2018 UTAH BOARD OF OIL, GAS AND MINING
ENVIRONMENTAL EXCELLENCE AWARDS

Nomination Form

Nominee Information:

Company Name: Kerr McGee Oil and Gas Onshore L.P. - Anadarko Petroleum Corporation
Address: 1368 S 1200 E
City, State, Zip: Vernal, Utah 84078
Contact Person: Grizz Oleen
Phone: (435)781-7009
Site Name: Greater Natural Buttes
Location:

Activity and Category (Please check one activity and one category):

Activity:

☑ Oil and Gas
☐ Minerals
☐ Coal

Category:

☐ Environmental improvement to an active mine site, drilling or recovery site, or field
☐ Outstanding results following applications of innovative environmental technology
☐ Outstanding final reclamation or site restoration
☐ Other: Spill Mitigation Efforts
Utah Department of Natural Resources
Oil, Gas & Mining

Nominated By:

Name __________________________________________
Address_______________________________________
City, State, Zip________________________________
Phone_______________________________________

Nomination Summary (attach additional information if necessary)
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

Return by Wednesday, February 28 to:

Environmental Excellence Awards
Division of Oil, Gas and Mining
1594 West North Temple, Suite 1210
Salt Lake City, Utah 84114-5801
February 28, 2018

Environmental Excellence Awards
Division of Oil, Gas and Mining
1594 West North Temple, Suite 1210
Salt Lake City, Utah 84114-5801

RE: 2018 Utah Board of Oil, Gas and Mining Environmental Excellence Awards

To the Board,

Please consider this nomination from Kerr McGee Oil & Gas Onshore L.P. (KMG), a wholly owned subsidiary of Anadarko Petroleum Corporation, for the oil and gas category of the 2018 Utah Board of Oil, Gas and Mining Environmental Excellence Awards. Our operation is located in the Greater Natural Buttes (GNB) area of the Uinta Basin. Because of this unique environment, KMG is committed to conceptualize and implement environmentally sound designs and processes that will continue to prevent and mitigate loss of primary containment; spill prevention is one of our top priorities.

We produce and move an average of approximately 26,000 BBL of fluids per day. Effective management of this large volume of fluid involves several strategies:

1) Spill Prevention: design enhancements and inspection
2) Spill Mitigation: surveillance and control enhancements,
3) Spill response: training and boom deployment

Incorporating design enhancements has been an important first step in the quest to continually improve spill prevention performance. Automation (tank level sensors), internal fiberglass coating, anode installation, and stainless steel piping upgrades are all engineered solutions that we are now employing to address corrosion related fluid spills. In addition to design enhancements, an ultra-sonic tank wall inspection program is being employed to proactively assess tank integrity prior to tank failure.

In conjunction, with design enhancements, additional surveillance and control systems have been added to mitigate releases. Automation is used as a tool to help keep track of fluid levels in our tanks. If a tank should fail, the automation system registers a deviation from parameters and alarms our operations staff to respond to a loss of primary containment and thereby minimize the release. In combination with our automation surveillance system, we have incorporated the installation of lined metal tank berms. These impermeable berms act as secondary containment. Because of these types of berms, KMG is able to recover essentially all fluids that may have been released from a tank. In 2016, 78% of the fluids released were
captured in secondary containment. In 2017, 94% of the fluids released were captured in secondary containment. Currently in 2018 KMG is trending at 98% fluid capture.

Additional spill control enhancements include the three head gates which were installed on the main drainage below our Chipeta Gas Plant. This drainage collects a large area, including drainages from other operators, before it eventually reaches the White River. This control system will help prevent releases from reaching the river.

Spill response is the third area of focus for the GNB team. In 2017, a 25-person boom deployment team attended a 16-hour Inland Marine Oil Spill Training course where personnel were trained on overflow dam installation and swift water boom deployment. This trained team and equipment also positions KMG to assist other operators and companies with spill incidents that may occur in the area.

KMG’s commitment is to prevent, mitigate and effectively respond to releases. This ongoing effort involves numerous groups and disciplines that analyzes trends and assess strategies to maintain and enhance prevention and mitigation techniques.

If you have any questions or concerns please contact Roger Knight at (720) 929-6713 or by email at roger.knight@anadarko.com or myself at (435)781-7009 or by email at grizz.oleen@anadarko.com.

Sincerely,

Grizz Oleen
SR Staff HSE Representative, Anadarko Petroleum Corporation
Kerr McGee Oil and Gas Onshore L.P.
Anadarko Petroleum Corporation
Spill Prevention and Mitigation Efforts
UDOGM Environmental Excellence Awards
February 2018
Spill Prevention and Mitigation – Historical

- Effective management of this large volume of fluid involves several strategies:
  - **Spill Prevention**: design enhancements and inspection
  - **Spill Mitigation**: surveillance and control enhancements
  - **Spill Response**: training and boom deployment

- Efforts have resulted in a substantial improvement in fluids captured in secondary containment:
  - From 78% in 2016 to 94% in 2017
  - 2018 trend is at 98%

![% Captured in Secondary Containment](chart.png)
Spill Prevention Efforts – Design Enhancements

- **Automation**
  - *Tank level sensors – prevent overflow (>86% of tanks are equipped)*

- **On site Design**
  - *Lined metal tank Berms*
  - *Upgrade piping to stainless steel*
  - *Fiberglass liners installation*
    - Works as a barrier between produced water and metal. This will increase the life of the tank.
  - *Anode installation*
    - Sacrificial anodes protect the tank/piping from galvanic and bacteria based corrosion.
Spill Prevention Efforts – Inspection

- **Tank Integrity**
  - **Ultrasonic tank Testing**
    - Measure tank wall thickness to insure that the metal is sufficient. This allows us to find corrosion issues and address them before a release can occur (remove tank).

"NEW" tank steel = 3/16" or 5.0 mils

"Failed Tanks Sample 12" - 24" from floor = 2.7 mils
Spill Mitigation Efforts – Surveillance and Control Enhancements

- **Automation**
  - *Tank level sensors and computers monitor fluid changes and alarm if release is detected*

- **Lined metal tank berms**
Spill Mitigation Efforts – Control Enhancements

- **Head Gate Installation**
  
  - *We installed 3 head gates along a main drainage from Chipeta Plant.*
  
  - *These control enhancements help prevent a release from reaching the White River.*
Spill Mitigation Efforts - Training

- **Boom Deployment Team & Equipment**
  - *Emergency response team* - 25 employees attended 16 hour Inland Marine Oil Spill Training Course
    - Trained to deploy containment boom in a river or lake to contain a release
    - Trained to create an overflow dam
  - **2 emergency response spill trailers**
    - 1300’ of containment boom and support equipment to deploy boom at several sites.