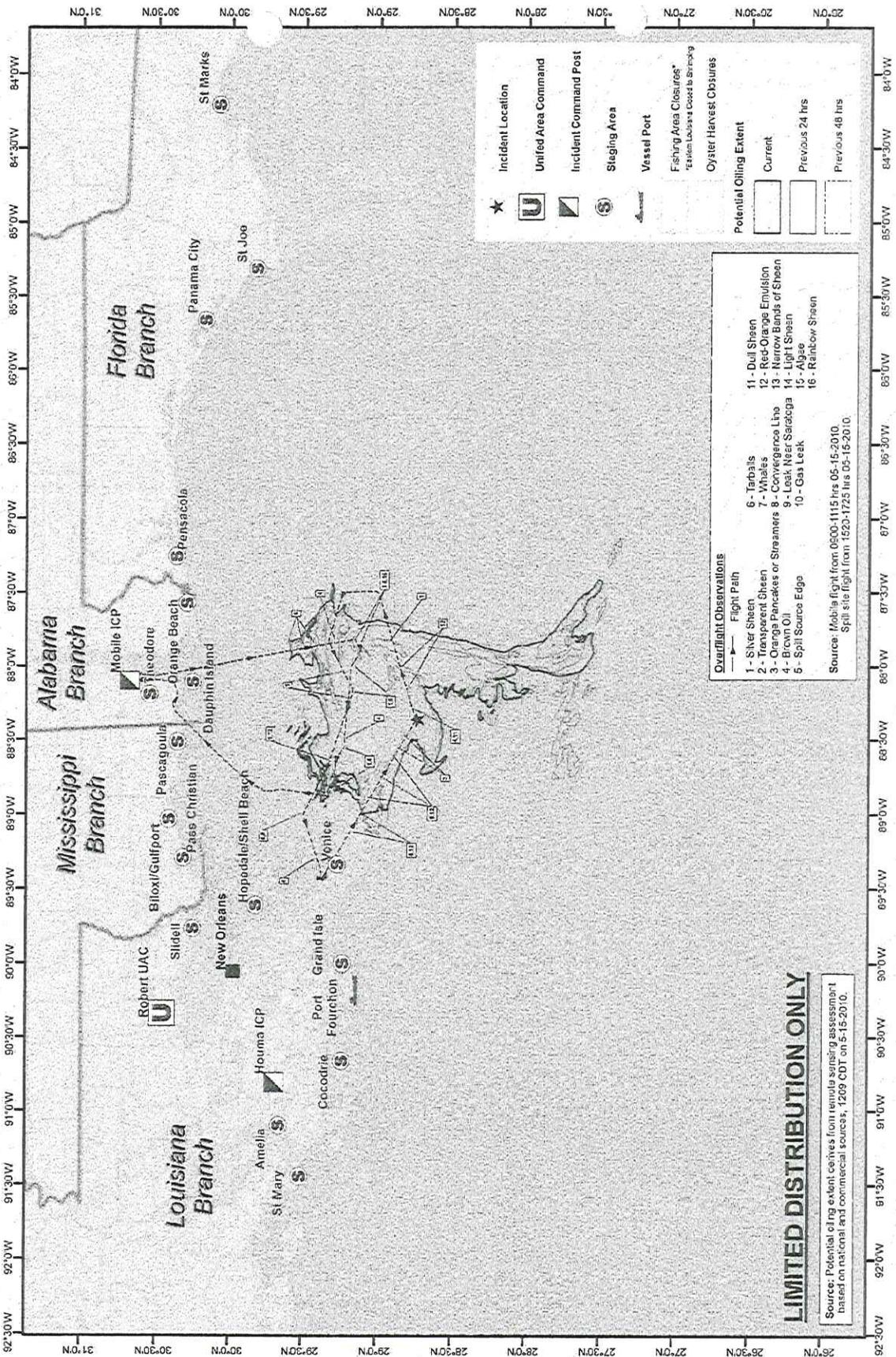
- Overflight Observations**
- 1 - Silver Sheen
 - 2 - Transparent Sheen
 - 3 - Orange Pancakes or Steamers
 - 4 - Brown Oil
 - 5 - Spill Source Edge
 - 6 - Tarballs
 - 7 - Whales
 - 8 - Convective Line
 - 9 - Leak Near Saraloga
 - 10 - Gas Leak
 - 11 - Dual Sheen
 - 12 - Red-Orange Emulsion
 - 13 - Narrow Bands of Sheen
 - 14 - Light Sheen
 - 15 - Algae
 - 16 - Rainbow Sheen
 - 17 - Windows of Sheen
 - 18 - Sheen off Weishead
- Source: Mobile flight from 1100-1455 hrs 05-16-2010.
Spill via flight from 0905-1035 hrs 05-16-2010.

Source: Potential oiling extent derives from remote sensing assessment based on national and commercial sources, 2351 CDT on 5-16-2010.

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Deepwater Horizon Incident - Situation Status Map

5/16/2010 0600 Hrs



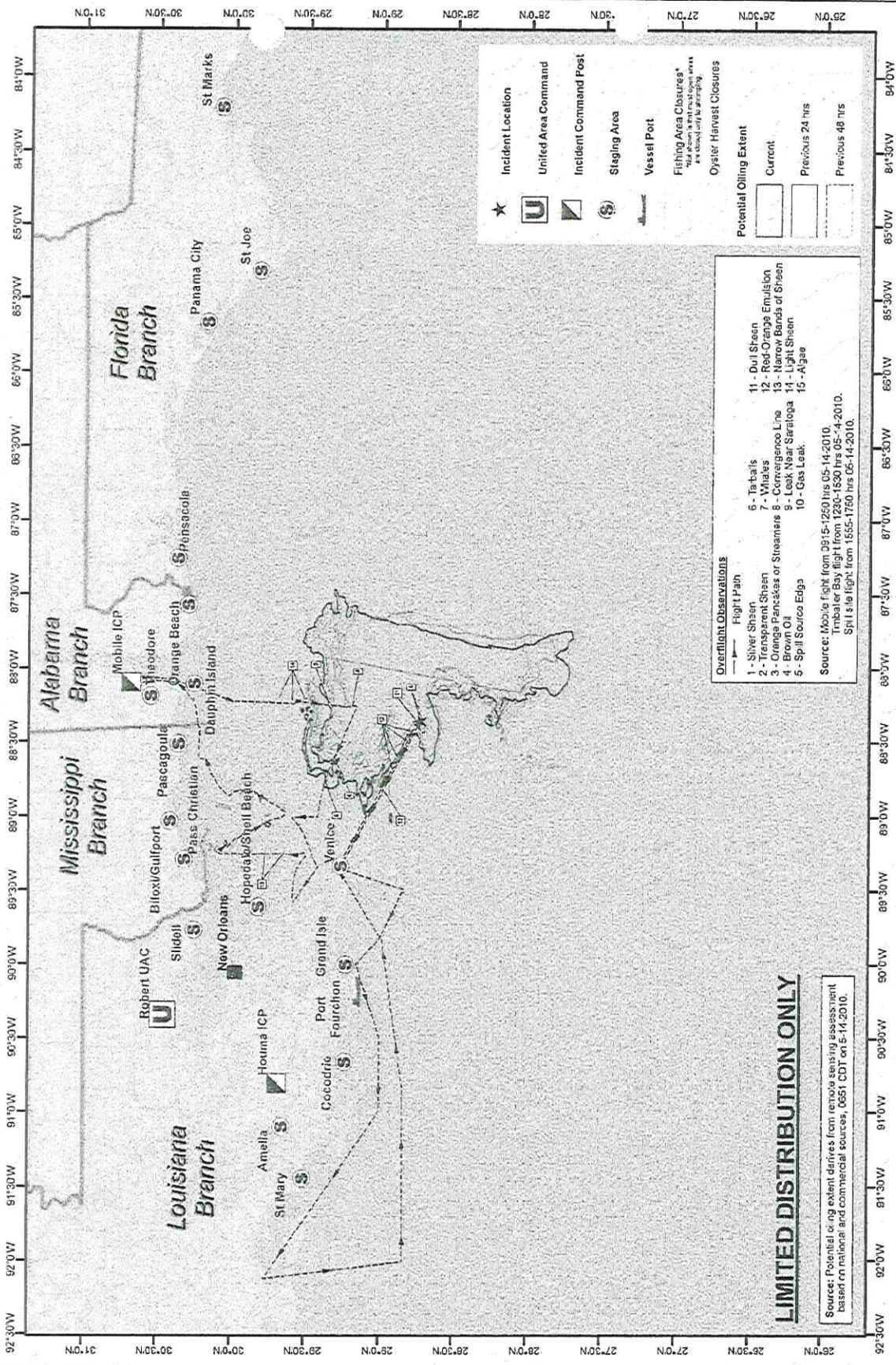
LIMITED DISTRIBUTION ONLY

Source: Potential oiling extent ceives from remote sensing assessment based on national and commercial sources, 1209 CDT on 5-15-2010.

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Deepwater Horizon (MC-252) - Situation Status Map

5/15/2010 0600 Hrs



- Overflight Observations**
- 1 - Silver Sheen
 - 2 - Transparent Sheen
 - 3 - Orange Pencakas or Steamers
 - 4 - Brown Oil
 - 5 - Spill Source Edges
 - 6 - Tabalis
 - 7 - Whales
 - 8 - Convergence Line
 - 9 - Leak Near Saratoga
 - 10 - Gas Leak
 - 11 - Dull Sheen
 - 12 - Red-Orange Emulsion
 - 13 - Narrow Bands of Sheen
 - 14 - Light Sheen
 - 15 - Algae
- Source: Mobile flight from 08:15-10:50 hrs 05-14-2010, Timberlake Bay flight 12:30-15:30 hrs 05-14-2010, SPIRIT flight from 15:55-17:00 hrs 05-14-2010.

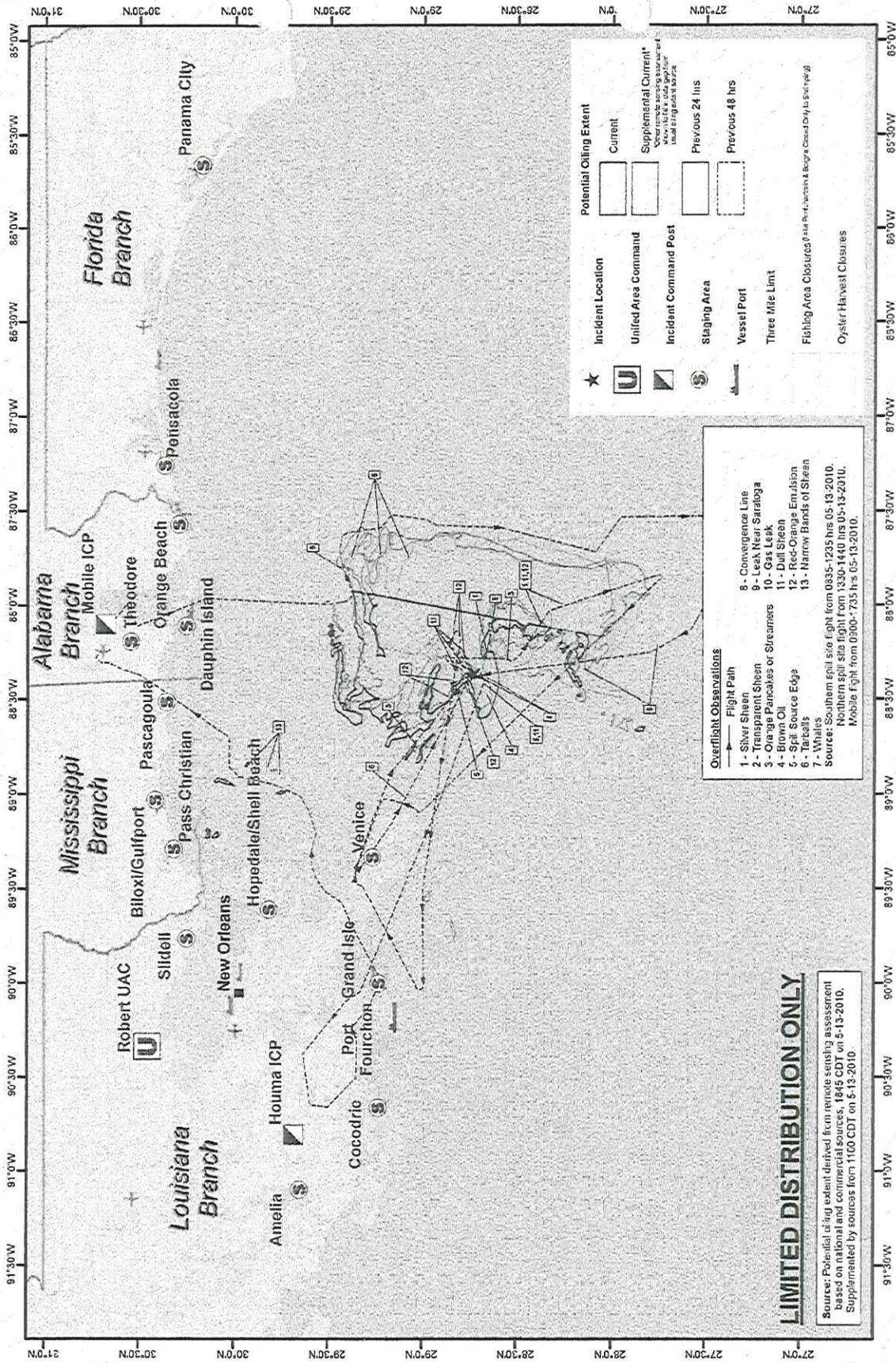


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Deepwater Horizon (MC-252) - Situation Status Map

3799

5/14/2010 0600 Hrs

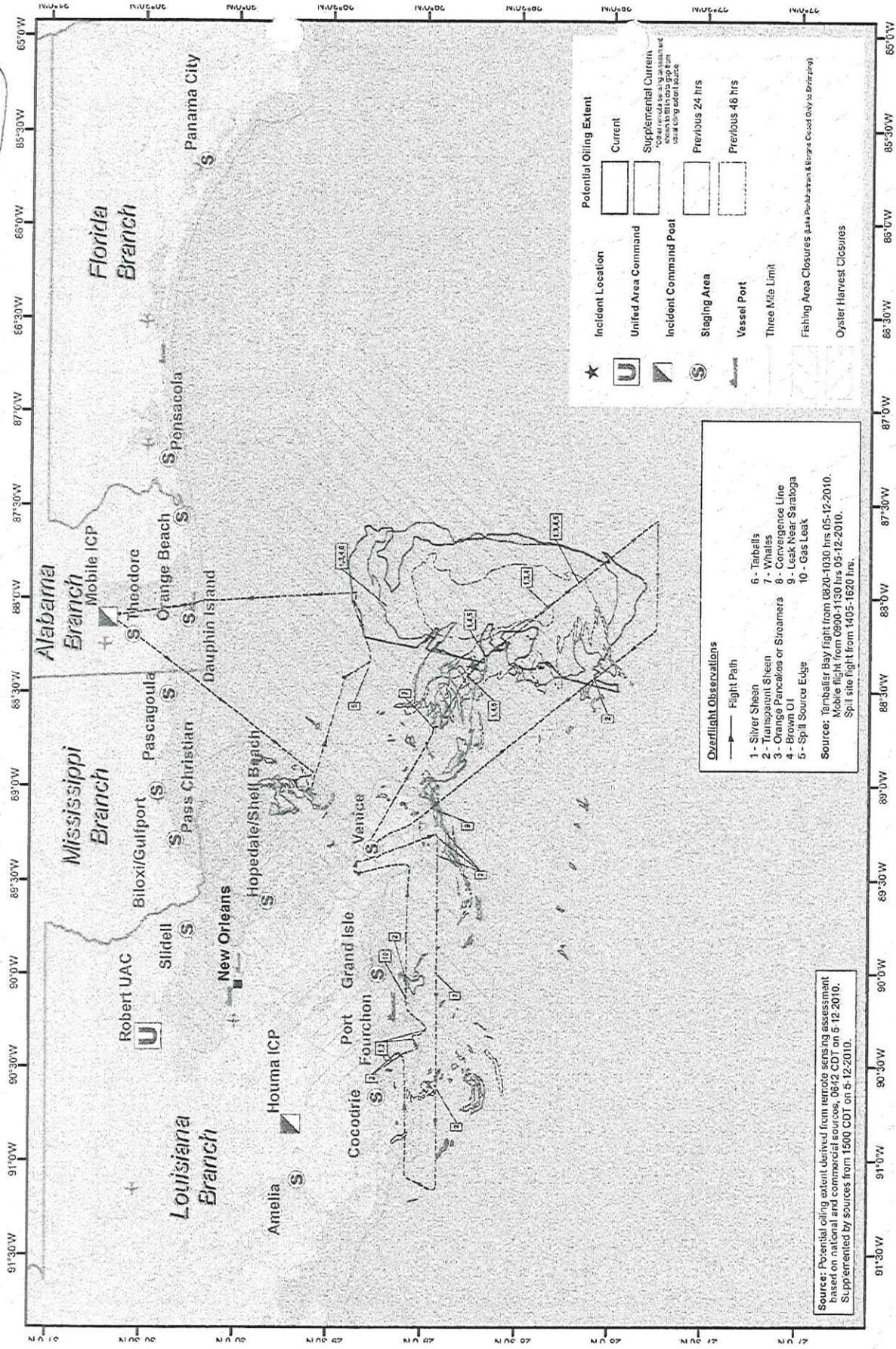


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Deepwater Horizon (MC-252) - Situation Status Map

5/13/2010 0600 Hrs

3983



Overflight Observations

- 1 - Silver Sheen
- 2 - Translucent Sheen
- 3 - Orange Percalcles or Streamers
- 4 - Brown Oil
- 5 - Spill Source Edge
- 6 - Trawlballs
- 7 - Whirls
- 8 - Core Rigence Line
- 9 - Leak Near Saratoga
- 10 - Gas Leak

Source: Jamballer Bay flight from 0820-1030 hrs 05-12-2010.
 Mobile flight from 0900-1130 hrs 05-12-2010.
 Spill site flight from 1405-1620 hrs.

Source: Potential oiling extent derived from remote sensing assessment based on national and commercial sources, 0642 CDT on 5-12-2010. Supplemented by sources from 1500 CDT on 5-12-2010.

The Response Group
 Coastal Response Unit

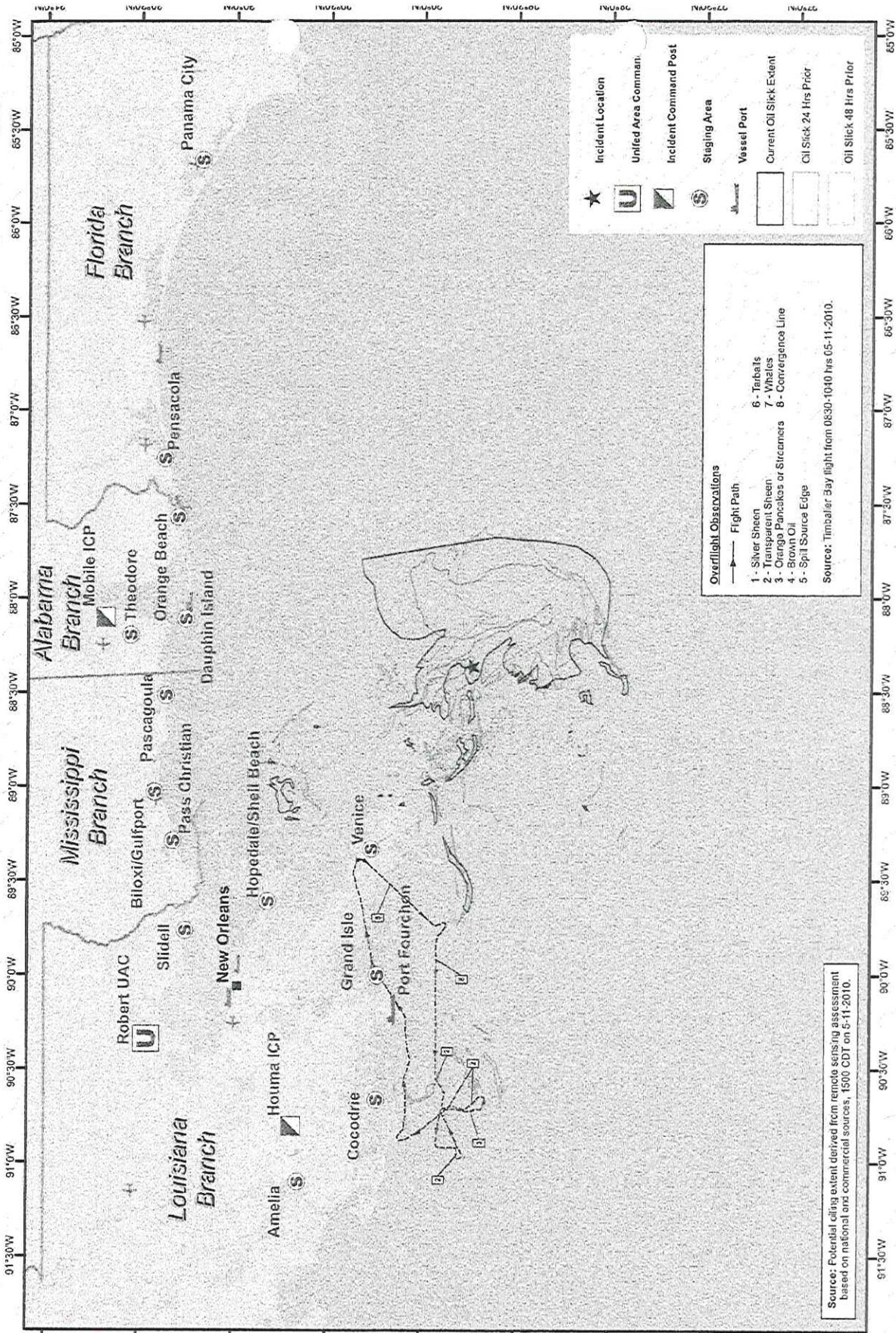


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3441

Deepwater Horizon (MC-252) - Situation Status Map

5/12/2010 0600 Hrs

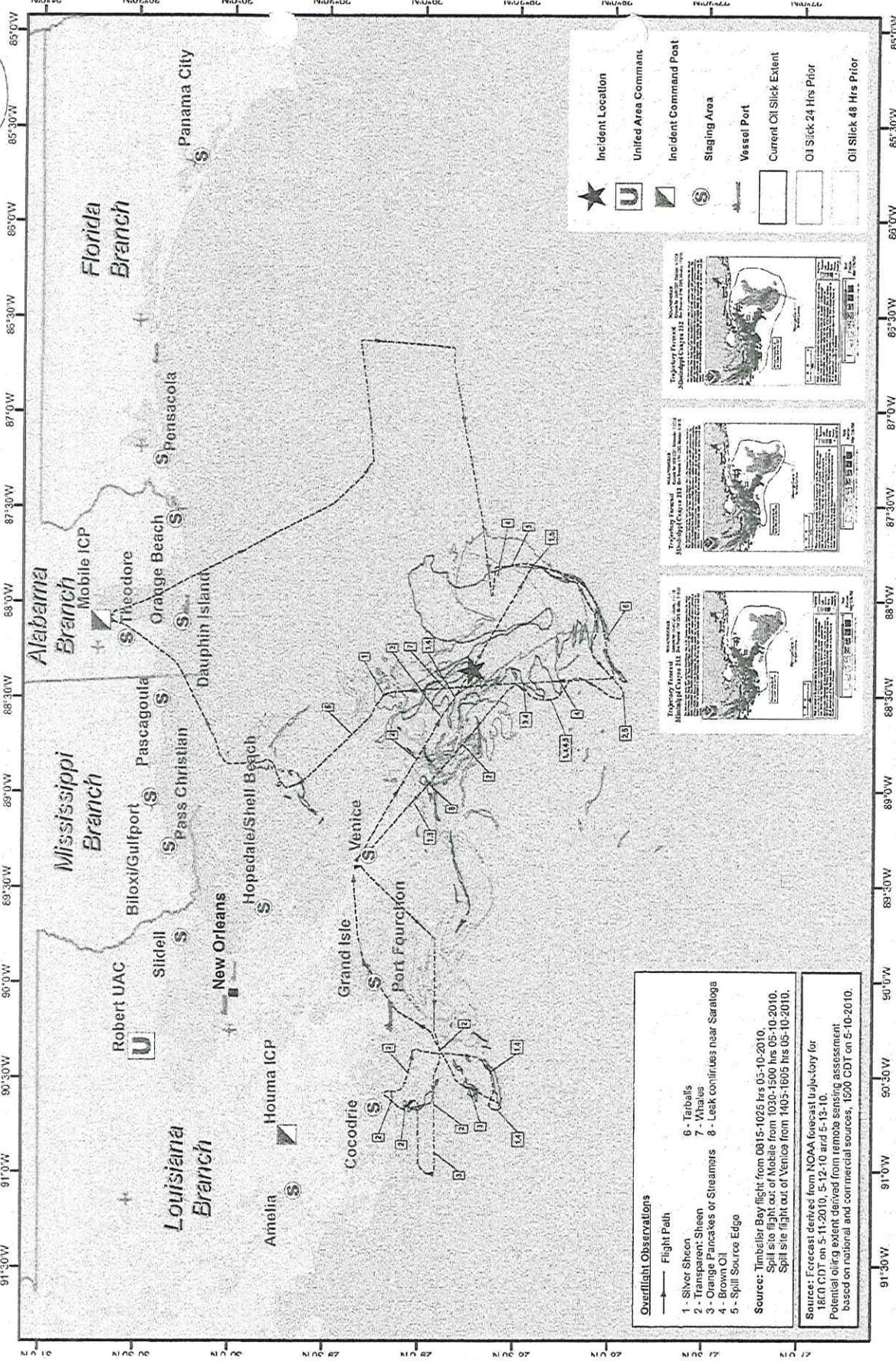


For Official Use Only

Deepwater Horizon (MC-252) - Situation Status Map

5/11/2010 0600 Hrs

1914



Overflight Observations

- 1 - Silver Sheen
- 2 - Transparent Sheen
- 3 - Orange Pancakes or Streamers
- 4 - Black Oil
- 5 - Spill Source Edge
- 6 - Tarballs
- 7 - Whales
- 8 - Leak continues near Saratoga

Source: Timbalier Bay flight from 0315-1025 hrs 05-10-2010.
 Split site flight out of Mobile from 1030-1500 hrs 05-10-2010.
 Split site flight out of Venice from 1405-1605 hrs 05-10-2010.

Source: Forecast derived from NOAA forecast trajectory for 1800 CDT on 5-11-2010, 5-12-10 and 5-13-10.
 Potential oiling extent derived from remote sensing assessment based on national and commercial sources, 1500 CDT on 5-10-2010.

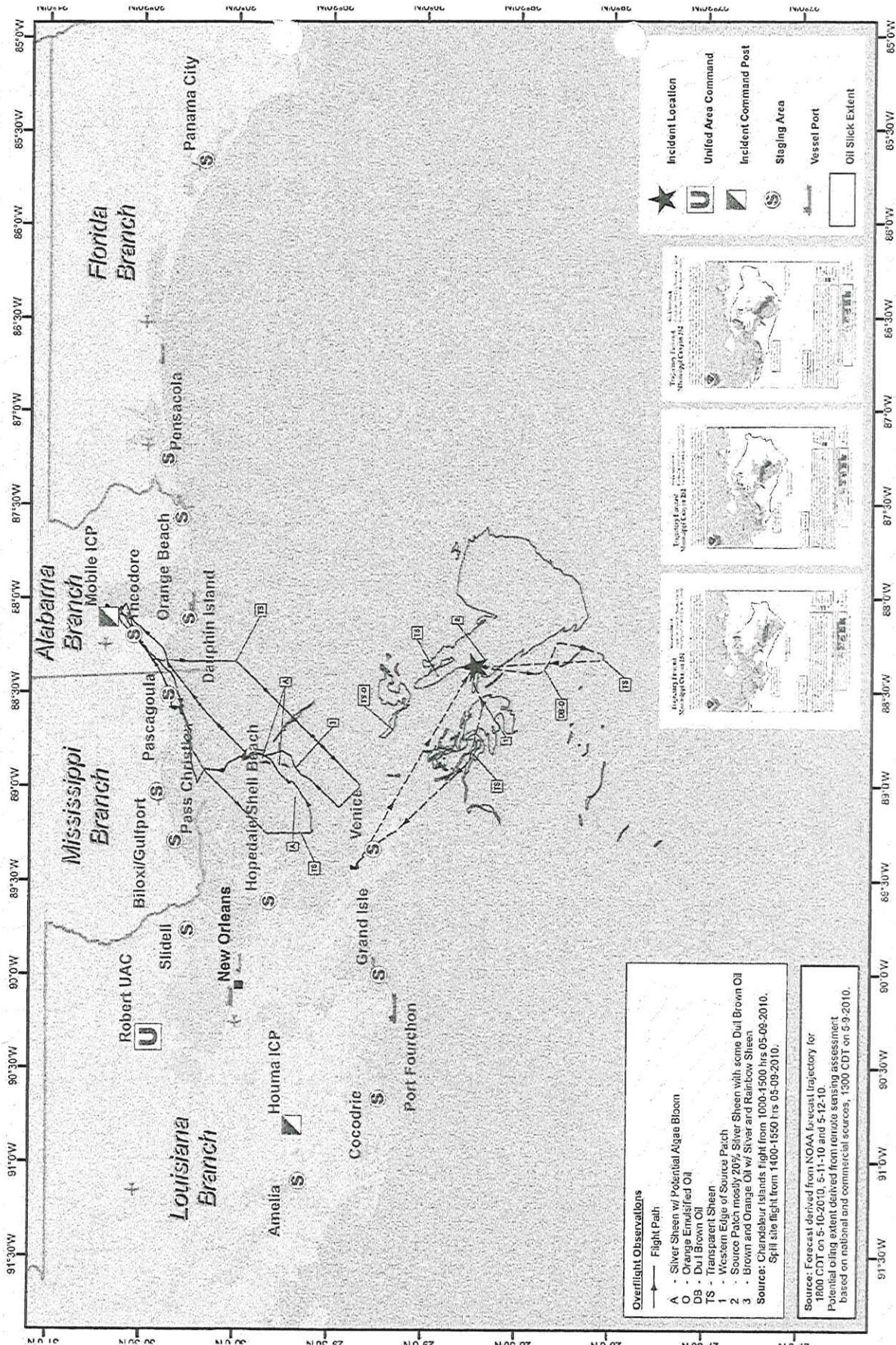
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The Response Group
 Incidents and Operations Support

Deepwater Horizon (MC-252) - Situation Status Map

5/10/2010 0600 Hrs



Overflight Observations

Flight Path

- A - Silver Sheen w/ Potential Algae Bloom
- O - Orange Emulsified Oil
- D9 - Dull Brown Oil
- TS - Transparent Sheen
- 1 - Western Edge of Source Patch
- 2 - Source Patch mostly 20% Silver Sheen with some Dull Brown Oil
- 3 - Brown and Orange Oil w/ Silver and Rainbow Sheen

Source: Chandeleur Islands flight from 1000-1500 hrs 05-08-2010.
 Split site flight from 1400-1850 hrs 05-09-2010.

Source: Forecast derived from NOAA forecast trajectory for 1800 CDT on 5-10-2010, 5-11-10 and 5-12-10.
 Potential oiling extent derived from remote sensing assessment based on national and commercial sources, 1500 CDT on 5-9-2010.

Incident Location

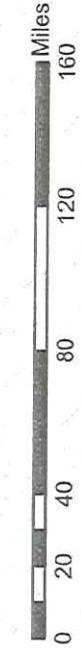
Unified Area Command

Incident Command Post

Staging Area

Vessel Port

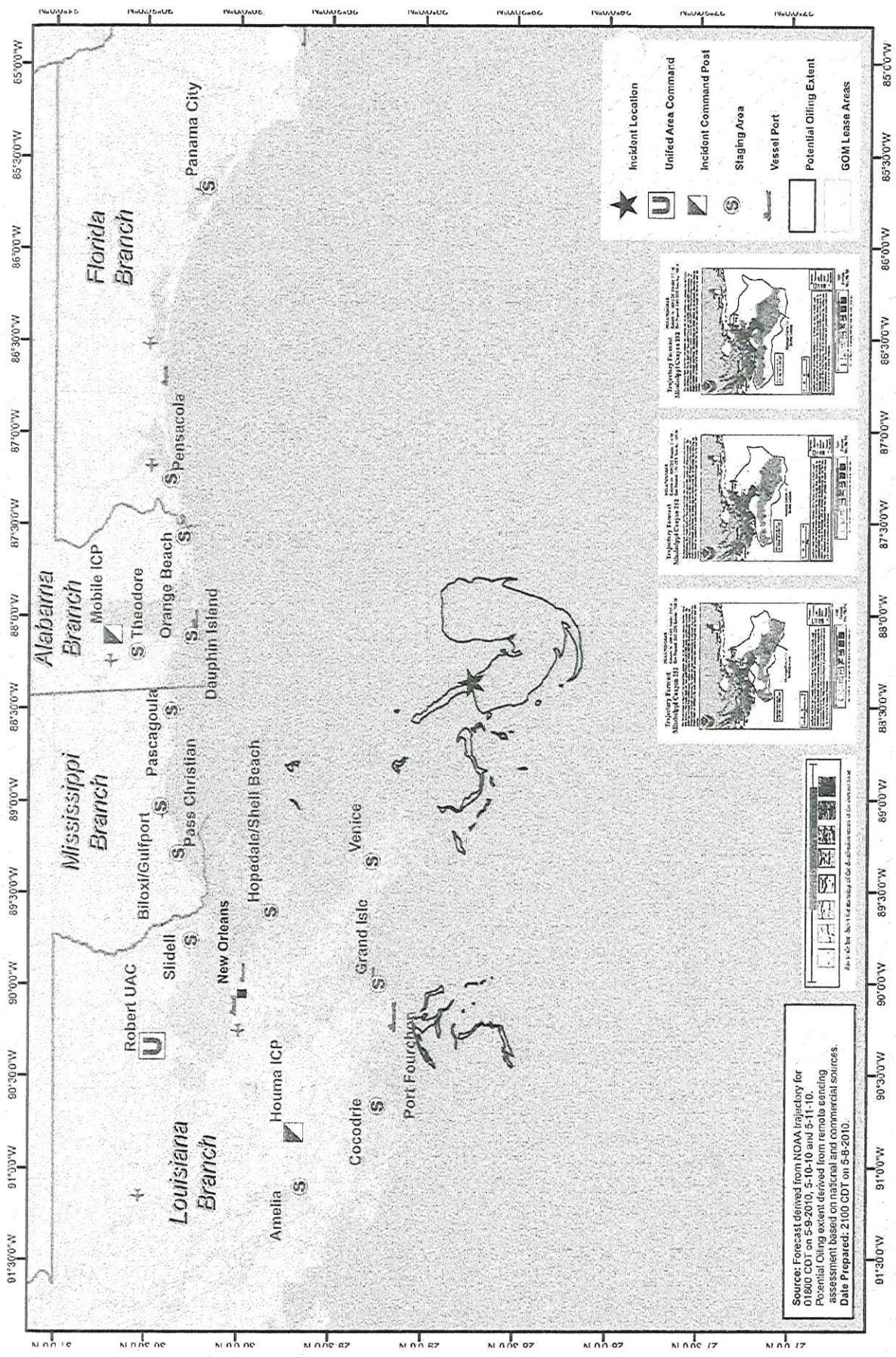
Oil Slick Extent



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Deepwater Horizon (MC-252) - Situation Status Map

5/9/2010 1800 Hrs



Source: Forecast derived from NOAA trajectory for 01600 CDT on 5-9-2010, 5-10-10 and 5-11-10. Potential Oiling extent derived from remote sensing assessment based on natural and commercial sources. Date Prepared: 2100 CDT on 5-8-2010.

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Miles
0 20 40 80 120 160



The Response Group
A Division of Baker Hughes Services Corporation

Using "Standard Guide for Visually Estimating Oil Spill Thickness on Water, ASTM F 2534 - 06."

Oil on Water Estimate - Low

	sq mi	Cover Factor	gal/sq m	gals	bbls
Sheen	2481	0.5	50	62025	1477
Dull oil	160	0.2	666	21312	507
Dark oil	35	0.15	3330	17483	416

Total oil on water 100820 2400

x 2 to compensate for evap and disp 4801

recovered 500

chemically dispersed 1600

Total emitted 6801

Barrels emitted per day 920

$\frac{1}{1/2-1/2}$
 4/26 15000
 4/27 27000
 4/28 42000
 4/29 61000
 4/30 80000
 4/31 100000

Oil on Water Estimate - Best Guess

	sq mi	Cover Factor	gal/sq m	gals	bbls
Sheen	2481	0.66	333	545274	12983
Dull oil	160	0.35	1332	74592	1776
Dark oil	35	0.25	6660	56275	1388

Total oil on water 678141 16146

x 2 to compensate for evap and disp 32292

recovered 2000

chemically dispersed 4900

Total emitted 39192

Barrels emitted per day 5226

Oil on Water Estimate - High

	sq mi	Cover Factor	gal/sq m	gals	bbls
Sheen	2481	0.75	666	1239260	29506
Dull oil	160	0.5	3330	266400	6343
Dark oil	35	0.35	13320	163170	3865

Total oil on water 1666630 39734

x 2 to compensate for evap and disp 79468

recovered 4000

chemically dispersed 7200

Total emitted 90668

Barrels emitted per day 12089

Using "Extended Guidelines for the Use of the Bonn Agreement Oil Appearance Code (BAOAC)"

Oil on Water Estimate - Low

sq mi	sq km	Cover Factor	litres/sq km	litres	gals	bbls
2491	6426	0.5	40	125515	33350	625
Dil oil	160	0.2	5000	414388	109472	2026
Dil oil	35	0.15	50000	879872	178603	3276

Total oil on water 1722766 372326 7691
 x 2 to compensate for evap and disp 15332
 recovered 5X0
 chemically disposed 16X0
 Total emitted 17432
 Barrels emitted per day 2311

Oil on Water Estimate - Best Guess

sq mi	sq km	Cover Factor	litres/sq km	litres	gals	bbls
2491	6426	0.65	300	1272301	335106	6200
Dil oil	160	0.35	20000	2329737	769307	14545
Dil oil	35	0.25	100000	2255200	598877	11254

Total oil on water 6433327 1701060 40502
 x 2 to compensate for evap and disp 81004
 recovered 2000
 chemically disposed 4000
 Total emitted 87004
 Barrels emitted per day 11721

Oil on Water Estimate - High

sq mi	sq km	Cover Factor	litres/sq km	litres	gals	bbls
2491	6426	0.75	5000	24966202	6605549	121593
Dil oil	160	0.5	50000	10959952	2738910	51197
Dil oil	35	0.35	200000	8345471	1574566	30912

Total oil on water 40802625 10778155 226697
 x 2 to compensate for evap and disp 512274
 recovered 4000
 chemically disposed 7200
 Total emitted 534474
 Barrels emitted per day 69930

Mass Balance Best Guess - ASTM

	Last 24 hrs	Cumulative
Oil emitted	1000 - 6000	38,397
Oil dispersed naturally	200 - 1200	1235 - 7420
Oil dispersed chemically	500 - 3000	200 - 12000
Oil burned	0	0
Oil evaporated	300 - 1800	2100 - 12600
Oil recovered	120 - 360	470 - 1410
Oil on water	180 - 1440	16,343

Time 0:00
Date 4.29.2010

Mass Balance

	Last 24 hrs	Cumulative
Oil emitted	1000 - 6000	8000 - 36000
Oil dispersed naturally	200 - 1200	1035 - 6220
Oil dispersed chemically	500 - 3000	1500 - 9000
Oil burned	0	0
Oil evaporated	300 - 1800	1800 - 10800
Oil recovered	120 - 360	350 - 1050
Oil on water	180 - 1440	1660 - 11440

Time 0:00
Date 4.28.2010

Mass Balance

	Last 24 hrs	Cumulative
Oil emitted	1000 - 6000	5000 - 30000
Oil dispersed naturally	200 - 1200	835 - 5020
Oil dispersed chemically	500 - 3000	1000 - 6000
Oil burned	0	0
Oil evaporated	300 - 1800	1600 - 9000
Oil recovered	120 - 360	230 - 690
Oil on water	180 - 1440	1500 - 10000

Time 10:01
Date 4.27.2010

Mass Balance Best Guess - ASTM

	Last 24 hrs	Cumulative
Oil emitted	1000 - 6000	39,192
Oil dispersed naturally	200 - 1200	7,838
Oil dispersed chemically	500 - 3000	4,900
Oil burned	0	0
Oil evaporated	300 - 1800	11,800
Oil recovered	120 - 360	2,000
Oil on water	180 - 1440	13,000

Time 6:00:00 AM
Date 4.30.2010

based on 20% of oil emitted
need to refine this number

based on 30% of oil emitted
based on 20% of recovered liquids

Using "Standard Guide for Visually Estimating Oil Spill Thickness on Water, ASTM F 2534 - 05."

Oil on Water Estimate - Low

sq mi	Cover Factor	gal/sq m	gals	bbls
1929	0.5	50	48225	1148
Dull oil	0.2	666	31702	755
Dark oil	0.15	3330	45455	1082

Total oil on water 125381 2385

x 2 to compensate for evap and disp 5971

recovered 400

chemically dispersed 1400

Total emitted 7771

Barrels emitted per day 1195

Oil on Water Estimate - Best Guess

sq mi	Cover Factor	gal/sq m	gals	bbls
1929	0.66	333	423950	10084
Dull oil	0.35	1332	110958	2642
Dark oil	0.25	6660	151515	3608

Total oil on water 686428 18343

x 2 to compensate for evap and disp 32687

recovered 1500

chemically dispersed 4200

Total emitted 38387

Barrels emitted per day 5906

Oil on Water Estimate - High

sq mi	Cover Factor	gal/sq m	gals	bbls
1929	0.75	666	869596	22841
Dull oil	0.5	3330	396270	9435
Dark oil	0.35	13320	424242	10101

Total oil on water 1784048 42477

x 2 to compensate for evap and disp 84655

recovered 3000

chemically dispersed 6000

Total emitted 93955

Barrels emitted per day 14455

4/29

Using "Extended Guidelines for the Use of the Bonn Agreement Oil Appearance Code (BAOAC)"

Oil on Water Estimate - Low

	sq ml	sq km	Cover Factor	litres/sq km	area	gals	lbs
Sheen	1828	4935	0.3	40	19722	26327	623
Dark oil	238	616	0.2	5000	308417	407840	3777
Dark oil	91	238	0.15	6000	1427387	186928	11118
Total oil on water					2484266	656205	15274

x 2 to compensate for evap and disp

recovered

chemically dispersed

Total emitted

Barrels emitted per day

31248
400
1400
33048
6000

Oil on Water Estimate - Best Guess

	sq ml	sq km	Cover Factor	litres/sq km	area	gals	lbs
Sheen	1641	4250	0.66	300	841504	222310	5293
Dark oil	235	609	0.35	2000	1262950	1725519	26185
Dark oil	21	54	0.25	19000	1037141	136228	8333
Total oil on water					2111695	3311097	39711

x 2 to compensate for evap and disp

recovered

chemically dispersed

Total emitted

Barrels emitted per day

8187
1500
400
6687
16616

Oil on Water Estimate - High

	sq ml	sq km	Cover Factor	litres/sq km	area	gals	lbs
Sheen	1700	4403	0.75	5000	1651174	4851794	103852
Dark oil	152	394	0.3	5000	891055	2592639	61604
Dark oil	21	54	0.35	20000	3877233	1007718	23347
Total oil on water					3119442	7667151	167703

x 2 to compensate for evap and disp

recovered

chemically dispersed

Total emitted

Barrels emitted per day

38907
3000
6000
38907
70618

Mass Balance

	Last 24 hrs	Cumulative
Oil emitted	1000 - 6000	5000 - 30000
Oil dispersed naturally	200 - 1200	835 - 5020
Oil dispersed chemically	500 - 3000	1000 - 6000
Oil burned	0	0
Oil evaporated	300 - 1800	1500 - 9000
Oil recovered	120 - 360	230 - 690
Oil on water	180 - 1440	1500 - 10000

Time 10:01
Date 4.27.2010

Mass Balance

	Last 24 hrs	Cumulative
Oil emitted	1000 - 6000	6000 - 36000
Oil dispersed naturally	200 - 1200	1035 - 6220
Oil dispersed chemically	500 - 3000	1500 - 9000
Oil burned	0	0
Oil evaporated	300 - 1800	1800 - 10800
Oil recovered	120 - 360	350 - 1050
Oil on water	180 - 1440	1880 - 11440

Time 0:00
Date 4.28.2010

Mass Balance t Guess - ASTM

	Last 24 hrs	Cumulative
Oil emitted	1000 - 6000	38,387
Oil dispersed naturally	200 - 1200	1235 - 7420
Oil dispersed chemically	500 - 3000	200 - 12000
Oil burned	0	0
Oil evaporated	300 - 1800	2100 - 12600
Oil recovered	120 - 360	470 - 1410
Oil on water	180 - 1440	19,343

Time 0:00
Date 4.29.2010

Oil on Water Estimate - Low

	sq mi	Cover Factor	gal/sq m	gals	bbls
Sheen	1641	0.5	50	41025	977
Dull oil	235	0.2	666	31302	745
Dark oil	21	0.15	3330	10490	250

Total oil on water 82817 1972

x 2 to compensate for evap and disp 3944

recovered 200

chemically dispersed 1000

Total emitted 5144

Barrels emitted per day 935

Oil on Water Estimate - Best Guess

	sq mi	Cover Factor	gal/sq m	gals	bbls
Sheen	1641	0.66	333	360659	8587
Dull oil	235	0.35	1332	109557	2609
Dark oil	21	0.25	6660	34965	833

Total oil on water 505181 12028

x 2 to compensate for evap and disp 24056

recovered 450

chemically dispersed 3500

Total emitted 28006

Barrels emitted per day 6092

Oil on Water Estimate - High

	sq mi	Cover Factor	gal/sq m	gals	bbls
Sheen	1641	0.75	666	819660	19516
Dull oil	235	0.5	3330	381275	9316
Dark oil	21	0.35	13320	97902	2331

Total oil on water 1308857 31163

x 2 to compensate for evap and disp 62327

recovered 700

chemically dispersed 6000

Total emitted 69027

Barrels emitted per day 12550

1897

1897

87
12
1

Using "Extended Guidelines for the Use of the Bonn Agreement Oil Appearance Code (BAOAC)"

Oil on Water Estimate - Low

sq mi	sq km	Cover Factor	litres/km ²	litres	gals	bbls	
1641	4250	0.5	40	165000	22453	535	
205	530	0.2	5000	60000	16078	3928	
Dark oil	21	54	0.15	50000	13782	2566	
Total oil on water							6979

x 2 to compensate for evap and disp
 recovered 13857
 chemically dispersed 200
 Total emitted 1000
Barrels emitted per day 1567

Oil on Water Estimate - Best Guess

sq mi	sq km	Cover Factor	litres/km ²	litres	gals	bbls	
1641	4250	0.60	300	124500	22310	5231	
Dark oil	235	609	0.35	20000	42800	28788	
Dark oil	21	54	0.25	100000	135974	3559	
Total oil on water							42641

x 2 to compensate for evap and disp
 recovered 81287
 chemically dispersed 450
 Total emitted 3500
Barrels emitted per day 14398

Oil on Water Estimate - High

sq mi	sq km	Cover Factor	litres/km ²	litres	gals	bbls	
1720	4409	0.75	5000	1651174	4361791	103352	
Dark oil	152	334	0.5	50000	841055	218862	
Dark oil	21	54	0.55	200000	380723	100573	
Total oil on water							183703

x 2 to compensate for evap and disp
 recovered 319407
 chemically dispersed 700
 Total emitted 6200
Barrels emitted per day 70201

Mass Balance

	Last 24 hrs	Cumulative
Oil emitted	1000 - 6000	5000 - 30000
Oil dispersed naturally	200 - 1200	835 - 5020
Oil dispersed chemically	500 - 3000	1000 - 6000
Oil burned	0	0
Oil evaporated	300 - 1800	1500 - 9000
Oil recovered	120 - 360	230 - 690
Oil on water	180 - 1440	1500 - 10000

Time 10:01
Date 4.27.2010

Mass Balance

	Last 24 hrs	Cumulative
Oil emitted	1000 - 6000	6000 - 36000
Oil dispersed naturally	200 - 1200	1035 - 6220
Oil dispersed chemically	500 - 3000	1500 - 9000
Oil burned	0	0
Oil evaporated	300 - 1800	1800 - 10800
Oil recovered	120 - 360	350 - 1050
Oil on water	180 - 1440	1680 - 11440

20%
50% ?
0
30%
12%
18%

Time 0:00
Date 4.28.2010

Polygon Sheen = 1897

Beak = 21

Null = 235

Sheen = 1641

Using "Standard Guide for Visually Estimating Oil Spill Thickness on Water, ASTM F 2534 - 06."

Oil on Water Estimate - Low

	sq mi	Cover Factor	gal/sq m	gals	bbbs
Sheen	1500	0.5	50	37500	893
Dull oil	250	0.2	666	33300	793
Dark oil	9	0.15	3300	4495.5	107

Total oil on water 75296 1793

x 2 to compensate for evap and disp 3586

recovered 200

chemically dispersed 1000

Total emitted 4786

Barrels emitted per day 1063

Oil on Water Estimate - Best Guess

	sq mi	Cover Factor	gal/sq m	gals	bbbs
Sheen	1500	0.66	333	329670	7849
Dull oil	250	0.35	1332	116550	2775
Dark oil	9	0.25	6660	14985	357

Total oil on water 461205 10981

x 2 to compensate for evap and disp 21962

recovered 450

chemically dispersed 3500

Total emitted 25912

Barrels emitted per day 5758

Oil on Water Estimate - High

	sq mi	Cover Factor	gal/sq m	gals	bbbs
Sheen	1500	0.75	666	749250	17839
Dull oil	250	0.5	3330	416250	9911
Dark oil	9	0.35	13320	41958	999

Total oil on water 1E+06 28749

x 2 to compensate for evap and disp 57498

recovered 700

chemically dispersed 6000

Total emitted 64198

Barrels emitted per day 14266

1759

1
www
fr

Using "Extended Guidelines for the Use of the Bonn Agreement Oil Appearance Code (BAOAC)"

Oil on Water Estimate - Low

sq mi	sq km	Cover Factor	liters/sq km	liters	gals	bbls
1500	3885	0.5	40	77700	23226	489
250	647	0.2	500	64700	17151	4073
9	23	0.15	5000	17550	45184	1100

Total oil on water 90321 23750 5661

x2 to compensate for evap and disp

recovered 11522

chemically dispersed 200

Total emitted 1000

Barrels emitted per day 12522

2783

Oil on Water Estimate - Best Guess

sq mi	sq km	Cover Factor	liters/sq km	liters	gals	bbls
1500	3885	0.65	300	76500	200205	4831
250	647	0.35	2000	452175	1197354	28503
9	23	0.25	10000	552147	145946	3665

Total oil on water 585413 1554508 37012

x2 to compensate for evap and disp

recovered 74024

chemically dispersed 450

Total emitted 3000

Barrels emitted per day 77674

17328

Oil on Water Estimate - High

sq mi	sq km	Cover Factor	liters/sq km	liters	gals	bbls
1500	3885	0.75	5000	11568883	30419539	97634
250	647	0.5	50000	18187429	47268653	137816
9	23	0.35	200000	16316931	431048	10253

Total oil on water 3238701 855562 203713

x2 to compensate for evap and disp

recovered 427426

chemically dispersed 700

Total emitted 6020

Barrels emitted per day 41428

92028

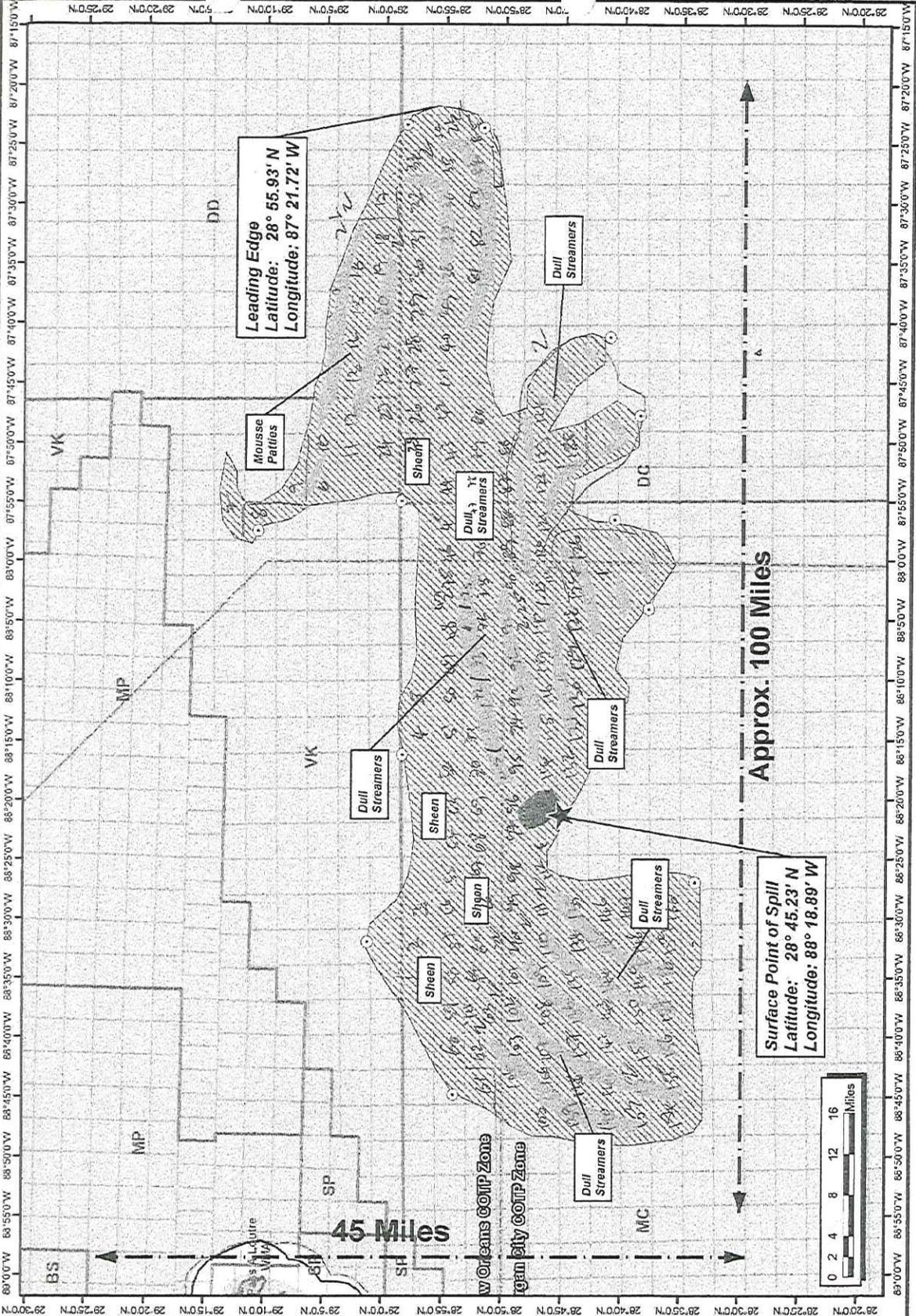
Mass Balance

	Last 24 hrs	Cumulative
Oil emitted	1000 - 6000	5000 - 30000
Oil dispersed naturally	200 - 1200	835 - 5020
Oil dispersed chemically	500 - 3000	1000 - 6000
Oil burned	0	0
Oil evaporated	300 - 1800	1500 - 9000
Oil recovered	120 - 360	230 - 690
Oil on water	180 - 1440	1500 - 10000

Time 10:01
Date 4.27.2010

MISSISSIPPI CANYON 252
 OVERFLIGHT MAP MAP
 4/27/2010 10:40 hrs

Scale: 1:750,000



ICS 209 - Incident Status Summary (Oil Spill)

Incident: Mississippi Canyon 252 Prepared By: Salmen, Angelique at 4/27/2010 10:01

Period: Period 7 Working (4/27/2010 06:00 - 4/28/2010) Version Name: 4/27/2010 09:00 MC 252 Response

Spill Status (Estimated)

Source Status: Remaining potential: Unknown
 Secured Rate of spillage: 42 -250 bbls/hr
 Unsecured Amounts below measured in:

	Last 24 Hours	Total
Tot. Vol. (1000-6000) (4950-29500)		

Mass Balance/Oil Budget

Rcvrd Product (120-360) (230-690)*	
Evap. (300-1800) ;(1500-8900)*	
Nat. Disp. (200-1200); (835-5020)*	
Chem Disp. (500-3000) (1000-5900)	
Burned	
Floating, Contained	
Fltg, Uncont.(180-1440)(1490-10020)*	
Onshore	
Total spilled product accounted for: 0	

Waste Management (Estimated)

Type	Recovered	Stored	Disposed
Oil			
Oily Liquid	2409	2409	
Liquid			
Oily Solid			
Solid			

Shoreline Impacts

Degree of Oiling	Affected	Cleaned	Remaining to be Cleaned
Very Light			
Light			
Medium			
Heavy			
Total	0	0	0

Wildlife Impacts

Type	Captured	Cleaned	Released	DOA	Died in Facility	
					Euth.	Other
Bird						
Mammal						
Reptile						
Fish						
Other						
Total	0	0	0	0	0	0

Safety Status

Type	Last 24 Hours	Total
Responder Injury	2	0
Public Injury	0	0
Other	0	17

Equipment Resources

Type	Ordered	Available /Staged	Assigned	Out-Of-Service
Boom	400,080	109,120	62,780	
Dispersant		119,734	29,140	
Boom: Fire	1,000	2,000		
Sorbent: Pads		300	3	
Vessel	26	33	30	
Skimmer	32	35	11	
Vehicle	21	3	5	
Barge: Inland		13	1	
OSRV	1	1	11	
Storage: Solid	4	4	4	
Aircraft: Helo	3	2	6	
Aircraft: Fixed Wing		2	8	
Storage: Liquid	5	1	4	
ROV		2	6	
Trailer	4	3	1	
Tug		1	6	
Dispersant: AppSystem			5	
Vacuum Truck	4			
Barge: Offshore			3	
Crane	2			
Generator	1		1	
OSRB			2	
Sorbent: Boom			2	

Personnel Resources

Organization	People in the Field	People in Cmd. Post	Total People On Scene
Federal	3	110	113
State		5	5
Local	0	0	0
RP	1	196	197
Contract Personnel	545	137	682
Volunteers			0
			0
			0
			0
Total Response Personnel:			997

Special Notes

Safety Status as of 4/27/2010 0900hrs.
 17 Injured from 4/20/2010 Initial incident, 11 Missing,
 2 responder injuries as of 0900 4/27/2010.
 Mass Balance Information based on 4/26/2010 Overflight.
 * Ranges included in left column of Mass Balance/Oil Budget
 * Total spilled product accounted for: 4950-29500 bbls
 Dispersant availability summary can be obtained from Operations Section Chief.
 10 Vessels conducting on-going skimming operations
 Personnel Resources will be updated with the 1400 ICS 209 Report

