United States Department of the Interior

BUREAU OF OCEAN ENERGY
MANAGEMENT, REGULATION AND ENFORCEMENT
Alaska Outer Continental Shelf Region
3801 Centerpoint Drive, Suite 500
Anchorage, Alaska 99503-5823

AUG 4 2011

Ms. Susan Childs
Shell Offshore, Inc.
3601 C. Street, Suite 1000
Anchorage, AK 99503

Dear Ms. Childs:

The Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) has reviewed Shell's revised OCS Lease Exploration Plan, Camden Bay, Beaufort Sea, Alaska (EP) dated May 2011 and supporting information. The BOEMRE hereby approves the revised EP subject to the eleven conditions below.

1) No exploratory drilling activities may be conducted without an approved Application for Permit to Drill (APD). Shell is advised that its APD must comply with all applicable BOEMRE regulations and Notice to Lessees 2010- N10.

2) No drilling activities may be conducted beyond each casing shoe unless approved by BOEMRE. BOEMRE will evaluate the condition of the well, results of safety equipment tests, the nature and duration of the next phase of the drilling program, existing and forecasted environmental conditions, and the procedures under an approved contingency plan [30 CFR 250.417(c)(2)] that addresses design and operating limitations of the drilling unit as well as the actions necessary (i.e. suspension, curtailment, or modification of drilling or rig operations) to remedy various operational or environmental situations in order to maintain safety and prevent damage to the environment; including implementing well capping and containment or relief well drilling plans.

3) No exploratory drilling activities can be conducted until Shell receives an approved Marine Mammal Protection Act (MMPA) authorization from the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service and the BOEMRE has received a corresponding Endangered Species Act (ESA) Incidental Take Statement (ITS).

4) No exploratory drilling activities can be conducted until Shell receives a New Source Review (NSR)/Title V Outer Continental Shelf air permit or a Prevention of Significant Deterioration (PSD) permit from the EPA, as appropriate.

5) The BOEMRE concludes that Shell has demonstrated that its oil and gas exploration drilling activities will be scheduled and will be located to prevent unreasonable conflicts

with subsistence activities in compliance with Lease Sale's 195 and 202 Lease Stipulation No. 5.

No exploratory drilling activities may be conducted until Shell has documented to the satisfaction of the Regional Supervisor that the monitoring and mitigating measures detailed in the Plan of Cooperation (POC) to prevent unreasonable conflicts with subsistence activities are in place and operational prior to the Camden Bay program drilling season.

Shell must provide this office with daily summaries on the POC activities and daily monitoring results, including, but not limited to Marine Mammal Observer's and local Subsistence Advisors reports and notifications and Shell's responses to each incident. Shell must include the BOEMRE contact number (907) 334-5300 in the Subsistence Advisory Handbook with specific instructions for the Subsistence Advisor to call BOEMRE if they are unable to contact Shell and/or if any subsistence uses conflict has not been resolved. A copy of the handbook must be submitted to this office prior to commencement of exploratory drilling operations.

6) No exploratory drilling activity can be conducted from August 1 through October 31 without an approved site-specific bowhead whale monitoring program in accordance with Lease Stipulation No. 4 As provided for under this stipulation, Shell is seeking an Incidental Harassment Authorization (IHA) from the NMFS in lieu of meeting the requirement of Stipulation No. 4. The BOEMRE will coordinate with the NMFS to assure that the IHA monitoring program and peer review process satisfy the requirements of Stipulation No. 4.

7) Exploratory drilling operations must be suspended by August 25. Exploratory drilling operations may not resume until after Nuiqsut and Kaktovik have completed their bowhead whale subsistence hunting activities and Shell has received approval from BOEMRE. The BOEME will consult with the NMFS to confirm that subsistence hunting activities have been completed.

8) Prior to commencement of exploratory drilling operations, Shell must confirm the final staging location and schedule for mobilizing the designated relief well rig to the drill site and that the response times for commencement and completion of a relief well are consistent with the approved EP.

Prior to commencement of drilling operations, Shell must demonstrate that the relief well drilling unit meets the requirements of 30 CFR 250.417 and BOEMRE must approve the relief well drilling unit for use in the Beaufort Sea.

Prior to commencement of drilling operations, Shell must also document that it has the capability to construct a well cellar if deemed necessary as part of the relief well planning effort.

Prior to commencement of exploratory drilling operations, Shell must confirm in writing that relief well equipment and supplies as described in the EP are available and will be made available in time to implement the relief well drilling program.

9) Shell has committed to having a subsea well capping and containment system. The system is currently in the design stage. Prior to commencement of exploratory drilling operations, Shell must provide documentation that the system is designed for the projected worst case discharge conditions for approval by BOEMRE. Shell must also submit documentation on the procedures for deployment, installation and operation of the system under anticipated environmental conditions, including the potential presence of sea ice for approval by BOEMRE. Shell will also be required to conduct a field exercise to demonstrate Shell's ability to deploy the system.

10) No exploratory activities may be conducted until BOEMRE completes Endangered Species Act consultation with the U.S. Fish and Wildlife Service regarding the polar bear critical habitat.

11) Shell's fuel-transfer plan does not fully comply with the requirement of Lease Stipulation No. 6 to surround the fuel barge with oil-spill containment boom before fuel transfer. Prior to conducting exploratory drilling operations, Shell must either modify their fuel-transfer plans to comply with the stipulation or provide justification of how their proposed alternative configuration would provide and equivalent level of response preparedness. This information must be submitted to this office for approval.

As provided by 30 CFR 250.284, the BOEMRE will periodically review the activities conducted under the approved EP and may require Shell to submit updated information or revise the approved EP. BOEMRE plans to conduct this review annually, prior to each subsequent open water season, but may review the plan earlier if it receives substantial new information at an earlier date.

If you have any questions regarding this action, please contact me directly at (907) 334-5300.

Sincerely,

Jeff Walker
Regional Supervisor, Field Operations

United States Department of the Interior
BUREAU OF OCEAN ENERGY MANAGEMENT
Alaska Outer Continental Shelf Region
3801 Centerpoint Drive, Suite 500
Anchorage, Alaska 99503-5823

DEC 16 2011

Ms. Susan Childs
Shell Gulf of Mexico, Inc.
3601 C Street, Suite 1334
Anchorage, Alaska 99503

Dear Ms. Childs:

The Bureau of Ocean Energy Management (BOEM) Alaska Region has reviewed the Shell Gulf of Mexico Inc. (Shell) Revised 2012 Outer Continental Shelf Lease Exploration Plan, Chukchi Sea, Alaska (EP) for OCS Leases Y-2280, Y-2267, Y-2321, Y-2294, Y-2278, and Y-2324.

BOEM hereby approves the EP subject to the conditions below:

1. Shell must inform the Regional Supervisor for Leasing and Plans (RS/LP) before deviating from activities specified under the EP.

2. No exploratory drilling operations may be conducted under this EP until Shell has satisfied the Bureau of Safety and Environmental Enforcement (BSEE) requirements with respect to the Oil Spill Response Plan (OSRP). Once BSEE's requirements are met, Shell must submit a copy of the OSRP to the RS/LP.

3. No exploratory drilling activities can be conducted without an approved Application for a Permit to Drill (APD) issued by BSEE. Shell must submit a copy of the approved APD to the RS/LP prior to commencing drilling operations.

   Shell is advised that the APD must comply with all applicable BSEE regulations and Notice to Lessee 2010-N10. In accordance with 30 CFR 250.410-418 (MODU), BSEE must receive all required information for APD approval. This includes a current Certificate of Inspection or Letter of Compliance from the U.S. Coast Guard (USCG), current documentation of any operational limitations imposed by an appropriate classification society, and other fitness requirements for the M/V Noble Discoverer (Discoverer) mobile offshore drilling unit required in accordance with 30 CFR 250.417 (Certification of the Drilling Unit).

4. In consideration of the distance to limited support infrastructure on the Chukchi coast, as well as limited drilling experience in the Chukchi Sea, and in keeping with the Secretary of the Interior's desire to proceed cautiously with oil and gas exploration and development in the Chukchi Sea, BOEM will require the following condition designed to reduce risks associated with the proposal by assuring a greater opportunity for response and cleanup in the unlikely event of a late season oil spill.

   No exploratory drilling will be allowed below the last casing point set prior to penetrating a *zone capable of flowing liquid hydrocarbons in measureable quantities into the well* within 38 days of a "trigger date" established each year by BOEM, based upon the date of first ice encroachment over the drill site within any of the last 5 years. For 2012, based upon interpretation of satellite imagery for the period 2007 to 2011, BOEM has determined November 1 as the earliest date in which sea ice covered the Shell drill sites listed in the EP. Accordingly, Shell must not drill below the casing shoe of the last string of casing set before penetrating a zone capable of flowing liquid hydrocarbons in measureable quantities into the well after September 24, 2012. In all other aspects, Shell can continue to operate as conditions permit up to October 31. A new trigger date will be established by the RS/LP for each subsequent year that operations are conducted under the EP.

   Consistent with adaptive management principles, the RS/LP may revise its method for determining the trigger date based upon changes to best available scientific information (i.e., availability of a reliable ice forecasting system capable of predicting with a high degree of certainty when ice will likely encroach upon the drill site locations).

5. No exploratory drilling activities can be conducted until Shell has received an approved Marine Mammal Protection Act (MMPA) authorization from the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) for the specific activity, and the RS/LP has received a corresponding Endangered Species Act Incidental Take Statement (ITS) for threatened, endangered and protected species. Shell must submit a copy of the approved IHA or LOA to the RS/LP prior to commencing operations.

6. Shell's EP includes a marine mammal monitoring program and Shell has applied for an Incidental Harassment Authorization (IHA) from the National Marine Fisheries Service (NMFS) and a Letter of Authorization (LOA) from the US Fish and Wildlife Service (USFWS). The EP describes Shell's plans for aerial monitoring, on-vessel marine mammal observers, real time acoustical recorders, and site-specific sound source verification to confirm acoustic safety zones prior to commencement of drilling operations. The RS/LP, in consultation with the NMFS and the USFWS, may modify lease operations as necessary to comply with the requirements of authorizations issued by NMFS and USFWS.

7. Shell has developed a Plan of Cooperation (POC) designed to prevent unreasonable conflicts with subsistence activities in compliance with Lease Stipulation 5 (Conflict

Avoidance Mechanisms to Protect Subsistence Whaling and Other Subsistence-harvest Activities). Stipulation 5 applies to support activities, such as vessel and aircraft traffic, that traverse the blocks listed or Federal waters landward of the sale during periods of subsistence use regardless of lease location.

No support activities may be conducted on the blocks listed or on Federal waters landward of the Sale 193 area until Shell has documented to the satisfaction of the RS/LP that the monitoring and mitigating measures detailed in the POC to prevent unreasonable conflicts with subsistence activities for the Chukchi Sea program are in place and operational prior to mobilization of each drilling season.

BOEM retains the authority to restrict lease-related use if it is determined that it is necessary to prevent unreasonable conflicts with local subsistence hunting activities. Shell must provide this office with daily summaries on POC activities and daily monitoring results including but not limited to Marine Mammal Observers' and local Subsistence Advisors' reports and notifications and Shell's responses to each incident. Shell must also include the BOEM contact number (907) 334-5200 in the Subsistence Advisors Handbook with specific instructions for the Subsistence Advisors to call BOEM if they are unable to contact Shell and/or if any subsistence use conflict has not been resolved. A copy of the handbook must be submitted to this office prior to commencement of exploratory drilling operations.

The POC states that Shell plans to have continuing engagement with local subsistence users to discuss and possibly further supplement the POC. Shell must inform the RS/LP (or designee) promptly of any deviation from or alteration of the POC that Shell intends to take as a result of these ongoing community meetings.

Shell shall inform the RS/LP of any presentation/meeting Shell intends to conduct under the POC to allow the RS/LP (or designee) to attend such engagement.

8. Prior to commencement of exploratory drilling operations, Shell must confirm the final staging location and schedule for mobilizing the designated relief well rig to the drill site and the consistency of response times for commencement and completion of a relief well with the approved EP. Confirmation must be sent to the RS/LP.

   Prior to commencement of drilling operations, Shell must demonstrate that the relief well drilling unit meets the requirements of 30 CFR 250.417 and confirm that they have received approval from BSEE for the relief well drilling unit for use in the Chukchi Sea. Shell must present a copy of BSEE's approval letter to the RS/LP prior to commencing operations.

9. Shell has committed to having a subsea well capping and containment system. The system is currently in the design stage. Prior to commencement of exploratory drilling operations, Shell must confirm that they have documented and received approval from BSEE that the system is designed for the projected worst case discharge conditions. Shell must also confirm that they have documented and received approval from BSEE

regarding the procedures for deployment, installation and operation of the system under anticipated environmental conditions, including the potential presence of sea ice.

Shell will also be required to conduct a field exercise to demonstrate their ability to deploy the system. Shell must confirm that they are in compliance with any agreement concerning well capping and containment reached with BSEE.

Shell must present a copy of BSEE's approval letter to the RS/LP prior to commencing operations.

10. An orientation program that will satisfy the requirements of Lease Stipulation 2 (Orientation Program) must be submitted to the RS/LP annually for approval prior to commencing drilling operations.

11. If Shell transits to the Chukchi Sea from the Beaufort Sea during the fall bowhead whale migration and before or during Barrow's fall bowhead whale subsistence hunt, Shell shall meet with the appropriate whaling captains to coordinate vessel transit routes westward through the Beaufort Sea to prevent any deflection of the bowhead whale migration and any conflicts with Barrow's fall whaling season. Emergency operations will take precedence over this condition.

12. The Marine Mammal Observers (MMOs) on vessels underway in the Chukchi Sea must monitor the ocean waters near the vessel for surfacing whales. If a surfacing whale is observed within 300 ft (100 m) of the vessel, the vessel must disengage propellers to avoid potential propeller injury to the whale (prop strike) and, to a lesser degree, collision. Propellers must remain disengaged until the whale moves beyond 300 ft (100 m). Safety of the vessel and its personnel will take precedence over this condition.

13. In addition to the measures committed to by Shell in its Bird Strike Avoidance and Lighting Plan to comply with Lease Stipulation 7 (Lighting of Lease Structures to Minimize Effects to Spectacled and Steller's Eider), the following measures also are required pursuant to the September 3, 2009, FWS *Biological Opinion for Beaufort and Chukchi Sea Program Area Lease Sales and Associated Seismic Surveys and Exploratory Drilling*:

    a. Routine deck searches for dead or injured birds should be performed, especially during or following periods of darkness or inclement weather. Most avian collisions occur during periods of darkness and/or inclement weather such as rain or fog.

    b. Birds perching on ship structures (such as antennas or rigging) should be allowed to rest and depart on their own.

    c. All bird fatalities shall be documented and reported within 3 days to the RS/LP. Minimum information will include species, date/time, location, weather,

identification of the vessel involved and its operational status when the strike occurred. Carcasses should be returned to the sea.

Photographs are not required, but would be very helpful in verifying species as part of the collision report. If photographs are taken, FWS has requested the following views of any birds killed by collision: wingspread (if possible), top and bottom views, and head.

If a bird strikes and remains on the vessel, leave it to recover and depart on its own. If necessary to take it out of harm's way, move it to a dry place where it can depart on its own. If the bird does not depart after about 12 hours but is still alive, carefully return it to the sea surface.

14. Shell's fuel-transfer plan does not fully comply with the requirements of Lease Stipulation 6 to surround the fuel barge with oil-spill containment boom before fuel transfer. Prior to conducting exploratory drilling operations, Shell must either modify its fuel-transfer plans to comply with the stipulation or provide justification of how the alternative configuration would provide an equivalent level of response preparedness. This information must be submitted to the RS/LP for approval.

15. No exploratory activities may be conducted until BOEM completes its ongoing Endangered Species Act consultation with the U.S. Fish and Wildlife Service.

As provided by 30 CFR 550.284, BOEM will annually conduct a pre/post review of the activities conducted under the approved EP and may require Shell to submit updated information or revise the approved EP. BOEM plans to conduct this review annually, prior to each subsequent open water season, but may review the plan earlier if it receives substantial new information.

If you have any questions regarding this action, please contact me directly at (907) 334-5200.

Sincerely,

David W. Johnston
Regional Supervisor, Leasing and Plans.

cc: State of Alaska - Office of the Governor
Office of the Governor - EXECUTIVE OFFICE ANCH, ATT: Jeffrey Jones, Special Staff Assistant
Department of Natural Resources OPM-OFFICE PRJ MGMT/PERMIT, ATT: Sara Longan
Alaska Oil & Gas Conservation Commission, ATT: Steve Davies
Department of Natural Resources Division of Geological and Geophysical Surveys, ATT: Patty Burns
Department of Environmental Conservation Commissioner's Office
Department of Environmental Conservation Commissioner's Office, Prog Coordinator, ATT: Gary Mendivil
U.S. Department of Environmental Conservation, Division of Water
U.S. Department of Environmental Conservation, Division of Air
U.S. Department of Environmental Conservation, Spill Response
U.S. Department of Environmental Conservation, Division of Spill Prevention & Response, ATT: Larry Iwamoto
U.S. Department of Environmental Conservation, Division of Spill Prevention & Response, ATT. Dale W. Gardner
U.S. Department of the Interior, Office of the Secretary, Environmental Policy and Compliance, ATT: Pamela Bergmann
U.S. Fish and Wildlife Service Region 7, Regional Director, ATT. Geoff Haskett
U.S. Fish & Wildlife Service – Endangered Species, ATT: Tim Jennings
U.S. Fish & Wildlife Service – Endangered Species, ATT: Ted Swem
U.S. Fish & Wildlife Service – Marine Mammal Management, ATT: Craig Perham
U.S. Fish & Wildlife Service – Marine Mammal Management, ATT: Christopher Putnam
U.S. Fish & Wildlife Service – Marine Mammal Management, ATT: Joel GarlichMiller
U.S. Fish & Wildlife Service – Northern Alaska Ecological SVCS
U.S. Fish & Wildlife Service – Conservation Planning Branch, ATT: Jewel Bennett
U.S. Fish & Wildlife Service – Conservation Planning Assistance, ATT: Louise Smith
Alaska Region National Marine Fisheries Service - Alaska Region, ATT: James W. Balsiger
Alaska Region National Marine Fisheries Service, ATT: Brad Smith
U.S. NMFS NOAA – Office of Protected Species, ATT: Michael Payne
U.S. Army Corps of Engineers Regulatory Branch Alaska District, ATT: Chief Kevin Morgan
U.S. Environmental Protection Agency Region X Alaska, ATT: Diane Soderland
U.S. Coast Guard Alaska Region, ATT: U.S. Coast Guard Commander
U.S. Coast Guard Alaska Region, ATT: COMMANDING OFFICER MARINE SAFETY OFFICE
U.S. National Park Service, ATT: Glen Yankus
Mayor of Northwest Arctic Borough
Mayor of North Slope Borough
North Slope Borough Planning Department, ATT: Dan Forrester
North Slope Borough Dept of Wildlife Management, ATT: Taqulik Hepa
North Slope Borough Dept of Wildlife Management, ATT: Robert Suydam
North Slope Borough, ATT: Andrew Mack
North Slope Borough, ATT: Tom Lohman
Mayor of Kaktovik
Mayor of Nuiqsut
Mayor of Barrow
Mayor of Wainwright
Native Village of Wainwright
Mayor of Point Hope
Native Village of Point Hope
Native Village of Point Lay
Native Village of Kotzebue
Inupiat Community of the Arctic Slope
Alaska Eskimo Whaling Commission, ATT Harry Brower
Alaska Eskimo Whaling Commission, ATT: Janice Meadows
Alaska Beluga Whale Committee
Alaska Nanuuq Commission
Alaska Ice Seal Committee
Eskimo Walrus Commission
Earthjustice, ATT: Erik Grafe
Alaska Wilderness League, ATT: David Dickson

Center for Biological Diversity, ATT: Rebecca Noblin
Audubon Alaska, ATT: Stanley E. Senner
Defenders of Wildlife, ATT: Richard Charter
Natural Resource Defense Council, ATT: Charles M. Clusen
Northern Alaska Environmental Center, Pamela A. Miller
Ocean Conservancy, Andrew Hartsig
Pacific Oceana, ATT: Jim Ayers
Pacific Environment, ATT: Whit Sheard
Sierra Club, Trish Rolfe
The Wilderness Society, ATT: Eleanor Huffines
World Wildlife Fund, ATT: Layla Hughes

Tankersley, Yolanda J

From: Fesmire, Mark E
Sent: Monday, January 09, 2012 3:48 PM
To: Feldgus, Steve H
Cc: Tankersley, Yolanda J; Fesmire, Mark E
Subject: RE: Shell issues

Steve:

You hit on everything we are working on last week and so far this week.

As I reported at the meeting this morning, we have negotiated a testing and inspection protocol with Shell. They are drafting it up in the form of a proposal which we will review and approve.

What I believe we will get in writing this week is that each component of the capping and capping and flowing systems will have a design that is signed off by a registered professional engineer or a certification organization (ABS). The system components will be pressure tested when manufactured. The entire system will then be shipped to Bellingham Washington where it will be assembled and deployment tested in May. We will then pressurize the system with Nitrogen and ship the system under pressure so that we may make sure that there are no leaks. We will perform inspections during these processes and when it arrives in theater. The barge will also meet all applicable Coast Guard requirements and API Recommended Practices.

The new well screening tool that was developed by BOEMRE and industry will be used to model the casing design so that the well can be shut in under any anticipated pressure conditions (Capped). As long as the well head is intact, we ought to be able to shut it in without exceeding the casing design pressures or the fracture gradient of exposed casing shoes and formation. The portion of the system designed to recover fluid, conduct it to the surface and treat and store it is a further redundancy that would be necessary if we could not get a well head connection that would hold the pressure.

I have sat in on some of the discussions of the DEIS, but have seen no documents yet.

We are trying to work out a logistics plan for transportation now. Due to the size of Alaska (AK) and the travel time and expense it is impossible to go from Anchorage to an OCS operation and back to Anchorage in a day. We have experience in that we currently travel to the Northstar gravel island, which is located in state water and close to the Prudhoe Bay field and airport.

BSEE has committed to the public that there would be 24/7 coverage of exploration drilling in the AK OCS. With two rigs running the first season (and possibly 4 the second season), we will require 2 additional inspectors, probably from other regions.

To inspect any operations that occur this summer the inspector must to fly commercially from Anchorage to the North Slope, at a cost that is between $800 and $900. The exact cost depends on if you fly into Barrow AK to go to Burger drill site in the Chukchi Sea, or into Deadhorse AK to go to Sivulliq drill site in the Beaufort Sea.

There are approximately 400 miles between the 2 operations that Shell has planned to begin in July. Sivulliq is 50 miles East of Deadhorse, and the estimated cost for BSEE to run its own contracted helicopter round trip from Deadhorse to the Sivulliq drill site is $8800 per trip.

Burger is 140 miles west of Barrow and we unable to estimate the cost to BSEE to contract a helicopter because there isn't a helicopter operator in Barrow.

The alternative is to purchase a seat on the Shell flights from the Shell Contractor. Shell is planning to use Augusta 139 for transportation of personnel. The helicopter will have twin engines, floats, two pilots, and be VFR and IFR certified. For the BSEE inspectors to fly on these trips, the aircraft and pilots would have to be certified by our Aviation Management Division.

The AKOCS plan, at this time, is to work the same schedule that Shells employees are working, which is a 2 week hitch, and we would fly on their regular schedule flights and live on the MODU. Shells employees will be alternating weekly with the contactor's employees. The major reason that we will coordinate with the Shell employees is that they generally are fewer in number than the contractor's crews and leave more room on the Helicopter.

Mark

-----Original Message-----
From: Feldgus, Steve H
Sent: Monday, January 09, 2012 1:00 PM
To: Fesmire, Mark E
Subject: Shell issues

Hi Mark,

The Director just talked to Shell (Dave Lawrence, Pete Slaiby), and a few things came up: first, they said they will be submitting their APDs on 1/31, so wanted to give you the heads-up on that. Also, they want to know what we were thinking of in terms of testing their barge that they're building for potentially flowing from their capping stack. Were we planning on testing that? And have we confirmed that they'd be able to cap without flow, or do we need to wait for their APD to be sure? They also had some concerns about the recent NOAA/NMFS DEIS, saying it doesn't line up with DOI EISes, although I don't have more detail on that.

Separately, we were curious about the logistics for our inspectors that would be on their rigs 24/7... What would their schedule be? 2-on/2-off, or something else? And would they be getting to and from the rig on the regularly scheduled helicopters that Shell would be flying?

Thanks,

--Steve

Shell Exploration & Production

January 30, 2012

Mark Fesmire
Alaska Region Director
Alaska OCS Region
U.S. Department of Interior
Bureau of Safety & Environmental Enforcement
3801 Centerpoint Drive, Suite 500
Anchorage, AK 99503-5823

3601 C Street, Suite 1000
Anchorage, AK 99503
Tel. (907) 646-7112
Email susan.childs@shell.com
Internet http://www.shell.com/

Re: Bureau of Safety and Environmental Enforcement (BSEE) – Alaska OCS Region - Request to Review Functionality Information for Shell's Arctic Capping Stack and Arctic Containment System

Dear Mr. Fesmire:

It is the understanding of Shell Exploration & Production Company , on behalf of Shell Offshore Inc. and Shell Gulf of Mexico Inc. (collectively Shell) that by issuance of notice to lessees (NTL) No. 2010 – N10 (*NTL 10), Statement of Compliance with Applicable Regulations and Evaluation of Information Demonstrating Adequate Spill Response and Well Containment Resources (November 8, 2010)* the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE; now BOEM) created an opportunity for Operators to voluntarily provide additional information demonstrating well containment resources.

Even though not required by regulation, Shell elected to provide a capping stack for the Arctic and informed BOEM in revised exploration plans (EPs) for the Chukchi and Beaufort Seas in 2011 that Shell will have a capping stack available for use. The Arctic capping stack will be function and pressure tested, and the vessel deployment system will be tested prior to the 2012 drilling season.

Also, even though not required for the wells in the EPs, Shell elected to provide an Arctic Containment System to accept flow from the capping stack and so informed BOEM in the EPs in 2011. The topsides processing facilities are designed according to applicable industry standards, including API Recommended Practices. In order to provide Bureau of Safety and Environmental Enforcement (BSEE) with additional information to facilitate review of the safety and oil throughput capacity of the topside processing facilities, Shell has agreed to provide BSEE access to the following documents, at Shell's Anchorage office:

- SAFE Charts,
- Safety Flow Schematic,
- Topsides Hazardous Area Classification drawing,

- Statement letter that the capacity of the containment system meets the volume for a worst case discharge (WCD) of 25,000 barrels oil per day and is designed for Arctic conditions.

Each of these documents will be certified by a Professional Engineer in the applicable engineering discipline designated by the owner. The topsides facilities, including the safety shutdown system, control system, and processing systems will be commissioned prior to the 2012 drilling season. The US Coast Guard has jurisdiction over the marine systems, including power generation, mooring, ballast and bilge, navigation aids, potable water, ship systems, fire detection and suppression, cranes, communication systems, heating and ventilation, life saving equipment, and living quarters which will be commissioned. Upon arrival in Alaska, the Arctic Containment System will be inspected by Shell to verify integrity and readiness for mobilization.

BSEE may coordinate requests to observe commissioning and testing through me at (907) 646-7112 or at Susan.Childs@Shell.com, or Pauline Ruddy at (907) 771-7243 or at Pauline.Ruddy@Shell.com.

Thank you,

Susan Childs
AK Venture Support Integrator, Manager

United States Department of the Interior
BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT
Alaska OCS Region
3801 Centerpoint Drive, Suite 500
Anchorage, Alaska 99503-5823
FEB 03 2012

Ms. Susan Childs
Venture Support Integrator, Alaska
Shell Exploration and Production Company
3601 C Street, Suite 1334
Anchorage, AK 99503

Dear Ms. Childs:

BSEE AKOCS is in receipt of your letter dated January 30, 2012 concerning "Bureau of Safety and Environmental Enforcement (BSEE) - Alaska OCS Region – Request to Review Functionality Information for Shell's Arctic Capping Stack and Arctic Containment System."

While Shell and BSEE may not agree on some of the premises stated in your letter, BSEE does appreciate the effort Shell has made to memorialize the discussions had at the meetings held on October 28th, November 9th, November 17th, December 7th, December 21st, January 17th and January 20th. The objective of those discussions was to clarify the design standards and testing and inspection protocol for certain equipment to be deployed in the Arctic during Shell's exploration programs in the Beaufort and Chukchi Seas. While your letter does contain some of that agreement, BSEE feels that it is necessary to clarify what we expect with respect to the subject "Arctic Capping Stack and Arctic Containment System."

The (full) system will consist of three components.

- First, the capping portion of the system, consisting of the subsurface equipment necessary to achieve a connection thru a mechanical connector or a metal to metal connection with sufficient integrity to shut in the well or flow fluids to the surface with no loss of fluid to the environment (the capping system).

- Second, the subsea collection device designed to set over the well head or other leak site and gather flowing well fluids so that they might be conveyed to the surface thru the tubular components of the containment system (the subsea portion of the containment system).

- And Third, the surface treating and storage component being the floating facilities necessary to treat and store fluids produced from the well during an attempt to regain well control or prevent a loss of well control, and the tubular goods necessary to

conduct the Capping and Containment systems to the well head and convey the fluids to the surface (the surface containment system).

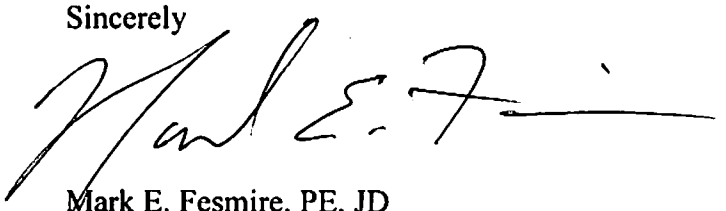
As agreed, Shell will comply with all applicable BSEE requirements, Coast Guard requirements, provisions in their Exploration Plans (EP's), provisions in their Oil Spill Response Plans (OSRP's), conditions of approval, lease stipulations, Notices to Lessees (NTL's) and API Recommended Practices. For those systems or equipment that are not subject to the above requirements, verification by a third party certifying agency (such as DNV or ABS) or a Registered Professional Engineer (Who is not a Shell employee) will be required. Each component of the system will be certified for arctic conditions and pressure and function tested. All components will then be shipped to one point where a deployment test of the full system to a depth equivalent to the depth of the mudline at the deepest wellsite will be performed prior to departure for the Arctic. The schedule will provide the time and facilities necessary to remediate any issues that might arise during the test with sufficient time remaining that the repair will not delay departure for the Arctic. This time is estimated to be no later than 6 weeks prior to the beginning of the drilling season.

After a successful test is completed, the pressurized portions of the system will be flushed with nitrogen and shipped under a nitrogen charge sufficient to verify pressure integrity of the system during transit and drilling operations. Upon arrival in the Arctic, the system will be re-inspected by Shell and BSEE to verify integrity and readiness for mobilization. All systems will be "commissioned" and operational upon arrival in the Arctic and prior to the beginning of drilling operations.

BSEE is to be kept apprised of each step of the manufacturing and assembly process and have the right to perform unannounced inspections where BSEE deems there is a need. BSEE will also have access to all drawings, design specifications and data generated during the manufacturing, assembly and testing of the systems.

Again, BSEE would like to thank Shell and their technical representatives for the effort necessary to explore these concerns, and express BSEE's wish to clarify these expectations so as to minimize misunderstandings and facilitate a successful deployment.

Sincerely



Mark E. Fesmire, PE, JD
Regional Director

CC:
Dr. James Kendal (BOEM AK)
Mr. David Moore (BSEE OSRP)
Mr. Jeff Walker (BSEE AKOCS)

Project Reference Number: BOR 81100599	**Project Name:** Alaskan Containment Systems Project	**Product:** SOGS 6
Bornemann contact: Joh. Heinr. Bornemann GmbH Subsea Division Nick Malorny Industriestrasse 2 31683 Obernkirchen, Germany	**Customer contact:** Superior Energy Services LLC Marine Division Gerald Kekule 16610 Aldine Westfield US Houston, Texas 77032	**End customer:** Shell

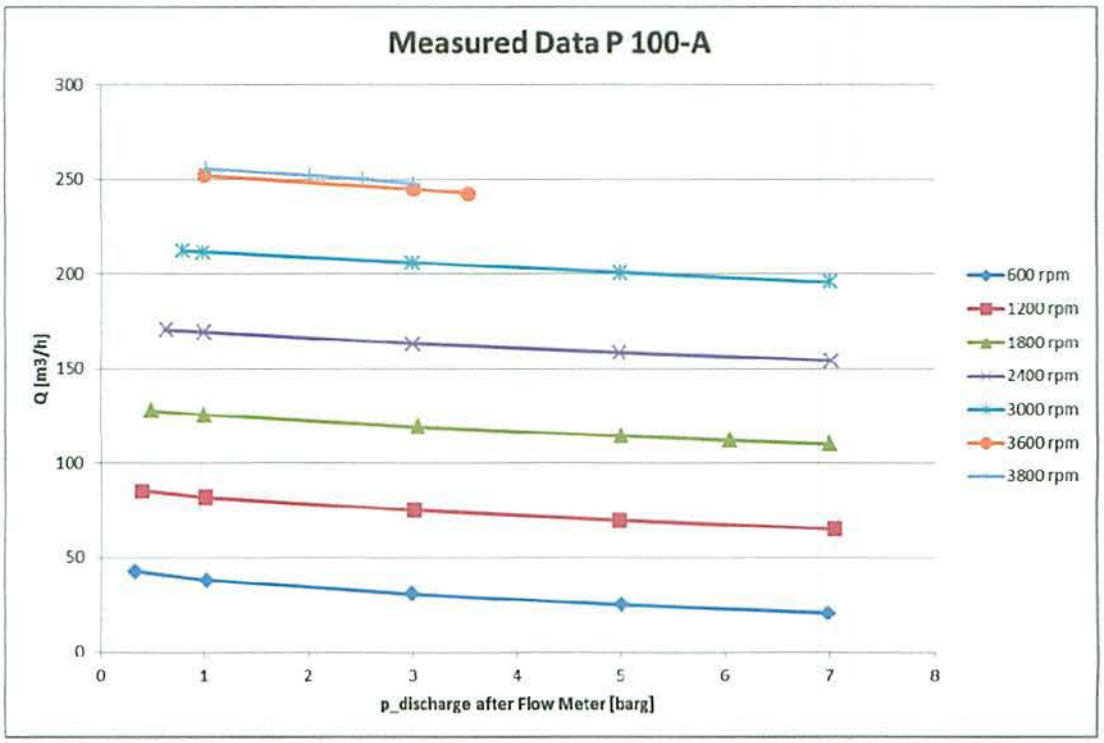
Installation and Operation Information of SOGS 6:

Site:	Alaska, Chukchi Sea	Pump inlet pressure:	0 to 10 bar
Water depth:	up to 100m	Pump outlet pressure:	0 to 17 bar
Water temperature:	0 °C to 5 °C	Max. differential pressure:	7 bar
Speed:	0 to 3550 rpm	Flow rate:	240 m³/h
Medium:	Hydrocarbons as multiphase mixture, seawater, fresh water		

Document Number: 81100599-Q-PP-004 R02 Test Procedure P-100-A		
Originator: Nick Malorny	**Approved by (BOR/Customer):**	**Date of Approval:**

REVIEWED
WITNESSED
Date / Signature:
23+24.02.12
Germanischer Lloyd
Industrial Services

Tag Number / Serial Number: P-100 A
Assembly Drawing Number:



3.5. Recalculation to real operating conditions

3.6. 50h run test

Condition: Passed performance test
Test bed control system is in automatic operation. All shutdown values are set correctly and tested.

Speed rpm	**dp bar**	**Flow m3/h**	**Start**	**Stop**	**Duration** hours	**Comment**
1500	5	116	22.02.12 10:00	22.02.12 12:00	2	
2000	5	131	22.02.12 12:00	22.02.12 14:00	2	
2500	5	167	22.02.12 14:00	22.02.12 16:00	2	
3000	4	206	22.02.12 16:00	23.02.12 13:00	21	
3000	4	206	23.02.12 16:00	24.02.12 08:00	16	
3500	4	238	24.02.12 8:00	24.02.12 10:00	2	
3800	2	252	24.02.12 10:00	24.02.12 11:00	1	
600 – 3800	variable		23.02.12 13:00	23.02.12 16:00	3	Performance curves

Date: 24.02.2012	Name of Executer: SL	Result: accepted
Comments: Test tank temperature increased from 13 to 24°C Ambient temperature 3 to 10°C, partly windy and rain.		

4. Results – Conclusion

Design Point Flow:
240m3/h @ 7 bar dp

Design Point Power:
max. 100kW

Tolerance:
+-10%, flow rate and power consumption

4.1. Summary Test Results

50h Run Test:
The pump shall run for 50h at various loads without detectable fault, change in performance or power consumption.

Result 50h Run Test:
Pump was running without unexpected or unacceptable results. No change in performance and power consumption was detected.

Results Flow Rate and Power consumption:

Pump Performance:	230m3/h @ 7 bar dp at 100Hz (3550rpm*), 110 kW Flow: - 4% Power: + 10%
Pump Performance:	240m3/h @ 5 bar dp at 100Hz (3550rpm*), 100 kW
Max. Flow Rate:	270m3/h at 3800 rpm

* - taking the 50rpm motor slippage of the asynchronous motor into consideration.

Explanation Flow Rate:
The inlet pressure to the pump with 0.3 barg (4 psig) is low for the high flow-rate at pump inlet. We can also see, that between 3600 rpm and 3800 rpm the increase in capacity is much less than expected. This is a typical indication for beginning cavitation at the given pressure. At this point the screw chamber filling efficiency is reduced. For the speed range from 600 to 3000 rpm, the theoretical data are in line with the test results. The theoretical flow rate for 3000 rpm (at 0 bar dp) is 220 m3/h, measured is 220 m3/h. The theoretical flow rate for 3800 rpm (at 0 bar dp) is 282 m3/h, measured is 270 m3/h. Under field conditions with higher inlet pressure we can expect approx. 12 m3/h higher flow rates at high speed.

In addition the slippage of the asynchronous motor is not considered into our measurement. We take the frequency of the VFD as indication for the pump speed. In reality at full load, the pump speed is approx. 50 rpm less – or the correct capacity at indicated speed is 2% higher.

Power Consumption:
Shaft power is 10% higher than expected.

Explanation Shaft Power:
The total power consumption of the pump is defined by the hydraulic power consumption of the pump rotors and the hydraulic friction losses of the oil filled components as bearings, coupling and motor. Due to the lower seal oil temperature, the seal oil viscosity is higher as foreseen. This will cause some higher friction losses. An increase of the seal oil temperature by 10K should reduce the friction losses by approx. 3 kW. This effect has been confirmed during the 50h run test.

Project Reference Number: BOR 81100599	**Project Name:** Alaskan Containment Systems Project	**Product:** SOGS 6
Bornemann contact: Joh. Heinr. Bornemann GmbH Subsea Division Nick Malorny Industriestrasse 2 31683 Obernkirchen, Germany	**Customer contact:** Superior Energy Services LLC Marine Division Gerald Kekule 16610 Aldine Westfield US Houston, Texas 77032	**End customer:** Shell

Installation and Operation Information of SOGS 6:

Site:	Alaska, Chukchi Sea	Pump inlet pressure:	0 to 10 bar
Water depth:	up to 100m	Pump outlet pressure:	0 to 17 bar
Water temperature:	0 °C to 5 °C	Max. differential pressure:	7 bar
Speed:	0 to 3550 rpm	Flow rate:	240 m³/h
Medium:	Hydrocarbons as multiphase mixture, seawater, fresh water		

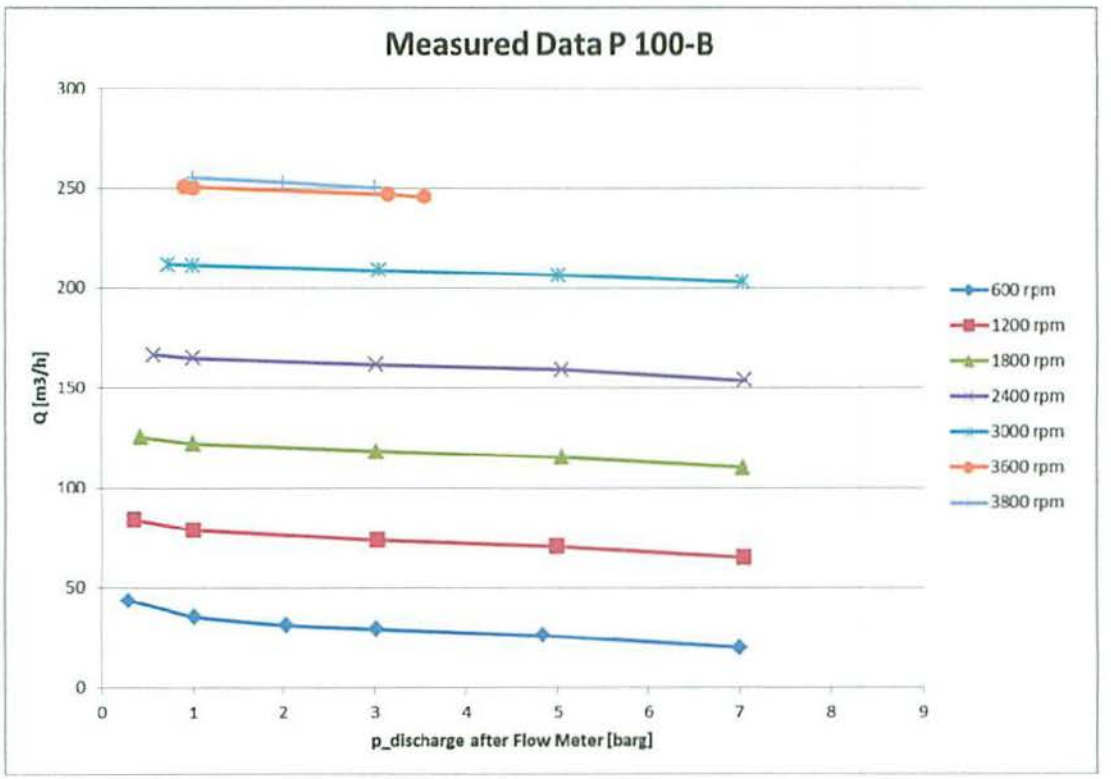
Document Number:
81100599-Q-PP-004 R02 Test Procedure P-100-B

Originator: Nick Malorny	**Approved by (BOR/Customer):**	**Date of Approval:**

☒ REVIEWED
☐ WITNESSED
Date / Signature:
23.02.12
Germanischer Lloyd
Industrial Services

Tag Number / Serial Number:
P-100 B

Assembly Drawing Number:



3.5. Recalculation to real operating conditions

3.6. 50h run test

Condition: Passed performance test
Test bed control system is in automatic operation. All shutdown values are set correctly and tested.

Speed rpm	**dp bar**	**Flow m3/h**	**Start**	**Stop**	**Duration** hours	**Comment**
1500	5	116	18.02.12 10:00	18.02.12 18:00	8	
2000	5	131	18.02.12 18:00	19.02.12 9:00	15	
2500	5	167	19.02.12 9:00	19.02.12 16:00	7	
3000	4	206	19.02.12 17:00	20.02.12 8:00	16	
3500	4	238	20.02.12 8:00	20.02.12 12:00	4	
3800	2	252	19.02.12 16:00	19.02.12 17:00	1	
600 – 3800	variable		21.02.12 9:00	21.02.12 12:00	3	Performance curves

Date: 24.02.2012	Name of Executer: AJ	Result: accepted
Comments: Test tank temperature increased from 4 to 14°C Ambient temperature -8 to 8°C, partly windy and rain and snow.		

4. Results – Conclusion

Design Point Flow:
240m3/h @ 7 bar dp

Design Point Power:
max. 100kW

Tolerance:
+-10%, flow rate and power consumption

4.1. Summary Test Results

50h Run Test:
The pump shall run for 50h at various loads without detectable fault, change in performance or power consumption.

Result 50h Run Test:
Pump was running without unexpected or unacceptable results. No change in performance and power consumption was detected.

Results Flow Rate and Power consumption:

Pump Performance:	235m3/h @ 7 bar dp at 100Hz (3550rpm*), 108 kW Flow: - 4% Power: + 10%
Pump Performance:	240m3/h @ 6 bar dp at 100Hz (3550rpm*), 101 kW
Max. Flow Rate:	270m3/h at 3800 rpm

* - taking the 50rpm motor slippage of the asynchronous motor into consideration.

Explanation Flow Rate:
The inlet pressure to the pump with 0.3 barg (4 psig) is low for the high flow-rate at pump inlet. We can also see, that between 3600 rpm and 3800 rpm the increase in capacity is much less than expected. This is a typical indication for beginning cavitation at the given pressure. At this point the screw chamber filling efficiency is reduced. For the speed range from 600 to 3000 rpm, the theoretical data are in line with the test results. The theoretical flow rate for 3000 rpm (at 0 bar dp) is 220 m3/h, measured is 220 m3/h. The theoretical flow rate for 3800 rpm (at 0 bar dp) is 282 m3/h, measured is 270 m3/h. Under field conditions with higher inlet pressure we can expect approx. 12 m3/h higher flow rates at high speed.

In addition the slippage of the asynchronous motor is not considered into our measurement. We take the frequency of the VFD as indication for the pump speed. In reality at full load, the pump speed is approx. 50 rpm less – or the correct capacity at indicated speed is 2% higher.

Power Consumption:
Shaft power is 8% higher than expected.

Explanation Shaft Power:
The total power consumption of the pump is defined by the hydraulic power consumption of the pump rotors and the hydraulic friction losses of the oil filled components as bearings, coupling and motor. Due to the lower seal oil temperature, the seal oil viscosity is higher as foreseen. This will cause some higher friction losses. An increase of the seal oil temperature by 10K should reduce the friction losses by approx. 3 kW. This effect has been confirmed during the 50h run test.

Tankersley, Yolanda J

From: Susan.Childs@shell.com
Sent: Thursday, May 24, 2012 3:31 PM
To: Fesmire, Mark E
Cc: mark.duplantis@shell.com; Sean.Churchfield@shell.com
Subject: FW: verify inspection dates

Importance: High

Hi Mark

Wanted to confirm the following dates as we discussed and include the SEMS audit on the Disco and Kulluk.

1. Drillship inspections – week of June 11, BSEE and USCG

2. Capping Demonstration – Week of June 11, BSEE

3. SEMS audit on Disco and Kulluk – week of June 11, BSEE

4. Containment Demonstration – week of June 4, BSEE (still tentative)

I understand that you would like Shell to identify a representative that will be on the ground during these activities for logistics, etc. I have copied Mark Duplantis so he can let us know who that person will be for 1 through 3, and Sean Churchfield for 4.

Please let me know if you have any questions.

Susan

BSEE AKOCSR Review of Shell Arctic Containment System (ACS)
May 15-30, 2012
Shell Offices, Anchorage, AK

INTRODUCTION AND BACKGROUND:

This review consisted of a study of specific design documents, drawings, and component information associated with the Shell Arctic Containment System (ACS). The review was conducted by BSEE Alaska OCS Region engineers, James Lusher and Kathy Crumrine, at the Shell Anchorage offices during the period May 15-31, 2012. BSEE engineers were provided hard copy access to all requested ACS design information.

System Description: The Arctic Containment System (ACS) is an asset designed for emergency response to oil spill scenarios under current and future oil and gas operations in the Chukchi and Beaufort Seas. Superior Energy Services, LLC[1] was contracted to design, assemble, construct, and operate the ACS.

The ACS is comprised of the following primary sub-systems as described in the Basis for Design: capture system (domes), ROVs, processing system, control system, flare system, offloading system, utility systems, safety systems, lifting and hoisting, and subsea dispersant injection. An expanded description of the functional elements of these sub-systems is provided as Attachment (1) to this report.

Seasonal Operation: The ACS Basis for Design includes the requirement to be capable of operating during the open water period starting in July through freeze-up and into early winter, ending in late December. In the event of emergency operations late in this period (November/December), Shell Ice and Weather Advisory Center (SIWAC) will monitor ice conditions (MDA RadarSat 2 imagery, MODIS satellite, Canadian Ice Services, National Ice Center, Contract weather services, IceNav images, and Field Observations) and ice management vessels are to be on station throughout the operation to aid in managing potentially hazardous ice from impacting operation of the ACS. Information on ice management and associated vessels is provided in the *Ice Management Plan* and *Critical Operations and Curtailment Plan* provided with the Beaufort and Chukchi Seas Exploration Plans.

OBJECTIVES:

BSEE intent for this review is to assess the potential functionality of this purpose built Arctic Containment System (ACS) for emergency operation in response to an oil spill; with the

[1] Superior Energy Services, LLC is a Texas Registered Engineering Firm, F-11244 (Certified 8/21/2009; Expires 8/31/2012); headquartered at 11000 Equity Drive, Suite 150; Houston, Texas 77041. Note: Any entity offering engineering services to the public of Texas must be a registered engineering firm; the Texas Board of Professional Engineers licenses these entities and they must be renewed annually.

maximum design processing capacity of 25,000 barrels per day of crude oil. This review looks to achieve a level of confidence in the capability of the system to perform its design functions and serve as an emergency response asset in the event of an oil spill scenario.

SCOPE AND METHODOLOGY:

The overall design process and associated specifications for select sub-systems and components were evaluated to assess the relative level of engineering design assurance built into the ACS. As such, the scope of this review included qualitative and quantitative review elements. Focus was placed on those aspects of the ACS that reasonably fall within the authorities provided under 30 CFR Part 250 and associated documents incorporated by reference (listed under 250.198) for OCS facilities of similar function. This review is limited to the ACS design and did not include the build phase of the project.

Worst Case Discharge (WCD) Models vs. ACS Design Flow Capacities: The ACS design flow capacities were compared to WCD model flow rates/properties to verify the ACS process capacities meets or exceeds the maximums modeled for the WCD.

API RP Reference Documents: As a basis for evaluation criteria, the following American Petroleum Institute (API) recommended practices (RP) and associated elements were utilized to guide the review:

- API RP 14C Analysis, Design, Installation, and Testing of Basic Surface Safety Systems for Offshore Production Platforms;
  - Section 2 Safety Device Symbols and Identification
  - Appendix A Process Component Analysis
  - Appendix C Support Systems

- API RP 14J Design and Hazards analysis for Offshore Production Facilities
  - Section 2.2.2 Surface Safety Systems
  - Section 2.2.4 Equipment Operation
  - Section 2.6 Hazards Analysis
  - Section 3.0 Basic Facilities Design Concepts
  - Section 6.2 Safety and Environmental Information
  - Section 7.0 Hazards Analysis

- API RP 75 Development of a Safety and Environmental Management Program for Offshore Operations and Facilities;
  - Section 2 Mechanical and Facilities Design Information
  - Section 3 Hazards Analysis

- API RP 505 – Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities
  - Section 6 Classification Criteria

- Section 7 Extent of a Classified Location

- API RP 2SK Design and Analysis of Stationkeeping Systems for Floating Structures;
  - Section 3 Environmental Criteria

- API RP 2N Planning, Designing, and Constructing Structures and Pipelines for Arctic Conditions;
  - Section 4 Environmental Considerations

PERSONNEL INTERVIEWED:

As this review required technical information to be provided by Shell and Superior Energy Services, the following personnel were contacted as needed and interviewed to acquire additional information associated with the design of the ACS.

Brian Miller, P.E.
ACS Project Manager
Shell International Exploration and Production, Inc.

John M. Ward, P.E.
Principal Concept Engineer - Projects and Technology
Shell International Exploration and Production, Inc.

Mario J. Garces
ACS Project Engineer
Shell International Exploration and Production, Inc.

For source stream information (stream composition, crude oil properties, and worst case discharge model data) needed to verify ACS design flow capacities, the following personnel were consulted:

Kirk Sherwood, PhD
Geologist
BOEM, Alaska OCS Region

DOCUMENTS REQUESTED AND REVIEWED:

The primary focus of this effort was to understand the engineering design and process flow of a WCD flow stream through the ACS. Accordingly, the following documents were reviewed in conjunction with the engineering principles of the API recommended practice documents listed above:

- Arctic Containment System Capacity Certification, March 6, 2012

- Superior Energy Services provided a letter of certification to Shell that states the ACS has been designed and engineered to produce a spill recovery and capability which meets or exceeds the worst case discharge of 25,000 barrels per day of crude oil. This letter has been signed and stamped by a Registered Professional Engineer with the State of Texas. This letter is provided as Attachment (2) to this report.

- Arctic Spill Containment System Basis for Design (Shell document)
  Issued October, 2010; revision 2
  Account Code: USE6000031
  ECCN Number: EAR 99
  - Appendix A
    - Alaska Containment System - Blowout Scenarios and Responses; revised 7/21/2010
  - Appendix C Metocean
    - Joint frequency distribution tables and rose plots for wind, wave, and current parameters at the Burger site in the Chukchi Sea. Wave parameters developed using USACE-WAM operational hindcast for the open season (June-November) from data gathered from June 1982 to November 2003; and continuous measurements of ocean current profiles collected from October 2008 to October 2009.
    - Air temperature tables: Maximum, minimum, and mean air temperature tables for variety of land based data stations.
    - Wave and wind parameters for the Sivulliq site developed from operational hindcast data from the Beaufort Sea Ocean Extreme Response (BORE). Data from period January 1998 through December 2007; and continuous measurements of ocean current profiles collected from September 2005 through April 2009.

- Arctic Containment System Basis of Design (Superior Energy Services document)
  Process Equipment Package - 2011-009-SESI-BOD-MTS-0001 Rev. A

- Arctic Containment System Process Design Drawings:
  - Process Flow Diagrams (PFDs)[2]
    - 2010-009-200-PFD-01 Light Crude Oil – Deep Water 25 MBPD of 32°F API Crude and 600 GOR;
    - 2010-009-200-PFD-02 Glycol Heater System 25 MBPD of 32°F API Crude and 600 GOR;

[2] PFDs provide table of stream properties (at 23 different locations throughout the ACS) by stream components (total basis, light liquid (oil), heavy liquid (water), and vapor). Properties include temperature, pressure, mole fraction vapor, molecular weight, mass density, molar flow, mass flow, vapor volumetric flow, liquid volumetric flow, STD vapor volumetric flow, STD liquid volumetric flow, enthalpy, mass enthalpy, mass heat capacity, and composition (mol%).

- 2010-009-200-PFD-03 Heavy Crude Oil Case – Deep Water 7 MBPD Oil of 20°F API Crude and 250 GOR;
- 2010-009-200-PFD-04 High Water Case 50 MBPD Water and 7 MBPD Crude from Capping Stack Operation;
- 2010-009-200-PFD-05 Medium Dome in Shallow Water 5 MBPD of 32°F API Crude and Water with 600 GOR;
- 2010-009-200-PFD-06 Light Crude Oil – Shallow Water 25 MBPD of 32°F API Crude and 600 GOR;

  - Piping and Instrument Diagrams (P&IDs)
    - 2010-009-200-PID-01 Large Subsea Containment Dome V-100;
    - 2010-009-200-PID-02 Manifold System;
    - 2010-009-200-PID-03 Surge Drum V-110;
    - 2010-009-200-PID-04 Crude/Crude Exchanger E-120;
    - 2010-009-200-PID-05 Crude/Glycol Exchanger E-110;
    - 2010-009-200-PID-06 Production Separator V-120;
    - 2010-009-200-PID-07 Transfer Pumps P-110 A/B;
    - 2010-009-200-PID-08 Flare Feed Drum V-200;
    - 2010-009-200-PID-09 Flare K.O. Drum V-130 & Pump P-120;
    - 2010-009-200-PID-10 Gas and Crude Oil Flare B-100 and B-110;
    - 2010-009-200-PID-11 Instrument Air/Plant Air N2 Supply System N-100;
    - 2010-009-200-PID-12 Flare Feed Drum Pumps P-130 A/B;
    - 2010-009-200-PID-13 CPI Oil/Water Separator T-100;
    - 2010-009-200-PID-14 Sea Water/Air Supply System FWD Machinery Space;
    - 2010-009-200-PID-15 Sea Water/Glycol Exchanger E-200;
    - 2010-009-200-PID-16 Chemical Injection Package G-100;
    - 2010-009-200-PID-17 Instrument Air & Nitrogen Distribution;
    - 2010-009-200-PID-18 Heating Medium

- Arctic Challenger Safety Analysis
  - Safety Analysis Flow Diagrams; Drawing No. 2011-009-209-SF-001; Sheets 1-4
  - Safety Analysis Function Evaluation (SAFE) Charts; Sheets 1-4

- Area Classification Drawings (Electrical)
  - SV-110916-EL-001; Sheets 1-7

- Artic Challenger Fire and Safety Plan
  - B1129-600-001; Sheets 1-3
    - Includes locations of Emergency Shutdown (ESD) Stations

- Arctic Containment System Safety Critical Element List
  - Production Systems (pressure vessels and tanks, flare and vent systems, over-pressure protection/emergency depressurization systems, process piping)
  - Process Safety and Control Systems (process shutdown valves and ESD).

- Arctic Containment System Design HSSE (Health, Safety, Security, and Environment) Case)[3]
  - 2011-009-SESI-HSE-P-0010
    - List of Hazards Analyses performed for ACS project; including table comprised of Hazard ID, Action Item, Status, Close out Response/Comments, and Supporting Documentation

- Critical Equipment (Sample) Mechanical Information:
  - Subsea Pumps P-100 A/B
  - Control Valve ZLB 102
  - 8" Gas Hose (dome to processing)
  - 6" Oil Hose (dome to processing)

- Subsea Containment Dome Flow Assurance and Computational Flow Dynamics (CFD) Analysis
  - Document No.: 121H002-010R-C

- Mooring Analysis
  - Mooring analysis requested; however, analysis not complete at the time of this review. The U.S. Coast Guard in consult with the American Bureau of Shipping (ABS) identified issues with the Arctic Challenger Motion Analysis (2011-009-406-EGR-02) and associated global motion results in relation to the application of local environmental conditions. The U.S. Coast Guard and ABS are working directly with Shell to resolve the concerns.

- American Bureau of Shipping (ABS) Class Certificate for Arctic Challenger
  - Class Certificate requested; however, certificate not yet issued by ABS. The Class Certificate and associated review directly relates to resolution of the concerns over Arctic Challenger survivability and/or maneuverability under extreme storm events (environmental conditions).

[3] The Design HSSE Case defines the systems and infrastructure that have been included in ACS design to effectively manage safety; and includes results of the detailed design formal assessment process applied to ensure all reasonable risk reduction measures have been implemented. This HSSE Case applies to the ACS barge (arctic challenger); emergency power; bear cub fast rescue boats; subsea containment dome; and separation and treatment process. The Design HSSE Case is a separate document from the Operational HSSE Case. The Operational HSSE Case is to demonstrate the major hazards associated with the facility operation are adequately understood and controlled with appropriate recovery measures in place. The Operational HSSE Case was not within the scope of this review.

ACS CONTRACT – TECHNICAL DESIGN SPECIFICATIONS:

As a basis for evaluating the overall design process and specifically the standards applied to the ACS, contractual specifications were requested. The following specifications were identified as requirements to the design/build of the ACS:

American Petroleum Institute

- API RP 11S2- Recommended practice for Electric Submersible Pump Testing
- API RP 14C – Recommended Practice for Analysis, Design, Installation and Testing of Basic Surface Safety Systems for Offshore Production Platforms
- API RP 14E – Recommended Practice for Design and Installation of Offshore Production Platform Piping Systems
- API RP 14F – Recommended Practice for Design and Installation of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities
- API RP 14J – Recommended Practice for Design and Hazards Analysis for Offshore Production Facilities
- API RP 17A – Recommended Practice for Design and Operation of Subsea Production Systems; General Requirements and Recommendations
- API RP 17B – Recommended Practice for Flexible Pipe
- API Spec 17D – Specification for Subsea Wellhead and Christmas Tree Equipment
- API Spec 17F – Specification for Subsea Production Control Systems
- API Spec 17J – Specification for Unbonded Flexible Pipe
- API RP 500 – Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities
- API RP 520 – Recommended Practice for the Sizing, selection and Installation of Pressure Relieving Systems in Refineries
- API RP 521 – Guide for Pressure-Relieving and Depressuring Systems
- API Standard 526 – Flanged Steel Pressure Relief Valves
- API Standard 527 – Seat Tightness of Pressure Relief Valves
- API 537 – Flare Details for General Refinery and Petrochemical Services
- API 610 – Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries (ISO 13709:2003)
- API 650 – Welded Steel Tanks for Oil Storage
- API 662 – Plate Heat Exchange for General Refinery Services
- API 682 - Pumps-Shaft Sealing Systems for Centrifugal and Rotary Pumps

American Society of Mechanical Engineers

- ASME Boiler & Pressure Vessel Code – Sections I, II, IV, V, VII, VIII and IX
- ANSI/ASME B16.5-2003 – Pipe Flanges and Flanged Fittings
- ASME B31.3-2006 – Process Piping
- ASME B73.1-2001 – Specification for Horizontal End Suction Pumps for Chemical Process

International Electro technical Commission (IEC)

- IEC 61508 – Functional Safety of Electrical / Electronic / Programmable Electrical Safety-related System

- IEC 61511 – Functional Safety-Safety instrumented systems for the process industry sector.
- IEC 61131-1, Programmable Controllers-Part 3: Programming Languages.

International Maritime Organization

- International Convention for the Safety of Life at Sea (SOLAS), 1974 (amendments up to 2007)

National Fire Protection Association

- NFPA 16 – Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems
- NFPA 20 – Standards for Installation of Stationary Pumps for Fire Protection
- NFPA 72 – National Fire Alarm Code
- NFPA 70 - National Electrical Code (NEC) (2008)
- NFPA 85 – Safety Requirements for Fired Equipment

American Bureau of Shipping

- Guide for Vessels Operating in Low Temperature Environments-2008

International Association of Classification Societies (IACS)

- Polar Class Rules-2008

American Welding Society

- AWS D1.1-2008

American Institute of Steel Construction

- Steel Construction Manual 13th Edition.

Instrument Society of America

- ISA S5.1 – Instrumentation Symbols and Identification
- ISA S5.3 – Graphic Symbols for Distributed Control/Shared Display Instrumentation, Logic and Computer Systems.
- ISA S5.4, instrument Loop Diagrams
- ISA S5.5 – Graphic Symbols for Process Display
- ISA S7.0.01 – Quality Standard for Instrument Air
- ISA 18.2 – Alarm Management
- ISA S12.13.01 – Performance Requirements, Combustible Gas Detectors
- ISA S26 – Dynamic Response Testing of Process Control Instrumentation
- ISA 75.01.01 – Flow Equations for Sizing Control valves
- ISA S75.19 – Hydrostatic Testing of Control Valves
- ISA S84.00 – Application of Safety Instrumented Systems for the Process Industries (US adoption of IEC 61508)
- ISA 99.00.01 - Security for industrial Control Systems

Miscellaneous

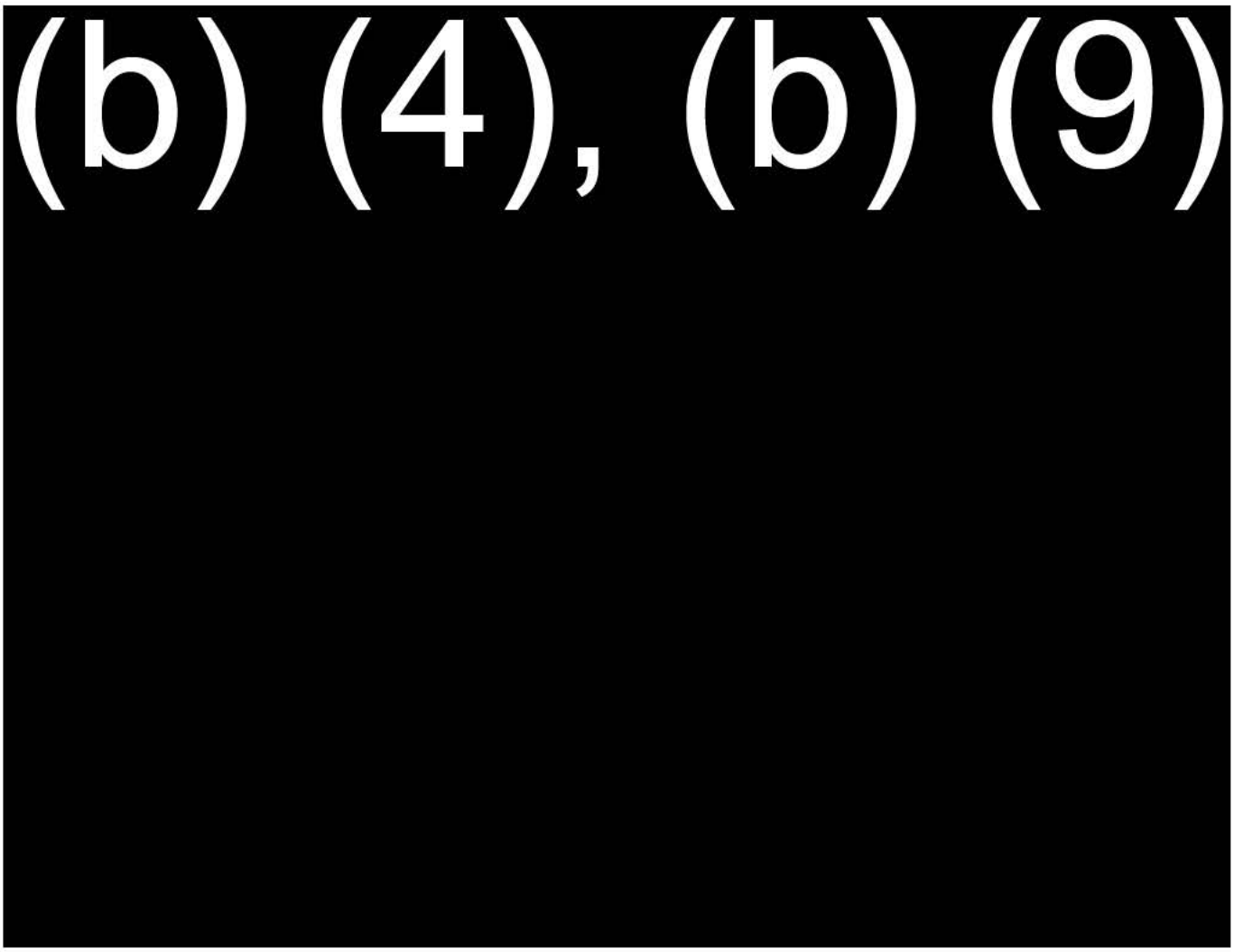
- IEEE 45-2002 – Recommended Practice for Electrical Installation on Shipboard

- ANSI/NACE MR0175-2002 – Sulfide Stress Cracking Resistant Metallic Materials for Oil Field Equipment
- ANSI/IEEE 515 – Electric Heat Trace
- ISO 19906 Marine Operations - Petroleum and natural gas industries - Arctic offshore structures[4]

(b) (4), (b) (9)

(b) (4), (b) (9)

(b) (4), (b) (9)



CONCLUSION:

Due to the concerns over the stability and/or station keeping capabilities of the Arctic Challenger under extreme environmental conditions (storms), the limiting conditions to which the Arctic Challenger can actually moor and process a worst case discharge stream is still under review by the U.S. Coast Guard in consult with ABS and BSEE.

Notwithstanding the stability and station keeping capabilities of the Arctic Challenger barge itself, this review found no evidence to suggest that the design of the ACS to capture and process a worst case discharge flow stream was anything other than within standard engineering practices. The design process implemented by Shell and Superior Energy Services appears of adequate quality and technical rigor to provide a functionally capable purpose-built system. Component (or sub-system) functional tests could provide additional confidence in the functional capabilities of the ACS.

[7] A list/database of hazards identified under hazards analyses is often termed the Hazard Registry.

The ACS has not been designed for operation in an H2S environment. The Chukchi Sea is currently designated as "H2S unknown" per the Chukchi Sea Exploration Plan.

RECOMMENDATIONS:

- Shell/Superior Energy Services require a robust as-built drawing program to evidence determinacy between design drawings and field installation. This is considered a prudent records management step and appropriate information to capture in evidencing a facility management program that incorporates the principles outlined in API RP 75.

- Shell provide BSEE a close-out status report on all hazard registry items identified under the various ACS hazards and risk assessments listed in this report (to be accounted for in the *ACS Project HSSE Action Tracking Database).*

- Verify electrical installations comply with area classification drawings (SV-110916-EL-001; Sheets 1-7). Evaluation of compliance to API RP 505 would require an onsite ACS inspection of electrical installations.

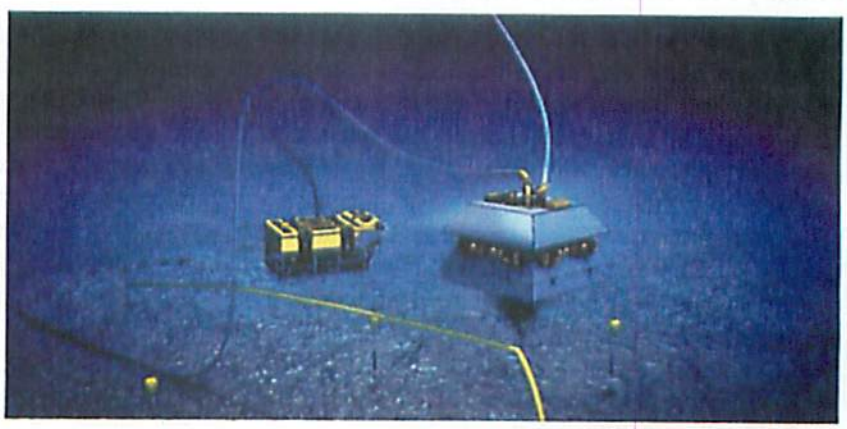
- Continue collaborative review of ACS stability and station keeping capabilities with the U.S. Coast Guard and ABS.

1 System Description

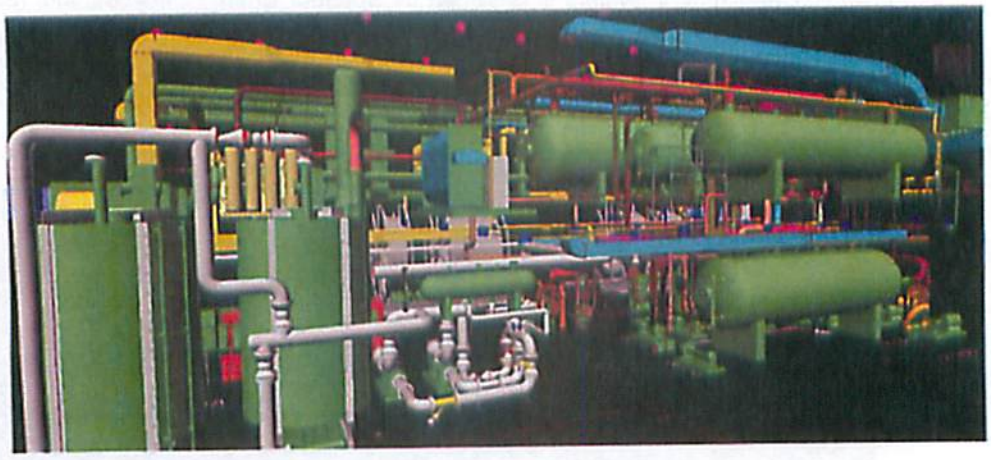
1.1 Arctic Containment System Overview

The Arctic Containment System is designed by Superior Energy Services, Inc. (SESI) to "vacuum up" uncontrolled oil and gas subsea well leaks by utilizing a barge carrying oil and gas recovery processing equipment. The SESI Arctic Containment System is designed to support Shell's exploratory drilling activities in the Beaufort and Chukchi Seas.

The Containment System starts with a specially designed containment dome that captures and directs the well leak fluids through separate oil and gas recovery hoses to the processing module equipment that is stationed on the barge.



Recovered production fluids enter the process module equipment which consists of a series of two and three phase separator vessels, process heaters and exchangers, pumps instrumentation and control system to separate the oil, gas and recovered water.



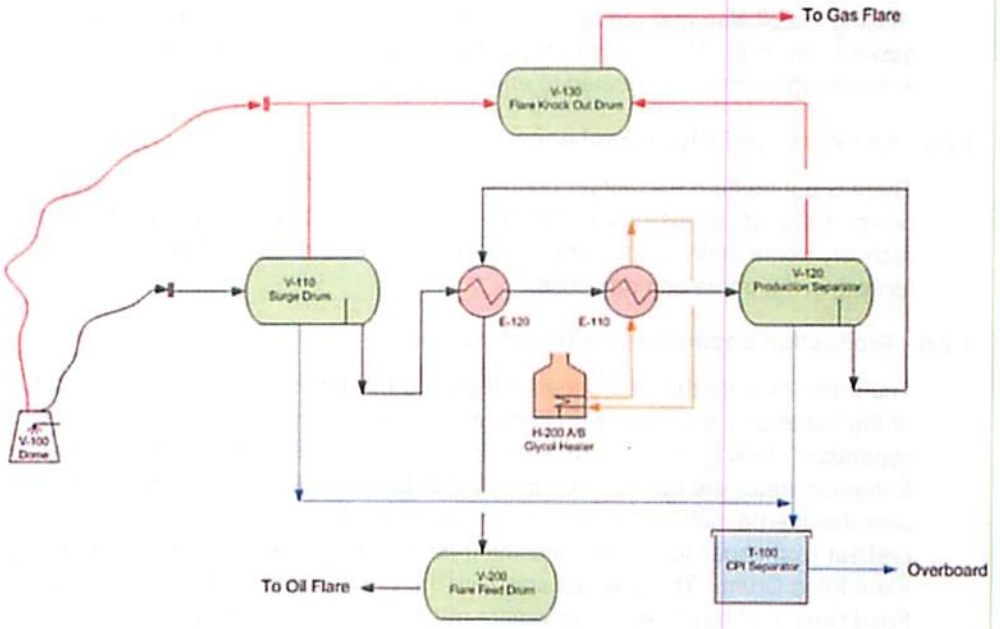
The recovered oil is either offloaded for recovery or sent to a flare system for burning. The recovered gas is burned in the flare system. Recovered sea water is purified and returned to the sea.

Another way the well leak flows can enter the processing module equipment on the barge is through a capping stack operation where a well intervention team directs the well leak flows up through well intervention hoses to a choke manifold on the barge. The choke manifold on the barge is piped to the processing module equipment in the same way as the subsea recovery dome.

1.2 Primary Process Module Equipment

The process module equipment includes pressure vessels, pumps, heat exchangers, piping, and other equipment required to separate oil, gas and water and send these phases to disposal or holding vessels. Vessels are typical 2 and 3-phase horizontal separators with appropriate baffles and inlets and outlets. Sand jetting internals are available for washing out the vessels if necessary. Plate style heat exchangers are provided to heat the recovered oil to a sufficient temperature to enhance oil-water separation and reduce the vapor pressure required for lightering operations. Recovered gas and oil from a contained subsea leak are burned in segregated flare sections. Any recovered water from a subsea leak is returned to the sea. An overview schematic of the process module equipment is shown in the figure below.

Simplified Process Flow Schematic



1.2.1 Flare Knock-Out Drum

The Flare Knock-Out Drum is a simple 2-phase separator that receives the gas from Containment Dome. Any entrained liquid carried up the gas hose is collected and pumped to the Surge Drum through one of two pumps whose selection is determined based on the rate of liquid accumulation. The gas stream is then routed to the flare.

1.2.2 Surge Drum

The Surge Drum is designed as a 3-phase separator. The oil from the subsea dome pumps is routed into the Surge Drum where free water settles out from the recovered oil and flows out the bottom to the CPI Separator. Any gas vaporizing in the oil stream due to de-pressuring in the drum will vent through the top outlet line and on to the Flare Knock-Out Drum. Oil in the Surge Drum floats on top the water settling side and over the baffle and passes through the process heater section on its way to the Production Separator. Due to the cold subsea temperatures from the dome, the oil-water separation in the Surge Drum is not expected to be very efficient.

1.2.3 Process Heat Exchangers

The oil from the Surge Drum will be cold from the sea bottom and will need to be warmed up to achieve more efficient oil and water separation in the downstream settler. Heating the oil also and reduce the oil's vapor pressure by allowing the lighter dissolved gases to boil out. The oil from Surge Drum passes through plate and frame exchangers in series where the oil is heated to enhance separation.

1.2.4 Sea Water and Glycol Exchanger

There is a third heat exchanger on the barge that heats sea water. The hot sea water is pumped through a hose down into the subsea containment dome and dispersed within recovery dome in order to warm the dome contents sufficiently to prevent hydrates from forming in the dome and gas hose.

1.2.5 Production Separator and Transfer Pumps

The warm oil from the exchangers enters the Production Separator on the settling side of the baffle and a demulsifier chemical is added to this drum to enhance the oil-water separation. Gas generated from the heating process is vented to the Knock-Out Drum. Entrained water will be removed from the bottom of the settling side with the oil flowing over the internal baffle into the oil collection side. The oil is around pumped through the preheat exchanger to preheat incoming fluid from the Surge Drum before going to the Flare Feed Drum. This preheat step with the Surge Drum fluid cools the oil to the Flare Feed Drum and helps reduce any more gas liberation from the oil.

1.2.6 Flare Feed Drum

Recovered oil from the Production Separator flows to the Flare Feed Drum which acts as a surge vessel or "wide spot in the line" to provide some hold up time before being burned in the flare or offloaded to another barge.

1.2.7 CPI Separator

The water from the bottom of the Surge Drum and Product Separator joins and flows through a Corrugated Plate Interceptor (CPI) Separator. The corrugated plate pack inside the Separator aides in the oil-water separation process. The CPI floats any entrained oil in the water off the top for recovery back to the process before the water is sent overboard.

1.2.8 Glycol Heaters

Parallel diesel fired heaters are used to heat a 60 wt% propylene glycol in water solution which supplies the heat to the sea water exchanger and to the oil preheat exchanger. Propylene glycol was chosen over other glycols due to its lower toxicity and environmental acceptance.

1.2.9 Flare System

If the recovered oil is not offloaded, than the recovered oil and gas recovered from the well leak is disposed of by burning the contents in separate oil and gas burners on the flare. The flare system has a forced air injection for clean burning and a water curtain for radiant heat protection.

1.3 Primary Subsea Equipment

1.3.1 Containment Dome and Subsea Hoses

The containment dome is a proprietary box-like structure which acts as a bulk 3-phase separator. The dome separates the liquids and gas phases of leaked hydrocarbons along with seawater in order for the oil and gas to be fully recovered and transported to the on-board ACS processing equipment.

A gas hose connected to the top of the dome will transport recovered gas back to the ACS under its own pressure while a separate oil hose connected on the dome will carry the recovered oil from the dome back to the ACS system.

1.3.2 Subsea Umbilical

The Subsea Umbilical is stored and deployed from the ACS system which supplies hydraulic and electrical power to the subsea containment dome equipment. It also provides fiber optic and electrical signals via a multiplexed control system. Nitrogen is also supplied to the dome to aide in its buoyancy.

1.3.3 Subsea Pumps

Redundant specially designed subsea pumps are mounted on the dome top to pump any recovered oil in the dome back to the ACS system.

1.4 Marine Systems

The marine systems are considered the utilities and offsites for the process area. It consists of storage and handling of bilge and ballast, diesel, potable water, black/gray water, and oily water. Additionally the marine system comprises the fire water distribution and power generation.

1.4.1 Potable Water

Fresh water is made using the reverse osmosis process. Sea water is pre-heated by a Sea Water Heater and filtered through a multi-media filter and a cartridge filter. The heated, filtered seawater is pressurized by a booster pump to force it through molecular membranes. The resulting fresh water is then disinfected by a UV sterilizer and stored in a Potable water storage tank. Reverse osmosis efficiency is approximately 60%, and therefore, it has a reject stream that is of high salinity sea water which discharges back to the sea.

1.4.2 Gray Water and Black Water Treatment

The Black and Gray Water Treatment System collect and treat all black and gray water from the accommodation modules. The system treats the water biologically with aerobic microbes. The microbes eat the solids and the clean water overflows to a clean well tank where it is then pumped overboard.

1.4.3 Fire Water Pumps

The Fire Water System is comprised of three pumps, one in the aft auxillary machinery space and two in the forward machinery space. Each pump delivers the required amount of sea water through the fire water main. The fire water main is dry until the fire detection system is activated and two of the Fire Water Pumps start. Fire water is automatically delivered to the deluge system in the area that triggered the alarm, and all other firefighting equipment receives fire water via manual activation to support the deluge system.

1.4.4 Diesel System

Diesel system is comprised of two storage tanks, coalescing unit, and two distribution pumps. The two storage tanks hold enough fuel to power the process unit and accommodations for a minimum of forty five days.

The diesel is cleaned by a coalescing filtration unit. The unit pressurizes the diesel to enter a dual stage filtration that is all housed in one vessel.

A dedicated diesel pump delivers diesel to the service boat (bear cub) aft fueling station, emergency generator day tank, two crane fill stations (port & starboard), and the diesel emergency firewater/ballast pump. A second dedicated diesel pump delivers diesel to the process glycol heaters and the HVAC glycol heater.

SUPERIOR
ENERGY SERVICES
MARINE TECHNICAL SERVICES

Captain Scott Powell
Vice President
Marine Technical Services

March 6, 2012

Mario J. Garces
PM Arctic Containment System
Shell International Exploration and Production Inc.
200 North Dairy Ashford
Houston, Texas 77079-1197 USA

Subject: Arctic Containment System Capacity Certification

This letter provides certification that the Arctic Containment System has been designed and engineered to produce a spill recovery and containment capability which meets or exceeds the worst case discharge of 25,000 barrels per day of crude oil. The Arctic Challenger vessel and its associated marine and process plant recovery equipment and systems have been designed to safely and effectively operate in the arctic conditions of the Beaufort and Chukchi seas off the northern coast of Alaska.

Best regards,

Scott Powell
Vice President, Marine Technical Services
Superior Energy Services LLC

I hereby certify the above information is true in all respects to the best of my knowledge.

Paul D. Marinshaw, P.E.
Project Engineering Coordinator, Marine Technical Services
Superior Energy Services LLC

SUPERIOR ENERGY SERVICES, LLC
Texas Registered Engineering Firm F-11211
11000 Equity Drive, Suite 150
Houston, Texas 77041

United States Department of the Interior

BUREAU OF OCEAN ENERGY MANAGEMENT
Alaska OCS Region
3801 Centerpoint Drive, Suite 500
Anchorage, Alaska 99503-5823

JUN 13 2012

Shell Exploration and Production
AK Venture Support Integrator
Attn: Susan Childs, Manager
3601 C Street, Suite 1000
Anchorage, Alaska 99503

RECEIVED
JUN 15 2012
Regional Director, Alaska OCS
Bureau of Safety and Environmental Enforcement
Anchorage, Alaska

Dear Ms. Childs:

This letter is to inform you that the Bureau of Ocean Energy Management (BOEM) has completed its review of the Marine Mammal Protection Act (MMPA) authorizations and the Endangered Species Act authorizations issued by the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS). Neither NMFS nor USFWS established criteria requiring Shell to disengage propellers if surfacing whales are sighted within 300 feet of the vessel. Accordingly, BOEM is modifying condition 12 of your Chukchi Sea EP to align with the criteria established by NMFS in its Incidental Take Statement for incidental harassment authorization under the MMPA.

Condition 12 now reads (new language underlined, deleted language lined out):

1. The Marine Mammal Observers (MMOs) on vessels underway in the Chukchi Sea must monitor the ocean waters near the vessel for surfacing whales. Vessel speed must be reduced to no more than 5 knots when within 300 yards of whales, and avoid multiple changes in direction or operating the vessel in a manner causing the whale to make multiple changes in direction when operating within 300 yards of a whale. ~~If a surfacing whale is observed within 300 ft (100 m) of the vessel, the vessel must disengage propellers to avoid potential propeller injury to the whale (prop strike) and, to a lesser degree, collision. Propellers must remain disengaged until the whale moves beyond 300 ft (100 m).~~ Safety of the vessel and its personnel will take precedence over this condition.

This action is consistent with our February 8, 2012 letter to you that stated BOEM would remove the requirement to disengage propellers on vessels within 300 feet of a surfacing whale if NMFS or FWS did not require the mitigation under their respective MMPA or ESA authorizations.

If you have any questions concerning this letter, please contact me at (907) 334-5273.

Sincerely,

David W. Johnston, Regional Supervisor
Office of Leasing & Plans

cc: Mark Fesmire, Bureau of Safety and Environmental Enforcement
Jeffrey Missal, Bureau of Safety and Environmental Enforcement
David Moore, Bureau of Safety and Environmental Enforcement
Geoff Haskett, U.S. Fish & Wildlife Service
Craig Perham, U.S. Fish & Wildlife Service
James Balsiger, National Marine Fisheries Service
Brad Smith, National Marine Fisheries Service

Tankersley, Yolanda J

From: Susan.Childs@shell.com
Sent: Wednesday, August 01, 2012 2:14 PM
To: Fesmire, Mark E
Subject: No deployment this weekend

Hi Mark,

We have to cancel again. Will update at the end of this week.

Susan

Tankersley, Yolanda J

From: Susan.Childs@shell.com
Sent: Thursday, August 23, 2012 3:06 PM
To: Fesmire, Mark E
Subject: Field observations in Bellingham
Attachments: Arctic Containment System Process Circulation Aug 21 2012.pdf; Arctic Containment System Deployment Exercise Aug 21 2012.pdf

Hi Mark, <<Arctic Containment System Process Circulation Aug 21 2012.pdf>> <<Arctic Containment System Deployment Exercise Aug 21 2012.pdf>>

The team I Bellingham sent the attached as recommended system overview guidelines for field observations. Let us know your comments if you have any.

Have a great trip and let me know if you need anything.

Thanks

Susan

Arctic Containment System August 21, 2012

Process Water Circulation Demonstration

1. Fill process vessels V110 and V120 with fresh water to sufficient levels to overflow the oil weir.
2. Fill vessel V200 and V130 with fresh water to about half full.
3. Fill oil bucket on T100 with fresh water.
4. (W) Demonstrate main process flow by circulating water from V110 through heat exchangers E110 and E120 to V120. Continue flowing to V200 via pumps P110A/B and flow back to V110 from V200 via pumps P130A/B.
5. Demonstrate operation of V200 water draw by pumping water from the bottom of V200 to V120 via pump P190.
6. Demonstrate recirculation of skimmed oil from the CPI separator, T100, by circulating water from T100 oil bucket to V120 via pump P140.
7. Demonstrate operation of Flare Drum pumps by pumping water out of V130 via pumps P120 and P125.

(W) – Identified as an activity to be witnessed by BSEE.

Arctic Containment System Deployment Exercise August 21, 2012

1. Arrive on-site at Vendovi anchorage
   1.1. Position Arctic Challenger at the pre-established deployment test location with minimal vegetation and 100 – 150 ft water depth
2. Deploy the Arctic Challenger mooring system
3. Launch ROV
   3.1. (W) Demonstrate subsea navigation and cameras with survey of area
   3.2. Select a seabed location as the "leak point"
   3.3. Deploy one clump weight as the target leak point
4. Deploy 4 clump weights to N, S, E, and W of target.
5. Deploy containment dome and support buoy using crane alongside ACS barge
   5.1. (W) Connect hoses and umbilical
   5.2. (W) Verify operation of winches, valves, and instruments
   5.3. Overboard the containment dome and associated rigging
   5.4. Connect Bear Cubs and tugger to dome flotation
6. (W) Tow dome to target (> 300' away from ACS) site with Bear Cubs
   6.1. Demonstrate wye towing pattern
   6.2. Stop tow with dome approximately 50 -75 feet horizontally from target
7. Connect containment dome to 4 clump weights with ROV
   7.1. (W) Demonstrate ability to reposition a clump weight and attachment to subsea mooring line
      7.1.1. Note: This will be done with a 5th clump weight to assure stability of the containment dome
   7.2. Fill buoyancy tanks with nitrogen to proper winch tension and disconnect support buoy
   7.3. Fill gas line with nitrogen until bubbles are seen by the ROV at the J-tube outlets. Verify level transmitter calibrations.
   7.4. Verify proper operation of inclinometer using ROV and adjusting buoyancy tank levels
8. (W) Demonstrate positioning capability of dome by maneuvering dome above target. Monitor with ROV and track on subsea navigation system.
9. (W) Flow water from the dome with Bornemann pumps
   9.1. (W) Flow through the hose to the barge and then bypass it back overboard.
   9.2. No seawater will be flowed through the process equipment.
10. Flow sea water to flare demonstrating water curtain
11. Flow atomizing air to flare oil burners
12. Disconnect containment dome from clump weights
13. Recover containment dome and stow for transit
14. Recover clump weights including target
15. Recover ROV
16. Recover mooring system
17. Tow back to dock.

(W) – Identified as an activity to be witnessed by BSEE.

United States Department of the Interior

BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT
Alaska OCS Region
3801 Centerpoint Drive, Suite 500
Anchorage, Alaska 99503-5823

Ms. Susan Childs
Shell Gulf of Mexico, Inc.
3601 C Street, Suite 1334
Anchorage, AK 99503
United States of America

AUG 30 2012

Dear Ms. Childs:

The Alaska Region of the Bureau of Safety and Environmental Enforcement (BSEE) is in receipt of Shell's Application for a Permit to Drill (APD) **Well Number 001, Burger A, on lease OCS Y-2280, Block 6764, in the Chukchi Sea (API number 55-352-0000200).** The application was partially submitted and dated January 31, 2012 and completed on July 18th 2012. More recently, in a letter to BSEE from Shell Vice President Peter Slaiby, dated August 21, 2012, you sought "conditional approval" of the APD to allow for limited drilling operations before the arrival of the Arctic containment system. In particular, you requested permission to drill and set the 30" structural and the 20" surface casings. Your application has been reviewed for compliance with the Outer Continental Shelf Lands Act, 30 CFR Part 250 and other statutes and regulations applicable to APD's. BSEE finds that Shell has complied with those authorities and approves the subject APD to a depth equal to the casing point associated with the 20 inch casing at approximately 1440 feet true vertical depth. Upon completion of the testing and siting of the Arctic Containment System Shell will submit an Application for Permit to Modify, which, if approved, would allow Shell to continue operations outlined in the initial APD.

This approval is based on the findings below and subject to the conditions attached to this communication as Attachment A, Conditions of Approval for the Burger A, Well #001 and Attachment B Procedures for Well Data and Records Submittal. It is also conditioned on Shell's compliance during the permitted activities with all applicable BSEE regulations and requirements, U.S. Coast Guard regulations and requirements, provisions in the Exploration Plan (EP) dated May 2011, as approved by the Bureau of Ocean Energy Management (BOEM), BOEM regulations and requirements, provisions in the Oil Spill Response Plan approved by BSEE, conditions of approval for all permits or authorizations issued by Federal agencies, all lease stipulations, and Notices to Lessees.

This approval is valid unless and until there is a material change to conditions or facts as presented in Shell's application.

If any provision contained in any plan or application conflicts with any provision or condition approved in writing by BSEE, the provision or condition approved by BSEE later in time will control. In the event another agency approves deviations from plans, permits or conditions initially issued by that agency, copies of such approvals must be sent to BSEE. Except when emergency action is required, a written request for authorization must be sent to BSEE for the bureau's review and approval prior to deviating from BSEE approved plans, applications, or conditions.

BSEE finds that you have provided sufficient data, as required with relation to the applicable provisions of 30 CFR 250.417, to show that the Mobile Offshore Drilling Unit Noble Discoverer is in compliance and

is hereby approved for all exploratory drilling operations conducted in the Chukchi Sea of the Arctic Outer Continental Shelf (OCS) pursuant to this application and the EP.

BSEE also finds that you have provided sufficient data, as required with relation to the applicable provisions of 30 CFR 250.417, to show that the designated relief well drilling unit Kulluk is in compliance, and is hereby approved, for all exploratory drilling operations conducted in the Chukchi Sea of the Arctic Outer Continental Shelf (OCS) pursuant to this application and to the EP. In the event hydrogen sulfide is found during the drilling operations the Kulluk will be required to comply with 30 CFR 250.490 if used as a relief well rig.

BSEE further finds that Shell's proposed well capping and containment systems have been designed for the projected worst case discharge conditions. The intended uses of these systems are hereby approved. BSEE will require that a witnessed deployment test of the containment system in which Shell has demonstrated that it has the ability to successfully deploy the system and have it on location pursuant to the oil spill response plan prior to BSEE's consideration of Shell's request to drill below the 20 inch casing point.

BSEE hereby approves Shell's Welding and Burning Program and Hydrogen Sulfide Contingency Plans for operations conducted on the Noble Discoverer.

BSEE will provide a continuous inspection presence during drilling operations and will use Shell transportation and lodging for this purpose. As allowed in 30 CFR 250.133, Shell will request reimbursement for transportation based on the existing agreement between Shell, DOI Aviation Management Division and BSEE. Reimbursement for lodging must be submitted within 90 days of the completion of the drilling program. In addition BSEE will be conducting inspections and collecting data in regard to the EPA's National Pollutant Discharge Elimination System General Permit No. AKG-28-0000 and EPA issued air quality permits at the request of the EPA by letter dated July 27, 2012(copy enclosed).

After office hours, weekends, and holidays, all notifications relating to activities approved pursuant to this application should be made to the BSEE active duty officer at 855-277-2733 (toll free) and during business hours, all notifications should be made to the BSEE, active duty officer at (907) 334-5300.

Sincerely,

Mark Fesmire PE, JD
Regional Director, BSEE

Attachments

cc: U.S. DOI, BOEM, AKOCSR, Regional Director
U.S. DOC, NOAA, NMFS
U.S. DOI, Fish and Wildlife

Conditions of Approval for the Burger A, #001 Well

1. The following waivers have been authorized:
    a. Testing of casing strings as indicated on Form BSEE -0123S is approved.
    b. Your request for a waiver to the requirements under 30 CFR 250. 423 (c) regarding a negative pressure test is approved.
    c. Testing of the BOP components to the pressures indicated on Form BSEE -0123S is approved.
    d. Your test pressure for the annular preventer as indicated on Form BSEE -0123S is approved.
    e. Deployment of a remote BOP control panel intended to operate the BOP stack from the sea floor is approved.
    f. Your request to test the deadman/autoshear system during the stump test only is approved.
    g. Your requested method to temporarily abandon the proposed pilot hole is approved.
2. This office will conduct a predrill inspection of your drilling vessel prior to the start of operations.
3. Shell will not be able to drill below the 20 inch casing point without fulfilling the conditions stated in the letter accompanying these conditions.
4. No drilling activities may be conducted beyond each additional casing shoe unless specifically approved by the BSEE inspector on location. BSEE will evaluate the condition of the well, results of safety equipment tests, the nature and duration of the next phase of the drilling program, existing and forecasted environmental conditions, and the procedures under an approved contingency plan [30 CFR250.417(c)(2)] that addresses design and operating limitations of the drilling unit as well as the actions necessary (i.e. suspension, curtailment, or modification of drilling or rig operations) to remedy various operational or environmental situations in order to maintain safety and prevent damage to the environment; including implementing well capping and containment or relief well drilling plans.
5. Final certification of the blowout preventer system as required in 30 CFR 250.416 (f) shall be provided to this office prior to the initial use of the BOP on this well.
6. Data submission procedures and criteria for this well are listed in a attached document (Procedures for Well Data and Records Submittal)
7. Shell must submit a daily summary report on form BSEE-0133 to this office until the final status of the well is established (one copy). Daily marine mammal reports shall be attached to the form.
8. Shell must notify this office immediately in the event the well encounters shallow gas, abnormal pressure, or lost circulation.
9. Shell must provide this office with representative dry samples collected during the drilling of this well as soon as available. Shell is also requested to collect and retain a set of wet well cuttings for the Bureau of Ocean Energy Management. This request is voluntary and the samples are intended to provide for public access once the proprietary term for the samples is concluded. Further discussions related to this voluntary request can be concluded with appropriate BOEM representatives.
10. Shell must submit within thirty days of completion of the well all oceanographic and meteorological data collected during the drilling of this well.
11. Shell must submit an Application for Permit to Modify to change any approved portion of the APD prior to the commencement of the proposed operations. Verbal approval in an emergency

may be granted, however written APM's must be submitted no later than the end of the 3rd business day following the verbal approval.

12. Shell shall notify this office as well as the onsite representative 24 hours in advance of a Blowout Preventer test.
13. Shell must submit form BSEE – 0124 in advance of either temporarily or permanently abandoning this well. This form must contain all information required in 30 CFR 250, Subpart Q for abandonment of wells.

BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT
ALASKA OCS REGION

Procedures for Well Data and Records Submittal

This document defines the procedures on how lessees/operators submit well records required by 30 CFR 250.468 and 469, and clarifies the specific well records you should submit, the submittal dates of the various well records, and the correct locations where you should send these well records.

The BSEE collects, verifies, and stores data by the well's unique 12-digit American Petroleum Institute (API) number we assign. The BSEE Alaska Outer Continental Shelf Region (AKOCS) uses the data collected to make informed regulatory decisions based on your timely submittal of complete and accurate well records. We define "submittal date" as the original date the data are due to the appropriate office.

According to 30 CFR 250.468(a), "you must submit copies of logs or charts of electrical, radioactive, sonic, and other well-logging operations; directional and vertical well surveys; velocity profiles and surveys; and analysis of cores to BSEE." Also, in accordance with 30 CFR 250.469(b), the AKOCS will also require submittal of paleontological reports as well as washed and dried samples collected from the well.

When to Submit Well Data Records

1. Field Data

   As stated in the approval documents for these operations this office will take an active role in assess plans for the continuation of well activities. Shell will be expected to make available digital data and field prints electronically from the well site via a secure website data delivery system or equivalent to enable this review from this office. This should be done for all logging operations including pilot hole, surface, intermediate and final runs(both wireline and Logging While Drilling logs). This also includes detailed mud logging data.

2. Final Data

   Operators should submit one copy of the digital data on a CD or DVD in a read-only format to the appropriate entity as outlined in Attachment 1. Each CD or DVD should be properly labeled with the Area, Block, OCS, Well Number, Well Suffix, API, and the data type (i.e., Paleo Report, Conventional Core Report, Vertical Seismic Survey, etc.). Digital and image NMR data must be submitted on separate physical media and nomenclature for NMR data files and tool codes should clearly identify them as NMR datasets.

Well records are divided into four groups for the timely submittal of the data.

a) Well Log Data, Directional Surveys, Velocity Surveys, Analyses of Percussion Sidewall Cores, Wireline Formation Test Logs, Drill Stem Tests and Mudlogs/Reports

Submit:

Well log data,
Directional surveys,
Velocity surveys (time/depth pairs),
Percussion/rotary sidewall analysis of cores,
Wireline formation tests logs (summary log), and
Drill stem tests (initial report)

To be submitted within 30 days of the "Date Operations Completed" of the last logging run (MWD/LWD or wireline) that you report in Item 7 of the Open Hole Report (Form BSEE-0133S) for each 12-digit wellbore, sidetrack, and/or bypass. Note: "Date Operations Completed" for MWD/LWD is when the data is retrieved from the drill string.

b) Paleontological, Detailed Rotary Sidewall and Conventional Core Analyses, and Vertical Seismic Profile Reports and Information

For each wellbore in which these data were collected, submit no later than 90 days after the "TD DATE" you report in Item 10 of the Well Activity Report (Form BSEE-0133).

Detailed paleontological reports and information,
Detailed rotary sidewall and conventional core analyses/reports and information, and
Detailed vertical seismic profile reports

Submit these well records when the report is completed, even if the report is generated by you and/or third party (i.e., academic partners, non-lessee partners and/or consultants) years after the wellbore is completed.

c) Geochemical Analyses and PVT Analysis of Fluid Samples

For each wellbore in which these data were collected, submit geochemical analyses and/or PVT Analysis of Fluid Samples no later than 120 days after the "TD DATE" that you report in Item 10 of the Well Activity Report (Form BSEE-0133). Submit these well records when the report is completed, even if the

report is generated by you and/or third party (i.e., academic partners, non-lessee partners and/or consultants) years after the wellbore is completed.

d) End of Operations Report (Form BSEE-0125)

For each wellbore, submit an End of Operations Report (Form BSEE-0125) and all its attachments no later than 30 days after the "END DATE" you report in Item 10 of the Well Activity Report (Form BSEE-0133).

The BSEE AKOCS uses the Well Activity Report (Form BSEE-0133) and Open Hole Report (Form BSEE-0133S) to track well activity; therefore, it is crucial that you submit a complete and accurate report to the appropriate BSEE AKOCS District Office in a timely manner. We will treat delinquent and/or incomplete reports in the same manner as delinquent and/or incomplete well data, and such violations may result in the BSEE AKOCS exacting an appropriate remedy, such as issuing an Incident of Non-compliance (INC).

The BSEE AKOCS may request that you submit well logging data, directional surveys, velocity profiles and surveys, percussion sidewall analyses of cores, wireline formation tests, and drill stem tests before the 30- day limit when we determine that circumstances warrant such action. When we determine that circumstances so warrant, we may also request that you submit preliminary reports of analytical data, namely

Geochemical analyses/reports and information,
PVT analyses of fluid samples,
Detailed paleontological reports and information,
Detailed rotary sidewall core analysis and information, and
Detailed conventional core analysis and information before the respective 90-day or 120-day limits.

The BSEE AKOCS recognizes that you need adequate time to submit complete and accurate well records. If you request it, BSEE AKOCS may grant you a departure under 30 CFR 250.142 for a new required date for submitting the data pertaining to that wellbore.

Where to Submit Well Records

Shell will need to coordinate access to field digital well logs with the following office. This office will also handle receipt of dry samples.

Bureau of Safety and Environmental Enforcement
Alaska OCS Office
3801 Centerpoint Dr., Suite 500
Anchorage, AK 99503
Office Phone: 907-334-5300
Office Fax: 907-334-5302

Shell will provide final copies of all digital image and vector well log data and related reports to both the Alaska BSEE office and to:

A2D Technologies
d/b/a TGS Geological Products and Services
1010 Common Street, Suite 2040
Attn: BSEE Well Records (Alaska)
New Orleans, LA 70112
Office telephone: 504-524-3450
Fax: 504-524-3454

A "Well Records Submission Summary" in Attachment 1 of this NTL provides an overview of the various well records, including which entity receives which well records and the addresses and contact numbers of the appropriate BSEE AKOCS Offices, and A2D Technologies. We strongly recommend that you provide a transmittal letter when you submit any well records. This transmittal should contain the following information:

- Operator's Name
- Operator's Contact Name and Telephone Number
- Bottomhole Location: Area/Block/Lease/Well Name and Number/API Number
- Date Well Records Sent
- Detailed List of Well Records

It is your responsibility to ensure that the BSEE AKOCS and A2D Technologies receive all well data and information within the specific periods. If we notify you of delinquent data, we will initiate an appropriate remedy, such as issuing an Incident of Non-Compliance (INC). If you choose to use a third party to submit well data, it remains your responsibility to ensure that the data are timely received by the BSEE AKOCS and A2D Technologies. Realizing that you may need time beyond the specified deadlines to prepare unique data or information, we will address the submission of such on an individual basis. We will address INC's issued by the BSEE AKOCS Office for the delinquent data submittal at your yearly performance review or through other appropriate and timely measures.

Well Naming and Numbering

Show the API Number and well name assigned by the BSEE AKOCS Office on all well records you submit to us. You can find these on the approved Application for Permit to Drill (Form BSEE-0123) for the original hole, sidetracks, and/or bypasses.

Data Types and Formats

A. Well Log Data types

a. Log Curve Requirements: Submit the following curve types and log images in final form, if the data were obtained in the open-hole portion of a wellbore, sidetrack, or bypass****:

- Acoustic or Sonic
- Bulk Density
- Caliper
- Conductivity
- Density Correction
- Dipmeter (computed)
- Gamma Ray
- Resistivity/Induction
- Spontaneous Potential
- Nuclear Magnetic Resonance *
- Mudlogs***
- Neutron
- Tension
- Porosity
- Borehole Image
- Equivalent circulation density
- Rwa
- Temperature
- Formation Tester**
- Rate of Penetration
- Photoelectric
- Slide Indicator

b. Cased hole log data: Submit all curve types and log images as identified above for any cased hole logs collected in lieu of, or in addition to, open hole logs.

* For the submittal of digital NMR vector curve data,. The following are examples of curve types are to be submitted, and are not limited to you should submit:

- Quality Control Curves
- Computed Curves
- T2 Bin Distributions

Due to NMR file sizes and complexities, the BSEE now requires that digital and image NMR data are submitted on separate physical media (separate from other well log data) to its logging contractor, A2D Technologies. Also, NMR data file and tool code nomenclature should clearly identify these data as NMR-related. We encourage direct submittal of the completed log data set from the acquiring service company.

** Formation Tester is considered any logging tool that collects pressure data and/or fluid samples from the borehole. Summary Print log images, pressure gradient plots, and preliminary sample analysis must be submitted. Formation Tester summary data should also be submitted in ASCII format. All detailed reports (i.e., PVT Analysis) generated from the samples collected from the borehole must be submitted in a timely manner (see Attachment 1).

*** For mudlog specifications, see section Part I, Section G of this NTL. You will be required to submit an image file for these types of logs to A2D Technologies.

****Although API Recommended Practice (RP) 31A, Standard Form for Hardcopy Presentation of Downhole Well Log Data, is not incorporated by reference in BSEE regulation's, you may use it for guidance on providing complete and accurate well information.

Note: Do not submit digital data for Formation Tester, Borehole Image, and Computed Dipmeter to A2D Technologies.

c. Well Log Image File:

Submit image files in one of the formats listed below. For Formation Tester type logs, the summary logs will suffice. See Part I, Section H of this NTL for mudlog specifications.

i. For all vertical wells, as defined in 30 CFR 250.461, submit image files for

- Measured depth (MD) 1-inch, or 2-inch correlation, and 5-inch formation evaluation logs and
- Any additional scales you obtained.

ii. For all non-vertical wells, as defined in 30 CFR 250.461, submit image files for

- True vertical depth (TVD) 1-inch, or 2-inch correlation and, 5-inch formation evaluation logs,
- Measured depth (MD) 1-inch, or 2-inch correlation, and 5-inch formation evaluation logs, and
- Any additional scales you obtained.

Detailed 5- inch image logs must be composited, but individual runs do not need to be spliced.

If logging data from more than one logging vendor are collected in a borehole, you may submit either an image of the logging data from all vendors composited into a single set of logs or a set of images of the composited logs from each individual vendor.

d. Image File Formats: If the original log is in color, the submitted image file should also be in color.

i. The following image file formats are preferred:

- Computer Graphic Metafile (CGM) version 1-4
- Baker Metafile
- Schlumberger PDS (PDS files are usually for one logging run; any borehole with multiple runs should submit composited file format)
- Halliburton CGM
- Weatherford DPK

If the preferred formats listed above are not available, you may submit the image file in the Tag Image File Format (TIFF) with the following specifications:

ii. Format (TIFF) with the following specifications:

1. Black and White TIFF Images:

- Header tags as per TIFF standard
- Resolution – 200 dpi
- Compression – CCITT group IV
- Tiling – No

2. Color TIFF Images:

- Header tags as per TIFF standard
- Resolution – 200 dpi
- Palette color – 256 colors
- File format LZW Compressed TIFF
- Tiling - No

Clearly label each well log image with its associated API number, bottom hole lease number, well name, well name suffix, log type, scale and depth domain (MD or TVD).

e. Digital (Vector) Well Log Data: Submit composite digital curve data (one value per curve for each depth value and with individual tool runs merged) in the Canadian Well Log Society Log ASCII Standard (LAS), Version 2.0 format; and Digital Log Interchange Standard (DLIS) or Log Interchange Standard (LIS) format . Ensure that the curve data are in a MD composite layout, including full headers for each wireline and MWD/LWD logging tool run and curve description for all curves. Ensure that all required log curves (see Part A.1 of this NTL) represented on the log image file are included in the digital curve file. If you collect logging data from more than one logging vendor in a single borehole, submit a separate set of composited log curves from each individual vendor . Do not splice digital curves from different vendors to form a set of composited log curves.

i. Full header information, should including the following:

- 12-digit API number
- well name suffix
- bottom hole lease number
- bottom hole area and block
- well name

ii. Information for each tool run, should including the following:

- borehole fluids
- depth interval
- mud
- filtrate resistivity and temperatures
- casing information
- bottomhole or maximum recorded temperature
- circulation history information
- tool schematic
- tool calibration record

Full logging tool parameters (including matrix values), position of logging tool (i.e., centered or eccentered), and logging engineer's comments; and adequate curve description and

Tool -specific and service provider-specific curve and parameter mnemonics (names and abbreviations) maintained as originally acquired.

If a log is spliced, the splice depth should be clearly noted along with which files were used.

Submit digital and image logs on CD or DVD ROM (read-only memory). Digital and image logs may be submitted on the same CD or DVD.

Directional Surveys

Submit one digital copy of the final composite directional survey. For the Digital Directional Survey format, see NTL 2009-N10.

- Submit, on CD or DVD ROM these survey results coded in ASCII.
- According to 30 CFR 250.461(d) (2), "You must correct all surveys to Universal-Transverse-Mercator-Grid-north or Lambert-Grid-north after making the magnetic-to-true-north correction."

If your use of more than one vendor prevents the consolidation of the separate surveys within a well, submit the final composite survey from each vendor .

Velocity Profiles and Surveys

Vertical Seismic Profiles: Submit the results from all borehole seismic data (in cased or uncased holes), as well as concurrently run directional surveys for both vertical and directional wells, if they are different from directional surveys referred to in Part I, Section B of this NTL . Submit, on CD or DVD ROM, digitally recorded data in a industry standard format (LAS, DLIS, ASCII, CGM, TIFF, JPG, SEGY, DOC), that include, but are not limited to:

- Normal Incidence VSP;
- Acoustic Log Calibration Report;
- Final VSP and Corridor stacks for 2D data and final stacked and migrated volume for 3D VSP data;
- Composite plot with VSP, Corridor stacks, synthetic seismogram, and well logs;
- any referenced information within the report correlative with the acquisition, such as 2-way time indexed depths and velocities, survey parameters, digital images, and computed survey data and directional; and
- If acquired, format time/depth pairs.

Velocity Surveys (Time-Depth Pairs/Checkshots): Submit, on CD or DVD ROM, one digital copy coded in ASCII format (see Attachment 2 of this NTL). The report should include or be annotated with the following:

- API number
- Well name and number
- Well name suffix
- Contractor or service provider
- Contact name (phone number or e-mail address)

Note that the digital format has been modified to expand the columns for True Vertical Depth and One-Way Travel Time from 5 to 8 to include two decimal places for each column.

We encourage direct submittal of the completed survey from the acquiring service company .

Analysis of Conventional Cores, Percussion/Rotary Sidewall Cores, Wireline Formation Tests, and Drill Stem Tests

IF...
you conduct any of the following:

- Conventional cores descriptions and analysis
- Percussion/Rotary sidewall core analysis or equivalent,
- Wireline formation tests - include any logs (summary logs are acceptable) and associated lab results, or
- Drill stem tests

THEN...

As soon as the final and/or revised conventional core, percussion/rotary sidewall core reports and/or data become available to you, send one digital copy of the entire, detailed report. Reports should include, but are not limited to the following:

- Standard analyses for porosity,
- Permeability
- Water saturation
- Core photos
- compaction analyses
- laser grain size analyses
- stressed brine porosity and permeability analyses
- rock mechanic studies
- water extraction and core gamma logs
- core photos

In addition, provide one copy of all studies you performed on the core(s) and tests for the purpose of describing and characterizing the reservoir architecture through detailed stratigraphic or depositional analyses. In certain situations, the BSEE AKOCS may require that you submit preliminary or interim reports .

Submit, on CD or DVD ROM, one copy of the description and analysis of the conventional core, the percussion/rotary sidewall core, wireline formation tests, and drill stem tests reports in the original digital format (i.e., WordPerfect, Word, Excel, Lotus 1-2-3). Any data acquired in a log format should be submitted as a log image.

Geochemical Analyses/Reports and Information

Submit one copy of the Geochemical Analyses/Reports and Information in the original digital format (i.e., WordPerfect, Word, Excel, Lotus 1-2-3, JPEG, CGM, TIFF) if you conducted any geochemical analyses/reports, including internal company or external contractor interpretation reports on

- Cuttings,
- Sidewall or conventional cores, and
- Fluid samples from the well. The term "sample" encompasses:
- Hydrocarbon gases, specifically methane through pentanes and C6+ hydrocarbons;
- Non-hydrocarbon gases (carbon dioxide, hydrogen sulfide, argon, helium, and radon); and
- Any liquid hydrocarbons (such as condensate, crude, and bitumen) encountered by the well in cuttings or shows and from any other well sampling or fluid testing.

The analyses, reports, and interpretations to be submitted include, but are not necessarily limited to , the following types of data:

- Total organic carbon
- Polynuclear aromatic hydrocarbons
- Rock-eval pyrolysis
- Stable isotope analyses of carbon & hydrogen
- Thermal chromatography-gas chromatography
- Compound-specific isotope ratio mass spectrometry
- Bulk pyrolysis & hydrous pyrolysis

- Isotope ratio mass spectrometry
- Gas chromatography
- Kerogen isolation & bitumen separation
- Pyrolysis/gas chromatography
- Organic petrography
- Complete saturated biomarker & aromatic hydrocarbon analysis by GC MS
- Vitrinite reflectance
- Elemental analysis of kerogen

In addition, submit all data and reports on geochemical characterization of produced oils, including

- All whole-oil GC, GC MS on oils,
- SARAH (or SARA),
- Isotopes on the fractions,
- Molecular and isotopic analyses of C1-C5 hydrocarbons metals data, and
- Any other geochemical data used from production samples intended for reservoir characterization studies.

Submit, on CD or DVD ROM, digitally recorded data in industry standard formats.

Detailed Paleontological Reports and Information

As soon as the final and/or revised paleontological information and/or data become available to you, submit one copy in digital format of the entire, detailed paleontological report(s), chart(s), striplog(s), checklist(s), and any other paleontological records. Include the following:

The range of samples taken,

- Sample analysis identifying fossils and lithology by MD,
- Summary and interpretation (based on identification of foraminifera, nannofossils, or other microfossils) of all biostratigraphic markers, zones, tops, or local markers,
- Description of paleontological ecological zones with water depth at the time of deposition (e.g., Middle Shelf/Neritic 20-100 meters, Outer Shelf/Neritic 100-200 meters),
- Sequence analysis interpretations based on histograms of faunal abundance,
- Identification of all rock units by depth to the top of relative chronostratigraphic stages (e.g., Upper Pleistocene, Middle Miocene, or Lower Oligocene), and
-
- Pleistocene, Middle Miocene, or Lower Oligocene), and
- Biostratigraphic chart noting the relative ages of the biostratigraphic zones you used in the detailed paleontological reports.

Submit, on CD or DVD ROM, one copy of the detailed paleontological report in the original digital format (i.e., WordPerfect, Word, Excel, Lotus 1-2-3, JPEG, CGM, TIFF).

Mudlogs and Reports

Submit one image copy of the following types of Mudlogs:

- Physical Formation Log
- Pore Pressure Log
- Engineering Log
- Show Report Log

Image File Formats for Mudlogs: If the original log is in color, the submitted image file must also be in color.

The following image file formats are preferred:

- Geologix - geo draft file (.gdf)
- Geologix - output data file (.odf)

If the preferred formats listed above are not available, submit the image file in the Tag Image File

Format (TIFF) with the following specifications:

Black and White TIFF Images
- Header tags as per TIFF standard
- Resolution – 200 dpi
- Compression – CCITT group IV
- Tiling – No

Color TIFF Images
- Header tags as per TIFF standard
- Resolution – 200 dpi
- Palette color – 256 colors
- File format LZW Compressed TIFF
- Tiling – No.

Submit one copy of the following types of Mudlogs reports, if collected:
- Show reports – composite into one file
- Mud reports – composite into one file
- End of Well reports – composite into one file
- Daily Drilling reports – composite into one file

Submit, on CD or DVD ROM, digitally recorded data in industry standard formats.

End of Operations Report (Form BSEE-0125) and Attachments

Pursuant to 30 CFR 250.465(a), you must submit End of Operations Report (Form BSEE-0125) and the required attachments.

Additional Information

Pursuant to 30 CFR 250.469(d), the BSEE AKOCS may require that you submit additional well reports or records for a specific well(s).

Tankersley, Yolanda J

From: Fesmire, Mark E
Sent: Saturday, September 15, 2012 12:13 AM
To: Feldgus, Steven H
Subject: Re: Cell #

12:30 PM.

Watching operations after we got the support bouy disconnected when the ROV screen filled with bubbles. The dome suddenly lifted to the surface and breached like a whale. Massive venting and dome then sunk to the end of a safety bouy about 20 feet off bottom.

Don't know cause or next steps. Will try to get some sleep while they figure it out. Will call when I know more.

I have not told anyone else yet.

Mark

From: Feldgus, Steven H
Sent: Friday, September 14, 2012 03:15 PM
To: Fesmire, Mark E
Subject: Cell #

Call anytime.

(b) (6)

Overview:

The goal of SESI is to be an industry leader in incident prevention and to take a proactive, progressive role in the protection of our environment. All personnel on board the Arctic Challenger are required to adhere to the safety, health and environmental protection regulations outlined during this briefing.

General Safety

1. Personal Protective Equipment
    a. All personnel are required to use the following PPE while on board the Arctic Challenger
        i. Hard Hat (meets ANSI Z89.1) 29 CFR 1910.135
            1. Exception provided when occupying space with appropriate overhead protection, such as living quarters
        ii. Eye protection (meets ANSI Z87.1) 29 CFR 1910.133
            1. Need for additional task-specific eye or face protection will be determined through JSA/Permitting process
            2. Prescription lenses with side shields permitted as long as they meet or exceed ANSI Z89.1 criteria
            3. Glasses are preferred over use of contact lenses
        iii. Foot protection (ASTM F-2412-2005) 29 CFR 1910.136
            1. Leather uppers or equivalent
            2. Crush-resistant toe
            3. Chemical resistant sole
            4. Electrical resistant preferred
        iv. Additional PPE requirements will be determined through JSA/permitting process
2. Smoking is prohibited on board the Arctic Challenger.
    a. Chewing tobacco is permitted, however sanitary use of tobacco is required
3. At no time will any personnel undertake any activity for which they are not properly trained
4. Reporting of incidents:
    a. All incidents are to be reported to safety personnel, the barge or deck foreman, or the chief engineer
    b. Report <u>all</u> injuries regardless of severity
    c. No employee will be subject to discipline for reporting incidents
5. Reporting of spills:
    a. All activity which poses a risk of spilling hazardous materials will have appropriate precautions in place prior to beginning work activity
    b. Any release of hazardous materials must be immediately isolated and reported
6. Reporting of unsafe acts or conditions:
    a. All personnel are obligated to report unsafe acts or conditions to their supervisor or to safety staff
    b. All personnel have Stop Work Authority

i. Stop Work authority allows anyone on the vessel to immediately stop any activity which they feel carries potential for immediate harm to other personnel, release of contaminants, or damage to property or equipment
ii. If stop work authority is exercised, the person supervising the activity will meet with the crew conducting the activity to review tasks and hazard controls.
iii. Activity can resume after all work activity and hazards have been discussed and addressed appropriately

7. All personnel will use proper lifting techniques to minimize risk of injury. If you need help, don't be afraid to ask.
8. All personnel must be trained in and use fall protection when working at heights above 6'.
    a. Untrained personnel will not be permitted to use fall protection
    b. Work over or near water may require use of life vests in addition to fall protection
9. Be conscious of crane activity. Never walk under a suspended load. Never turn your back to slings.
10. All hazardous materials are listed and MSDSs maintained under HazCom regulations. This information is available for review in the recreation room on level 1 of the accommodations. All workers should take time to review MSDS prior to beginning work activity.
11. Life jackets are maintained in various locations throughout the vessel. Life jackets must be worn when working in an area without approved railings or in any area which poses a risk of falling into water, or in any situation where safety deems it necessary for life vests to be worn.
    a. Man-Overboard – In the event someone falls overboard, the spotting person will:
        i. Point: Point at the location of the person overboard
        ii. Look: Keep their eyes trained on the person overboard
        iii. Scream: Yell "Man-Overboard" until they are sure the word has been spread
        iv. Do not take your eyes off the person in the water. Once you lose visual contact you will likely not re-establish it
12. Maintain three-points of contact with surface while ascending or descending stairs or ladders. Use lift lines to raise and lower tools or equipment instead of carrying them.
13. Good housekeeping is essential to preventing incidents. All personnel must take care to keep their work areas orderly and free of unnecessary clutter during work activity, and to clean their areas upon completion of work activity.
14. Radio communication is preferred over cell phone usage. In all instances, personnel should stop work activity and move out of walkways while using radios or cell-phones. Texting or reading/writing e-mails is prohibited while moving through walkways.
15. Personnel are required to follow energy isolation, or lock-out tag-out, procedures prior to beginning any work activity where exposure to electrical, hydraulic, pneumatic, or other types of energy poses risk to personnel or equipment. Energy isolation must be completed by each

worker engaged in the work activity and isolation functions must be witnessed, tested, and verified.

   a. Workers whose employer provides an energy isolation policy which differs from SESI will follow the policy with the more stringent guidelines

16. No alcohol, weapons or drugs are permitted on board. All prescription medications must be stored in their original containers with markings pursuant to 21 CFR 1306.14.
17. In the event of an alarm activation, muster locations are located at:
    a. Primary: Landing Deck
    b. Secondary: Galley
    c. Tertiary: Engineering
    d. All personnel not assigned to a station or task under the station bill will report to the primary muster location. If the emergency location restricts access to the muster station, personnel will proceed to the secondary or tertiary muster station if accessible.
    e. If abandon ship command given, personnel will report to their assigned lifeboat.

Emergency Alarms

1. General Alarm: Ringing Bell and Voice Over "General Alarm"
2. Fire, Combustible or Toxic Gas Release: Continuous Ringing of General Alarm with several short alarms to follow/Voice over "Fire – Location"
3. Man Overboard: Three (3) Long Rings of General Alarm, Voice Over and Commands, Word of Mouth
4. Abandon Platform: Continuous General Alarm with Voice Over "Abandon Platform"
5. Dismissal or Secure from Alarms: Three (3) short rings of General Alarm and Voice Command "All Clear"

Fire

1. Fire extinguishers are located throughout the vessel for use by trained personnel on small fires.
2. If a fire is spotted:
    a. Sound Fire Alarm
    b. Use appropriate extinguisher
    c. No personnel are expected to place themselves at unreasonable risk to extinguish a fire
3. Personnel are assigned to fire teams through the station bill

Medical Emergencies/First Aid

1. Medical and rescue personnel are on-board the Arctic Challenger to provide stabilizing care and make medical evacuation determination.
2. First Aid kits are located throughout the vessel to expedite care.
3. The medical treatment room (Hospital Room) is located on the first level of accommodations in the aft-starboard corner.
4. At no time will any personnel place themselves in a potentially IDLH environment or in other potential harm to facilitate rescue of other personnel without proper equipment or PPE.

Familiarization Walk-Through

Personnel will be taken on a walk-through of the vessel for familiarization purposes and general hazard identification. Special attention will be paid to first aid kit and fire extinguisher locations, muster locations, evacuation routes, and life boat stations.

Acknowledgement

All personnel will be required to sign a form acknowledging they have received, understand, and will comply with the information contained in the HSE briefing. Personnel are encouraged to ask questions and clarify any information or activity they are not comfortable with.

Tankersley, Yolanda J

From: Susan.Childs@shell.com
Sent: Wednesday, September 05, 2012 6:03 PM
To: Fesmire, Mark E
Subject: FW: Photo of dome pump operating
Attachments: IMG_0536.JPG

The folks in Bellingham wanted you to see this. They deployed the Dome either yesterday or today. Looks really good.

Susan


09/05/2012

Tankersley, Yolanda J

From: Fesmire, Mark E
Sent: Monday, September 10, 2012 6:38 AM
To: Feldgus, Steven H
Subject: Re: Have the sea trials started?

Steve:

It should be complete in a little more than a day from when they start. Things have been going very well and could be done before that. Anchoring is the real time consumer.

Mark

Sent from my iPad

On Sep 10, 2012, at 7:26 AM, "Feldgus, Steven H" <Steve.Feldgus@bsee.gov> wrote:

> Thanks very much, Mark. If they start deployment at midnight tonight,
> approximately when would they be finished, assuming all goes well? Is
> it still a two-day test, or was it two days assuming they started in
> the middle of Day 1?
>
> --Steve
>
> -----Original Message-----
> From: Fesmire, Mark E
> Sent: Monday, September 10, 2012 10:25 AM
> To: Feldgus, Steven H
> Subject: Re: Have the sea trials started?
>
> Yes, they got away from the dock about midnight, are anchoreing and
> doing tests for CG. Deployment may start as early as midnight.
>
> Mark
>
> Sent from my iPad
>
> On Sep 10, 2012, at 6:04 AM, "Feldgus, Steven H"
> <Steve.Feldgus@bsee.gov> wrote:
>
>> Steve

Tankersley, Yolanda J

From: Fesmire, Mark E
Sent: Tuesday, September 11, 2012 7:12 PM
To: Feldgus, Steven H
Subject: Re: Was having a hard time hearing you.

Loose connectioh. Corrected back in water.

Mark

From: Feldgus, Steven H
Sent: Tuesday, September 11, 2012 03:47 PM
To: Fesmire, Mark E
Subject: RE: Was having a hard time hearing you.

Hmmm… ok, keep us updated. Thanks.

From: Fesmire, Mark E
Sent: Tuesday, September 11, 2012 5:39 PM
To: Feldgus, Steven H
Subject: Re: Was having a hard time hearing you.

Steve

As I was talking to Margaret we lost connection to some of the dome winches. Don,t know how big a problem yet. Recovering dome to repair. Mark

---

From: Feldgus, Steven H
Sent: Tuesday, September 11, 2012 02:00 PM
To: Fesmire, Mark E
Subject: RE: Was having a hard time hearing you.

Thanks very much, Mark. Margaret has asked if there is anyone else from your office that would be able to go to the Halifax meeting? Would you have time to give her a call on the subject?

--Steve

From: Fesmire, Mark E
Sent: Tuesday, September 11, 2012 3:21 PM
To: Feldgus, Steven H
Subject: Re: Was having a hard time hearing you.

Steve

Things are going well, but slow.

Looks like time to pull plug on my Halifax trip to PAME. Is there any problem?

Exhausted and need to deal with APDs and APMs.

Sticking with my estimate of finishing test about midnight. Recover anchors and travel in another 4. Reprovision and repair 12 to 18. That makes sail off, if all goes well late tomorrow Wed afternoon.

CG agrees this is possible.

Mark

From: Feldgus, Steven H
Sent: Tuesday, September 11, 2012 06:37 AM
To: Fesmire, Mark E
Subject: RE: Was having a hard time hearing you.

Great, thanks! I'll try to come up with other "All The President's Men" forms of verification for future calls.

From: Fesmire, Mark E
Sent: Tuesday, September 11, 2012 8:26 AM
To: Feldgus, Steven H
Subject: Re: Was having a hard time hearing you.

Y

From: Feldgus, Steven H
Sent: Tuesday, September 11, 2012 06:15 AM
To: Fesmire, Mark E
Subject: Was having a hard time hearing you.

For some reason the reception seems to be bad out in the middle of Puget Sound. But I believe you said it would take about another 18 hours to finish the deployment test, and then four hours to get back to the dock? Just reply 'y' if I got that right, and some letter from from y on the keyboard if I got that wrong.

Thanks,

--Steve

Tankersley, Yolanda J

From: Fesmire, Mark E
Sent: Wednesday, September 12, 2012 10:09 PM
To: Feldgus, Steven H
Subject: Re: Response to PEW letter we received last week.

Steve

ROV tangled in rigging. Shell to get divers out. Am going to hotel to sleep. Will call when I know more. May be Noon or later washington time.

Mark

From: Feldgus, Steven H
Sent: Wednesday, September 12, 2012 08:00 PM
To: Fesmire, Mark E
Subject: Re: Response to PEW letter we received last week.

Nice.

From: Fesmire, Mark E
Sent: Wednesday, September 12, 2012 07:24 PM
To: Feldgus, Steven H
Subject: Re: Response to PEW letter we received last week.

Steve

Rov repaired, back in water. No need to go to plan "B".

Mark

From: Feldgus, Steven H
Sent: Wednesday, September 12, 2012 10:45 AM
To: Walker, Jeffrey
Cc: Fesmire, Mark E
Subject: RE: Response to PEW letter we received last week.

I agree – and I'll talk to BOEM about it. I can use the language you sent last Thursday for the letter. Thanks very much.

From: Walker, Jeffrey
Sent: Wednesday, September 12, 2012 12:22 PM
To: Feldgus, Steven H
Cc: Fesmire, Mark E
Subject: RE: Response to PEW letter we received last week.

Steve,

This is the first I have seen of the draft. I see Mark was on the distribution for the original draft on September 6th – I don't know if Mark provided any input into that draft.

You are correct that the PEW letter asked some specific BSEE related questions that are not addressed in the response.

PEW's letter was to BOEM and BSEE. Seems a joint response would be better than two separate letters and that the BSEE related questions should be addressed.

From: Feldgus, Steven H
Sent: Wednesday, September 12, 2012 7:33 AM
To: Walker, Jeffrey
Subject: FW: Response to PEW letter we received last week.

Hey Jeff,

Just got this draft response to Pew from BOEM… I noticed you were included on the initial email, so I was wondering if you had been part of the drafting of this. It appears to be purely BOEM-related, while there were some BSEE-specific Qs in the Pew letter.

Thanks,

--Steve

From: Lew, Shoshana M
Sent: Monday, September 10, 2012 7:26 PM
To: Feldgus, Steven H
Subject: Fw: Response to PEW letter we received last week.

From: Kendall, James
Sent: Monday, September 10, 2012 05:23 PM
To: Lew, Shoshana M <Shoshana.Lew@boem.gov>
Cc: Fesmire, Mark E <Mark.Fesmire@bsee.gov>; Loman, Jeffery (Jeffery.Loman@boem.gov)
Subject: FW: Response to PEW letter we received last week.

Shoshana,

As discussed last week……here's a draft of a proposed response back to PEW.

Short and sweet as originally planned,

Jjk

PS Thank you David Johnson!

_____
Dr. James (Jim) Kendall
Regional Director
Alaska OCS Region
Bureau of Ocean Energy Management,
3801 Centerpoint Drive, Suite 500
Anchorage, Alaska 99503
Phone: 907/334-5200
james.kendall@boem.gov

-----Original Message-----
From: Johnston, David
Sent: Thursday, September 06, 2012 5:13 PM
To: Kendall, James
Cc: Fesmire, Mark E; Loman, Jeffery
Subject: RE: Response to PEW letter we received last week.

First draft attached. I've set it up for Tommy signature, but if a joint letter is thought better, it can easily be tweaked. I'm off tomorrow, so if it looks ok, please send forward to Shoshana.

-----Original Message-----
From:
Sent: Wednesday, September 05, 2012 3:36 PM
To: Johnston, David; Fesmire, Mark E; Walker, Jeffrey
Cc: Lew, Shoshana M;; Benedetti, Deanna
Subject: Response to PEW letter we received last week.

David, Mark, Jeff,

Spoke with Shoshana today about the subject letter.

It was decided that we should try to draft a short, no more than 2 page, response that addresses their concerns, but at a high level, not burrow into the weeds. It is possible that it could be a joint response.

It would be great if we could have a draft to Shoshana by Friday night so she can tweak and give to Tommy early next week. We are a aiming to have this letter go out at the same time the one goes back to Eric Myers.

To start this off, I'll ask Dave to do the first draft and then get to Mark and Jeff.

Thanks, and let the fun begin.

Jjk

Sent from my iPad

Tankersley, Yolanda J

From: Fesmire, Mark E
Sent: Thursday, September 13, 2012 3:08 PM
To: Feldgus, Steven H
Subject: Re: Updates from Shell

Steve

There are definate communications gaps. If they can't get done by sunday, the urgency is probably gone.

Mark

From: Feldgus, Steven H
Sent: Thursday, September 13, 2012 05:05 PM
To: Fesmire, Mark E
Subject: Re: Updates from Shell

Well, use your judgment based on how things look there. We're getting our information from these conference calls with the executives - so don't stay just based on what I'm telling you.

From: Fesmire, Mark E
Sent: Thursday, September 13, 2012 04:52 PM
To: Feldgus, Steven H
Subject: Re: Updates from Shell

Ok, I will stay until sunday morning. If they aren't done by then, it is time to fall back and regroup.

Will do all signing and writing monday.

Mark

From: Feldgus, Steven H
Sent: Thursday, September 13, 2012 12:13 PM
To: Fesmire, Mark E
Subject: RE: Updates from Shell

He said he'd have something ready by Friday at noon, which I think is fine. Shell did mention they expected it would take 2.5 – 3 days to get the Kulluk into position and anchored once the final whale was landed by Kaktovik and they got the green light from AWEC, so they wouldn't be in position until Sunday at the earliest.

From: Fesmire, Mark E
Sent: Thursday, September 13, 2012 2:05 PM
To: Feldgus, Steven H
Subject: Re: Updates from Shell

I am up and getting ready to catch the noon boat to the barge.

Any coordination with David on the tophole memo?

Mark

From: Feldgus, Steven H
Sent: Thursday, September 13, 2012 11:57 AM
To: Fesmire, Mark E
Subject: Updates from Shell

They were extoling your effort and stamina on the call. But also saying that their new target sailaway date is this weekend. They also believe they'll be back on location at Burger A on Monday/Tuesday, although Sunday might be possible if there are favorable winds.

No other big news from their end. Still pushing the end-of-season issue in the Chukchi.

Tankersley, Yolanda J

From: Fesmire, Mark E
Sent: Thursday, September 13, 2012 10:59 PM
To: Feldgus, Steven H
Subject: Recovered rov

Steve;

Just recovered ROV. It will take 4 to 6 hours to fix. Shell has asked to continue tests using divers.

Asked if they would use divers in real situation. Safety would not allow them to use divers. Told them that they could use divers to replace connections they undid to recover ROV but I would not consided it a successful test unles completed with ROV.

They countered that they had already demonstrated all of the functions of ROV and that they would have other ROVs in the Arctic to help.

Repairing ROV before continueing. Director may get call.

Mark

Tankersley, Yolanda J

From: Fesmire, Mark E
Sent: Friday, September 14, 2012 10:51 AM
To: Feldgus, Steven H
Subject: Re: Recovered rov

Back in business. Going well.

----- Original Message -----
From: Feldgus, Steven H
Sent: Friday, September 14, 2012 05:22 AM
To: Fesmire, Mark E
Subject: Re: Recovered rov

Thanks - will alert him.

----- Original Message -----
From: Fesmire, Mark E
Sent: Friday, September 14, 2012 12:58 AM
To: Feldgus, Steven H
Subject: Recovered rov

Steve;

Just recovered ROV. It will take 4 to 6 hours to fix. Shell has asked to continue tests using divers.

Asked if they would use divers in real situation. Safety would not allow them to use divers. Told them that they could use divers to replace connections they undid to recover ROV but I would not consided it a successful test unles completed with ROV.

They countered that they had already demonstrated all of the functions of ROV and that they would have other ROVs in the Arctic to help.

Repairing ROV before continueing. Director may get call.

Mark

Tankersley, Yolanda J

From: Fesmire, Mark E
Sent: Saturday, September 15, 2012 1:23 PM
To: Feldgus, Steven H
Subject: Re: Got your message

Steve

As bad as I thought. Sent you a picture, but basically the top half is crushed like a beer can.

Going back to hotel. Be on conference monday, weather permitting.

Mark

----- Original Message -----
From: Feldgus, Steven H
Sent: Saturday, September 15, 2012 12:54 PM
To: Fesmire, Mark E
Subject: Got your message

Thanks for the update. The CG sent a report to the Director that mentioned the breaching of the dome, so he won't be surprised if you give him a call.

Tankersley, Yolanda J

From: Fesmire, Mark E
Sent: Monday, September 17, 2012 1:49 PM
To: Feldgus, Steven H
Subject: RE: Shell test

Steve:

My memory of the event is as follows:

At about 12:30 AM, Saturday 9-17, the dome had been released from the Oceanguard buoy that was supporting the weight and had been transferred from negative buoyancy to positive buoyancy to provide an upward force on the clump weights (they had been attached by the ROV), in preparation for using the winches to traverse laterally and down to a predetermined target that we had established. The movement was stopped by the Shell representative who wanted to calculate the lift available from displacing water in the chamber with Nitrogen. He was apparently satisfied with the calculation and the process continued.

As ballast was being adjusted, I was watching on the video feed from the ROV in the survey control room across the hall from the process control room, when the screen filled with bubbles. The dome started to rise and breached the surface for some period of time variously estimated by witnesses on deck as between 15 seconds to 2 and one half minutes. It vented gas (probably the nitrogen used to displace water out of the center chamber and ballast compartments) and then sunk. From the readings available in the survey room where I was, it probably did not hit the bottom, but was suspended by a line from a safety buoy a short distance above the bottom. A survey of the dome by the ROV showed some crushing damage to the dome. Later that morning, when the dome was retrieved, the crushing was more evident and appears to have been caused by the pressure differential in the ballast chambers in the cylindrical portion of the dome.

That evening, there had been two warning indicators that were determined to be bad sensors, one in a venting valve, and the other with the Hydraulic Power Unit that provided power to the winches. When the dome was retrieved, one of the 4 clump weights (8,000# each) was still attached to the dome, but was sitting on the bottom. The other 3 did not appear to be attached.

At this point, I do not have the information to determine the cause of these events.

Mark Fesmire

From: Feldgus, Steven H
Sent: Monday, September 17, 2012 12:33 PM
To: Fleming, Julie S; Fesmire, Mark E
Subject: FW: Shell test

Morgan's looking for some info on the Shell deployment test – Mark, is there any additional detail about the test that you think would be appropriate to share with Congress?

From: Gray, Morgan [mailto:Morgan.Gray@mail.house.gov]
Sent: Monday, September 17, 2012 4:21 PM

To: Feldgus, Steven H
Subject: Shell test

Steve, would it be possible to provide me additional detail about the test Shell conducted over the weekend of its capping dome for the Arctic? Specifically, I am looking for additional information on what exactly went wrong, whether we know why it went wrong, and whether we think this problem is specific only to Shell's technology or whether we have reason to believe that other similar devices might also be at risk of such an event. Thanks and please let me know if you have any questions.

_____

Morgan Gray
Senior Policy Advisor
Democratic Staff
Natural Resources Committee

United States Department of the Interior
BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT
Alaska OCS Region
3801 Centerpoint Drive, Suite 500
Anchorage, Alaska 99503-5823

SEP 20 2012

Ms. Susan Childs
Shell Gulf of Mexico
3601 C Street, Suite 1334
Anchorage, AK 99503

Dear Ms. Childs:

The Alaska Region of the Bureau of Safety and Environmental Enforcement (BSEE) is in receipt of Shell's Application for a Permit to Drill (APD) **Well Number 001, Sivulliq N, on lease OCS Y-1805, Block 6658, in the Beaufort Sea (API number 55-171-0001300).** A partial application was submitted and dated April 17, 2012 and completed on July 28, 2012. More recently, in a letter to BSEE from Alaska Venture Support Integrator, Manager Susan Childs, dated August 31, 2012, you sought "conditional approval" of this APD to allow for limited drilling operations before the arrival of the Arctic Containment System. In particular, you requested permission to drill and set the 30" structural casing and the 20" surface casing. Your application has been reviewed for compliance with the Outer Continental Shelf Lands Act, 30 CFR Part 250, and other statutes and regulations applicable to APDs. BSEE finds that Shell has complied with those authorities and approves the subject APD to a depth equal to the casing point associated with the 20 inch casing at approximately 1056 feet below the Rotary Kelly Bushing. Upon completion of the testing and siting of the Arctic Containment System, Shell will submit an Application for Permit to Modify, which, if approved, would allow Shell to continue operations outlined in the initial APD.

This APD approval is subject to the findings and the conditions attached to this communication as Attachment A, Conditions of Approval for the Sivulliq N, Well #001 and Attachment B, Procedures for Well Data and Records Submittal. It is also conditioned on Shell's compliance during the permitted activities with all applicable BSEE regulations and requirements, U.S. Coast Guard regulations and requirements, provisions in the Exploration Plan (EP) dated May, 2011 and the terms of its approval by the Bureau of Ocean Energy Management (BOEM), BOEM regulations, provisions in the Oil Spill Response Plan approved by BSEE, conditions of approval for all permits or authorizations issued by other Federal agencies, lease stipulations, and Notices to Lessees.

This approval is valid unless and until there is a material change to conditions or facts as presented in Shell's application.

If any provision contained in any plan or application conflicts with any provision or condition approved in writing by BSEE, the provision or condition approved by BSEE later in time will control. In the event another agency approves deviations from plans, permits, or conditions initially issued by that agency, copies of such approvals must be sent to BSEE.

BSEE finds that you have provided sufficient data, as required with relation to the applicable provisions of 30 CFR 250.417 to show that the Mobile Offshore Drilling Unit Kulluk is in compliance and is hereby approved for all exploratory drilling operations conducted in the Beaufort Sea of the Arctic Outer Continental Shelf (OCS) pursuant to this application and the EP.

BSEE also finds that you have provided sufficient data, as required by the applicable provisions of 30 CFR 250.417 to show that the designated relief well drilling unit Noble Discoverer is in compliance and is hereby approved for drilling operations conducted in the Beaufort Sea of the Arctic OCS pursuant to this application and the EP.

BSEE further finds that Shell's proposed well capping and containment systems have been designed for the projected worst case discharge. The intended uses of these systems are hereby approved. BSEE will require that a witnessed deployment test of the containment system demonstrating that Shell has the ability to successfully deploy the system and have it on location pursuant to the oil spill response plan prior to BSEE's consideration of Shell's request to drill below the 20 inch casing point.

BSEE hereby approves Shell's Welding and Burning Program for operations conducted on the Kulluk.

BSEE will provide a continuous inspection presence during drilling operations and will use Shell transportation and lodging for this purpose. As allowed in 30 CFR 250.133, Shell will request reimbursement for transportation, meals, and lodging based on the existing agreement between Shell, DOI Aviation Management Division and BSEE. Reimbursement requests must be submitted within 90 days of the completion of the drilling program. In addition, BSEE will conduct inspections and collect data in regard to the EPA's National Pollutant Discharge Elimination System General Permit No. AKG-28-0000 and EPA-issued air quality permits at the request of the EPA by letter dated July 27, 2012 (copy enclosed).

All notifications related to activities described in the approved applications should be made to the BSEE active duty officer at 907-334-5300 during business hours and 855-277-2733 (toll free) after business hours.

Sincerely,

Mark Fesmire PE, JD
Regional Director

cc: U.S. DOI, BOEM, AKOCS, Regional Director
cc: U.S. DOC, NOAA, NMFS
cc: U.S. DOI, Fish and Wildlife Service

ATTACHMENT A
Conditions of Approval for the Sivulliq N, #001 Well

1. The following waivers have been authorized:
    a. Testing of casing strings as indicated on Form BSEE -0123S is approved.
    b. Your request for a waiver to the requirements under 30 CFR 250. 423 (c) regarding a negative pressure test is approved.
    c. Testing of the BOP components to the pressures indicated on Form BSEE -0123S is approved.
    d. Your test pressure for the annular preventer as indicated on Form BSEE -0123S is approved.
    e. Deployment of a remote BOP control panel intended to operate the BOP stack from the sea floor is approved.
    f. Your request to test the deadman/autoshear system during the stump test only is approved.
    g. Your requested method to temporarily abandon the proposed pilot hole is approved.
2. This office will conduct a predrill inspection of your drilling vessel prior to the start of operations.
3. Shell will not be able to drill below the 20 inch casing point without fulfilling the conditions stated in the letter accompanying these conditions
4. No drilling activities may be conducted beyond each casing shoe unless specifically approved by the BSEE inspector on location. BSEE will evaluate the condition of the well, results of safety equipment tests, the nature and duration of the next phase of the drilling program, existing and forecasted environmental conditions, and the procedures under an approved contingency plan [30 CFR250.417(c)(2)] that addresses design and operating limitations of the drilling unit as well as the actions necessary (i.e. suspension, curtailment, or modification of drilling or rig operations) to remedy various operational or environmental situations in order to maintain safety and prevent damage to the environment; including implementing well capping and containment or relief well drilling plans.
5. Final certification of the blowout preventer system as required in 30 CFR 250.416 (f) shall be provided to this office prior to the initial use of the BOP on this well.
6. Data submission procedures and criteria for this well are listed in Attachment B Procedures for Well Data and Records Submittal.
7. Shell must submit a daily summary report on form BSEE-0133 to this office until the final status of the well is established (one copy). Daily marine mammal reports shall be attached to the form.
8. Shell must notify this office immediately in the event the well encounters shallow gas, abnormal pressure, or lost circulation.
9. The BOEM office has provided this office with an alternative geo-pressure model for the Sivulliq drilling program. They have indicated that their interpretation shows a potential presence of excess pore pressure below 6,650 feet. BSEE has reviewed BOEMS finding with regard to the proposed well program and find that at total depth both model indicate essentially the same bottom hole pore pressure. Therefore no change to Shell's program for this well is required. Attached to this document is the proprietary evaluation provided by BOEM for your information. Please contact this office in the event you have questions regarding these findings.
10. Shell must provide this office with representative dry samples collected during the drilling of this well as soon as available. Shell is also requested to collect and retain a set of wet well cuttings for the Bureau of Ocean Energy Management. This request is voluntary and the samples are

intended to be made available to the public once the proprietary term for the samples is concluded. Further discussions related to this voluntary request can be concluded with appropriate BOEM representatives.

11. Shell must submit within thirty days of completion of the well all oceanographic and meteorological data collected during the drilling of this well.
12. Shell must submit an Application for Permit to Modify to change an approved portion of the APD prior to the commencement of the proposed operations. Verbal approval in an emergency may be granted, but written APMs must be submitted no later than the end of the 3rd business day following the oral approval.
13. Shell shall notify this office as well as the onsite representative 24 hours in advance of a Blowout Preventer test.
14. Shell must submit form BSEE – 0124 in advance of either temporarily or permanently abandoning this well. This form must contain all information required in subpart Q for abandonment of wells.

Attachment B

BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT
ALASKA OCS REGION

Procedures for Well Data and Records Submittal

This document defines the procedures on how lessees/operators submit well records required by 30 CFR 250.468 and 469, and clarifies the specific well records you should submit, the submittal dates of the various well records, and the correct locations where you should send these well records.

The BSEE collects, verifies, and stores data by the well's unique 12-digit American Petroleum Institute (API) number we assign. The BSEE Alaska Outer Continental Shelf Region (AKOCS) uses the data collected to make informed regulatory decisions based on your timely submittal of complete and accurate well records. We define "submittal date" as the original date the data are due to the appropriate office.

According to 30 CFR 250.468(a), "you must submit copies of logs or charts of electrical, radioactive, sonic, and other well-logging operations; directional and vertical well surveys; velocity profiles and surveys; and analysis of cores to BSEE." Also, in accordance with 30 CFR 250.469(b), the AKOCS will also require submittal of paleontological reports as well as washed and dried samples collected from the well.

When to Submit Well Data Records

1. Field Data

   As stated in the approval documents for these operations this office will take an active role in assess plans for the continuation of well activities. Shell will be expected to make available digital data and field prints electronically from the wellsite via a secure website data delivery system or equivalent to enable this review. This should be done for all logging operations including pilot, surface, intermediate and final runs.

2. Final Data

   Operators should submit one copy of the digital data on a CD or DVD in a read-only format to the appropriate entity as outlined in Attachment 1. Each CD or DVD should be properly labeled with the Area, Block, OCS, Well Number, Well Suffix, API, and the data type (i.e., Paleo Report, Conventional Core Report, Vertical Seismic Survey, etc.). Digital and image NMR data must be submitted on separate physical media and nomenclature for NMR data files and tool codes should clearly identify them as NMR datasets.

   Well records are divided into four groups for the timely submittal of the data.

a) Well Log Data, Directional Surveys, Velocity Surveys, Analyses of Percussion Sidewall Cores, Wireline Formation Test Logs, Drill Stem Tests and Mudlogs/Reports

Submit:

Well log data,
Directional surveys,
Velocity surveys (time/depth pairs),
Percussion/rotary sidewall analysis of cores,
Wireline formation tests logs (summary log), and
Drill stem tests (initial report)

To be submitted within 30 days of the "Date Operations Completed" of the last logging run (MWD/LWD or wireline) that you report in Item 7 of the Open Hole Report (Form BSEE-0133S) for each 12-digit wellbore, sidetrack, and/or bypass. Note: "Date Operations Completed" for MWD/LWD is when the data is retrieved from the drill string.

b) Paleontological, Detailed Rotary Sidewall and Conventional Core Analyses, and Vertical Seismic Profile Reports and Information

For each wellbore in which these data were collected, submit no later than 90 days after the "TD DATE" you report in Item 10 of the Well Activity Report (Form BSEE-0133).

Detailed paleontological reports and information,
Detailed rotary sidewall and conventional core analyses/reports and information, and
Detailed vertical seismic profile reports

Submit these well records when the report is completed, even if the report is generated by you and/or third party (i.e., academic partners, non-lessee partners and/or consultants) years after the wellbore is completed.

c) Geochemical Analyses and PVT Analysis of Fluid Samples

For each wellbore in which these data were collected, submit geochemical analyses and/or PVT Analysis of Fluid Samples no later than 120 days after the "TD DATE" that you report in Item 10 of the Well Activity Report (Form BSEE-0133). Submit these well records when the report is completed, even if the report is generated by you and/or third party (i.e., academic partners, non-lessee partners and/or consultants) years after the wellbore is completed.

d) End of Operations Report (Form BSEE-0125)

For each wellbore, submit an End of Operations Report (Form BSEE-0125) and all its attachments no later than 30 days after the "END DATE" you report in Item 10 of the Well Activity Report (Form BSEE-0133).

The BSEE AKOCS uses the Well Activity Report (Form BSEE-0133) and Open Hole Report (Form BSEE-0133S) to track well activity; therefore, it is crucial that you submit a complete and accurate report to the appropriate BSEE AKOCS District Office in a timely manner. We will treat delinquent and/or incomplete reports in the same manner as delinquent and/or incomplete well data, and such violations may result in the BSEE AKOCS exacting an appropriate remedy, such as issuing an Incident of Non-compliance (INC).

The BSEE AKOCS may request that you submit well logging data, directional surveys, velocity profiles and surveys, percussion sidewall analyses of cores, wireline formation tests, and drill stem tests before the 30- day limit when we determine that circumstances warrant such action. When we determine that circumstances so warrant, we may also request that you submit preliminary reports of analytical data, namely

Geochemical analyses/reports and information,
PVT analyses of fluid samples,
Detailed paleontological reports and information,
Detailed rotary sidewall core analysis and information, and
Detailed conventional core analysis and information before the respective 90-day or 120-day limits.

The BSEE AKOCS recognizes that you need adequate time to submit complete and accurate well records. If you request it, BSEE AKOCS may grant you a departure under 30 CFR 250.142 for a new required date for submitting the data pertaining to that wellbore.

Where to Submit Well Records

Shell will need to coordinate access to field digital well logs with the following office. This office will also handle receipt of samples.

Bureau of Safety and Environmental Enforcement
Alaska OCS Office
3801 Centerpoint Dr., Suite 500
Anchorage, AK 99503
Office Phone: 907-334-5300
Office Fax: 907-334-5302

Shell should provide final copies of all digital image and vector well log data and related reports to
A2D Technologies
d/b/a TGS Geological Products and Services
1010 Common Street, Suite 2040
Attn: BSEE Well Records (Alaska)

New Orleans, LA 70112
Office telephone: 504-524-3450
Fax: 504-524-3454

A "Well Records Submission Summary" in this document provides an overview of the various well records, including which entity receives which well records and the addresses and contact numbers of the appropriate BSEE AKOCS Offices, and A2D Technologies. We strongly recommend that you provide a transmittal letter when you submit any well records. This transmittal should contain the following information:

- Operator's Name
- Operator's Contact Name and Telephone Number
- Bottomhole Location: Area/Block/Lease/Well Name and Number/API Number
- Date Well Records Sent
- Detailed List of Well Records

It is your responsibility to ensure that the BSEE AKOCS and A2D Technologies receive all well data and information within the specific periods. If we notify you of delinquent data, we will initiate an appropriate remedy, such as issuing an Incident of Non-Compliance (INC). If you choose to use a third party to submit well data, it remains your responsibility to ensure that the data are timely received by the BSEE AKOCS and A2D Technologies. Realizing that you may need time beyond the specified deadlines to prepare unique data or information, we will address the submission of such on an individual basis. We will address INC's issued by the BSEE AKOCS Office for the delinquent data submittal at your yearly performance review or through other appropriate and timely measures.

Well Naming and Numbering

Show the API Number and well name assigned by the BSEE AKOCS Office on all well records you submit to us. You can find these on the approved Application for Permit to Drill (Form BSEE-0123) for the original hole, sidetracks, and/or bypasses.

Data Types and Formats

A. Well Log Data types

a. Log Curve Requirements: Submit the following curve types and log images in final form, if the data were obtained in the open-hole portion of a wellbore, sidetrack, or bypass****:

- Acoustic or Sonic
- Bulk Density
- Caliper
- Conductivity
- Density Correction
- Dipmeter (computed)
- Gamma Ray
- Resistivity/Induction
- Spontaneous Potential
- Nuclear Magnetic Resonance *
- Mudlogs***
- Neutron
- Tension
- Porosity
- Borehole Image
- Equivalent circulation density
- Rwa
- Temperature
- Formation Tester**
- Rate of Penetration
- Photoelectric
- Slide Indicator

b. Cased hole log data: Submit all curve types and log images as identified above for any cased hole logs collected in lieu of, or in addition to, open hole logs.

* For the submittal of digital NMR vector curve data,. The following are examples of curve types are to be submitted, and are not limited to you should submit:

- Quality Control Curves
- Computed Curves
- T2 Bin Distributions

Due to NMR file sizes and complexities, the BSEE now requires that digital and image NMR data are submitted on separate physical media (separate from other well log data) to its logging contractor, A2D Technologies. Also, NMR data file and tool code nomenclature should clearly identify these data as NMR-related. We encourage direct submittal of the completed log data set from the acquiring service company.

** Formation Tester is considered any logging tool that collects pressure data and/or fluid samples from the borehole. Summary Print log images, pressure gradient plots, and preliminary sample analysis must be submitted. Formation Tester summary data should also be submitted in ASCII format. All detailed reports (i.e., PVT Analysis) generated from the samples collected from the borehole must be submitted in a timely manner (see Attachment 1).

*** You will be required to submit an image file for these types of logs to A2D Technologies.

****Although API Recommended Practice (RP) 31A, Standard Form for Hardcopy Presentation of Downhole Well Log Data, is not incorporated by reference in BSEE regulations, you may use it for guidance on providing complete and accurate well information.

Note: Do not submit digital data for Formation Tester, Borehole Image, and Computed Dipmeter to A2D Technologies.

c. Well Log Image File:

Submit image files in one of the formats listed below. For Formation Tester type logs, the summary logs will suffice.

i. For all vertical wells, as defined in 30 CFR 250.461, submit image files for

- Measured depth (MD) 1-inch, or 2-inch correlation, and 5-inch formation evaluation logs and
- Any additional scales you obtained.

ii. For all non-vertical wells, as defined in 30 CFR 250.461, submit image files for

- True vertical depth (TVD) 1-inch, or 2-inch correlation and, 5-inch formation evaluation logs,
- Measured depth (MD) 1-inch, or 2-inch correlation, and 5-inch formation evaluation logs, and
- Any additional scales you obtained.

Detailed 5- inch image logs must be composited, but individual runs do not need to be spliced.

If logging data from more than one logging vendor are collected in a borehole, you may submit either an image of the logging data from all vendors composited into a single set of logs or a set of images of the composited logs from each individual vendor.

d. Image File Formats: If the original log is in color, the submitted image file should also be in color.

i. The following image file formats are preferred:

- Computer Graphic Metafile (CGM) version 1-4
- Baker Metafile
- Schlumberger PDS (PDS files are usually for one logging run; any borehole with multiple runs should submit composited file format)
- Halliburton CGM
- Weatherford DPK

If the preferred formats listed above are not available, you may submit the image file in the Tag Image File Format (TIFF) with the following specifications:

ii. Format (TIFF) with the following specifications:

1. Black and White TIFF Images:

- Header tags as per TIFF standard
- Resolution – 200 dpi
- Compression – CCITT group IV
- Tiling – No

2. Color TIFF Images:

- Header tags as per TIFF standard
- Resolution – 200 dpi
- Palette color – 256 colors
- File format LZW Compressed TIFF
- Tiling - No

Clearly label each well log image with its associated API number, bottom hole lease number, well name, well name suffix, log type, scale and depth domain (MD or TVD).

e. Digital (Vector) Well Log Data: Submit composite digital curve data (one value per curve for each depth value and with individual tool runs merged) in the Canadian Well Log Society Log ASCII Standard (LAS), Version 2.0 format; and Digital Log Interchange Standard (DLIS) or Log Interchange Standard (LIS) format. Ensure that the curve data are in a MD composite layout, including full headers for each wireline and MWD/LWD logging tool run and curve description for all curves. Ensure that all required log curves represented on the log image file are included in the digital curve file. If you collect logging data from more than one logging vendor in a single borehole, submit a separate set of composited log curves from each individual vendor. Do not splice digital curves from different vendors to form a set of composited log curves.

i. Full header information, should including the following:

- 12-digit API number
- well name suffix
- bottom hole lease number
- bottom hole area and block
- well name

ii. Information for each tool run, should including the following:

- borehole fluids
- depth interval
- mud
- filtrate resistivity and temperatures
- casing information
- bottomhole or maximum recorded temperature
- circulation history information
- tool schematic
- tool calibration record

Full logging tool parameters (including matrix values), position of logging tool (i.e., centered or eccentered), and logging engineer's comments; and adequate curve description and

Tool -specific and service provider-specific curve and parameter mnemonics (names and abbreviations) maintained as originally acquired.

If a log is spliced, the splice depth should be clearly noted along with which files were used.

Submit digital and image logs on CD or DVD ROM (read-only memory). Digital and image logs may be submitted on the same CD or DVD.

Directional Surveys

Submit one digital copy of the final composite directional survey. For the Digital Directional Survey format, see NTL 2009-N10.

- Submit, on CD or DVD ROM these survey results coded in ASCII.
- According to 30 CFR 250.461(d) (2), "You must correct all surveys to Universal-Transverse-Mercator-Grid-north or Lambert-Grid-north after making the magnetic-to-true-north correction."

If your use of more than one vendor prevents the consolidation of the separate surveys within a well, submit the final composite survey from each vendor.

Velocity Profiles and Surveys

Vertical Seismic Profiles: Submit the results from all borehole seismic data (in cased or uncased holes), as well as concurrently run directional surveys for both vertical and directional wells. Submit, on CD or

DVD ROM, digitally recorded data in a industry standard format (LAS, DLIS, ASCII, CGM, TIFF, JPG, SEGY, DOC), that include, but are not limited to:

- Normal Incidence VSP;
- Acoustic Log Calibration Report;
- Final VSP and Corridor stacks for 2D data and final stacked and migrated volume for 3D VSP data;
- Composite plot with VSP, Corridor stacks, synthetic seismogram, and well logs;
- any referenced information within the report correlative with the acquisition, such as 2-way time indexed depths and velocities, survey parameters, digital images, and computed survey data and directional; and
- If acquired, format time/depth pairs.

Velocity Surveys (Time-Depth Pairs/Checkshots): Submit, on CD or DVD ROM, one digital copy coded in ASCII format. The report should include or be annotated with the following:

- API number
- Well name and number
- Well name suffix
- Contractor or service provider
- Contact name (phone number or e-mail address)

Note that the digital format has been modified to expand the columns for True Vertical Depth and One-Way Travel Time from 5 to 8 to include two decimal places for each column.

We encourage direct submittal of the completed survey from the acquiring service company .

Analysis of Conventional Cores, Percussion/Rotary Sidewall Cores, Wireline Formation Tests, and Drill Stem Tests

IF...
you conduct any of the following:

- Conventional cores descriptions and analysis
- Percussion/Rotary sidewall core analysis or equivalent,
- Wireline formation tests - include any logs (summary logs are acceptable) and associated lab results, or
- Drill stem tests

THEN...

As soon as the final and/or revised conventional core, percussion/rotary sidewall core reports and/or data become available to you, send one digital copy of the entire, detailed report. Reports should include, but are not limited to the following:

- Standard analyses for porosity,
- Permeability
- Water saturation

- Core photos
- compaction analyses
- laser grain size analyses
- stressed brine porosity and permeability analyses
- rock mechanic studies
- water extraction and core gamma logs
- core photos

In addition, provide one copy of all studies you performed on the core(s) and tests for the purpose of describing and characterizing the reservoir architecture through detailed stratigraphic or depositional analyses. In certain situations, the BSEE AKOCS may require that you submit preliminary or interim reports .

Submit, on CD or DVD ROM, one copy of the description and analysis of the conventional core, the percussion/rotary sidewall core, wireline formation tests, and drill stem tests reports in the original digital format. Any data acquired in a log format should be submitted as a log image.

Geochemical Analyses/Reports and Information

Submit one copy of the Geochemical Analyses/Reports and Information in the original digital format (i.e., WordPerfect, Word, Excel, Lotus 1-2-3, JPEG, CGM, TIFF) if you conducted any geochemical analyses/reports, including internal company or external contractor interpretation reports on

- Cuttings,
- Sidewall or conventional cores, and
- Fluid samples from the well. The term "sample" encompasses:
- Hydrocarbon gases, specifically methane through pentanes and C6+ hydrocarbons;
- Non-hydrocarbon gases (carbon dioxide, hydrogen sulfide, argon, helium, and radon); and
- Any liquid hydrocarbons (such as condensate, crude, and bitumen) encountered by the well in cuttings or shows and from any other well sampling or fluid testing.

The analyses, reports, and interpretations to be submitted include, but are not necessarily limited to , the following types of data:

- Total organic carbon
- Polynuclear aromatic hydrocarbons
- Rock-eval pyrolysis
- Stable isotope analyses of carbon & hydrogen
- Thermal chromatography-gas chromatography
- Compound-specific isotope ratio mass spectrometry
- Bulk pyrolysis & hydrous pyrolysis
- Isotope ratio mass spectrometry
- Gas chromatography
- Kerogen isolation & bitumen separation
- Pyrolysis/gas chromatography
- Organic petrography

- Complete saturated biomarker & aromatic hydrocarbon analysis by GC MS
- Vitrinite reflectance
- Elemental analysis of kerogen

In addition, submit all data and reports on geochemical characterization of produced oils, including

- All whole-oil GC, GC MS on oils,
- SARAH (or SARA),
- Isotopes on the fractions,
- Molecular and isotopic analyses of C1-C5 hydrocarbons metals data, and
- Any other geochemical data used from production samples intended for reservoir characterization studies.

Submit, on CD or DVD ROM, digitally recorded data in industry standard formats.

Detailed Paleontological Reports and Information

As soon as the final and/or revised paleontological information and/or data become available to you, submit one copy in digital format of the entire, detailed paleontological report(s), chart(s), striplog(s), checklist(s), and any other paleontological records. Include the following:

- The range of samples taken,
- Sample analysis identifying fossils and lithology by MD,
- Summary and interpretation (based on identification of foraminifera, nannofossils, or other microfossils) of all biostratigraphic markers, zones, tops, or local markers,
- Description of paleontological ecological zones with water depth at the time of deposition (e.g., Middle Shelf/Neritic 20-100 meters, Outer Shelf/Neritic 100-200 meters),
- Sequence analysis interpretations based on histograms of faunal abundance,
- Identification of all rock units by depth to the top of relative chronostratigraphic stages (e.g., Upper Pleistocene, Middle Miocene, or Lower Oligocene), and
- Pleistocene, Middle Miocene, or Lower Oligocene), and
- Biostratigraphic chart noting the relative ages of the biostratigraphic zones you used in the detailed paleontological reports.

Submit, on CD or DVD ROM, one copy of the detailed paleontological report in the original digital format

Mudlogs and Reports

Submit one image copy of the following types of Mudlogs:

- Physical Formation Log
- Pore Pressure Log
- Engineering Log
- Show Report Log

Image File Formats for Mudlogs: If the original log is in color, the submitted image file must also be in color.

The following image file formats are preferred:

- Geologix - geo draft file (.gdf)
- Geologix - output data file (.odf)

If the preferred formats listed above are not available, submit the image file in the Tag Image File

Format (TIFF) with the following specifications:

Black and White TIFF Images
- Header tags as per TIFF standard
- Resolution – 200 dpi
- Compression – CCITT group IV
- Tiling – No

Color TIFF Images
- Header tags as per TIFF standard
- Resolution – 200 dpi
- Palette color – 256 colors
- File format LZW Compressed TIFF
- Tiling – No.

Submit one copy of the following types of Mudlogs reports, if collected:
- Show reports – composite into one file
- Mud reports – composite into one file
- End of Well reports – composite into one file
- Daily Drilling reports – composite into one file

Submit, on CD or DVD ROM, digitally recorded data in industry standard formats.

End of Operations Report (Form BSEE-0125) and Attachments

Pursuant to 30 CFR 250.465(a), you must submit End of Operations Report (Form BSEE-0125) and the required attachments.

Additional Information

Pursuant to 30 CFR 250.469(d), the BSEE AKOCS may require that you submit additional well reports or records for a specific well(s).

United States Department of the Interior
BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT
Alaska OCS Region
3801 Centerpoint Drive, Suite 500
Anchorage, Alaska 99503-5823

SEP 27 2012

Ms. Susan Childs
Shell Gulf of Mexico, Inc.
3601 C Street, Suite 1334
Anchorage, AK 99503
United States of America

Dear Ms. Childs:

The Alaska Region of the Bureau of Safety and Environmental Enforcement (BSEE) is in receipt of Shell's Application for a Permit to Drill (APD) **Well Number 001, Burger J, on lease OCS Y-2321, Posey Block 6912, in the Chukchi Sea (API number 55-352-00004-00).** An initial application was submitted April 2012 and completed August 2012. More recently, in a letter to BSEE from Shell Vice President Peter Slaiby, dated August 21, 2012, you sought "conditional approval" of the APD to allow for limited drilling operations before the arrival of the Arctic Containment System. In particular, you requested permission to drill and set the 30" structural and the 20" surface casings. Your application has been reviewed for compliance with the Outer Continental Shelf (OCS) Lands Act, 30 CFR Part 250 and other statutes and regulations applicable to APDs. BSEE finds that Shell has complied with those authorities and approves the subject APD to a depth equal to the casing point associated with the 20 inch casing at approximately 1434 feet true vertical depth. Upon completion of the testing and siting of the Arctic Containment System Shell will submit an Application for Permit to Modify, which, if approved, would allow Shell to continue operations outlined in the initial APD.

This approval is based on the findings below and subject to the conditions attached to this communication as Attachment A, Conditions of Approval for the Burger J, Well #001 and Attachment B Procedures for Well Data and Records Submittal. It is also conditioned on Shell's compliance during the permitted activities with all applicable BSEE regulations and requirements, U.S. Coast Guard regulations and requirements, provisions in the Exploration Plan (EP) as approved by the Bureau of Ocean Energy Management (BOEM) December 2011, BOEM regulations and requirements, provisions in the Oil Spill Response Plan approved by BSEE, conditions of approval for all permits or authorizations issued by Federal agencies, all lease stipulations, and Notices to Lessees.

This approval is valid unless and until there is a material change to conditions or facts as presented in Shell's application.

If any provision contained in any plan or application conflicts with any provision or condition approved in writing by BSEE, the provision or condition approved by BSEE later in time will control. In the event another agency approves deviations from plans, permits or conditions initially issued by that agency, copies of such approvals must be sent to BSEE.

In a letter dated August 30, 2012 BSEE approved both the Noble Discoverer and the Kulluk for operations in the Arctic OCS. Also as stated in that letter, in the event hydrogen sulfide Is found during the drilling operations the Kulluk will be required to comply with 30 CFR 250.490 if used as a relief well rig.

BSEE further finds that Shell's proposed well capping and containment systems have been designed for the projected worst case discharge conditions. The intended uses of these systems are hereby approved. BSEE will require that a witnessed deployment test of the containment system in which Shell has demonstrated that it has the ability to successfully deploy the system and have it on location pursuant to the oil spill response plan prior to BSEE's consideration of Shell's request to drill below the 20 inch casing point.

In a letter dated August 30, 2012 BSEE approved Shell's Welding and Burning Program and Hydrogen Sulfide Contingency Plans for operations conducted on the Noble Discoverer.

BSEE will provide a continuous inspection presence during drilling operations and will use Shell transportation and lodging for this purpose. As allowed in 30 CFR 250.133, Shell will request reimbursement for transportation based on the existing agreement between Shell, DOI Aviation Management Division and BSEE. Reimbursement for meals and lodging must be submitted within 90 days of the completion of the drilling program. In addition BSEE will be conducting inspections and collecting data in regard to the EPA's National Pollutant Discharge Elimination System General Permit No. AKG-28-0000 and EPA issued air quality permits at the request of the EPA letter dated July 27, 2012(copy enclosed).

All notifications related to activities described in the approved applications should be made to the BSEE active duty officer at 907-334-5300 during business hours and 855-277-2733 (toll free) after business hours.

Sincerely,

Mark Fesmire PE, JD
Regional Director, BSEE

Attachments:
Attachment A, Conditions of Approval for the Burger J, Well #001
Attachment B, Procedures for Well Data and Records Submittal
Attachment, EPA letter dated July 27, 2012
Attachment, Copy 3 of 3 Burger J APD Binder (1)

Cc: U.S. DOI, BOEM, AKOCS, Regional Director (Letter & Attachment A)
Cc: U.S. DOC, NOAA, NMFS (Letter & Attachment A)
Cc: U.S. DOI, Fish and Wildlife Service(Letter & Attachment A)

ATTACHMENT A
Conditions of Approval for the Burger J, #001 Well

1. The following waivers have been authorized:
    a. Testing of casing strings as indicated on Form BSEE -0123S is approved.
    b. Your request for a waiver to the requirements under 30 CFR 250. 423 (c) regarding a negative pressure test is approved.
    c. Testing of the BOP components to the pressures indicated on Form BSEE -0123S is approved.
    d. Your test pressure for the annular preventer as indicated on Form BSEE -0123S is approved.
    e. Deployment of a remote BOP control panel intended to operate the BOP stack from the sea floor is approved.
    f. Your request to test the deadman/autoshear system during the stump test only is approved.
    g. Your requested method to temporarily abandon the proposed pilot hole is approved.
    h. Your request to eliminate the addition of a flare, to the Discoverer, for possible use during an H2S event is granted.
2. This office will conduct a predrill inspection of your drilling vessel prior to the start of operations.
3. Shell will not be able to drill below the 20 inch casing point without fulfilling the conditions stated in the letter accompanying these conditions.
4. No drilling activities may be conducted beyond each additional casing shoe unless specifically approved by the BSEE inspector on location. BSEE will evaluate the condition of the well, results of safety equipment tests, the nature and duration of the next phase of the drilling program, existing and forecasted environmental conditions, and the procedures under an approved contingency plan [30 CFR250.417(c)(2)] that addresses design and operating limitations of the drilling unit as well as the actions necessary (i.e. suspension, curtailment, or modification of drilling or rig operations) to remedy various operational or environmental situations in order to maintain safety and prevent damage to the environment; including implementing well capping and containment or relief well drilling plans.
5. Final certification of the blowout preventer system as required in 30 CFR 250.416 (f) shall be provided to this office prior to the initial use of the BOP on this well.
6. Data submission procedures and criteria for this well are listed in an attached document (Procedures for Well Data and Records Submittal)
7. Shell must submit a daily summary report on form BSEE-0133 to this office until the final status of the well is established (one copy). Daily marine mammal reports shall be attached to the form.
8. Shell must notify this office immediately in the event the well encounters shallow gas, abnormal pressure, or lost circulation.
9. Shell must provide this office with representative dry samples collected during the drilling of this well as soon as available. Shell is also requested to collect and retain a set of wet well cuttings for the Bureau of Ocean Energy Management. This request is voluntary and the samples are intended to provide for public access once the proprietary

term for the samples is concluded. Further discussions related to this voluntary request can be concluded with appropriate BOEM representatives.

10. Shell must submit within thirty days of completion of the well all oceanographic and meteorological data collected during the drilling of this well.
11. Shell must submit an Application for Permit to Modify to change any approved portion of the APD prior to the commencement of the proposed operations. Verbal approval in an emergency may be granted, however written APM's must be submitted no later than the end of the 3rd business day following the verbal approval.
12. Shell shall notify this office as well as the onsite representative 24 hours in advance of a Blowout Preventer test.
13. Shell must submit form BSEE – 0124 in advance of either temporarily or permanently abandoning this well. This form must contain all information required in 30 CFR 250, Subpart Q for abandonment of wells.

Attachment B

BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT
ALASKA OCS REGION

Procedures for Well Data and Records Submittal

This document defines the procedures on how lessees/operators submit well records required by 30 CFR 250.468 and 469, and clarifies the specific well records you should submit, the submittal dates of the various well records, and the correct locations where you should send these well records.

The BSEE collects, verifies, and stores data by the well's unique 12-digit American Petroleum Institute (API) number we assign. The BSEE Alaska Outer Continental Shelf Region (AKOCS) uses the data collected to make informed regulatory decisions based on your timely submittal of complete and accurate well records. We define "submittal date" as the original date the data are due to the appropriate office.

According to 30 CFR 250.468(a), "you must submit copies of logs or charts of electrical, radioactive, sonic, and other well-logging operations; directional and vertical well surveys; velocity profiles and surveys; and analysis of cores to BSEE." Also, in accordance with 30 CFR 250.469(b), the AKOCS will also require submittal of paleontological reports as well as washed and dried samples collected from the well.

When to Submit Well Data Records

1. Field Data

   As stated in the approval documents for these operations this office will take an active role in assess plans for the continuation of well activities. Shell will be expected to make available digital data and field prints electronically from the well site via a secure website data delivery system or equivalent to enable this review from this office. This should be done for all logging operations including pilot hole, surface, intermediate and final runs (both wireline and Measurement While Drilling logs). This also includes detailed mud logging data.

2. Final Data

   Operators should submit one copy of the digital data on a CD or DVD in a read-only format to the appropriate entity as outlined in Attachment 1. Each CD or DVD should be properly labeled with the Area, Block, OCS, Well Number, Well Suffix, API, and the data type (i.e., Paleo Report, Conventional Core Report,

Vertical Seismic Survey, etc.). Digital and image NMR data must be submitted on separate physical media and nomenclature for NMR data files and tool codes should clearly identify them as NMR datasets.

Well records are divided into four groups for the timely submittal of the data.

a) Well Log Data, Directional Surveys, Velocity Surveys, Analyses of Percussion Sidewall Cores, Wireline Formation Test Logs, Drill Stem Tests and Mudlogs/Reports

Submit:

Well log data,
Directional surveys,
Velocity surveys (time/depth pairs),
Percussion/rotary sidewall analysis of cores,
Wireline formation tests logs (summary log), and
Drill stem tests (initial report)

To be submitted within 30 days of the "Date Operations Completed" of the last logging run (MWD/LWD or wireline) that you report in Item 7 of the Open Hole Report (Form BSEE-0133S) for each 12-digit wellbore, sidetrack, and/or bypass. Note: "Date Operations Completed" for MWD/LWD is when the data is retrieved from the drill string.

b) Paleontological, Detailed Rotary Sidewall and Conventional Core Analyses, and Vertical Seismic Profile Reports and Information

For each wellbore in which these data were collected, submit no later than 90 days after the "TD DATE" you report in Item 10 of the Well Activity Report (Form BSEE-0133).

Detailed paleontological reports and information,
Detailed rotary sidewall and conventional core analyses/reports and information, and
Detailed vertical seismic profile reports

Submit these well records when the report is completed, even if the report is generated by you and/or third party (i.e., academic partners, non-lessee partners and/or consultants) years after the wellbore is completed.

c) Geochemical Analyses and PVT Analysis of Fluid Samples

For each wellbore in which these data were collected, submit geochemical analyses and/or PVT Analysis of Fluid Samples no later than 120 days

after the "TD DATE" that you report in Item 10 of the Well Activity Report (Form BSEE-0133). Submit these well records when the report is completed, even if the report is generated by you and/or third party (i.e., academic partners, non-lessee partners and/or consultants) years after the wellbore is completed.

d) End of Operations Report (Form BSEE-0125)

For each wellbore, submit an End of Operations Report (Form BSEE-0125) and all its attachments no later than 30 days after the "END DATE" you report in Item 10 of the Well Activity Report (Form BSEE-0133).

The BSEE AKOCS uses the Well Activity Report (Form BSEE-0133) and Open Hole Report (Form BSEE-0133S) to track well activity; therefore, it is crucial that you submit a complete and accurate report to the appropriate BSEE AKOCS District Office in a timely manner. We will treat delinquent and/or incomplete reports in the same manner as delinquent and/or incomplete well data, and such violations may result in the BSEE AKOCS exacting an appropriate remedy, such as issuing an Incident of Non-compliance (INC).

The BSEE AKOCS may request that you submit well logging data, directional surveys, velocity profiles and surveys, percussion sidewall analyses of cores, wireline formation tests, and drill stem tests before the 30- day limit when we determine that circumstances warrant such action. When we determine that circumstances so warrant, we may also request that you submit preliminary reports of analytical data, namely

Geochemical analyses/reports and information,
PVT analyses of fluid samples,
Detailed paleontological reports and information,
Detailed rotary sidewall core analysis and information, and
Detailed conventional core analysis and information before the respective 90-day or 120-day limits.

The BSEE AKOCS recognizes that you need adequate time to submit complete and accurate well records. If you request it, BSEE AKOCS may grant you a departure under 30 CFR 250.142 for a new required date for submitting the data pertaining to that wellbore.

Where to Submit Well Records

Shell will need to coordinate access to field digital well logs with the following office. This office will also handle receipt of dry samples.

Bureau of Safety and Environmental Enforcement
Alaska OCS Office
3801 Centerpoint Dr., Suite 500
Anchorage, AK 99503
Office Phone: 907-334-5300
Office Fax: 907-334-5302

Shell will provide final copies of all digital image and vector well log data and related reports to both the Alaska BSEE office and to:

A2D Technologies
d/b/a TGS Geological Products and Services
1010 Common Street, Suite 2040
Attn: BSEE Well Records (Alaska)
New Orleans, LA 70112
Office telephone: 504-524-3450
Fax: 504-524-3454

A "Well Records Submission Summary" in Attachment B of this document provides an overview of the various well records, including which entity receives which well records and the addresses and contact numbers of the appropriate BSEE AKOCS Offices, and A2D Technologies. We strongly recommend that you provide a transmittal letter when you submit any well records. This transmittal should contain the following information:

- Operator's Name
- Operator's Contact Name and Telephone Number
- Bottomhole Location: Area/Block/Lease/Well Name and Number/API Number
- Date Well Records Sent
- Detailed List of Well Records

It is your responsibility to ensure that the BSEE AKOCS and A2D Technologies receive all well data and information within the specific periods. If we notify you of delinquent data, we will initiate an appropriate remedy, such as issuing an Incident of Non-Compliance (INC). If you choose to use a third party to submit well data, it remains your responsibility to ensure that the data are timely received by the BSEE AKOCS and A2D Technologies. Realizing that you may need time beyond the specified deadlines to prepare unique data or information, we will address the submission of such on an individual basis. We will address INC's issued by the BSEE AKOCS Office for the delinquent data submittal at your yearly performance review or through other appropriate and timely measures.

Well Naming and Numbering

Show the API Number and well name assigned by the BSEE AKOCS Office on all well records you submit to us. You can find these on the approved Application for Permit to Drill (Form BSEE-0123) for the original hole, sidetracks, and/or bypasses.

Data Types and Formats

A. Well Log Data types

a. Log Curve Requirements: Submit the following curve types and log images in final form, if the data were obtained in the open-hole portion of a wellbore, sidetrack, or bypass****:

- Acoustic or Sonic
- Bulk Density
- Caliper
- Conductivity
- Density Correction
- Dipmeter (computed)
- Gamma Ray Resistivity/Induction
- Spontaneous Potential
- Nuclear Magnetic Resonance *
- Mudlogs***
- Neutron
- Tension
- Porosity
- Borehole Image
- Equivalent circulation density
- Rwa
- Temperature
- Formation Tester**
- Rate of Penetration
- Photoelectric
- Slide Indicator

b. Cased hole log data: Submit all curve types and log images as identified above for any cased hole logs collected in lieu of, or in addition to, open hole logs.

* For the submittal of digital NMR vector curve data, The following are examples of curve types are to be submitted, and are not limited to you should submit:

- Quality Control Curves
- Computed Curves
- T2 Bin Distributions

Due to NMR file sizes and complexities, the BSEE now requires that digital and image NMR data are submitted on separate physical media (separate from other well log data) to its logging contractor, A2D Technologies. Also, NMR data file and tool code nomenclature should clearly identify these data as NMR-related. We encourage direct submittal of the completed log data set from the acquiring service company.

** Formation Tester is considered any logging tool that collects pressure data and/or fluid samples from the borehole. Summary Print log images, pressure gradient plots, and preliminary sample analysis must be submitted. Formation Tester summary data should also be submitted in ASCII format. All detailed reports (i.e., PVT Analysis) generated from the samples collected from the borehole must be submitted in a timely manner (see Attachment 1).

*** You will be required to submit an image file for these types of logs to A2D Technologies.

****Although API Recommended Practice (RP) 31A, Standard Form for Hardcopy Presentation of Downhole Well Log Data, is not incorporated by reference in BSEE regulations, you may use it for guidance on providing complete and accurate well information.

Note: Do not submit digital data for Formation Tester, Borehole Image, and Computed Dipmeter to A2D Technologies.

c. Well Log Image File:

Submit image files in one of the formats listed below. For Formation Tester type logs, the summary logs will suffice

i. For all vertical wells, as defined in 30 CFR 250.461, submit image files for

- Measured depth (MD) 1-inch, or 2-inch correlation, and 5-inch formation evaluation logs and
- Any additional scales you obtained.

ii. For all non-vertical wells, as defined in 30 CFR 250.461, submit image files for

- True vertical depth (TVD) 1-inch, or 2-inch correlation and, 5-inch formation evaluation logs,
- Measured depth (MD) 1-inch, or 2-inch correlation, and 5-inch formation evaluation logs, and
- Any additional scales you obtained.

Detailed 5- inch image logs must be composited, but individual runs do not need to be spliced.

If logging data from more than one logging vendor are collected in a borehole, you may submit either an image of the logging data from all vendors composited into a single set of logs or a set of images of the composited logs from each individual vendor.

d. Image File Formats: If the original log is in color, the submitted image file should also be in color.

i. The following image file formats are preferred:

- Computer Graphic Metafile (CGM) version 1-4
- Baker Metafile
- Schlumberger PDS (PDS files are usually for one logging run; any borehole with multiple runs should submit composited file format)
- Halliburton CGM
- Weatherford DPK

If the preferred formats listed above are not available, you may submit the image file in the Tag Image File Format (TIFF) with the following specifications:

ii. Format (TIFF) with the following specifications:

1. Black and White TIFF Images:

- Header tags as per TIFF standard
- Resolution – 200 dpi
- Compression – CCITT group IV
- Tiling – No

2. Color TIFF Images:

- Header tags as per TIFF standard
- Resolution – 200 dpi
- Palette color – 256 colors
- File format LZW Compressed TIFF
- Tiling - No

Clearly label each well log image with its associated API number, bottom hole lease number, well name, well name suffix, log type, scale and depth domain (MD or TVD).

e. Digital (Vector) Well Log Data: Submit composite digital curve data (one value per curve for each depth value and with individual tool runs merged) in the Canadian Well Log Society Log ASCII Standard (LAS), Version 2.0 formats; and Digital Log Interchange Standard (DLIS) or Log Interchange Standard (LIS) format. Ensure that the curve data are in a MD composite layout, including full headers for each wireline and MWD/LWD logging tool run and curve description for all curves. Ensure that all required log curves represented on the log image file are included in the digital curve file. If you collect logging data from more

than one logging vendor in a single borehole, submit a separate set of composited log curves from each individual vendor. Do not splice digital curves from different vendors to form a set of composited log curves.

i. Full header information, should including the following:

- 12-digit API number
- well name suffix
- bottom hole lease number
- bottom hole area and block
- well name

ii. Information for each tool run, should including the following:

- borehole fluids
- depth interval
- mud
- filtrate resistivity and temperatures
- casing information
- bottomhole or maximum recorded temperature
- circulation history information
- tool schematic
- tool calibration record

Full logging tool parameters (including matrix values), position of logging tool (i.e., centered or eccentered), and logging engineer's comments; and adequate curve description and

Tool -specific and service provider-specific curve and parameter mnemonics (names and abbreviations) maintained as originally acquired.

If a log is spliced, the splice depth should be clearly noted along with which files were used.

Submit digital and image logs on CD or DVD ROM (read-only memory). Digital and image logs may be submitted on the same CD or DVD.

Directional Surveys

Submit one digital copy of the final composite directional survey. For the Digital Directional Survey format, see NTL 2009-N10.

- Submit, on CD or DVD ROM these survey results coded in ASCII.
- According to 30 CFR 250.461(d) (2), "You must correct all surveys to Universal-Transverse- Mercator-Grid-north or Lambert-Grid-north after making the magnetic-to-true-north correction."

If your use of more than one vendor prevents the consolidation of the separate surveys within a well, submit the final composite survey from each vendor.

Velocity Profiles and Surveys

Vertical Seismic Profiles: Submit the results from all borehole seismic data (in cased or uncased holes), as well as concurrently run directional surveys for both vertical and directional wells. Submit, on CD or DVD ROM, digitally recorded data in an industry standard format (LAS, DLIS, ASCII, CGM, TIFF, JPG, SEGY, DOC), that include, but are not limited to:

- Normal Incidence VSP;
- Acoustic Log Calibration Report;
- Final VSP and Corridor stacks for 2D data and final stacked and migrated volume for 3D VSP data;
- Composite plot with VSP, Corridor stacks, synthetic seismogram, and well logs;
- any referenced information within the report correlative with the acquisition, such as 2-way time indexed depths and velocities, survey parameters, digital images, and computed survey data and directional; and
- If acquired, format time/depth pairs.

Velocity Surveys (Time-Depth Pairs/Checkshots): Submit, on CD or DVD ROM, one digital copy coded in ASCII format. The report should include or be annotated with the following:

- API number
- Well name and number
- Well name suffix
- Contractor or service provider
- Contact name (phone number or e-mail address)

Note that the digital format has been modified to expand the columns for True Vertical Depth and One- Way Travel Time from 5 to 8 to include two decimal places for each column.

We encourage direct submittal of the completed survey from the acquiring service company.

Analysis of Conventional Cores, Percussion/Rotary Sidewall Cores, Wireline Formation Tests, and Drill Stem Tests

IF...
you conduct any of the following:

- Conventional cores descriptions and analysis
- Percussion/Rotary sidewall core analysis or equivalent,
- Wireline formation tests - include any logs (summary logs are acceptable) and associated lab results, or
- Drill stem tests

THEN...

As soon as the final and/or revised conventional core, percussion/rotary sidewall core reports and/or data become available to you, send one digital copy of the entire, detailed report. Reports should include, but are not limited to the following:

- Standard analyses for porosity,
- Permeability
- Water saturation
- Core photos
- compaction analyses
- laser grain size analyses
- stressed brine porosity and permeability analyses
- rock mechanic studies
- water extraction and core gamma logs
- core photos

In addition, provide one copy of all studies you performed on the core(s) and tests for the purpose of describing and characterizing the reservoir architecture through detailed stratigraphic or depositional analyses. In certain situations, the BSEE AKOCS may require that you submit preliminary or interim reports.

Submit, on CD or DVD ROM, one copy of the description and analysis of the conventional core, the percussion/rotary sidewall core, wireline formation tests, and drill stem tests reports in the original digital format. Any data acquired in a log format should be submitted as a log image.

Geochemical Analyses/Reports and Information

Submit one copy of the Geochemical Analyses/Reports and Information in the original digital format. If you conducted any geochemical analyses/reports, including internal company or external contractor interpretation reports on

- Cuttings,
- Sidewall or conventional cores, and
- Fluid samples from the well. The term "sample" encompasses:
- Hydrocarbon gases, specifically methane through pentanes and C6+ hydrocarbons;
- Non-hydrocarbon gases (carbon dioxide, hydrogen sulfide, argon, helium, and radon); and
- Any liquid hydrocarbons (such as condensate, crude, and bitumen) encountered by the well in cuttings or shows and from any other well sampling or fluid testing.

The analyses, reports, and interpretations to be submitted include, but are not necessarily limited to, the following types of data:

- Total organic carbon
- Polynuclear aromatic hydrocarbons
- Rock-eval pyrolysis

- Stable isotope analyses of carbon & hydrogen
- Thermal chromatography-gas chromatography
- Compound-specific isotope ratio mass spectrometry
- Bulk pyrolysis & hydrous pyrolysis
- Isotope ratio mass spectrometry
- Gas chromatography
- Kerogen isolation & bitumen separation
- Pyrolysis/gas chromatography
- Organic petrography
- Complete saturated biomarker & aromatic hydrocarbon analysis by GC MS
- Vitrinite reflectance
- Elemental analysis of kerogen

In addition, submit all data and reports on geochemical characterization of produced oils, including

- All whole-oil GC, GC MS on oils,
- SARAH (or SARA),
- Isotopes on the fractions,
- Molecular and isotopic analyses of C1-C5 hydrocarbons metals data, and
- Any other geochemical data used from production samples intended for reservoir characterization studies.

Submit, on CD or DVD ROM, digitally recorded data in industry standard formats.

Detailed Paleontological Reports and Information

As soon as the final and/or revised paleontological information and/or data become available to you, submit one copy in digital format of the entire, detailed paleontological report(s), chart(s), striplog(s), checklist(s), and any other paleontological records. Include the following:

The range of samples taken,

- Sample analysis identifying fossils and lithology by MD,
- Summary and interpretation (based on identification of foraminifera, nannofossils, or other microfossils) of all biostratigraphic markers, zones, tops, or local markers,
- Description of paleontological ecological zones with water depth at the time of deposition (e.g., Middle Shelf/Neritic 20-100 meters, Outer Shelf/Neritic 100-200 meters),
- Sequence analysis interpretations based on histograms of faunal abundance,
- Identification of all rock units by depth to the top of relative chronostratigraphic stages (e.g., Upper Pleistocene, Middle Miocene, or Lower Oligocene), and
- Pleistocene, Middle Miocene, or Lower Oligocene), and
- Biostratigraphic chart noting the relative ages of the biostratigraphic zones you used in the detailed paleontological reports.

Submit, on CD or DVD ROM, one copy of the detailed paleontological report in the original digital format.

Mudlogs and Reports

Submit one image copy of the following types of Mudlogs:

- Physical Formation Log
- Pore Pressure Log
- Engineering Log
- Show Report Log

Image File Formats for Mudlogs: If the original log is in color, the submitted image file must also be in color.

The following image file formats are preferred:

- Geologix - geo draft file (.gdf)
- Geologix - output data file (.odf)

If the preferred formats listed above are not available, submit the image file in the Tag Image File

Format (TIFF) with the following specifications:

Black and White TIFF Images
- Header tags as per TIFF standard
- Resolution – 200 dpi
- Compression – CCITT group IV
- Tiling – No

Color TIFF Images
- Header tags as per TIFF standard
- Resolution – 200 dpi
- Palette color – 256 colors
- File format LZW Compressed TIFF
- Tiling – No.

Submit one copy of the following types of Mudlogs reports, if collected:
- Show reports – composite into one file
- Mud reports – composite into one file
- End of Well reports – composite into one file
- Daily Drilling reports – composite into one file

Submit, on CD or DVD ROM, digitally recorded data in industry standard formats.

End of Operations Report (Form BSEE-0125) and Attachments

Pursuant to 30 CFR 250.465(a), you must submit End of Operations Report (Form BSEE-0125) and the required attachments.

Additional Information

Pursuant to 30 CFR 250.469(d), the BSEE AKOCS may require that you submit additional well reports or records for a specific well(s).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF THE
REGIONAL
ADMINISTRATOR

JUL 27 2012

Mr. Mark Fesmire
Director of Alaska Region
Bureau of Safety and Environmental Enforcement
3801 Centerpoint Drive, Suite 500
Anchorage, Alaska 99503-5820

Dear Mr. Fesmire:

The U.S. Environmental Protection Agency, Region 10, is contacting the Bureau of Safety and Environmental Enforcement to finalize the EPA's request for assistance in conducting inspections and collecting data on exploration facilities located on the Alaska outer continental shelf during the 2012 drilling season.

Our respective agency inspectors have been working cooperatively to develop procedures to assist BSEE inspectors in conducting inspections and collecting data related to exploration facilities covered by the National Pollutant Discharge Elimination System General Permit for Oil and Gas Exploration Facilities on the Outer Continental Shelf and Contiguous State Waters, NPDES Permit No. AKG-28-0000, and EPA-issued air quality permits. These procedures are based, in part, on the 1993 memorandum of agreement between the EPA and the Minerals Management Service that was intended to improve cooperation and coordination in oil and gas lease activities on the outer continental shelf.

Our proposed joint efforts will assist the EPA's ongoing OCS compliance and enforcement program and increase regulatory accountability of exploration facilities that are drilling in the OCS during the 2012 drilling season. The respective agency inspectors are in the process of developing the procedures for these joint efforts and in working through logistical and procedural issues that may arise during the drilling season.

Accordingly, I want to take this opportunity to recognize BSEE's ongoing assistance and to request your confirmation of our joint efforts for this drilling season. Please contact me or have your staff contact Mr. Rick Cool in our Office of Compliance and Enforcement at 206-553-6223 if you have any questions about this letter.

Sincerely,

Dennis J. McLerran
Regional Administrator

United States Department of the Interior
BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT
Alaska OCS Region
3801 Centerpoint Drive, Suite 500
Anchorage, Alaska 99503-5823

OCT 18 2012

Ms. Susan Childs
Shell Gulf of Mexico, Inc.
3601 C Street, Suite 1334
Anchorage, AK 99503
United States of America

Dear Ms. Childs:

The Alaska Region of the Bureau of Safety and Environmental Enforcement (BSEE) is in receipt of Shell's Application for a Permit to Drill (APD) **Well Number 001, Burger V, on lease OCS Y-2324, Posey Block 6915, in the Chukchi Sea (API number 55-352-00007-00).** An initial application was submitted April 2012 and completed September 2012. In a letter to BSEE from Shell Vice President Peter Slaiby, dated August 21, 2012, you sought "conditional approval" of the APD to allow for limited drilling operations before the arrival of the Arctic Containment System. In particular, you requested permission to drill and set the 30" structural and the 20" surface casings. Your application has been reviewed for compliance with the Outer Continental Shelf (OCS) Lands Act, 30 CFR Part 250 and other statutes and regulations applicable to APDs. BSEE finds that Shell has complied with those authorities and approves the subject APD to a depth equal to the casing point associated with the 20 inch casing at approximately 1437 feet true vertical depth. Upon completion of the testing and siting of the Arctic Containment System Shell will submit an Application for Permit to Modify, which, if approved, would allow Shell to continue operations outlined in the initial APD.

This approval is based on the findings below and subject to the conditions attached to this communication as Attachment A, Conditions of Approval for the Burger V, Well #001 and Attachment B Procedures for Well Data and Records Submittal. It is also conditioned on Shell's compliance during the permitted activities with all applicable BSEE regulations and requirements, U.S. Coast Guard regulations and requirements, provisions in the Exploration Plan (EP) as approved by the Bureau of Ocean Energy Management (BOEM) December 2011, BOEM regulations and requirements, provisions in the Oil Spill Response Plan approved by BSEE, conditions of approval for all permits or authorizations issued by Federal agencies, all lease stipulations, and Notices to Lessees.

This approval is valid unless and until there is a material change to conditions or facts as presented in Shell's application.

If any provision contained in any plan or application conflicts with any provision or condition approved in writing by BSEE, the provision or condition approved by BSEE later in time will control. In the event another agency approves deviations from plans, permits or conditions initially issued by that agency, copies of such approvals must be sent to BSEE.

In a letter dated August 30, 2012 BSEE approved both the Noble Discoverer and the Kulluk for operations in the Arctic OCS. Also as stated in that letter, in the event hydrogen sulfide Is found during the drilling operations the Kulluk will be required to comply with 30 CFR 250.490 if used as a relief well rig.

BSEE further finds that Shell's proposed well capping and containment systems have been designed for the projected worst case discharge conditions. The intended uses of these systems are hereby approved. BSEE will require that a witnessed deployment test of the containment system in which Shell has demonstrated that it has the ability to successfully deploy the system and have it on location pursuant to the oil spill response plan prior to BSEE's consideration of Shell's request to drill below the 20 inch casing point.

In a letter dated August 30, 2012 BSEE approved Shell's Welding and Burning Program and Hydrogen Sulfide Contingency Plans for operations conducted on the Noble Discoverer.

BSEE will provide a continuous inspection presence during drilling operations and will use Shell transportation and lodging for this purpose. As allowed in 30 CFR 250.133, Shell will request reimbursement for transportation based on the existing agreement between Shell, DOI Aviation Management Division and BSEE. Reimbursement for meals and lodging must be submitted within 90 days of the completion of the drilling program. In addition BSEE will be conducting inspections and collecting data in regard to the EPA's National Pollutant Discharge Elimination System General Permit No. AKG-28-0000 and EPA issued air quality permits at the request of the EPA by letter dated July 27, 2012(copy enclosed).

All notifications related to activities described in the approved applications should be made to the BSEE active duty officer at 907-334-5300 during business hours and 855-277-2733 (toll free) after business hours.

Sincerely,

Mark Fesmire PE, JD
Regional Director, BSEE

Cc: U.S. DOI, BOEM, AKOCS, Regional Director
Cc: U.S. DOC, NOAA, NMFS
Cc: U.S. DOI, Fish and Wildlife Service

ATTACHMENT A
Conditions of Approval for the Burger V, #001 Well

1. The following waivers have been authorized:
    a. Testing of casing strings as indicated on Form BSEE -0123S is approved.
    b. Your request for a waiver to the requirements under 30 CFR 250. 423 (c) regarding a negative pressure test is approved.
    c. Testing of the BOP components to the pressures indicated on Form BSEE -0123S is approved.
    d. Your test pressure for the annular preventer as indicated on Form BSEE -0123S is approved.
    e. Deployment of a remote BOP control panel intended to operate the BOP stack from the sea floor is approved.
    f. Your request to test the deadman/autoshear system during the stump test only is approved.
    g. Your requested method to temporarily abandon the proposed pilot hole is approved.
    h. Your request to eliminate the addition of a flare, to the Discoverer, for possible use during an H2S event is granted.
2. This office will conduct a predrill inspection of your drilling vessel prior to the start of operations.
3. Shell will not be able to drill below the 20 inch casing point without fulfilling the conditions stated in the letter accompanying these conditions.
4. No drilling activities may be conducted beyond each additional casing shoe unless specifically approved by the BSEE inspector on location. BSEE will evaluate the condition of the well, results of safety equipment tests, the nature and duration of the next phase of the drilling program, existing and forecasted environmental conditions, and the procedures under an approved contingency plan [30 CFR250.417(c)(2)] that addresses design and operating limitations of the drilling unit as well as the actions necessary (i.e. suspension, curtailment, or modification of drilling or rig operations) to remedy various operational or environmental situations in order to maintain safety and prevent damage to the environment; including implementing well capping and containment or relief well drilling plans.
5. Final certification of the blowout preventer system as required in 30 CFR 250.416 (f) shall be provided to this office prior to the initial use of the BOP on this well.
6. Data submission procedures and criteria for this well are listed in an attached document (Procedures for Well Data and Records Submittal)
7. Shell must submit a daily summary report on form BSEE-0133 to this office until the final status of the well is established (one copy). Daily marine mammal reports shall be attached to the form.
8. Shell must notify this office immediately in the event the well encounters shallow gas, abnormal pressure, or lost circulation.
9. Shell must provide this office with representative dry samples collected during the drilling of this well as soon as available. Shell is also requested to collect and retain a set of wet well cuttings for the Bureau of Ocean Energy Management. This request is voluntary and the samples are intended to provide for public access once the proprietary

term for the samples is concluded. Further discussions related to this voluntary request can be concluded with appropriate BOEM representatives.

10. Shell must submit within thirty days of completion of the well all oceanographic and meteorological data collected during the drilling of this well.
11. Shell must submit an Application for Permit to Modify to change any approved portion of the APD prior to the commencement of the proposed operations. Verbal approval in an emergency may be granted, however written APM's must be submitted no later than the end of the 3rd business day following the verbal approval.
12. Shell shall notify this office as well as the onsite representative 24 hours in advance of a Blowout Preventer test.
13. Shell must submit form BSEE – 0124 in advance of either temporarily or permanently abandoning this well. This form must contain all information required in 30 CFR 250, Subpart Q for abandonment of wells.

Attachment B

BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT
ALASKA OCS REGION

Procedures for Well Data and Records Submittal

This document defines the procedures on how lessees/operators submit well records required by 30 CFR 250.468 and 469, and clarifies the specific well records you should submit, the submittal dates of the various well records, and the correct locations where you should send these well records.

The BSEE collects, verifies, and stores data by the well's unique 12-digit American Petroleum Institute (API) number we assign. The BSEE Alaska Outer Continental Shelf Region (AKOCS) uses the data collected to make informed regulatory decisions based on your timely submittal of complete and accurate well records. We define "submittal date" as the original date the data are due to the appropriate office.

According to 30 CFR 250.468(a), "you must submit copies of logs or charts of electrical, radioactive, sonic, and other well-logging operations; directional and vertical well surveys; velocity profiles and surveys; and analysis of cores to BSEE." Also, in accordance with 30 CFR 250.469(b), the AKOCS will also require submittal of paleontological reports as well as washed and dried samples collected from the well.

When to Submit Well Data Records

1. Field Data

   As stated in the approval documents for these operations this office will take an active role in assess plans for the continuation of well activities. Shell will be expected to make available digital data and field prints electronically from the well site via a secure website data delivery system or equivalent to enable this review from this office. This should be done for all logging operations including pilot hole, surface, intermediate and final runs (both wireline and Measurement While Drilling logs). This also includes detailed mud logging data.

2. Final Data

   Operators should submit one copy of the digital data on a CD or DVD in a read-only format to the appropriate entity as outlined in Attachment 1. Each CD or DVD should be properly labeled with the Area, Block, OCS, Well Number, Well Suffix, API, and the data type (i.e., Paleo Report, Conventional Core Report,

Vertical Seismic Survey, etc.). Digital and image NMR data must be submitted on separate physical media and nomenclature for NMR data files and tool codes should clearly identify them as NMR datasets.

Well records are divided into four groups for the timely submittal of the data.

a) Well Log Data, Directional Surveys, Velocity Surveys, Analyses of Percussion Sidewall Cores, Wireline Formation Test Logs, Drill Stem Tests and Mudlogs/Reports

Submit:

Well log data,
Directional surveys,
Velocity surveys (time/depth pairs),
Percussion/rotary sidewall analysis of cores,
Wireline formation tests logs (summary log), and
Drill stem tests (initial report)

To be submitted within 30 days of the "Date Operations Completed" of the last logging run (MWD/LWD or wireline) that you report in Item 7 of the Open Hole Report (Form BSEE-0133S) for each 12-digit wellbore, sidetrack, and/or bypass. Note: "Date Operations Completed" for MWD/LWD is when the data is retrieved from the drill string.

b) Paleontological, Detailed Rotary Sidewall and Conventional Core Analyses, and Vertical Seismic Profile Reports and Information

For each wellbore in which these data were collected, submit no later than 90 days after the "TD DATE" you report in Item 10 of the Well Activity Report (Form BSEE-0133).

Detailed paleontological reports and information,
Detailed rotary sidewall and conventional core analyses/reports and information, and
Detailed vertical seismic profile reports

Submit these well records when the report is completed, even if the report is generated by you and/or third party (i.e., academic partners, non-lessee partners and/or consultants) years after the wellbore is completed.

c) Geochemical Analyses and PVT Analysis of Fluid Samples

For each wellbore in which these data were collected, submit geochemical analyses and/or PVT Analysis of Fluid Samples no later than 120 days

after the "TD DATE" that you report in Item 10 of the Well Activity Report (Form BSEE-0133). Submit these well records when the report is completed, even if the report is generated by you and/or third party (i.e., academic partners, non-lessee partners and/or consultants) years after the wellbore is completed.

d) End of Operations Report (Form BSEE-0125)

For each wellbore, submit an End of Operations Report (Form BSEE-0125) and all its attachments no later than 30 days after the "END DATE" you report in Item 10 of the Well Activity Report (Form BSEE-0133).

The BSEE AKOCS uses the Well Activity Report (Form BSEE-0133) and Open Hole Report (Form BSEE-0133S) to track well activity; therefore, it is crucial that you submit a complete and accurate report to the appropriate BSEE AKOCS District Office in a timely manner. We will treat delinquent and/or incomplete reports in the same manner as delinquent and/or incomplete well data, and such violations may result in the BSEE AKOCS exacting an appropriate remedy, such as issuing an Incident of Non-compliance (INC).

The BSEE AKOCS may request that you submit well logging data, directional surveys, velocity profiles and surveys, percussion sidewall analyses of cores, wireline formation tests, and drill stem tests before the 30- day limit when we determine that circumstances warrant such action. When we determine that circumstances so warrant, we may also request that you submit preliminary reports of analytical data, namely

Geochemical analyses/reports and information,
PVT analyses of fluid samples,
Detailed paleontological reports and information,
Detailed rotary sidewall core analysis and information, and
Detailed conventional core analysis and information before the respective 90-day or 120-day limits.

The BSEE AKOCS recognizes that you need adequate time to submit complete and accurate well records. If you request it, BSEE AKOCS may grant you a departure under 30 CFR 250.142 for a new required date for submitting the data pertaining to that wellbore.

Where to Submit Well Records

Shell will need to coordinate access to field digital well logs with the following office. This office will also handle receipt of dry samples.

Bureau of Safety and Environmental Enforcement
Alaska OCS Office
3801 Centerpoint Dr., Suite 500
Anchorage, AK 99503
Office Phone: 907-334-5300
Office Fax: 907-334-5302

Shell will provide final copies of all digital image and vector well log data and related reports to both the Alaska BSEE office and to:

A2D Technologies
d/b/a TGS Geological Products and Services
1010 Common Street, Suite 2040
Attn: BSEE Well Records (Alaska)
New Orleans, LA 70112
Office telephone: 504-524-3450
Fax: 504-524-3454

A "Well Records Submission Summary" in Attachment B of this document provides an overview of the various well records, including which entity receives which well records and the addresses and contact numbers of the appropriate BSEE AKOCS Offices, and A2D Technologies. We strongly recommend that you provide a transmittal letter when you submit any well records. This transmittal should contain the following information:

- Operator's Name
- Operator's Contact Name and Telephone Number
- Bottomhole Location: Area/Block/Lease/Well Name and Number/API Number
- Date Well Records Sent
- Detailed List of Well Records

It is your responsibility to ensure that the BSEE AKOCS and A2D Technologies receive all well data and information within the specific periods. If we notify you of delinquent data, we will initiate an appropriate remedy, such as issuing an Incident of Non-Compliance (INC). If you choose to use a third party to submit well data, it remains your responsibility to ensure that the data are timely received by the BSEE AKOCS and A2D Technologies. Realizing that you may need time beyond the specified deadlines to prepare unique data or information, we will address the submission of such on an individual basis. We will address INC's issued by the BSEE AKOCS Office for the delinquent data submittal at your yearly performance review or through other appropriate and timely measures.

Well Naming and Numbering

Show the API Number and well name assigned by the BSEE AKOCS Office on all well records you submit to us. You can find these on the approved Application for Permit to Drill (Form BSEE-0123) for the original hole, sidetracks, and/or bypasses.

Data Types and Formats

A. Well Log Data types

a. Log Curve Requirements: Submit the following curve types and log images in final form, if the data were obtained in the open-hole portion of a wellbore, sidetrack, or bypass****:

- Acoustic or Sonic
- Bulk Density
- Caliper
- Conductivity
- Density Correction
- Dipmeter (computed)
- Gamma Ray Resistivity/Induction
- Spontaneous Potential
- Nuclear Magnetic Resonance *
- Mudlogs***
- Neutron
- Tension
- Porosity
- Borehole Image
- Equivalent circulation density
- Rwa
- Temperature
- Formation Tester**
- Rate of Penetration
- Photoelectric
- Slide Indicator

b. Cased hole log data: Submit all curve types and log images as identified above for any cased hole logs collected in lieu of, or in addition to, open hole logs.

* For the submittal of digital NMR vector curve data, The following are examples of curve types are to be submitted, and are not limited to you should submit:

- Quality Control Curves
- Computed Curves
- T2 Bin Distributions

Due to NMR file sizes and complexities, the BSEE now requires that digital and image NMR data are submitted on separate physical media (separate from other well log data) to its logging contractor, A2D Technologies. Also, NMR data file and tool code nomenclature should clearly identify these data as NMR-related. We encourage direct submittal of the completed log data set from the acquiring service company.

** Formation Tester is considered any logging tool that collects pressure data and/or fluid samples from the borehole. Summary Print log images, pressure gradient plots, and preliminary sample analysis must be submitted. Formation Tester summary data should also be submitted in ASCII format. All detailed reports (i.e., PVT Analysis) generated from the samples collected from the borehole must be submitted in a timely manner (see Attachment 1).

*** You will be required to submit an image file for these types of logs to A2D Technologies.

****Although API Recommended Practice (RP) 31A, Standard Form for Hardcopy Presentation of Downhole Well Log Data, is not incorporated by reference in BSEE regulations, you may use it for guidance on providing complete and accurate well information.

Note: Do not submit digital data for Formation Tester, Borehole Image, and Computed Dipmeter to A2D Technologies.

c. Well Log Image File:

Submit image files in one of the formats listed below. For Formation Tester type logs, the summary logs will suffice

i. For all vertical wells, as defined in 30 CFR 250.461, submit image files for

- Measured depth (MD) 1-inch, or 2-inch correlation, and 5-inch formation evaluation logs and
- Any additional scales you obtained.

ii. For all non-vertical wells, as defined in 30 CFR 250.461, submit image files for

- True vertical depth (TVD) 1-inch, or 2-inch correlation and, 5-inch formation evaluation logs,
- Measured depth (MD) 1-inch, or 2-inch correlation, and 5-inch formation evaluation logs, and
- Any additional scales you obtained.

Detailed 5- inch image logs must be composited, but individual runs do not need to be spliced.

If logging data from more than one logging vendor are collected in a borehole, you may submit either an image of the logging data from all vendors composited into a single set of logs or a set of images of the composited logs from each individual vendor.

d. Image File Formats: If the original log is in color, the submitted image file should also be in color.

i. The following image file formats are preferred:

- Computer Graphic Metafile (CGM) version 1-4
- Baker Metafile
- Schlumberger PDS (PDS files are usually for one logging run; any borehole with multiple runs should submit composited file format)
- Halliburton CGM
- Weatherford DPK

If the preferred formats listed above are not available, you may submit the image file in the Tag Image File Format (TIFF) with the following specifications:

ii. Format (TIFF) with the following specifications:

1. Black and White TIFF Images:

- Header tags as per TIFF standard
- Resolution – 200 dpi
- Compression – CCITT group IV
- Tiling – No

2. Color TIFF Images:

- Header tags as per TIFF standard
- Resolution – 200 dpi
- Palette color – 256 colors
- File format LZW Compressed TIFF
- Tiling - No

Clearly label each well log image with its associated API number, bottom hole lease number, well name, well name suffix, log type, scale and depth domain (MD or TVD).

e. Digital (Vector) Well Log Data: Submit composite digital curve data (one value per curve for each depth value and with individual tool runs merged) in the Canadian Well Log Society Log ASCII Standard (LAS), Version 2.0 formats; and Digital Log Interchange Standard (DLIS) or Log Interchange Standard (LIS) format. Ensure that the curve data are in a MD composite layout, including full headers for each wireline and MWD/LWD logging tool run and curve description for all curves. Ensure that all required log curves represented on the log image file are included in the digital curve file. If you collect logging data from more

than one logging vendor in a single borehole, submit a separate set of composited log curves from each individual vendor. Do not splice digital curves from different vendors to form a set of composited log curves.

i. Full header information, should including the following:

- 12-digit API number
- well name suffix
- bottom hole lease number
- bottom hole area and block
- well name

ii. Information for each tool run, should including the following:

- borehole fluids
- depth interval
- mud
- filtrate resistivity and temperatures
- casing information
- bottomhole or maximum recorded temperature
- circulation history information
- tool schematic
- tool calibration record

Full logging tool parameters (including matrix values), position of logging tool (i.e., centered or eccentered), and logging engineer's comments; and adequate curve description and

Tool -specific and service provider-specific curve and parameter mnemonics (names and abbreviations) maintained as originally acquired.

If a log is spliced, the splice depth should be clearly noted along with which files were used.

Submit digital and image logs on CD or DVD ROM (read-only memory). Digital and image logs may be submitted on the same CD or DVD.

Directional Surveys

Submit one digital copy of the final composite directional survey. For the Digital Directional Survey format, see NTL 2009-N10.

- Submit, on CD or DVD ROM these survey results coded in ASCII.
- According to 30 CFR 250.461(d) (2), "You must correct all surveys to Universal-Transverse- Mercator-Grid-north or Lambert-Grid-north after making the magnetic-to-true-north correction."

If your use of more than one vendor prevents the consolidation of the separate surveys within a well, submit the final composite survey from each vendor.

Velocity Profiles and Surveys

Vertical Seismic Profiles: Submit the results from all borehole seismic data (in cased or uncased holes), as well as concurrently run directional surveys for both vertical and directional wells. Submit, on CD or DVD ROM, digitally recorded data in an industry standard format (LAS, DLIS, ASCII, CGM, TIFF, JPG, SEGY, DOC), that include, but are not limited to:

- Normal Incidence VSP;
- Acoustic Log Calibration Report;
- Final VSP and Corridor stacks for 2D data and final stacked and migrated volume for 3D VSP data;
- Composite plot with VSP, Corridor stacks, synthetic seismogram, and well logs;
- any referenced information within the report correlative with the acquisition, such as 2-way time indexed depths and velocities, survey parameters, digital images, and computed survey data and directional; and
- If acquired, format time/depth pairs.

Velocity Surveys (Time-Depth Pairs/Checkshots): Submit, on CD or DVD ROM, one digital copy coded in ASCII format. The report should include or be annotated with the following:

- API number
- Well name and number
- Well name suffix
- Contractor or service provider
- Contact name (phone number or e-mail address)

Note that the digital format has been modified to expand the columns for True Vertical Depth and One- Way Travel Time from 5 to 8 to include two decimal places for each column.

We encourage direct submittal of the completed survey from the acquiring service company.

Analysis of Conventional Cores, Percussion/Rotary Sidewall Cores, Wireline Formation Tests, and Drill Stem Tests

IF...
you conduct any of the following:

- Conventional cores descriptions and analysis
- Percussion/Rotary sidewall core analysis or equivalent,
- Wireline formation tests - include any logs (summary logs are acceptable) and associated lab results, or
- Drill stem tests

THEN...

As soon as the final and/or revised conventional core, percussion/rotary sidewall core reports and/or data become available to you, send one digital copy of the entire, detailed report. Reports should include, but are not limited to the following:

- Standard analyses for porosity,
- Permeability
- Water saturation
- Core photos
- compaction analyses
- laser grain size analyses
- stressed brine porosity and permeability analyses
- rock mechanic studies
- water extraction and core gamma logs
- core photos

In addition, provide one copy of all studies you performed on the core(s) and tests for the purpose of describing and characterizing the reservoir architecture through detailed stratigraphic or depositional analyses. In certain situations, the BSEE AKOCS may require that you submit preliminary or interim reports.

Submit, on CD or DVD ROM, one copy of the description and analysis of the conventional core, the percussion/rotary sidewall core, wireline formation tests, and drill stem tests reports in the original digital format. Any data acquired in a log format should be submitted as a log image.

Geochemical Analyses/Reports and Information

Submit one copy of the Geochemical Analyses/Reports and Information in the original digital format. If you conducted any geochemical analyses/reports, including internal company or external contractor interpretation reports on

- Cuttings,
- Sidewall or conventional cores, and
- Fluid samples from the well. The term "sample" encompasses:
- Hydrocarbon gases, specifically methane through pentanes and C6+ hydrocarbons;
- Non-hydrocarbon gases (carbon dioxide, hydrogen sulfide, argon, helium, and radon); and
- Any liquid hydrocarbons (such as condensate, crude, and bitumen) encountered by the well in cuttings or shows and from any other well sampling or fluid testing.

The analyses, reports, and interpretations to be submitted include, but are not necessarily limited to, the following types of data:

- Total organic carbon
- Polynuclear aromatic hydrocarbons
- Rock-eval pyrolysis

- Stable isotope analyses of carbon & hydrogen
- Thermal chromatography-gas chromatography
- Compound-specific isotope ratio mass spectrometry
- Bulk pyrolysis & hydrous pyrolysis
- Isotope ratio mass spectrometry
- Gas chromatography
- Kerogen isolation & bitumen separation
- Pyrolysis/gas chromatography
- Organic petrography
- Complete saturated biomarker & aromatic hydrocarbon analysis by GC MS
- Vitrinite reflectance
- Elemental analysis of kerogen

In addition, submit all data and reports on geochemical characterization of produced oils, including

- All whole-oil GC, GC MS on oils,
- SARAH (or SARA),
- Isotopes on the fractions,
- Molecular and isotopic analyses of C1-C5 hydrocarbons metals data, and
- Any other geochemical data used from production samples intended for reservoir characterization studies.

Submit, on CD or DVD ROM, digitally recorded data in industry standard formats.

Detailed Paleontological Reports and Information

As soon as the final and/or revised paleontological information and/or data become available to you, submit one copy in digital format of the entire, detailed paleontological report(s), chart(s), striplog(s), checklist(s), and any other paleontological records. Include the following:

The range of samples taken,
- Sample analysis identifying fossils and lithology by MD,
- Summary and interpretation (based on identification of foraminifera, nannofossils, or other microfossils) of all biostratigraphic markers, zones, tops, or local markers,
- Description of paleontological ecological zones with water depth at the time of deposition (e.g., Middle Shelf/Neritic 20-100 meters, Outer Shelf/Neritic 100-200 meters),
- Sequence analysis interpretations based on histograms of faunal abundance,
- Identification of all rock units by depth to the top of relative chronostratigraphic stages (e.g., Upper Pleistocene, Middle Miocene, or Lower Oligocene), and
- Pleistocene, Middle Miocene, or Lower Oligocene), and
- Biostratigraphic chart noting the relative ages of the biostratigraphic zones you used in the detailed paleontological reports.

Submit, on CD or DVD ROM, one copy of the detailed paleontological report in the original digital format.

Mudlogs and Reports

Submit one image copy of the following types of Mudlogs:

- Physical Formation Log
- Pore Pressure Log
- Engineering Log
- Show Report Log

Image File Formats for Mudlogs: If the original log is in color, the submitted image file must also be in color.

The following image file formats are preferred:

- Geologix - geo draft file (.gdf)
- Geologix - output data file (.odf)

If the preferred formats listed above are not available, submit the image file in the Tag Image File

Format (TIFF) with the following specifications:

Black and White TIFF Images
- Header tags as per TIFF standard
- Resolution – 200 dpi
- Compression – CCITT group IV
- Tiling – No

Color TIFF Images
- Header tags as per TIFF standard
- Resolution – 200 dpi
- Palette color – 256 colors
- File format LZW Compressed TIFF
- Tiling – No.

Submit one copy of the following types of Mudlogs reports, if collected:
- Show reports – composite into one file
- Mud reports – composite into one file
- End of Well reports – composite into one file
- Daily Drilling reports – composite into one file

Submit, on CD or DVD ROM, digitally recorded data in industry standard formats.

End of Operations Report (Form BSEE-0125) and Attachments

Pursuant to 30 CFR 250.465(a), you must submit End of Operations Report (Form BSEE-0125) and the required attachments.

Additional Information

Pursuant to 30 CFR 250.469(d), the BSEE AKOCS may require that you submit additional well reports or records for a specific well(s).

United States Department of the Interior
BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT
Alaska OCS Region
3801 Centerpoint Drive, Suite 500
Anchorage, Alaska 99503-5823

OCT 18 2012

Ms. Susan Childs
Shell Offshore Inc.
3601 C Street, Suite 1334
Anchorage, AK 99503
United States of America

Dear Ms. Childs:

The Alaska Region of the Bureau of Safety and Environmental Enforcement (BSEE) is in receipt of Shell's Application for a Permit to Drill (APD) **Well Number 001, Torpedo H, on lease OCS Y-1941, Flaxman Island Block 6912, in the Beaufort Sea (API number 55-171-00017-00).** An initial application was submitted January 2012, completed October 2012. In a letter to BSEE from Alaska Venture Support Integrator, Manager Susan Childs, dated August 31, 2012, you sought "conditional approval" of the APD to allow for limited drilling operations before the arrival of the Arctic Containment System. In particular, you requested permission to drill and set the 30" structural and the 20" surface casings. Your application has been reviewed for compliance with the Outer Continental Shelf (OCS) Lands Act, 30 CFR Part 250 and other statutes and regulations applicable to APDs. BSEE finds that Shell has complied with those authorities and approves the subject APD to a depth equal to the casing point associated with the 20 inch casing at approximately 1227 feet true vertical depth. Upon completion of the testing and siting of the Arctic Containment System Shell will submit an Application for Permit to Modify, which, if approved, would allow Shell to continue operations outlined in the initial APD.

This approval is based on the findings below and subject to the conditions attached to this communication as Attachment A, Conditions of Approval for the Torpedo H, Well #001 and Attachment B Procedures for Well Data and Records Submittal. It is also conditioned on Shell's compliance during the permitted activities with all applicable BSEE regulations and requirements, U.S. Coast Guard regulations and requirements, provisions in the Exploration Plan (EP) as approved by the Bureau of Ocean Energy Management (BOEM) August 2011, BOEM regulations and requirements, provisions in the Oil Spill Response Plan approved by BSEE, conditions of approval for all permits or authorizations issued by Federal agencies, all lease stipulations, and Notices to Lessees.

This approval is valid unless and until there is a material change to conditions or facts as presented in Shell's application.

If any provision contained in any plan or application conflicts with any provision or condition approved in writing by BSEE, the provision or condition approved by BSEE later in time will

control. In the event another agency approves deviations from plans, permits or conditions initially issued by that agency, copies of such approvals must be sent to BSEE.

In a letter dated September 20, 2012 BSEE approved both the Kulluk and Noble Discoverer for operations in the Beaufort Sea of the Arctic OCS.

BSEE further finds that Shell's proposed well capping and containment systems have been designed for the projected worst case discharge conditions. The intended uses of these systems are hereby approved. BSEE will require that a witnessed deployment test of the containment system in which Shell has demonstrated that it has the ability to successfully deploy the system and have it on location pursuant to the oil spill response plan prior to BSEE's consideration of Shell's request to drill below the 20 inch casing point.

In a letter dated September 20, 2012 BSEE approved Shell's Welding and Burning Program for operations conducted on the Kulluk.

BSEE will provide a continuous inspection presence during drilling operations and will use Shell transportation and lodging for this purpose. As allowed in 30 CFR 250.133, Shell will request reimbursement for transportation based on the existing agreement between Shell, DOI Aviation Management Division and BSEE. Reimbursement for meals and lodging must be submitted within 90 days of the completion of the drilling program. In addition BSEE will be conducting inspections and collecting data in regard to the EPA's National Pollutant Discharge Elimination System General Permit No. AKG-28-0000 and EPA issued air quality permits at the request of the EPA by letter dated July 27, 2012(copy enclosed).

All notifications related to activities described in the approved applications should be made to the BSEE active duty officer at 907-334-5300 during business hours and 855-277-2733 (toll free) after business hours.

Sincerely,

Mark Fesmire PE, JD
Regional Director, BSEE

Cc: U.S. DOI, BOEM, AKOCS, Regional Director
Cc: U.S. DOC, NOAA, NMFS
Cc: U.S. DOI, Fish and Wildlife Service

ATTACHMENT A
Conditions of Approval for the Torpedo H, #001 Well

1. The following waivers have been authorized:
    a. Testing of casing strings as indicated on Form BSEE -0123S is approved.
    b. Your request for a waiver to the requirements under 30 CFR 250. 423 (c) regarding a negative pressure test is approved.
    c. Testing of the BOP components to the pressures indicated on Form BSEE -0123S is approved.
    d. Your test pressure for the annular preventer as indicated on Form BSEE -0123S is approved.
    e. Deployment of a remote BOP control panel intended to operate the BOP stack from the sea floor is approved.
    f. Your request to test the deadman/autoshear system during the stump test only is approved.
    g. Your requested method to temporarily abandon the proposed pilot hole is approved.
2. This office will conduct a predrill inspection of your drilling vessel prior to the start of operations.
3. Shell will not be able to drill below the 20 inch casing point without fulfilling the conditions stated in the letter accompanying these conditions.
4. No drilling activities may be conducted beyond each additional casing shoe unless specifically approved by the BSEE inspector on location. BSEE will evaluate the condition of the well, results of safety equipment tests, the nature and duration of the next phase of the drilling program, existing and forecasted environmental conditions, and the procedures under an approved contingency plan [30 CFR250.417(c)(2)] that addresses design and operating limitations of the drilling unit as well as the actions necessary (i.e. suspension, curtailment, or modification of drilling or rig operations) to remedy various operational or environmental situations in order to maintain safety and prevent damage to the environment; including implementing well capping and containment or relief well drilling plans.
5. Final certification of the blowout preventer system as required in 30 CFR 250.416 (f) shall be provided to this office prior to the initial use of the BOP on this well.
6. Data submission procedures and criteria for this well are listed in an attached document (Procedures for Well Data and Records Submittal)
7. Shell must submit a daily summary report on form BSEE-0133 to this office until the final status of the well is established (one copy). Daily marine mammal reports shall be attached to the form.
8. Shell must notify this office immediately in the event the well encounters shallow gas, abnormal pressure, or lost circulation.
9. Shell must provide this office with representative dry samples collected during the drilling of this well as soon as available. Shell is also requested to collect and retain a set of wet well cuttings for the Bureau of Ocean Energy Management. This request is voluntary and the samples are intended to provide for public access once the proprietary term for the samples is concluded. Further discussions related to this voluntary request can be concluded with appropriate BOEM representatives.

10. Shell must submit within thirty days of completion of the well all oceanographic and meteorological data collected during the drilling of this well.
11. Shell must submit an Application for Permit to Modify to change any approved portion of the APD prior to the commencement of the proposed operations. Verbal approval in an emergency may be granted, however written APM's must be submitted no later than the end of the 3rd business day following the verbal approval.
12. Shell shall notify this office as well as the onsite representative 24 hours in advance of a Blowout Preventer test.
13. Shell must submit form BSEE – 0124 in advance of either temporarily or permanently abandoning this well. This form must contain all information required in 30 CFR 250, Subpart Q for abandonment of wells.

Attachment B

BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT
ALASKA OCS REGION

Procedures for Well Data and Records Submittal

This document defines the procedures on how lessees/operators submit well records required by 30 CFR 250.468 and 469, and clarifies the specific well records you should submit, the submittal dates of the various well records, and the correct locations where you should send these well records.

The BSEE collects, verifies, and stores data by the well's unique 12-digit American Petroleum Institute (API) number we assign. The BSEE Alaska Outer Continental Shelf Region (AKOCS) uses the data collected to make informed regulatory decisions based on your timely submittal of complete and accurate well records. We define "submittal date" as the original date the data are due to the appropriate office.

According to 30 CFR 250.468(a), "you must submit copies of logs or charts of electrical, radioactive, sonic, and other well-logging operations; directional and vertical well surveys; velocity profiles and surveys; and analysis of cores to BSEE." Also, in accordance with 30 CFR 250.469(b), the AKOCS will also require submittal of paleontological reports as well as washed and dried samples collected from the well.

When to Submit Well Data Records

1. Field Data

   As stated in the approval documents for these operations this office will take an active role in assess plans for the continuation of well activities. Shell will be expected to make available digital data and field prints electronically from the well site via a secure website data delivery system or equivalent to enable this review from this office. This should be done for all logging operations including pilot hole, surface, intermediate and final runs (both wireline and Measurement While Drilling logs). This also includes detailed mud logging data.

2. Final Data

   Operators should submit one copy of the digital data on a CD or DVD in a read-only format to the appropriate entity as outlined in Attachment 1. Each CD or DVD should be properly labeled with the Area, Block, OCS, Well Number, Well Suffix, API, and the data type (i.e., Paleo Report, Conventional Core Report, Vertical Seismic Survey, etc.). Digital and image NMR data must be submitted

on separate physical media and nomenclature for NMR data files and tool codes should clearly identify them as NMR datasets.

Well records are divided into four groups for the timely submittal of the data.

a) Well Log Data, Directional Surveys, Velocity Surveys, Analyses of Percussion Sidewall Cores, Wireline Formation Test Logs, Drill Stem Tests and Mudlogs/Reports

Submit:

Well log data,
Directional surveys,
Velocity surveys (time/depth pairs),
Percussion/rotary sidewall analysis of cores,
Wireline formation tests logs (summary log), and
Drill stem tests (initial report)

To be submitted within 30 days of the "Date Operations Completed" of the last logging run (MWD/LWD or wireline) that you report in Item 7 of the Open Hole Report (Form BSEE-0133S) for each 12-digit wellbore, sidetrack, and/or bypass. Note: "Date Operations Completed" for MWD/LWD is when the data is retrieved from the drill string.

b) Paleontological, Detailed Rotary Sidewall and Conventional Core Analyses, and Vertical Seismic Profile Reports and Information

For each wellbore in which these data were collected, submit no later than 90 days after the "TD DATE" you report in Item 10 of the Well Activity Report (Form BSEE-0133).

Detailed paleontological reports and information,
Detailed rotary sidewall and conventional core analyses/reports and information, and
Detailed vertical seismic profile reports

Submit these well records when the report is completed, even if the report is generated by you and/or third party (i.e., academic partners, non-lessee partners and/or consultants) years after the wellbore is completed.

c) Geochemical Analyses and PVT Analysis of Fluid Samples

For each wellbore in which these data were collected, submit geochemical analyses and/or PVT Analysis of Fluid Samples no later than 120 days after the "TD DATE" that you report in Item 10 of the Well Activity

Report (Form BSEE-0133). Submit these well records when the report is completed, even if the report is generated by you and/or third party (i.e., academic partners, non-lessee partners and/or consultants) years after the wellbore is completed.

d) End of Operations Report (Form BSEE-0125)

For each wellbore, submit an End of Operations Report (Form BSEE-0125) and all its attachments no later than 30 days after the "END DATE" you report in Item 10 of the Well Activity Report (Form BSEE-0133).

The BSEE AKOCS uses the Well Activity Report (Form BSEE-0133) and Open Hole Report (Form BSEE-0133S) to track well activity; therefore, it is crucial that you submit a complete and accurate report to the appropriate BSEE AKOCS District Office in a timely manner. We will treat delinquent and/or incomplete reports in the same manner as delinquent and/or incomplete well data, and such violations may result in the BSEE AKOCS exacting an appropriate remedy, such as issuing an Incident of Non-compliance (INC).

The BSEE AKOCS may request that you submit well logging data, directional surveys, velocity profiles and surveys, percussion sidewall analyses of cores, wireline formation tests, and drill stem tests before the 30- day limit when we determine that circumstances warrant such action. When we determine that circumstances so warrant, we may also request that you submit preliminary reports of analytical data, namely

Geochemical analyses/reports and information,
PVT analyses of fluid samples,
Detailed paleontological reports and information,
Detailed rotary sidewall core analysis and information, and
Detailed conventional core analysis and information before the respective 90-day or 120-day limits.

The BSEE AKOCS recognizes that you need adequate time to submit complete and accurate well records. If you request it, BSEE AKOCS may grant you a departure under 30 CFR 250.142 for a new required date for submitting the data pertaining to that wellbore.

Where to Submit Well Records

Shell will need to coordinate access to field digital well logs with the following office. This office will also handle receipt of dry samples.

Bureau of Safety and Environmental Enforcement
Alaska OCS Office
3801 Centerpoint Dr., Suite 500
Anchorage, AK 99503
Office Phone: 907-334-5300
Office Fax: 907-334-5302

Shell will provide final copies of all digital image and vector well log data and related reports to both the Alaska BSEE office and to:

A2D Technologies
d/b/a TGS Geological Products and Services
1010 Common Street, Suite 2040
Attn: BSEE Well Records (Alaska)
New Orleans, LA 70112
Office telephone: 504-524-3450
Fax: 504-524-3454

A "Well Records Submission Summary" in Attachment B of this document provides an overview of the various well records, including which entity receives which well records and the addresses and contact numbers of the appropriate BSEE AKOCS Offices, and A2D Technologies. We strongly recommend that you provide a transmittal letter when you submit any well records. This transmittal should contain the following information:

- Operator's Name
- Operator's Contact Name and Telephone Number
- Bottomhole Location: Area/Block/Lease/Well Name and Number/API Number
- Date Well Records Sent
- Detailed List of Well Records

It is your responsibility to ensure that the BSEE AKOCS and A2D Technologies receive all well data and information within the specific periods. If we notify you of delinquent data, we will initiate an appropriate remedy, such as issuing an Incident of Non-Compliance (INC). If you choose to use a third party to submit well data, it remains your responsibility to ensure that the data are timely received by the BSEE AKOCS and A2D Technologies. Realizing that you may need time beyond the specified deadlines to prepare unique data or information, we will address the submission of such on an individual basis. We will address INC's issued by the BSEE AKOCS Office for the delinquent data submittal at your yearly performance review or through other appropriate and timely measures.

Well Naming and Numbering

Show the API Number and well name assigned by the BSEE AKOCS Office on all well records you submit to us. You can find these on the approved Application for Permit to Drill (Form BSEE-0123) for the original hole, sidetracks, and/or bypasses.

Data Types and Formats

A. Well Log Data types

a. Log Curve Requirements: Submit the following curve types and log images in final form, if the data were obtained in the open-hole portion of a wellbore, sidetrack, or bypass****:

- Acoustic or Sonic
- Bulk Density
- Caliper
- Conductivity
- Density Correction
- Dipmeter (computed)
- Gamma Ray
- Resistivity/Induction
- Spontaneous Potential
- Nuclear Magnetic Resonance *
- Mudlogs***
- Neutron
- Tension
- Porosity
- Borehole Image
- Equivalent circulation density
- Rwa
- Temperature
- Formation Tester**
- Rate of Penetration
- Photoelectric
- Slide Indicator

b. Cased hole log data: Submit all curve types and log images as identified above for any cased hole logs collected in lieu of, or in addition to, open hole logs.

* For the submittal of digital NMR vector curve data, The following are examples of curve types are to be submitted, and are not limited to you should submit:

- Quality Control Curves
- Computed Curves
- T2 Bin Distributions

Due to NMR file sizes and complexities, the BSEE now requires that digital and image NMR data are submitted on separate physical media (separate from other well log data) to its logging contractor, A2D Technologies. Also, NMR data file and tool code nomenclature should clearly identify these data as NMR-related. We encourage direct submittal of the completed log data set from the acquiring service company.

** Formation Tester is considered any logging tool that collects pressure data and/or fluid samples from the borehole. Summary Print log images, pressure gradient plots, and preliminary sample analysis must be submitted. Formation Tester summary data should also be submitted in ASCII format. All detailed reports (i.e., PVT Analysis) generated from the samples collected from the borehole must be submitted in a timely manner (see Attachment 1).

*** You will be required to submit an image file for these types of logs to A2D Technologies.

****Although API Recommended Practice (RP) 31A, Standard Form for Hardcopy Presentation of Downhole Well Log Data, is not incorporated by reference in BSEE regulations, you may use it for guidance on providing complete and accurate well information.

Note: Do not submit digital data for Formation Tester, Borehole Image, and Computed Dipmeter to A2D Technologies.

c. Well Log Image File:

Submit image files in one of the formats listed below. For Formation Tester type logs, the summary logs will suffice

i. For all vertical wells, as defined in 30 CFR 250.461, submit image files for

- Measured depth (MD) 1-inch, or 2-inch correlation, and 5-inch formation evaluation logs and
- Any additional scales you obtained.

ii. For all non-vertical wells, as defined in 30 CFR 250.461, submit image files for

- True vertical depth (TVD) 1-inch, or 2-inch correlation and, 5-inch formation evaluation logs,
- Measured depth (MD) 1-inch, or 2-inch correlation, and 5-inch formation evaluation logs, and
- Any additional scales you obtained.

Detailed 5- inch image logs must be composited, but individual runs do not need to be spliced.

If logging data from more than one logging vendor are collected in a borehole, you may submit either an image of the logging data from all vendors composited into a single set of logs or a set of images of the composited logs from each individual vendor.

d. Image File Formats: If the original log is in color, the submitted image file should also be in color.

i. The following image file formats are preferred:

- Computer Graphic Metafile (CGM) version 1-4
- Baker Metafile
- Schlumberger PDS (PDS files are usually for one logging run; any borehole with multiple runs should submit composited file format)
- Halliburton CGM
- Weatherford DPK

If the preferred formats listed above are not available, you may submit the image file in the Tag Image File Format (TIFF) with the following specifications:

ii. Format (TIFF) with the following specifications:

1. Black and White TIFF Images:

- Header tags as per TIFF standard
- Resolution – 200 dpi
- Compression – CCITT group IV
- Tiling – No

2. Color TIFF Images:

- Header tags as per TIFF standard
- Resolution – 200 dpi
- Palette color – 256 colors
- File format LZW Compressed TIFF
- Tiling - No

Clearly label each well log image with its associated API number, bottom hole lease number, well name, well name suffix, log type, scale and depth domain (MD or TVD).

e. Digital (Vector) Well Log Data: Submit composite digital curve data (one value per curve for each depth value and with individual tool runs merged) in the Canadian Well Log Society Log ASCII Standard (LAS), Version 2.0 formats; and Digital Log Interchange Standard (DLIS) or Log Interchange Standard (LIS) format. Ensure that the curve data are in a MD composite layout, including full headers for each wireline and MWD/LWD logging tool run and curve description for all curves. Ensure that all required log curves represented on the log image file are included in the digital curve file. If you collect logging data from more

than one logging vendor in a single borehole, submit a separate set of composited log curves from each individual vendor. Do not splice digital curves from different vendors to form a set of composited log curves.

i. Full header information, should including the following:

- 12-digit API number
- well name suffix
- bottom hole lease number
- bottom hole area and block
- well name

ii. Information for each tool run, should including the following:

- borehole fluids
- depth interval
- mud
- filtrate resistivity and temperatures
- casing information
- bottomhole or maximum recorded temperature
- circulation history information
- tool schematic
- tool calibration record

Full logging tool parameters (including matrix values), position of logging tool (i.e., centered or eccentered), and logging engineer's comments; and adequate curve description and

Tool -specific and service provider-specific curve and parameter mnemonics (names and abbreviations) maintained as originally acquired.

If a log is spliced, the splice depth should be clearly noted along with which files were used.

Submit digital and image logs on CD or DVD ROM (read-only memory). Digital and image logs may be submitted on the same CD or DVD.

Directional Surveys

Submit one digital copy of the final composite directional survey. For the Digital Directional Survey format, see NTL 2009-N10.

- Submit, on CD or DVD ROM these survey results coded in ASCII.
- According to 30 CFR 250.461(d) (2), "You must correct all surveys to Universal-Transverse- Mercator-Grid-north or Lambert-Grid-north after making the magnetic-to-true-north correction."

If your use of more than one vendor prevents the consolidation of the separate surveys within a well, submit the final composite survey from each vendor.

Velocity Profiles and Surveys

Vertical Seismic Profiles: Submit the results from all borehole seismic data (in cased or uncased holes), as well as concurrently run directional surveys for both vertical and directional wells. Submit, on CD or DVD ROM, digitally recorded data in an industry standard format (LAS, DLIS, ASCII, CGM, TIFF, JPG, SEGY, DOC), that include, but are not limited to:

- Normal Incidence VSP;
- Acoustic Log Calibration Report;
- Final VSP and Corridor stacks for 2D data and final stacked and migrated volume for 3D VSP data;
- Composite plot with VSP, Corridor stacks, synthetic seismogram, and well logs;
- any referenced information within the report correlative with the acquisition, such as 2-way time indexed depths and velocities, survey parameters, digital images, and computed survey data and directional; and
- If acquired, format time/depth pairs.

Velocity Surveys (Time-Depth Pairs/Checkshots): Submit, on CD or DVD ROM, one digital copy coded in ASCII format. The report should include or be annotated with the following:

- API number
- Well name and number
- Well name suffix
- Contractor or service provider
- Contact name (phone number or e-mail address)

Note that the digital format has been modified to expand the columns for True Vertical Depth and One- Way Travel Time from 5 to 8 to include two decimal places for each column.

We encourage direct submittal of the completed survey from the acquiring service company.

Analysis of Conventional Cores, Percussion/Rotary Sidewall Cores, Wireline Formation Tests, and Drill Stem Tests

IF...
you conduct any of the following:

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- Percussion/Rotary sidewall core analysis or equivalent,
- Wireline formation tests - include any logs (summary logs are acceptable) and associated lab results, or
- Drill stem tests

THEN...

As soon as the final and/or revised conventional core, percussion/rotary sidewall core reports and/or data become available to you, send one digital copy of the entire, detailed report. Reports should include, but are not limited to the following:

- Standard analyses for porosity,
- Permeability
- Water saturation
- Core photos
- compaction analyses
- laser grain size analyses
- stressed brine porosity and permeability analyses
- rock mechanic studies
- water extraction and core gamma logs
- core photos

In addition, provide one copy of all studies you performed on the core(s) and tests for the purpose of describing and characterizing the reservoir architecture through detailed stratigraphic or depositional analyses. In certain situations, the BSEE AKOCS may require that you submit preliminary or interim reports.

Submit, on CD or DVD ROM, one copy of the description and analysis of the conventional core, the percussion/rotary sidewall core, wireline formation tests, and drill stem tests reports in the original digital format. Any data acquired in a log format should be submitted as a log image.

Geochemical Analyses/Reports and Information

Submit one copy of the Geochemical Analyses/Reports and Information in the original digital format. If you conducted any geochemical analyses/reports, including internal company or external contractor interpretation reports on

- Cuttings,
- Sidewall or conventional cores, and
- Fluid samples from the well. The term "sample" encompasses:
- Hydrocarbon gases, specifically methane through pentanes and C6+ hydrocarbons;
- Non-hydrocarbon gases (carbon dioxide, hydrogen sulfide, argon, helium, and radon); and
- Any liquid hydrocarbons (such as condensate, crude, and bitumen) encountered by the well in cuttings or shows and from any other well sampling or fluid testing.

The analyses, reports, and interpretations to be submitted include, but are not necessarily limited to, the following types of data:

- Total organic carbon
- Polynuclear aromatic hydrocarbons
- Rock-eval pyrolysis

- Stable isotope analyses of carbon & hydrogen
- Thermal chromatography-gas chromatography
- Compound-specific isotope ratio mass spectrometry
- Bulk pyrolysis & hydrous pyrolysis
- Isotope ratio mass spectrometry
- Gas chromatography
- Kerogen isolation & bitumen separation
- Pyrolysis/gas chromatography
- Organic petrography
- Complete saturated biomarker & aromatic hydrocarbon analysis by GC MS
- Vitrinite reflectance
- Elemental analysis of kerogen

In addition, submit all data and reports on geochemical characterization of produced oils, including

- All whole-oil GC, GC MS on oils,
- SARAH (or SARA),
- Isotopes on the fractions,
- Molecular and isotopic analyses of C1-C5 hydrocarbons metals data, and
- Any other geochemical data used from production samples intended for reservoir characterization studies.

Submit, on CD or DVD ROM, digitally recorded data in industry standard formats.

Detailed Paleontological Reports and Information

As soon as the final and/or revised paleontological information and/or data become available to you, submit one copy in digital format of the entire, detailed paleontological report(s), chart(s), striplog(s), checklist(s), and any other paleontological records. Include the following:

The range of samples taken,

- Sample analysis identifying fossils and lithology by MD,
- Summary and interpretation (based on identification of foraminifera, nannofossils, or other microfossils) of all biostratigraphic markers, zones, tops, or local markers,
- Description of paleontological ecological zones with water depth at the time of deposition (e.g., Middle Shelf/Neritic 20-100 meters, Outer Shelf/Neritic 100-200 meters),
- Sequence analysis interpretations based on histograms of faunal abundance,
- Identification of all rock units by depth to the top of relative chronostratigraphic stages (e.g., Upper Pleistocene, Middle Miocene, or Lower Oligocene), and
- Pleistocene, Middle Miocene, or Lower Oligocene), and
- Biostratigraphic chart noting the relative ages of the biostratigraphic zones you used in the detailed paleontological reports.

Submit, on CD or DVD ROM, one copy of the detailed paleontological report in the original digital format.

Mudlogs and Reports

Submit one image copy of the following types of Mudlogs:

- Physical Formation Log
- Pore Pressure Log
- Engineering Log
- Show Report Log

Image File Formats for Mudlogs: If the original log is in color, the submitted image file must also be in color.

The following image file formats are preferred:

- Geologix - geo draft file (.gdf)
- Geologix - output data file (.odf)

If the preferred formats listed above are not available, submit the image file in the Tag Image File

Format (TIFF) with the following specifications:

Black and White TIFF Images
- Header tags as per TIFF standard
- Resolution – 200 dpi
- Compression – CCITT group IV
- Tiling – No

Color TIFF Images
- Header tags as per TIFF standard
- Resolution – 200 dpi
- Palette color – 256 colors
- File format LZW Compressed TIFF
- Tiling – No.

Submit one copy of the following types of Mudlogs reports, if collected:
- Show reports – composite into one file
- Mud reports – composite into one file
- End of Well reports – composite into one file
- Daily Drilling reports – composite into one file

Submit, on CD or DVD ROM, digitally recorded data in industry standard formats.

End of Operations Report (Form BSEE-0125) and Attachments

Pursuant to 30 CFR 250.465(a), you must submit End of Operations Report (Form BSEE-0125) and the required attachments.

Additional Information

Pursuant to 30 CFR 250.469(d), the BSEE AKOCS may require that you submit additional well reports or records for a specific well(s).

Transit to site at Vendovi Anchorage	4 hrs
Group 1: Use EC1000 to lift anchor #5 and lower and lock the fairlead.	1 hr
Group 1: Deploy anchor #5 pulling out to 1 layer (1191 ft), retrieve to 2 layers (1008 ft), and set anchor.	5 hrs
Group 1: Use EC1000 to lift anchor #1 and lower and lock the fairlead.	1 hr
Group 1: Deploy anchor #1 pulling out to 1 layer (1191 ft), retrieve to 2 layers (1008 ft), and set anchor.	5 hrs
Group 1: Use EC1000 to lift anchor #4 and lower and lock the fairlead.	1 hr
Group 1: Deploy anchor #4 pulling out to 1 layer (1191 ft), retrieve to 2 layers (1008 ft), and set anchor.	5 hrs
Group 1: Use EC1000 to lift anchor #8 and lower and lock the fairlead.	1 hr
Group 1: Deploy anchor #8 pulling out to 1 layer (1191 ft), retrieve to 2 layers (1008 ft), and set anchor.	5 hrs
Group 2: Use EC1000 to lift anchor #2 and lower and lock the fairlead.	1 hr
Group 2: Deploy anchor #2 pulling out to 1 layer (1191') and then retrieve under proper tension.	7 hrs
Group 2: Use EC1000 to lift anchor #3 and lower and lock the fairlead.	1 hr
Group 2: Deploy anchor #3 pulling out to 1 layer (1191') and then retrieve under proper tension.	7 hrs
Group 2: Use EC1000 to lift anchor #6 and lower and lock the fairlead.	1 hr
Group 2: Deploy anchor #6 pulling out to 1 layer (1191') and then retrieve under proper tension.	7 hrs
Group 2: Use EC1000 to lift anchor #7 and lower and lock the fairlead.	1 hr
Group 2: Deploy anchor #7 pulling out to 1 layer (1191') and then retrieve under proper tension.	7 hrs
Deploy the subsea navigation pole	1 hr
Launch ROV	6 hrs
(W) Demonstrate subsea navigation and cameras with survey of area.	6 hrs
Deploy one clump weight as the target leak point.	1 hr
Deploy 4 clump weights to N, S, E, and W of target.	4 hrs
(W) Verify operation of winches, valves, and instruments.	1 hr
Rig up dome and Oceanguard buoy and set in water with the EC1000	1 hr
Connect Bear Cubs and tugger to Oceanguard buoy.	4 hrs
(W) Tow dome to target (> 300' away from ACS) site with Bear Cubs.	6 hrs
Connect containment dome to 4 clump weights with ROV.	8 hrs
(W) Demonstrate ability to reposition a clump weight and attachment to subsea mooring line.	0 hrs
Fill buoyancy tanks or airbag with air to proper winch tension and disconnect Oceanguard buoy.	2 hrs
Fill umbilical gas line with air until bubbles are seen by the ROV at the J-tube outlets. Verify level transmitter calibrations. (May be able to complete prior to deployment)	2 hrs
Verify proper operation of inclinometer and adjust buoyancy tank levels.	1 hr
(W) Demonstrate positioning capability of dome by maneuvering dome above target. Monitor with ROV and track on subsea navigation system.	4 hrs
(W) Disconnect after second hose and flow water from the dome with Bornemann pumps. Remove saltwater from hose (reverse Bornemann pumps). Reconnect hose.	3 hrs
Reconnect Oceanguard buoy	4 hrs
Disconnect containment dome from clump weights.	3 hrs
Recover containment dome and hoses.	3 hrs
Lift, Rack, and Seafasten the Oceanguard Buoy.	1 hr
Recover clump weights including target.	4 hrs
Seafasten the clump weights	1 hr
Recover ROV.	1 hr
Retrieve the subsea navigation pole	1 hr
Recover anchor #1	3 hrs

Recover anchor #7	3 hrs
Recover anchor #4	3 hrs
Recover anchor #5	3 hrs