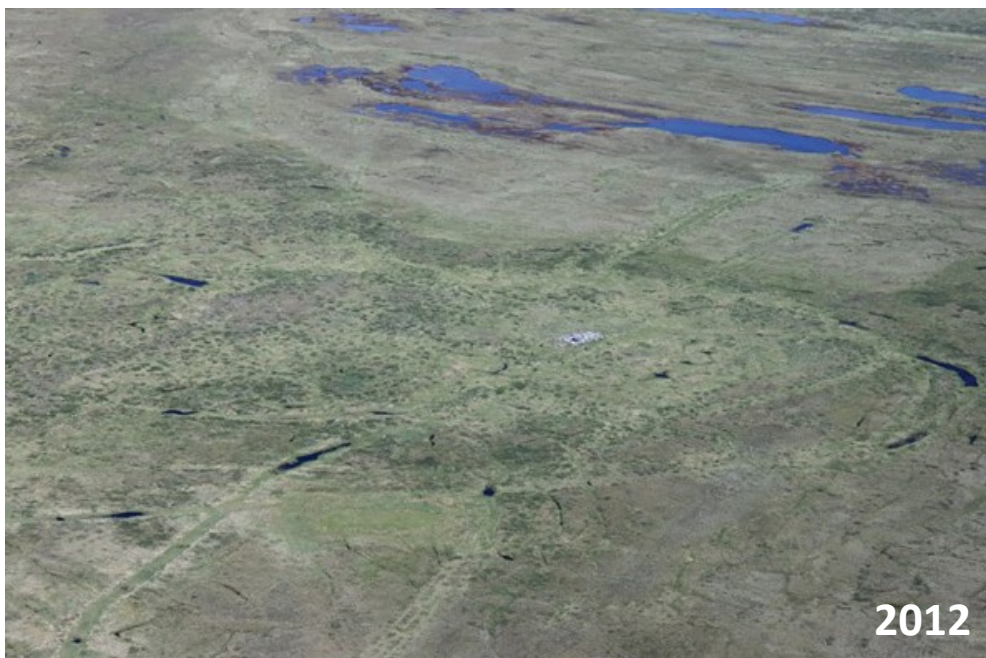


## National Petroleum Reserve in Alaska: 2013 Legacy Wells Strategic Plan



Alaska



## **Mission Statement**

The Bureau of Land Management sustains the health, diversity and productivity of the public lands for the use and enjoyment of present and future generations.

## **Cover Photos**

Fish Creek No. 1 well site during operations, summer 1949 taken by George Gryc. Same area as the 1949 photo of Fish Creek No. 1, summer 2012. The concrete pad is visible in the middle of the photo. Change in vegetation type identifies the disturbed area.

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## I. Introduction

Between 1944 and 1982, the U.S. Navy and the U.S. Geological Survey (USGS) conducted a program of exploratory and scientific drilling on Alaska’s North Slope in the Naval Petroleum Reserve No. 4 – now called the National Petroleum Reserve in Alaska (NPR-A). In 1976, the Bureau of Land Management (BLM) was given responsibility for managing the NPR-A, and in 1982 the BLM inherited the responsibility to assess, plug, and clean up the wells that the U.S. Navy and USGS left behind (see Appendix A for a detailed timeline).

Since 1982, the BLM has spent tens of millions of dollars cataloging and remediating these “legacy wells.” Some wells are still being used for scientific research, so at this point only 50 wells – fewer than half of the original number – currently require additional remediation work.

In order to take the next step towards full remediation of the remaining wells, the BLM has recently completed the *2013 Legacy Wells Summary Report*, which is a comprehensive site-by-site assessment of the condition of the remaining inherited wells, and this *2013 Legacy Wells Strategic Plan*, which lays out a dynamic and flexible near-term strategy for addressing some of the highest priority wells, while reemphasizing BLM’s commitment to achieving full remediation of all of the inherited wells. For the purposes of this document, remediation is defined as the completion of plugging the well bore to regulatory standards and surface cleanup activities at a legacy well site.

## II. Summary

The BLM conducted a full assessment of all 136 wells drilled under the direction of the U.S. Navy or the USGS, and grouped them into three categories (see **Table 1**):

Wells Requiring No Additional BLM Action	68
Wells Currently In Use By USGS	18
<b>Wells Currently Requiring BLM Action</b>	<b>50</b>

The wells requiring no additional action include those wells that have previously been remediated by the BLM or other federal agencies, those conveyed to the North Slope Borough under the Barrow Gas Field Transfer Act of 1984 (P.L. 98-366), and shallow test boreholes that present no subsurface or surface risks. The wells currently being used by the USGS are part of climate change monitoring studies, and the BLM will work with the USGS to establish a plan for the eventual disposition and remediation of these wells when they are no longer necessary for research.

The remaining 50 wells are analyzed in this plan based on the surface and subsurface risks they pose to human health, safety, and the environment. This plan presents a near-term strategy for addressing the highest priority wells. The strategy is dynamic and flexible, meaning that the order of remediation work will be adjusted as site conditions change and additional information

becomes available.

### III. Risk Assessment Methodology

The priorities outlined in this plan are based on the subsurface and surface risk assessments included in the *2013 Legacy Wells Summary Report*. **Table 2** in this strategic plan summarizes the subsurface and surface risk for each well site.

The sites are assigned surface and subsurface risk rankings of None, Low, Moderate or High. Generally, sites with higher risk ratings are considered for more immediate actions, and these risk assessments are used to prioritize the actions outlined in this strategic plan. However, sites with lower risk ratings may receive higher priority if they are at risk due to other factors or in close proximity to locations where work is being completed. The BLM regularly inspects all legacy well sites to assess changing conditions.

#### A. Surface Risks

The surface risk assessment is based on the potential of the well or core test site to pose a risk of negative impact to surface resources and activities, including air, water, vegetation, or wildlife resources, as well as to travel or visual resources. To assess surface risk, the BLM evaluated site conditions surrounding the well or core test.

Sites are given a surface risk rating of **High** when they possess any of the following:

- Known contaminants; or a release of contaminants present;
- A potential threat of being compromised due to accelerated coastal erosion in the near-term;
- Significant solid waste present that affects visual resources or public safety; or
- A potential to affect air or water quality due to the discharge of hydrocarbons under pressure.

Sites are given a surface risk rating of **Moderate** when they possess any of the following:

- Surface debris that presents a travel or transportation risk to local residents; or
- Debris that impacts visual resources.

Sites are given a surface risk rating of **Low** when they are under no threat due to erosion and possess any of the following:

- Minor amounts of solid waste,
- No known contaminants present; or
- Minimal impact to visual resources.

A site has no surface risk when it is considered fully remediated, with no surface debris or no

surface indication of a well site.

## **B. Subsurface Risks**

To determine a well or core test's subsurface risk, the BLM evaluated historical documents, such as drill logs and geologic reports, and conducted site assessments. The BLM also considered data on well plugging, including casing and cementing depth and materials, and the composition of materials in the borehole.

Sites are given a subsurface risk rating of **High** when the well or core test at the site penetrated oil or gas stratigraphy or water resources, and is leaking hydrocarbons.

Sites are given a subsurface risk rating of **Moderate** when the well or core test at the site penetrated oil and gas stratigraphy or water resources, and the following situations apply:

- The well or core test does not permanently isolate producible geologic horizons or casing perforations; or
- There is a cement plug below the perforations of the producing interval, but some surface controls are in place, such as a wellhead or column of frozen drill mud that currently isolates the formation, and there is no indication of migration of fluid or gas through the frozen column of drilling mud.

Sites are given a subsurface risk rating of **Low** when the well or core test at the site either:

- Penetrates oil or gas stratigraphy or water resources, but the producible oil and gas formations or water resources are isolated; or
- Any diesel in the wellbore, if present, is contained with no risk of release.

A site has no subsurface risk when the well or core test at the site:

- Does not penetrate oil or gas stratigraphy or water resources; or
- Has been adequately plugged.

## **C. Additional Risk Evaluation Criteria**

In addition to the surface and subsurface risk ratings, the BLM also evaluates risk by considering a number of different factors for each site, such as the specific impacts on public health and safety, how the site conditions may affect natural resources or future energy development, the type and condition of solid waste present, and the manner in which wells were plugged. For each factor, BLM evaluates the answers to a number of specific questions.

***Protection of Public Health and Safety***

1. Is the well near human activity? If so, are there conditions present that pose a risk to people?
2. Does the well have oil or gas shows? If so, is the well capable of flowing?
3. What is the condition of the wellhead? Have there been any previous problems or repair work?
4. What is the condition of the existing pad and pits, and is there any indication of contamination? If so, what is the type, nature and extent of contamination?

***Impact on Resources and Future Energy Development***

1. Does the well site in its current condition (such as oil and gas resource penetrated, but not currently isolated with plugs) impact future energy leasing?
2. Does the well site in its current condition pose an unacceptable risk to wildlife, subsistence, and other natural resource uses?
3. Are there open wellbores and cellars in which small animals may become trapped?
4. Is the wellsite threatened by the environment through coastal erosion, sloughing lakeshores, landslides, etc?

***Solid Waste Characterization***

1. Is there a reserve pit associated with the site? What is the character (volume and chemical nature) of waste associated with a reserve pit? What volume of water is within the reserve pit?
2. What is the surface condition of the existing pad and pits? Is contamination a possibility?
3. What is the inventory of other solid waste (old equipment, piping, barrels, etc.) and are there any associated current conditions that pose a potential hazardous material release?

***Plugging***

1. Were the wells plugged in compliance with current regulations and standard industry practices?
2. Are there any new risks that were not addressed during the original plugging operation that may need to be mitigated?



## **IV. Prioritization**

The BLM took several factors into account when selecting the highest priority wells in need of action. The risk posed to public health, safety, and the environment, as described in Section III, is one of those factors. The BLM assessed recent changes in well site conditions, such as through coastal erosion, and developed a geographic approach to allow clusters of well sites to be addressed in a cost-effective manner.

The actual sequencing of clean-up actions can be affected by several factors, including opportunities to share equipment and resources with other projects on the North Slope, infrastructure development, funding, emergence of new data, changing site conditions, among others. The actions identified in this strategic plan have been designed to address several of the sites with the highest risk, but the plan also is designed to reduce costs and maximize the number of remediated sites by combining work on multiple wells and sites that are in geographic proximity to higher risk sites.

Although not a factor in this strategic plan's priorities and actions, exploration and development of Federal oil and gas lease tracts in the coming years may help to facilitate legacy well plugging and site clean-up. Section 349 of the Energy Policy Act of 2005 allows the BLM to offset costs for remediation on lands subject to a new or current lease.

Also, the ability of the BLM to enter into partnerships may also influence the priority of legacy well work. Partnerships can help the BLM leverage resources with other Federal agencies or non-Federal entities that are conducting work near legacy well sites where additional action is necessary. These opportunities to share costs ultimately can benefit both parties.

Because of all these factors, this strategic plan presents a phased approach that is designed to cost-effectively address the largest number of well sites in the near-term, while providing for an adaptive dynamic approach that allows the BLM to monitor changing conditions and maximize available opportunities in the future.

## **V. Actions**

In order to address the risks posed by the legacy wells, and based on the prioritization of the wells described in the previous sections, the BLM plans to complete a number of administrative and legacy well site actions.

### **A. Administrative Actions**

1. The BLM will identify a Program Manager to lead an interdisciplinary team that will oversee and carry out the well site actions identified in this plan.
2. The BLM will use an adaptive management approach and adjust to the dynamic

situation on the ground in the NPR-A by continuing to conduct risk evaluations, monitor changing site conditions, evaluate strategic plan effectiveness, and develop new or updated actions if necessary to remediate legacy well sites.

3. The BLM will develop an agreement with the USGS for management, monitoring, and abandonment of the USGS temperature monitoring wells. The BLM and USGS will determine final disposition of each well after their use is no longer needed, or as changing site conditions warrant.
4. The BLM will identify opportunities to work cooperatively with DOD on legacy well clean-up actions.
5. The BLM will continue to work with stakeholders, such as the North Slope Borough (NSB) and the Arctic Slope Regional Corporation, to coordinate well plugging and clean-up activities, determine future prioritization, and assure cost effective closure of legacy well sites. The BLM will coordinate with Barrow Gas Field staff and the Alaska Oil and Gas Conservation Commission (AOGCC) on technical concerns for each well, and with the NSB to identify research opportunities in the Simpson Peninsula. The BLM will coordinate any contaminant investigation of a potential release with the Alaska Department of Environmental Conservation and appropriate stakeholders.

## **B. Well Site Activities**

In the near-term, the BLM will concentrate clean-up activities in two geographic areas: Barrow, and the Simpson Peninsula southeast of Barrow. The first high-priority wells to be addressed as part of this effort will be:

- Simpson Core Test #26 (High surface risk; low subsurface risk)
- Simpson Core Test #30 (High surface risk; no subsurface risk)
- Simpson Core Test #30A (High surface risk; no subsurface risk)
- Iko Bay Test #1 in Barrow (High surface risk; high subsurface risk)

The three Simpson Core Test wells all have high surface risks, with solid waste left behind by the U.S. Navy, including half barrels and other drums submerged in oil seeps. A detailed surface investigation and preliminary survey of the site occurred in June 2013. The data collected will be used for surface cleanup as soon as Summer 2014.

Iko Bay Test Well #1 has high surface and subsurface risk ratings, as the BLM has verified a small gas leak, which potentially poses a threat to public health and safety. The well lies near a well-traveled winter trail and the building that houses the well has been known to provide shelter for those traveling in inclement weather. A small drill rig will be used to plug the well, and all casing strings will be cut off 3-4 feet below ground level, with a steel identification plate welded over the top with appropriate weep holes. The abandoned wellhead stub will be

covered with sufficient earth to allow subsidence to a level surface over time. The plugging and surface cleanup for Iko Bay Test Well #1 well will begin during the winter season after a contract is awarded, and the BLM will coordinate with the NSB to assess opportunities for equipment sharing to reduce costs.

As part of the contract to plug and conduct surface cleanup of the Iko Bay Test Well #1, the following two wells in close proximity to the Iko Bay Test Well #1 will be addressed during the same winter season, if time and funding permit:

- South Barrow Test #3 (Moderate surface risk; moderate subsurface risk)
- Avak #1 (Moderate surface risk; low subsurface risk)

The Avak well site has low subsurface risk; it is included for plugging based on its geographic proximity to the other two well sites. The Avak well contains a well cellar at the surface which will be removed along with minor surface debris.

Following the initial group of well plugging and cleanup, four additional wells will be plugged in Barrow:

- South Barrow Test #1 (Moderate surface risk; moderate subsurface risk)
- South Barrow Test #2 (Low surface risk; moderate subsurface risk)
- Arcon Barrow Core Test #1 (Low surface risk; low subsurface risk)
- Barrow Core Rig Test #2 (Low surface risk; low subsurface risk)

In subsequent winter seasons following the completion of the Barrow work described above, the plugging equipment would be brought to the Simpson Peninsula to address six wells:

- Simpson Core Test #13 (Low surface risk; moderate subsurface risk)
- Simpson Core Test #14 (Low surface risk; low subsurface risk)
- Simpson Core Test #14A (Low surface risk; low subsurface risk)
- Simpson Core Test #15 (Low surface risk; low subsurface risk)
- Simpson Core Test #28 (Moderate surface risk; low subsurface risk)
- Simpson Core Test #29 (Low surface risk; moderate subsurface risk)

The BLM plugged five Simpson Core Test wells in 2006, and the BLM will coordinate with the AOGCC and determine if those wells require any additional subsurface work.

The BLM will pursue cost saving opportunities in the Umiat area. BLM currently has an interagency agreement (IA) with the Alaska District, Army Corps of Engineers to utilize existing contracts in the area to plug wells. The wells remaining in the project area include:

- Umiat 1 (Moderate surface risk, Moderate subsurface risk)
- Umiat 3 (Low surface risk, Subsurface plug evaluation)
- Umiat 4 (Low surface risk, Subsurface plug evaluation)

- Umiat 11 (Low surface risk)

Three additional wells:

- **Gubik #2** was most recently evaluated by the BLM in June 2013, and was assessed to have a high subsurface risk. A small amount of gas is seeping where the bell reducer attaches to the adapter flange below the only valve. The BLM plans to coordinate a joint evaluation with AOGCC to determine what future actions may be warranted for both Gubik #2 and Gubik #1. The BLM will also meet with ASRC, the surface owner, to develop plans to address any outstanding issues and identify future actions that may be required to close this well.
- **Skull Cliff Core Test** – The U.S. Navy left approximately 200 drums and other solid wastes at the Skull Cliff Core Test, a site with a High surface risk rating. The solid wastes present a hazard to winter travel as Skull Cliff lies within a popular corridor connecting Barrow and Wainwright. The USACE and the village of Barrow are working together through the Native American Lands Environmental Mitigation Program to characterize the site. The BLM will coordinate with the U.S. Navy, USACE and the village of Barrow to develop plans to clean up the site. The timeframe for this is currently being negotiated.
- **Topagoruk #1** warrants action based on its High surface risk rating. There are numerous solid wastes scattered over an approximately one-quarter mile surface area, such as a network of piping, approximately seven battery cores, and the remains of a burned out drill rig. The primary concern is the removal of the battery cores. The well has a moderate subsurface risk given the cement plug that is present below the hydrocarbon shows. The BLM will evaluate whether the surface clean up (or portions of it) at Topagoruk should be undertaken in the next five years, or during future well plugging activities.

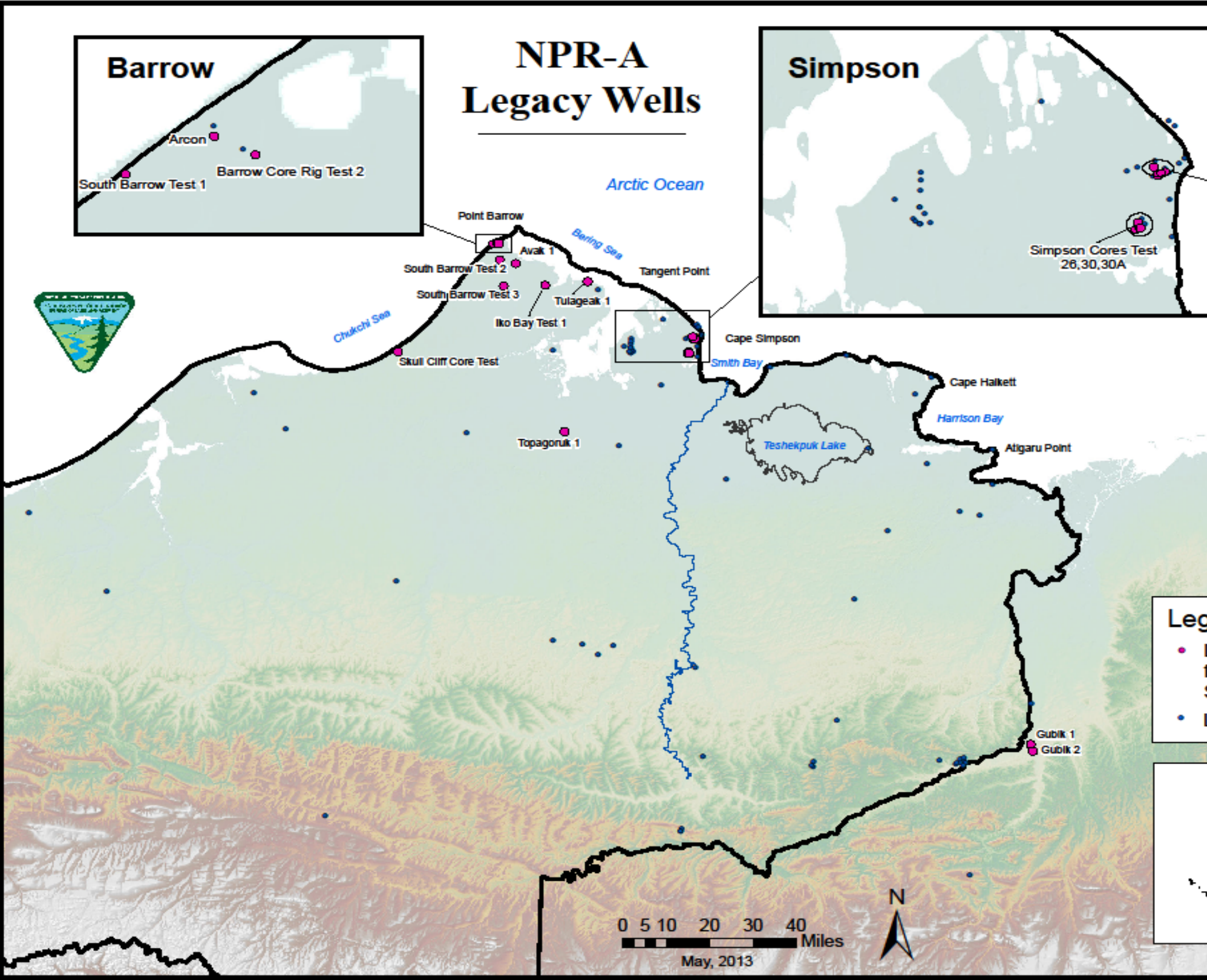
In addition, one of the in-use USGS temperature monitoring wells will also be subject to detailed monitoring:

- **Tulageak #1** has low subsurface and surface risks at this time, but the well site is only 350 feet from the coast. The BLM will continue to monitor this site based on the rate of coastal erosion, which is approximately 15-20 feet per year along the shoreline with the Beaufort Sea. The BLM will closely coordinate any necessary well plugging or pit remediation activities with the USGS.

The BLM will continue to monitor the remaining cased wells that require future action. In coordination with the AOGCC, the BLM will assess the current subsurface condition and adequacy of existing plugs for these wells. If additional actions are necessary, the BLM will develop a plugging design and site action plan. The BLM will continue to regularly inspect these wells for the following parameters to determine if any conditions have changed that would influence re-prioritization: rate of coastal erosion for those sites within 1,000 feet of the

coastline along the Beaufort Sea; erosional stability of the well site; the integrity (corrosion or failure) of any wellhead protection devices; visible petroleum contamination related to solid waste or wellhead leaks; other well integrity issues; and changes in land use patterns or proximity to travel corridors or population centers.

See foldout **MAP** on following page.



[BACKSIDE OF FOLD-OUT MAP]

## VI. Bibliography

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## **TABLES AND TIMELINE**

**TABLE 1: LEGACY WELLS DISPOSITION SUMMARY**

NUMBERS IN PARENTHESES INDICATE NUMBER OF WELLS

<b>Wells Requiring No Additional BLM Action (68)</b>	
Transferred under the Barrow Gas Field Transfer Act (19)	South Barrow 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 ,16, 17, 18, 19, 20; Walakpa 1, 2
Transferred to ASRC in 1981 (1)	W.T. Foran 1
Plugged: no subsurface risk, no surface risks (11)	Atigaru Point 1, Drew Point 1, East Teshekpuk 1, , Simpson Core Test 27, Simpson Core Test 31, Umiat 2, 5, 6, 7, 8, 10
Shallow, uncased wellbore: no subsurface risk, no surface risks (35)	Barrow Core Rig Test 1, Ikpihpuk Core 1, Oumalik Core Test 1; Oumalik Foundation 1, 2, 3, 4, 5, 6, 7, 8, 9, 10; Simpson Core Test 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12; Simpson Core Test 16, 17, 18, 19, 20, 21, 22, 23, 24, 25
Cased wellbore, surface inaccessible due to subsequent land use by NSB (1)	Barrow Big Rig Test 1
Plugged well, USACE doing surface clean-up (1)	Umiat 9
<b>Wells Currently in Use by USGS (18)</b>	
Wells being used by USGS for temperature monitoring; future plugging and surface clean-up will be necessary when no longer in use. (17)	Awuna 1, East Simpson 1, East Simpson 2, Ikpihpuk 1, Koluktak 1, Kugrua 1, Kuyanuk 1, Lisburne 1, North Inigok 1, North Kalikpik, Peard 1, Seabee 1, South Harrison Bay 1, South Meade 1, Tunalik 1, West Dease 1, West Fish Creek 1
As above, with additional surface monitoring (1)	Tulageak 1
<b>Wells Currently Requiring BLM Remediation (50)</b>	
Plugged, need surface clean-up (8)	Cape Halkett 1, Inigok 1, Simpson Core Test 30, 30A, South Simpson 1, Square Lake 1, Umiat 3, 4
Require plugging and surface clean-up (36)	Arcon Barrow Core Test 1, Avak 1, Barrow Core Rig Test 2, East Oumalik 1, East Topagoruk 1, Fish Creek 1, Iko Bay Test 1, Kaolak 1; Knifeblade 1, 2, 2A; Meade 1, North Simpson 1, Oumalik 1, Oumalik Core Test 2, Oumalik Core Test 11, Oumalik Core Test 12, Simpson 1; Simpson Core Test 13, 14, 14A, 15, 26, 28, 29, Skull Cliff Core Test 1; South Barrow 1, 2, 3; Titaluk 1, Topagoruk 1, Umiat 1, Umiat 11, Wolf Creek 1, Wolf Creek 2, Wolf Creek 3
Plugged; requires monitoring (1)	JW Dalton 1
Require monitoring and potential future plugging; No accurate GPS coordinates (2)	Minga Velocity Test 1, Sentinel Hill Core Test 1
Transferred to ASRC in 1996; require more BLM action (3)	Grandstand 1, Gubik Test 1, Gubik Test 2

TABLE 2: NPR-A LEGACY WELLS RISK AND ACTION SUMMARIES

Name	Subsurface	Surface	Strategic Plan Action	Well Category
Arcon Barrow Core Test #1	Low	Low	Barrow Area Phase 2 Plug & Remove Solid Waste	Cased Well
Atigaru Point #1	None	None	No action	Cased Well, Plugged
Avak #1	Low	Moderate	Barrow Area Phase 1 Plug & Remove Solid Waste	Cased Well
Awuna #1	Low	Moderate	Monitor for changing conditions	Cased Well, USGS Temperature Monitoring Well
Barrow Big Rig Test #1	None	None	No action	Cased Well
Barrow Core Rig Test #1	None	None	No action	Shallow, Uncased Legacy Well
Barrow Core Rig Test #2	Low	Low	Barrow Area Phase 2 Plug & Remove Solid Waste	Cased Well
Cape Halkett #1	None	Low	Monitor surface	Cased Well, Plugged
Drew Point #1	None	None	No action	Cased Well, Plugged
East Oumalik #1	Moderate	Low	Monitor, Develop a Plugging Design/ Site Action Plan	Cased Well
East Simpson #1	Low	Moderate	Monitor Annually	Cased Well, USGS Temperature Monitoring Well
East Simpson #2	Low	Low	Monitor for changing conditions	Cased Well, USGS Temperature Monitoring Well
East Teshekpuk #1	None	None	No action	Cased Well, Plugged
East Topagoruk	Low	Low	Monitor, Develop a Plugging Design/ Site Action Plan	Cased Well
Fish Creek	Moderate	Moderate	Monitor, Develop a Plugging Design/ Site Action Plan	Cased Well
Grandstand	Low	Low	Monitor, Develop a Plugging Design/ Site Action Plan	Cased Well
Gubik Test #1	Low	Low	Technical evaluation of actions required	Cased Well
Gubik Test #2	High	High	Technical evaluation of actions required	Cased Well
Iko Bay Test #1	High	High	Barrow Area Phase 1 Plug & Remove Solid Waste	Cased Well
Ikpikpuk #1	Low	Low	Monitor for changing conditions	Cased Well, USGS Temperature Monitoring Well

TABLE 2: NPR-A LEGACY WELLS RISK AND ACTION SUMMARIES

Name	Subsurface	Surface	Strategic Plan Action	Well Category
Ikpikpuk Core Test #1	None	None	No action	Shallow, Uncased Legacy Well
Inigok #1	None	Low	Monitor surface	Cased Well, Plugged
J. W. Dalton #1	Low	None	No action	Cased Well, Plugged
Kaolak #1	Moderate	Moderate	Monitor, Develop a Plugging Design/ Site Action Plan	Cased Well
Knifeblade #1	Moderate	Low	Monitor, Develop a Plugging Design/ Site Action Plan	Cased Well
Knifeblade #2	Low	Low	Monitor, Develop a Plugging Design/ Site Action Plan	Cased Well
Knifeblade #2A	Moderate	Low	Monitor, Develop a Plugging Design/ Site Action Plan	Cased Well
Koluktak #1	Low	Low	Monitor for changing conditions	Cased Well, USGS Temperature Monitoring Well
Kugrua #1	Low	Low	Monitor for changing conditions	Cased Well, USGS Temperature Monitoring Well
Kuyanak #1	Low	Low	Monitor for changing conditions	Cased Well, USGS Temperature Monitoring Well
Lisburne #1	Low	Low	Monitor for changing conditions	Cased Well, USGS Temperature Monitoring Well
Meade #1	Low	Low	Monitor, Develop a Plugging Design/ Site Action Plan	Cased Well
Minga Test Velocity #1	Low	None	Monitor for changing conditions	Cased Well
North Inigok #1	Low	Low	Monitor for changing conditions	Cased Well, USGS Temperature Monitoring Well
North Kalikpik #1	Low	Low	Monitor for changing conditions	Cased Well, USGS Temperature Monitoring Well
North Simpson #1	Low	Moderate	Monitor, Develop a Plugging Design/ Site Action Plan	Cased Well
Oumalik #1	Moderate	Moderate	Monitor, Develop a Plugging Design/ Site Action Plan	Cased Well
Oumalik Core Test #1	None	None	No action	Shallow, Uncased Legacy Well

**TABLE 2: NPR-A LEGACY WELLS RISK AND ACTION SUMMARIES**

Name	Subsurface	Surface	Strategic Plan Action	Well Category
Oumalik Core Test #2	Low	Moderate	Monitor, Develop a Plugging Design/ Site Action Plan	Cased Well
Oumalik Core Test #11	Low	Moderate	Monitor, Develop a Plugging Design/ Site Action Plan	Cased Well
Oumalik Core Test #12	Low	Moderate	Monitor, Develop a Plugging Design/ Site Action Plan	Cased Well
Oumalik Foundation #1	None	None	No action	Shallow, Uncased
Oumalik Foundation #2	None	None	No action	Shallow, Uncased
Oumalik Foundation #3	None	None	No action	Shallow, Uncased
Oumalik Foundation #4	None	None	No action	Shallow, Uncased
Oumalik Foundation #5	None	None	No action	Shallow, Uncased
Oumalik Foundation #6	None	None	No action	Shallow, Uncased
Oumalik Foundation #7	None	None	No action	Shallow, Uncased
Oumalik Foundation #8	None	None	No action	Shallow, Uncased
Oumalik Foundation #9	None	None	No action	Shallow, Uncased
Oumalik Foundation #10	None	None	No action	Shallow, Uncased
Peard #1	Low	Low	Monitor for changing conditions	Cased Well, USGS Temperature Monitoring Well
Seabee #1	Low	Low	Monitor for changing conditions	Cased Well, USGS Temperature Monitoring Well
Sentinel Hill Core Test #1	Low	None	Monitor for changing conditions	Cased Well
Simpson #1	Low	Moderate	Monitor, Develop a Plugging Design/ Site Action Plan	Cased Well
Simpson Core Test #1	None	None	No action	Shallow, Uncased
Simpson Core Test #2	None	None	No action	Shallow, Uncased

TABLE 2: NPR-A LEGACY WELLS RISK AND ACTION SUMMARIES

Name	Subsurface	Surface	Strategic Plan Action	Well Category
Simpson Core Test #3	None	None	No action	Shallow, Uncased
Simpson Core Test #4	None	None	No action	Shallow, Uncased
Simpson Core Test #5	None	None	No action	Shallow, Uncased
Simpson Core Test #6	None	None	No action	Shallow, Uncased
Simpson Core Test #7	None	None	No action	Shallow, Uncased
Simpson Core Test #8	None	None	No action	Shallow, Uncased
Simpson Core Test #9	None	None	No action	Shallow, Uncased
Simpson Core Test #10	None	None	No action	Shallow, Uncased
Simpson Core Test #11	None	None	No action	Shallow, Uncased
Simpson Core Test #12	None	None	No action	Shallow, Uncased
Simpson Core Test #13	Moderate	Low	Simpson Peninsula Area Phase 2 Plug & Remove Solid Waste	Cased Well
Simpson Core Test #14	Low	Low	Simpson Peninsula Area Phase 2 Plug & Remove Solid Waste	Cased Well
Simpson Core Test #14A	Low	Low	Simpson Peninsula Area Phase 2 Plug & Remove Solid Waste	Cased Well
Simpson Core Test #15	Low	Low	Simpson Peninsula Area Phase 2 Plug & Remove Solid Waste	Cased Well
Simpson Core Test #16	None	None	No action	Shallow, Uncased
Simpson Core Test #17	None	None	No action	Shallow, Uncased
Simpson Core Test #18	None	None	No action	Shallow, Uncased
Simpson Core Test #19	None	None	No action	Shallow, Uncased
Simpson Core	None	None	No action	Shallow, Uncased

TABLE 2: NPR-A LEGACY WELLS RISK AND ACTION SUMMARIES

Name	Subsurface	Surface	Strategic Plan Action	Well Category
Test #20				
Simpson Core Test #21	None	None	No action	Shallow, Uncased
Simpson Core Test #22	None	None	No action	Shallow, Uncased
Simpson Core Test #23	None	None	No action	Shallow, Uncased
Simpson Core Test #24	None	None	No action	Shallow, Uncased
Simpson Core Test #25	None	None	No action	Shallow, Uncased
Simpson Core Test #26	Low	High	Simpson Peninsula Area Phase 1 Remove Solid Waste	Cased Well, Plugged
Simpson Core Test #27	None	None	No action	Cased Well, Plugged
Simpson Core Test #28	Low	Moderate	Simpson Peninsula Area Phase 2 Plug & Remove Solid Waste	Cased Well
Simpson Core Test #29	Moderate	Low	Simpson Peninsula Area Phase 2 Plug & Remove Solid Waste	Cased Well
Simpson Core Test #30	None	High	Simpson Peninsula Area Phase 1 Remove Solid Waste	Cased Well, Plugged
Simpson Core Test #30A	None	High	Simpson Peninsula Area Phase 1 Remove Solid Waste	Cased Well, Plugged
Simpson Core Test #31	None	None	No action	Cased Well, Plugged
Skull Cliff Core Test	Moderate	High	Monitor, surface clean-up by PRP	Cased Well
South Barrow #1	Moderate	Moderate	Barrow Area Phase 2 Plug & Remove Solid Waste	Cased Well
South Barrow #2	Moderate	Low	Barrow Area Phase 2 Plug & Remove Solid Waste	Cased Well
South Barrow #3	Moderate	Moderate	Barrow Area Phase 1 Plug & Remove Solid Waste	Cased Well
South Barrow #4			No action	Transferred to North Slope Borough by Barrow Gas Field Transfer Act
South Barrow #5			No action	Transferred to North Slope Borough by



**TABLE 2: NPR-A LEGACY WELLS RISK AND ACTION SUMMARIES**

Name	Subsurface	Surface	Strategic Plan Action	Well Category
				Barrow Gas Field Transfer Act
South Barrow #6			No action	Transferred to North Slope Borough by Barrow Gas Field Transfer Act
South Barrow #7			No action	Transferred to North Slope Borough by Barrow Gas Field Transfer Act
South Barrow #8			No action	Transferred to North Slope Borough by Barrow Gas Field Transfer Act
South Barrow #9			No action	Transferred to North Slope Borough by Barrow Gas Field Transfer Act
South Barrow #10			No action	Transferred to North Slope Borough by Barrow Gas Field Transfer Act
South Barrow #11			No action	Transferred to North Slope Borough by Barrow Gas Field Transfer Act
South Barrow #12			No action	Transferred to North Slope Borough by Barrow Gas Field Transfer Act
South Barrow #13			No action	Transferred to North Slope Borough by Barrow Gas Field Transfer Act
South Barrow #14			No action	Transferred to North Slope Borough by Barrow Gas Field Transfer Act
South Barrow #15			No action	Transferred to North Slope Borough by Barrow Gas Field Transfer Act
South Barrow #16			No action	Transferred to North Slope Borough by

TABLE 2: NPR-A LEGACY WELLS RISK AND ACTION SUMMARIES

Name	Subsurface	Surface	Strategic Plan Action	Well Category
				Barrow Gas Field Transfer Act
South Barrow #17			No action	Transferred to North Slope Borough by Barrow Gas Field Transfer Act
South Barrow #18			No action	Transferred to North Slope Borough by Barrow Gas Field Transfer Act
South Barrow #19			No action	Transferred to North Slope Borough by Barrow Gas Field Transfer Act
South Barrow #20			No action	Transferred to North Slope Borough by Barrow Gas Field Transfer Act
South Harrison Bay #1	Low	Low	Monitor for changing conditions	Cased Well, USGS Temperature Monitoring Well
South Meade #1	Low	Low	Monitor for changing conditions	Cased Well, USGS Temperature Monitoring Well
South Simpson #1	None	Low	Monitor surface	Cased Well, Plugged
Square Lake #1	None	Low	Monitor surface	Cased Well, Plugged
Titaluk #1	Moderate	Low	Monitor, Develop a Plugging Design/ Site Action Plan	Cased Well
Topagoruk #1	Moderate	High	Plan Surface clean-up	Cased Well
Tulageak #1	Low	Moderate	Monitor Annually	Cased Well, USGS Temperature Monitoring Well
Tunalik #1	Low	Low	Monitor for changing conditions	Cased Well, USGS Temperature Monitoring Well
Umiat #1	Moderate	Moderate	Monitor, Develop a Plugging Design/ Site Action Plan	Cased Well
Umiat #2	None	None	No action	Cased Well, Plugged
Umiat #3	None	Low	Monitor surface	Cased Well, Plugged
Umiat #4	None	Low	Monitor surface	Cased Well, Plugged
Umiat #5	None	None	No action	Cased Well, Plugged

**TABLE 2: NPR-A LEGACY WELLS RISK AND ACTION SUMMARIES**

Name	Subsurface	Surface	Strategic Plan Action	Well Category
Umiat #6	None	None	No action	Cased Well, Plugged
Umiat #7	None	None	No action	Cased Well, Plugged
Umiat #8	None	None	No action	Cased Well, Plugged
Umiat #9	None	High	Ongoing Surface clean-up by USACE	Cased Well, Plugged
Umiat #10	None	None	No action	Cased Well, Plugged
Umiat #11	Low	Low	Monitor, Develop a Plugging Design/ Site Action Plan	Cased Well
W. T. Foran #1			No action	Transferred to ASRC through the Cape Halkett exchange in 1981
Walakpa #1			No action	Transferred to North Slope Borough by Barrow Gas Field Transfer Act
Walakpa #2			No action	Transferred to North Slope Borough by Barrow Gas Field Transfer Act
West Dease #1	Low	Moderate	Monitor Annually	Cased Well, USGS Temperature Monitoring Well
West Fish Creek #1	Low	Low	Monitor for changing conditions	Cased Well, USGS Temperature Monitoring Well
Wolf Creek #1	Moderate	Low	Monitor, Develop a Plugging Design/ Site Action Plan	Cased Well
Wolf Creek #2	Moderate	Low	Monitor, Develop a Plugging Design/ Site Action Plan	Cased Well
Wolf Creek #3	Low	Low	Monitor, Develop a Plugging Design/ Site Action Plan	Cased Well

## APPENDIX A

### TIMELINE - LEGACY WELLS

**1944 - 1952:** The U.S. Navy drills 91 wells in the Naval Petroleum Reserve No. 4 (PET-4), including 59 cased exploratory wells and 32 uncased core tests.

**1953 - 1975:** The Navy drills 17 additional wells near Barrow in support of the Barrow Gas Field development.

**1976:** The Naval Petroleum Reserves Production Act of 1976 (NPRPA; Public Law 94-258) re-names the PET-4 as the National Petroleum Reserve in Alaska (NPR-A), and orders the transfer of jurisdiction over the reserve from the Secretary of the Navy to the Secretary of the Interior, effective June 1, 1977.

The law directed the Department of the Interior to protect the surface and explore for oil and gas. At the time the law was enacted, the U.S. Geological Survey (USGS) supervised exploration and development for leases on Federal, Indian and certain Naval petroleum reserve land (to include NPR-A after the transfer).

**1977:** The BLM and USGS enter into a Memorandum of Understanding (42 FR 4542) giving USGS exclusive jurisdiction over the South Barrow Gas Field and specifying that the BLM and USGS share management of the surface of areas of operations. The MOU designated the USGS as manager of the continuing exploration program during the interim period between the transfer of jurisdiction from the Navy to Interior.

**1975 - 1982:** The Navy and USGS drill 28 wells through a contract with Husky Oil Company.

**1980:** The NPRPA is amended to direct an expedited program of leasing.

**1981:** The BLM conveys the W.T. Foran well to the Arctic Slope Regional Corporation (ASRC).

**1982:** In January, the Minerals Management Service (MMS) takes over the functions of oil and gas exploration and development from the USGS Conservation Division. In December, onshore minerals management functions are transferred to the BLM via Secretarial Order 3087.

**1982:** The first BLM oil and gas lease sale is held for the NPR-A.

**1984:** The Barrow Gas Transfer Act transfers ownership responsibility of 19 Legacy Wells to ASRC.

**1986:** The BLM conveys Grandstand #1 well to ASRC.

**1995:** The Alaska State Dept of Environmental Conservation issues final closure for 27 of the USGS reserve pits. ADEC issues one reserve pit (East Teshekpuk) conditional closure. BLM conveys Gubik #1 and Gubik #2 wells to ASRC.

**2002:** Umiat #2 and Umiat #5 wells plugged by the U.S. Army Corps of Engineers, under the oversight of the BLM at a cost of \$25 million.

**2003 - 2005:** The BLM inspects and evaluates all 136 wells and uncased core test sites to determine the threat posed to human health, safety and the environment. The 2004 Legacy Wells Summary Report prioritized those sites with the most immediate need of corrective action.

**2005 - 2013:** The BLM conducts clean-up efforts of several high priority well sites identified in the 2004 Legacy Wells Summary Report.