In the United States Court of Federal Claims

No. 06-491L
(Filed: December 21, 2010)*
***OPINION ORIGINALLY ISSUED UNDER SEAL ON NOVEMBER 22, 2010**

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WALLACE OENGA, GEORGENE SHUGLUK, LEROY OENGA, SR., MICHAEL DELIA, TONY DELIA, JOSEPH DELIA, JENNIE MILLER, and TRINITY DELIA,	*	
Plaintiffs,	*	**Alaska Native Allotment; Damages for Breach of Trust; Property Valuation.**
v.	*	
THE UNITED STATES,	*	
Defendant,	*	
and	*	
BP EXPLORATION (ALASKA) INC., CONOCOPHILLIPS ALASKA, INC., EXXONMOBIL ALASKA PRODUCTION INC., CHEVRON U.S.A. INC., and FOREST OIL CORPORATION,	*	
Defendant-Intervenors.	*	
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Raymond C. Givens, Bellevue, WA, for plaintiffs.

James M. Upton, U.S. Department of Justice, Washington, DC, with whom was *Ignacia S. Moreno*, Assistant Attorney General, for defendant. *Jason A. Hill*, U.S. Department of Justice, Washington, DC, and *Roger Hudson*, U.S. Department of Interior, Anchorage, AK, of counsel.

James E. Torgerson, Anchorage, AK, for defendant-intervenors.

O P I N I O N

FIRESTONE, *Judge*.

I. INTRODUCTION

This action concerns a lease (the "Oenga lease") entered into between the plaintiffs,[1] owners of a forty-acre Native Allotment on Alaska's North Slope, and BP Exploration (Alaska) Inc. ("BPX").[2] The Oenga allotment is located on a peninsula known as Heald Point that juts out into the Beaufort Sea and is strategically located for directional drilling into state oil and gas leases owned by the defendant-intervenors. The Oenga lease was approved by the United States Department of the Interior ("DOI") Bureau of Indian Affairs ("BIA") under 25 U.S.C. § 415(a) and the implementing regulations in 25 C.F.R. Part 162. It is not disputed that the Oenga lease, which was originally entered into in 1989, gave BPX the right to operate an oil and gas development

[1]The plaintiffs are the heirs of the original lessor, Andrew Oenga, and include his son Wallace, his daughter Georgene Shugluk, his grandsons Leroy Oenga, Michael Delia, Tony Delia, and Joseph Delia, as well as his granddaughter and great granddaughter.

[2]At the time the lease was entered into, BPX was called Standard Alaska Production Company. Standard Alaska changed its name to BPX effective January 31, 1989.

and production facility on the plaintiffs' allotment.[3] However, the scope of the rights granted under the lease are in dispute. A trial was held to determine the scope of BPX's rights under the lease and what damages, if any, are due to the plaintiffs for the government's breach of trust for failing to discover and report BPX's use of the allotment for activities outside the scope of the lease.[4]

This is the third opinion issued in this case. In its first opinion, Oenga v. United States, 83 Fed. Cl. 594 (2008), the court reviewed the major provisions of the 1989 lease and its amendments to determine whether the government had breached its trust responsibility in approving a lease that the plaintiffs claimed did not provide them with fair market rent for their property. The court determined that plaintiffs' claims based on the terms of the lease and in particular the way in which rent is calculated under the lease were barred by the statute of limitations. Id. at 616. The plaintiffs also charged that some of BPX's actions were not authorized by the lease and asserted breach of trust claims

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[3]Approximately 100 million barrels of oil with a gross value of approximately $2 billion has been produced from wells on the allotment or immediately adjacent to the allotment on Alaskan tidelands. The oil has been produced by BPX and the other defendant-intervenors, Conoco Phillips Alaska, Inc. ("Conoco Phillips") (formerly ARCO Alaska, Inc. ("ARCO")), Exxon Mobil Alaska, Inc. ("Exxon"), Chevron USA, Inc. ("Chevron"), and Forest Oil Corporation. These companies are collectively referred to as the "Working Interest Owners," and they reimburse BPX for certain costs incurred by BPX for certain oil and gas leases, including those at issue in this case, in exchange for which BPX delivers to each its proportionate share of all oil and gas produced through the facility at Heald Point from the subject leases.

[4]The plaintiffs have received approximately $2.1 million in rental payments from BPX over the past twenty-two years. They are seeking approximately $25,000,000 in damages resulting from BIA's breach of trust stemming from oil and gas development activities alleged to be outside the scope of the lease.

against the government based on its failure to take action to stop BPX from acting outside the scope of the lease. The court found that these claims were not time-barred and that the plaintiffs were entitled to summary judgment on a portion of their breach of trust claim. Id. at 619.

The lease and its amendments are described at length in the first opinion. Id. at 600-04. As set forth in that opinion, the initial lease covered ten acres of the Oengas' forty-acre allotment. As set forth in the lease, BPX sought to use the allotment for its "Niakuk Project." The Niakuk Project is described in attachments to the lease as an oil development facility on Niakuk Island #4 in the Beaufort Sea with a causeway leading to the allotment. According to attachments to the lease, oil from the island was to be transported to the mainland via a causeway to the tip of the plaintiffs' allotment. A road and pipeline would then take the oil across the allotment, through the L-5 drill site, and on to an existing oil processing facility known as the Lisburne Production Center, which is operated by ARCO.

Under the 1989 lease, BPX was authorized to use ten acres, "for any and all oil field exploration, development, construction, facilities, production and support purposes." (Ex. 1506 ¶ 10.) The lease permitted BPX to sublease all or portions of the ten acres without notice to the plaintiffs. (Ex. 1506 ¶¶ 10 & 13.) Paragraph 11 of the lease provided however that construction of any facilities is "limited to the ten(10) acres as

herein described on Exhibit A." (Ex. 1506 ¶ 11.) Exhibit A is a map of the proposed Niakuk Project described above. (Ex. 1506 Ex. A.)

The lease was divided into two phases. During the first phase, BPX had a year-to-year lease for up to ten years while it sought "to obtain required permits for the Niakuk Project." (Ex. 1506 ¶ 1.) At that time BPX was seeking permits from the United States Army Corps of Engineers ("USACE") to build the causeway from the allotment to Niakuk Island #4. The lease then provided for a second phase which would begin once BPX decided to proceed with the Niakuk Project. During the second phase BPX was authorized to extend the lease term up to twenty-five years. (Ex. 1506 ¶ 2.) The lease also gave BPX the unilateral option to increase the acreage occupied under the lease up to the allotment's total of forty acres.[5] (Ex. 1506 ¶¶ 10 & 11.)

The lease provided for an annual payment of $1,600 per acre, or $16,000, for the first ten acres. (Ex. 1506 ¶ 4.) The Oengas also received a one-time $25,000 signing bonus. (Ex. 1506 ¶ 3.) Under the lease the rent could be increased at successive five-year intervals based on an appraisal of the property based on the highest and best use of the property as undeveloped raw land or based on a cost adjustment factor for inflation using

[5]There was an issue regarding the exact size of the allotment. Although Andrew Oenga applied for a 40-acre allotment, the certificate of allotment issued by the Bureau of Land Management ("BLM") shows that the Oenga allotment is only 22.21 acres due to a mistake in the initial application from 1970. (Tr. 656; Ex. 2001.) BLM had transferred the remainder of the forty acres to the State. Although the DOI's Office of Hearings and Appeals issued a ruling in 2003 that the Oenga allotment was to include the total forty acres, apparently the process to formalize this decision remains incomplete. (Tr. 730-31; Ex. 1516.)

the consumer price index ("CPI"), whichever is greater. (Ex. 1506 ¶ 5.) However, whichever measure was used to increase the rent due for the allotment, under neither could the rent escalate more than fifty percent in a five-year period. (Ex. 1506 ¶ 5.)

The lease was amended in 1993, 1994, and 1995. In 1993, BPX invoked its right to convert the lease from a year-to-year lease to a fixed twenty-five-year term, based on its representation that permits for the "Niakuk Project" had been approved. In the 1993 correspondence, BPX explained that it had changed its Niakuk Project from the original project to build a causeway from Niakuk Island #4 to the allotment and to instead use the allotment for an oil development facility with a drill pad. (Ex. 1510.) BPX represented in its 1993 Notice that it intended to use the Oenga allotment to develop and produce oil and gas from BPX's "Niakuk oil accumulation." (Ex. 1510.) In order to build the oil development facility and gain permission to build facilities outside the original ten acres, BPX also sought to increase the size of the lease from ten to twenty acres.[6] The BIA approved BPX's requests. Thereafter, in 1994, BPX sought to increase the size of the

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[6]Much of the court's first decision was focused on the plaintiffs' claim that BPX's decision in 1993 to change its use of the allotment from a pipeline right-of-way to a drill site was invalid and that the government breached its trust responsibility when it allowed BPX to change the Niakuk Project without securing additional compensation for the plaintiffs. The court determined that plaintiffs' breach of trust claims filed in 2006 regarding the terms of the lease, including BPX's right to use additional acreage and build a drill site, were barred by the applicable statute of limitations, and therefore the plaintiffs' claim for compensation in connection with use of plaintiffs' allotment for a drill site was barred. Oenga, 83 Fed. Cl. at 616. The court concluded, however, that plaintiffs' additional claims regarding use of the drill site to explore and develop oil and gas accumulations that were not part of the "Niakuk" accumulation were outside the scope of the lease were continuing and therefore not barred by the statute of limitations. Id. at 619.

lease from twenty to the full forty acres. This amendment followed conversations between BPX, the BIA and ARCO, in which ARCO called the BIA to discuss leasing the un-leased portion of the allotment from the plaintiffs. The BIA and BPX determined that BPX had rights to the entire forty acres and the matter was not discussed with the plaintiffs. After BPX secured the 1994 lease amendment for the allotment, BPX entered into Facility Sharing Agreements ("FSAs") with ARCO and Exxon, which allowed those companies to use the allotment for oil production from their state oil and gas leases. This included oil and gas from an area that came to be known as West Niakuk as well as oil from the Lisburne oil accumulation.[7]

The lease was amended again in 1995. In the 1995 amendment, the rental payment schedule was changed and the BIA became the "sole contact" with BPX for all issues concerning the lease. (Ex. 1514.) The family agreed that "they will under no circumstances contact [BPX] in person or by telephone, facsimile, electronic mail . . . or any other means." (Ex. 1514.)

In its first decision, the court determined that the lease authorized use of the allotment for the "Niakuk Project" and that BPX could use the lease only in furtherance of the this purpose. Oenga, 83 Fed. Cl. at 619. The court determined that the Niakuk

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[7]These FSAs establish access fees and other conditions for one oil company to use oil production, drilling or other facilities belonging to another oil company. FSAs are private agreements. They are not approved by the State. With regard to the facility at Heald Point, BPX entered into FSAs giving the West Niakuk lease owners access to the facility for a fee and trading access to the facility for use of natural gas from the Lisburne owners.

Project evolved in 1993 to include use of the allotment to develop oil from BPX's "Niakuk oil accumulation" but that the lease did not go so far as to authorize BPX to use the allotment or allow others to use the allotment for oil and gas development from other non-Niakuk oil and gas accumulations. Id. at 619 n.68. Thus, the court found that BPX's agreements with other oil companies to use the allotment to develop oil and gas from other accumulations, including a previously known and identified oil accumulation referred to by the name "Lisburne," were outside the scope of the lease. Id. at 619. Under Alaska oil and gas law, oil and gas from separate accumulations or reservoirs are ordinarily developed independently from each other in accordance with specific rules.[8] The Lisburne oil accumulation involves a reservoir that is geologically and legally separate from the reservoir associated with Niakuk oil accumulation. The court determined that the government's failure to take steps to stop BPX's use of the Oenga allotment for oil and gas development from Lisburne caused a breach of the government's

[8]As discussed in greater detail in the opinion, oil and gas accumulations in Alaska are developed in accordance with rules set by the Alaska Department of Natural Resources Division of Oil and Gas ("DOG") and Alaska Oil and Gas Conservation Commission ("AOGCC"). Under the rules set by the DOG, ownership and oil and gas allocation issues are governed by the creation of "participating areas" for discrete oil accumulations. The AOGCC establishes the technical pooling rules for an oil accumulation to ensure that it is exploited to the maximum advantage of all parties having an interest in the oil and gas in a specified oil and gas accumulation.

trust responsibility under established DOI regulations governing the leasing of Native allotments.[9] Id. at 621-23.

The court further determined in that first decision that disputed issues of fact precluded the court from determining the full extent of the breach because there was conflicting evidence regarding the relationship between the Niakuk Participating Area ("PA") and West Niakuk, and therefore the court could not determine whether oil development from West Niakuk was authorized by the lease. Id. at 620. In particular, the court could not determine whether use of the Oenga lease to produce oil and gas from leases belonging to ARCO and Exxon and not included in the BPX Niakuk PA was within or outside the scope of the Oenga lease. The court stated that it needed more evidence to determine whether BPX's "Niakuk oil accumulation" as identified by BPX in 1993 encompassed oil and gas leases belonging to Exxon and ARCO. Id. In 2009, the plaintiffs filed their Third Amended Complaint, which added a claim regarding BPX's production from the Raven oil accumulation, which is owned exclusively by BPX but found in a separate formation deeper than the Niakuk formation. The plaintiffs did not learn of BPX's development from Raven until 2008.

In a second opinion, Oenga v. United States, 91 Fed. Cl. 629 (2010), the court addressed the proper measure of damages for the government's breach of trust in failing to take appropriate action in connection with BPX's oil and gas production activities

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[9]At trial the court heard testimony regarding the appropriate measure of damages for the breach of trust responsibility attributable to oil and gas development from Lisburne.

outside the scope of the Oenga lease. The court determined based on the BIA regulations that the plaintiffs must be paid present fair annual rental ("PFAR") for use of their property, and therefore the plaintiffs are entitled to receive PFAR for the unauthorized use of their allotment for oil development outside the scope of the lease. Id. at 644. The court found that the government breached its duty to monitor, discover and then report BPX's breach of the lease in 2001, when new 25 C.F.R. Part 162 regulations took effect. Id. at 646. The court held:

> The plaintiffs are entitled to a damage award that accounts for the damages the government should have recovered on their behalf had the government fulfilled its trust responsibilities under the regulations and lease in 2001 to stop the lease violation and recover damages. The government's ability to recover damages from BPX in 2001 would have been subject to the applicable statute of limitations, just as is the plaintiffs' present claim. Under 28 U.S.C. § 2515 or Alaska Stat. § 09.10.050, recovery would have been limited to the six years prior to the date of the government's claim against BPX. Because the government's breach began in 2001, a claim filed at that time would have resulted in recovery for BPX's breach dating back six years–to 1995.

Id. at 647 (footnotes omitted).

This opinion, the third opinion, follows the trial that was conducted in two phases over the course of eight days in July 2010. In the first phase testimony and evidence was introduced regarding the scope of the government's liability, also called the "scope of lease" or "liability" issue. The second phase of the trial focused on "damages" or the issue of PFAR. Live testimony was heard from ten witnesses and 249 exhibits were

introduced.[10] A summary of the testimony and evidence introduced at trial and the court's findings of fact and conclusions of law regarding liability and damages are separately addressed below.

II. SCOPE OF THE LEASE: LIABILITY FINDINGS AND CONCLUSIONS

At trial the plaintiffs presented testimony and evidence from Wallace Oenga, Andrew Oenga's son, Tony Delia, Andrew Oenga's grandson, and Blair Wondzell, a Registered Petroleum Engineer in the state of Alaska offered as an expert witness on BPX's development of the Niakuk oil accumulation. Through their testimony and exhibits the plaintiffs sought to establish that they reasonably interpreted the lease to mean that BPX was permitted to use their allotment for the "Niakuk Project," which included development of oil and gas from BPX's Niakuk accumulation only. The plaintiffs acknowledge that BPX in some communications with the BIA and other state and federal government officials may have indicated that BPX hoped to use the allotment for the development of oil and gas from additional oil accumulations. However, the plaintiffs maintain that in the lease and lease amendments BPX only identified use of the allotment for the "Niakuk Project" and for oil and gas development from BPX's "Niakuk oil

[10]The court also allowed the use of deposition testimony from Leroy Oenga and Michael Kotowski, which the court has reviewed and considered but which is not summarized at length here. Mr. Oenga testified regarding his understanding of the lease negotiations and his lack of understanding regarding references to participating areas, facility sharing agreements and the like. Mr. Kotowski, an ARCO employee who was the unit manager of the Prudhoe Bay Unit in the early 1990s testified in part regarding his understanding that BPX would try to develop any oil reservoirs reachable from the surface location developed.

accumulation." BPX never identified other accumulations it hoped to exploit. The plaintiffs argue that BPX knew of other oil accumulations that could be accessed from the allotment prior to entering into the lease but BPX did not seek to include the right to use the property to develop oil from those accumulations in the lease. The plaintiffs contend that the bargain they struck with BPX extended only to BPX developing oil and gas from the Niakuk accumulation, which BPX had specifically identified to the plaintiffs in the lease and lease amendments. The plaintiffs contend that, to the extent BPX's reading of the lease is plausible and the lease authorizes use of their property for oil development from other accumulations, BPX's reading must be viewed as creating a latent ambiguity in the lease that was not obvious from the face of the lease documents. The plaintiffs further contend that any latent ambiguity must be construed against the drafters of the lease, BPX and BIA, and in favor of the plaintiffs. Based on this reasoning and the evidence presented, the plaintiffs assert that use of their allotment by BPX and others for oil and gas development and production from ARCO and Exxon's West Niakuk PA and from the Raven PA was unauthorized by plaintiffs and is outside the scope of the Oenga lease.

The defendant, United States, and the defendant-intervenors, BPX, et al., presented testimony and evidence from James Eason, Kathleen Dickinson, George Ahmaogak, Diane Sam, Cindy Bailey, Dr. Amy Frankenburg, and Terry Obeney. Through their testimony and exhibits they sought to establish that the term "Niakuk Project" in the lease was never intended to limit BPX's use of the allotment. They sought to demonstrate that

"Niakuk Project" referred to a "surface project" from which BPX intended to develop oil and gas from any oil and gas accumulation within reach of the allotment, including oil and gas owned by other oil and gas companies.[11] The defendant and defendant-intervenors introduced testimony from witnesses to show that the plaintiffs did not understand that there were other oil and gas accumulations that could be reached through directional drilling from the allotment, they never asked any questions about which accumulations BPX was seeking to develop, and therefore the plaintiffs never intended to limit BPX's use of the allotment to oil and gas development from BPX's Niakuk accumulation. The defendant and defendant-intervenors maintain that the lease authorized BPX to use the allotment for any and all oil and gas development. They argue further that the lease is not ambiguous and that, under the terms of the lease, "Niakuk Project" does not limit BPX's rights to use the allotment for all oil and gas development from any accumulation.

A. Summary of Liability Testimony and Exhibits

1. Plaintiffs' Witnesses

Plaintiff Wallace Oenga, son of Andrew Oenga, testified regarding his knowledge of the negotiations and signing of the original Oenga lease with BPX in 1989 in addition to the events surrounding the signing of the 1994 and 1995 lease amendments after his

[11] The defendant and defendant-intervenors presented exhibits which indicated that BPX believed that oil and gas development from the Lisburne oil accumulation was covered by the Oenga lease. The court had previously granted summary judgment to the plaintiffs on their claim that oil and gas development from Lisburne was outside the scope of the lease and does not revisit that issue here for the reasons set forth in this opinion. See Oenga, 83 Fed. Cl. at 619.

father had died and title to the allotment had passed to himself and a number of other heirs. Mr. Oenga testified that his father understood that the original lease covered only the development of oil from BPX's Niakuk accumulation. (Tr. 65-66.) Mr. Oenga further stated that it was his father's understanding that the Oenga lease covered only the exploration phase of the Niakuk accumulation and that if BPX found productive volumes of oil from the Niakuk accumulation, the lease terms would change, resulting in more money for the landowners. (Tr. 70-71.) This understanding of the lease is confirmed by a November 10, 1993 letter sent to BPX representatives Stuart Hirsh and Cindy Bailey from Diane Sam, who was with the Arctic Slope Native Association ("ASNA"), and who stated on behalf of the plaintiffs, "[T]he heirs believe that lease payments would adjust dramatically when production began, and they individually had conversations with Andrew Oenga that indicated this universal understanding of the lease." (Tr. 104-105; Ex. 3244.) Mr. Oenga stated that his father understood that the term "Niakuk Project" in the 1989 lease meant BPX had the right to access its "Niakuk" oil, but he did not understand that the lease would allow for production by companies such as ARCO or Exxon or from other pools or oil accumulations. (Tr. 65-66.)

Mr. Oenga testified that the heirs of Andrew Oenga believed that the BIA had violated its responsibilities to them in 1993 when the BIA allowed BPX to change the project from a right-of-way to drill site, expand the lease site to twenty acres, and to change the lease to a twenty-five-year lease term. The original lease had limited actual

construction on the allotment to the initially-leased ten acres of the allotment. (Tr. 69-70; Exs. 1510, 1014.) Although BPX was authorized to expand the lease to twenty acres, when the heirs learned that BPX intended to lease all forty acres and operate a drill site, the heirs tried to negotiate for a rent increase from BPX. (Tr. 70-71.) In Mr. Oenga's estimation, the lease negotiations went badly, in part because the BIA had previously signed off on BPX's 1993 decision to change the use of the allotment from a right-of-way to a drill site without notice to the plaintiffs, and thus the plaintiffs did not have any leverage to negotiate a more favorable lease at that time. (Tr. 71, 73-74.) In the negotiation process, the parties never expressly discussed BPX's plans to allow other oil companies (ARCO and Exxon) to use the drill site for their own leases and to then charge those oil companies for use of the allotment. (Tr. 71-71; Ex. 1511.)[12] Mr. Oenga acknowledged that during the course of the negotiations he and the other heirs signed a "counseling record" prepared by Diane Sam who was helping them negotiate the 1994 lease amendment. In the counseling letter, Ms. Sam informed each of the heirs that BPX believed the 1994 lease amendment would allow BPX to "enter into any arrangement with

[12]As discussed in the original decision, in 1994 the plaintiffs agreed to a lease amendment that confirmed BPX's use of all of plaintiffs' allotment and that expressly provided that the plaintiffs would only be entitled to notice if the allotment were subleased, which expressly did not include "facility sharing agreements or other transactions which do not convey an interest in real property." (Ex. 1511.) The lease amendment further provided that the plaintiffs could only seek additional rent through the lease mechanism, stating, "Lessors shall make no additional claims, requests or demands of Lessee for Lease rental payments, rental payment adjustments or rental payment advances," except as provided for by the periodic rental adjustment term in the original lease. (Ex. 1511.) The amendment also shortened the period between rent adjustments from five to four years. (Ex. 1511.)

ARCO to develop this property." (Ex. 1512.) However, Mr. Oenga testified that he did not understand that they were agreeing to let BPX use the allotment for any and all oil and gas development. The counseling record refers to ARCO "develop[ing] the property." (Ex. 1512.) Mr. Oenga saw the counseling record as a hoop he had to pass through in order to receive the money they were owed from BPX because BPX had already constructed the drill site on more than the original ten acres without paying additional rent. He said it did not mean that he agreed with everything in the letter. (Tr. 75-56; Ex. 1512.)

Mr. Oenga testified that although Ms. Sam from ASNA was kind to the family, the ASNA representatives did not have a good understanding of the complexities of the family's lease with BPX or of the oil industry. (Tr. 81-82.) He further testified that the BIA representatives sided with BPX, rather than with the heirs, in the lease negotiations. (Tr. 81-82.) Although BIA and/or ASNA employees had notice that ARCO had some interest in the allotment, Mr. Oenga testified that the nature of ARCO's interest (i.e. to develop oil and gas from ARCO's leases into West Niakuk) was not communicated to him. (Tr. 126.)

On cross-examination, Mr. Oenga stated that although he was not living near his father during much of the time leading up to the 1989 lease signing he was at one of the negotiation meetings and reiterated his assertion that both he and his father understood that BPX was only planning to produce oil from "Niakuk" and that once oil production

began in earnest the family would receive more money from BPX. (Tr. 88-89, 104-06.) He stated that in signing the counseling record the family felt rushed and had questions left unanswered by the BIA or ASNA employees who didn't know enough about the family's lease nor the oil industry to be of much help. (Tr. 114.) He stated that there was no discussion at the time of the 1994 lease renegotiation about ARCO's interest in the allotment. (Tr. 118.) He admitted that he did not understand certain terms used by the state and in the industry in connection with oil production such as "participating area," or "facility sharing agreement," nor did he hear any discussion of "West Niakuk," "Sag River" or of the geologic formations making up the Raven PA, nor of the "Raven PA" itself. (Tr. 118, 121.)

The plaintiffs next called Blair Wondzell, a petroleum engineer, to testify. Mr. Wondzell had a long history working in the oil industry, both within and outside the government. He testified that he spent his first eleven years as an engineer working for Standard Oil Company and that from 1974 until 2001 he worked in various capacities for the State of Alaska. (Tr. 142-43; Ex. 1260.) He began his government career with the State of Alaska Division of Aviation. (Tr. 142-43; Ex. 1260.) He then worked for a year as a field surveillance officer during construction of the trans-Alaska pipeline and subsequently went to work as a petroleum engineer for the Alaska Division of Minerals and Energy Management[13] within the Department of Natural Resources ("DNR"), and

[13]The Department of Minerals and Energy Management has been known since 1984 as the Division of Oil and Gas; hereinafter "Division of Oil and Gas" refers to both, regardless of

finally worked from 1978 to 2001 he worked for the Alaska Oil and Gas Conservation Commission ("AOGCC") as a petroleum engineer.[14] (Tr. 143; Ex. 1260.) He has worked as a consultant since retiring from the state. (Tr. 142-43; Ex. 1260.)

Mr. Wondzell provided a basic primer on the history of oil development in Alaska and on the role of various State agencies in the oil development process. He explained that the Division of Oil and Gas ("DOG") within DNR manages the state's oil and gas PAs, and that the AOGCC sets pool rules.[15] (Tr. 157-164.) He testified that under the Alaskan system, "the regulators [(the AOGCC)] and the managers [(DOG)] were totally different people." (Tr. 364.)

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time.

[14]Mr. Wondzell explained that his work constructing airports gave him experience building gravel pads. (Tr. 352-53.) In his role at DNR, he did economic evaluations of the state's mineral leases to oil companies and water flooding, a technique for the efficient recovery of oil, in Prudhoe Bay, and was involved in redrafting the statutes governing the Division of Oil and Gas. (Tr. 351-52, 359.) In his capacity at AOGCC, he verified the technical capacity of equipment and techniques companies proposed to use to recover oil; led a team of inspectors that inspected field operations; worked with petroleum engineers, reservoir engineers, and geologists; and was involved in redrafting the AOGCC regulations multiple times. (Tr. 354-59.) He testified that his experience in these three positions had given him special expertise regarding oil and gas development and regulation in Alaska as well as a special understanding of the history of oil and gas development in Alaska. (Tr. 359-60.)

[15]As Mr. Wondzell explained:

> [W]hat the pool rules basically are is how they're going to drill and equip the wells, . . . where they're going to space them, what kind of a water flood they are going to use. . . . They talk about the rates, the pressure in the reservoir . . . and that becomes important because if you go below it you start losing energy.

(Tr. 203.) In other words, in setting pool rules, AOGCC ensures that minerals are extracted efficiently and in concert by various interested parties.

He explained the difference between PAs and units, such as the Prudhoe Bay Unit ("PBU"), as follows:

> A . . . unit just means unitization. The companies get together so they develop the leases as a unit and not everybody has to go drill an exploratory well on their own property after a discovery has been made and before production starts. . . . Before production starts, [oil companies] get together and allocate or determine how much of the production is going to be allocated to which lease, and that's called a participating area. The unit can be considerably bigger than the [PA], but the [PA] really cannot be bigger than the unit. That's why there are several [PAs] within the Prudhoe Bay unit . . . .

(Tr. 170.) He further explained that when an oil company obtains a lease from Alaska the company is given the right to develop and exploit the state's oil and gas interest. (Tr. 167, 171.) The lease gives the company right to conduct exploration and production activities at any depth and from any accumulation within that lease in exchange for a royalty paid to the state. (Tr. 167, 171.) He further explained that, unlike a state lease, a PA only encompasses a single geological group or geologic formation that holds an accumulation of oil and gas, such as the Niakuk accumulation. (Tr. 172-73.) He explained that the Niakuk accumulation is in the highest strata of BPX's leases, underlain by the Raven formation, with the Lisburne formation deeper still. (Tr. 172-73; 391-92.) Niakuk oil comes from the Kuparuk formation, Raven oil comes from the Sag River, Shugluk, and Ivishak formations, and Lisburne oil comes from the Lisburne formation, specifically from the Alapah area. (Tr. 172-73.) The Lisburne PA was created in December 1986, the Niakuk PA in March 1994, the West Niakuk PA in November 1997, and the Combined Niakuk PA, which combined Niakuk and West Niakuk PAs, and the Raven PA were

created by the State on December 21, 2007. (Tr. 178; Ex. 1568.) Prior to 2000, BPX had a 100% ownership in the Niakuk PA, ARCO and Exxon each had a 50% interest in the West Niakuk PA, and BPX had a 20% interest in the Lisburne PA, while ARCO and Exxon each had 40%.[16] (Ex. 1584.)

Mr. Wondzell testified as to the steps an oil company will take before beginning oil production: first the company will obtain land use permits and do field geology to determine likely sites for oil exploration; the company will then bid on and obtain a mineral lease from Alaska, usually spanning a ten-year period; and then the company will drill exploratory wells, and, if volumes of oil are found, the work enters a production phase. (Tr. 166-168.) Mr. Wondzell presented a chart showing the reach of directional drilling at various points of time to show that at the time BPX was planning on exploring and developing its Niakuk accumulation, its ability to exploit oil and gas resources was dependent in large part on the location of its drill site. (Tr. 179) The chart showed that the reach of directional drilling was around 13,000 feet in 1991, 15,000 feet in 1994, and beyond 20,000 feet by 2007. (Ex. 1563.)

Mr. Wondzell presented the following undisputed time line of BPX's activities in connection with use of plaintiffs' allotment. BPX discovered oil in the "Niakuk

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[16]Following 2000, companies operating in the PBU entered into an agreement known as "superalignment" by which they all shared their interest in all PAs in the Unit. A later witness for BPX, Dr. Frankenburg, explained that despite this alignment of interests between and among the companies producing in Prudhoe Bay, each individual lessee is responsible for the particular royalty obligations prescribed by its lease from the state. (Tr. 525-26.)

Structure" in 1988. (Tr. 193; Ex. 1520.) The original "Niakuk Project" is described in a 1988 letter from BPX to the United States Army Corps of Engineers ("USACE") as an application for a permit to construct a 6600-foot causeway from Heald Point to an expanded Niakuk Island #4. The application states that the project would be used "for development of the Niakuk oil and gas field," and that "[BPX] is the sole owner of the lease tracts to be developed." (Ex. 1521.) USACE documents show that the USACE denied BPX's permit application in 1988 due, in particular, to concerns about the causeway from the allotment to Niakuk Island #4. (Ex. 1522.) A Congressional hearing was held in Alaska regarding the USACE's concerns, which led the USACE to reconsider the project. (Tr. 153, 182-84; Ex. 1525.) During this period of evaluation and re-evaluation by the USACE, BPX acquired its lease of the Oenga allotment, which it intended to use for an access road and pipeline right of way to carry oil produced from Niakuk Island #4 across a causeway, over the allotment, and on to a processing center south of the allotment. As noted above, the original lease was for use of ten acres of the Oenga allotment but through the lease BPX secured the right to lease all forty acres of the allotment. (Ex. 1506.)

After the causeway proposal was finally rejected following reconsideration by the USACE, BPX sought and obtained the USACE's approval in 1992 for construction of a drill site on the Heald Point. (Ex. 1527.) In its permit application, BPX explained that

the purpose of the drill site on the Oenga allotment was to "access and develop the Niakuk oil and gas reservoir." (Tr. 187-88; Ex. 1527.)

In 1993, BPX sent a letter to the BIA entitled "Notification of Niakuk Project Commencement" in which it requested, pursuant to Paragraph 11 of the lease, that the lease be amended to increase the acreage leased from ten to twenty acres. (Ex. 1510.) BPX also sought, pursuant to Paragraph 1 of the lease, that the lease be converted from a year-to-year lease to a twenty-five year term. (Tr. 194; Ex. 1510.) BPX explained that "[t]he Lease provided authorization for BP to construct production facilities to support the development, and production from, our Niakuk oil accumulation," and attached to the letter was a map showing plans for a drill pad at the tip of Heald Point, rather than a right-of-way as was shown in the original lease. (Ex. 1510.) The drill pad was constructed on the allotment and drilling began in 1993. At this same time BPX petitioned DNR for creation of a Niakuk PA.[17] (Tr. 195; Ex. 1528.) Around the same time, AOGCC established Niakuk pool rules limited to BPX's leases. (Ex. 1532.)

After BPX secured the lease amendment in 1994, which expanded the lease from twenty to forty acres, BPX entered into FSAs with ARCO and Exxon allowing those companies to drill for oil from the allotment. As discussed above, a FSA is an agreement between or among oil and gas lessees for access and use of oil or gas production facilities in exchange for a fee or some other kind of compensation. BPX and ARCO/Exxon

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[17] As stated above, the Niakuk PA was created in 1994. (Ex. 1538.)

entered into the first FSA for "access to and loan of excess high pressure gas lift gas" from the Lisburne accumulation. (Tr. 195-97; Ex. 1533.) BPX and ARCO entered into a second FSA wherein ARCO in its capacity as the operator of the Lisburne PA authorized BPX to process its oil Lisburne Processing Center ("LPC").[18] (Tr. 199-201; Ex. 1534.) Finally, in a third FSA between BPX and ARCO and Exxon, the latter companies were given a drilling and manifold slot at the allotment to "test the prospectivity of their lease(s) at the western limit of the BPX Niakuk Field," in the area that came to be known as West Niakuk. (Tr. 198; Ex. 1535.) The third FSA provided that operations and maintenance costs would be shared and that ARCO and Exxon would be charged $1.70 per barrel of oil produced if the test resulted in commercial production. (Ex. 1535.) All three agreements were signed January 27, 1994. In 1996, BPX, ARCO, and Exxon revised the FSA that had established a $1.70 per barrel access fee for use of the facility for West Niakuk production. Under the new FSA, instead of paying $1.70 per barrel, the ARCO and Exxon would pay "a fixed, non-escalating fee of $1.25 per barrel of Hydrocarbon Fluids produced." (Tr. 207; Ex. 1540.) "After the production of Ten

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[18]Mr. Wondzell explained that at Heald Point, all oil is "manifolded into a single pipe for transporting to the L-5 drill site," which was owned by ARCO, Exxon and BPX and is located approximately half a mile south of Oenga property line. (Tr. 205.) "When oil is transported to the L-5 and onto the Lisburne production center, it's run through separators. . . gas is taken off the top and measured, water is taken off the bottom." (Tr. 205-206.) The water is disposed of and the gas is either used for fuel or injected back into the Lisburne reservoir. (Tr. 206.) "If [BPX] hadn't been able to use [the LPC], they would have had to build their own facilities and with the heaters and the separators and all the related equipment, they're fairly expensive to build." (Tr. 206.)

Million Barrels, the $1.25 fee will be reduced thereafter to $0.50 per barrel of Hydrocarbon Fluids." (Tr. 207; Ex. 1540.)

Mr. Wondzell explained that BPX did not believe that the Niakuk accumulation extended into ARCO and Exxon's West Niakuk leases. Thus when BPX petitioned DNR for creation of the Niakuk PA, it did not want ARCO and Exxon's leases to the west of the BPX leases to be included in the PA. The same was true when BPX applied to the AOGCC for pool rules applying to the Niakuk accumulation. Over Exxon and ARCO's objections, the DOG and the AOGCC agreed with BPX. (Tr. 202-203, 209-213; Exs. 1532, 1537.) Production from the newly-created Niakuk PA began in the spring of 1994. (Ex. 1538.)

Once productive quantities of oil and gas were discovered by ARCO and Exxon at West Niakuk in 1997, the DOG set up a PA for West Niakuk, separate from the Niakuk PA. (Tr. 214; Ex. 1541.) In January 1998, however, the AOGCC approved inclusion of the West Niakuk leases in the Niakuk pool rules. (Ex. 1609.) After that time, the companies were required to operate the accumulation "as a single entity rather than as two separate entities." (Tr. 217; Ex. 1609.) "Instead of ARCO operating their leases and BP operating those, they combine them and they operate them as one unit." (Tr. 217.) As stated above, the Niakuk and West Niakuk PAs were not combined into a single PA until 2007. (Tr. 220; Ex. 1544.)[19]

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[19]As discussed infra, a witness for the defendant-intervenor testified that the delay between the two decisions regarding the expansion of the Niakuk pool rules and creation of a

With regard to the Raven accumulation, Mr. Wondzell explained that it was operated as a separate pool from the outset under pool rules imposed in 2006. (Tr. 219; Ex. 1542.) In addition, the Raven PA was not established until 2007.[20] (Tr. 219; Ex. 1543.)

Mr. Wondzell testified as to several additional documents which he asserted supported his contention that the lease authorized activities associated with only the "Niakuk Project" or the development of the Niakuk oil accumulation. Mr. Wondzell pointed to the USACE application from 1989 which stated that it was for "development of the Niakuk oil and gas field," and further stated that "[BPX] is the sole owner of the lease tracts to be developed." (Tr. 224, 234-35; Ex. 1521.) Mr. Wondzell next highlighted the 1991 status report from BPX to the Oengas and BIA,[21] which stated,"BP still plans to utilize Heald Point in the development of the Niakuk Project and perhaps other potential development opportunities in the area." (Tr. 226; Ex. 1509.) Mr. Wondzell noted that the separate mention of these "other . . . opportunities" indicated that these "opportunities" were "not part of the Niakuk project." (Tr. 226.) He next identified the 1993 "Niakuk Project Commencement" letter from BPX to BIA, in which BPX

Combined Niakuk PA was due at least in part to the slow pace of equity negotiations to determine which company owned which proportion of the Kuparuk oil. (Tr. 860-61.)

[20] As mentioned above, by this time companies operating in the area had entered into superalignment, integrating their interests.

[21] BPX as part of its lease obligation was required to report on the status of the Niakuk Project.

sought to expand the lease from ten to twenty acres and which states, "The Lease provided authorization for BP to construct production facilities to support development of, and production from, our Niakuk oil accumulation." (Tr. 226; Ex. 1510.) Mr. Wondzell testified that BPX in its communications with the AOGCC noted that "[BPX] is not proposing to develop the ARCO/Exxon leases." (Tr. 227; Ex. 1532.) Mr. Wondzell also noted that in the counseling record signed by the family regarding the 1994 amendment, the scope of ARCO's activities on the allotment is not explained. (Tr. 228; Ex. 1512.)

With regard to BPX's claim that "Niakuk Project" refers to only a "surface project," Mr. Wondzell pointed to internal BPX documents in which "Niakuk Project" refers to more than a surface project. In particular, Mr. Wondzell pointed to one document entitled "Niakuk Project Review," which has such headings as "Niakuk Project: Hydrocarbons in Place," and "Niakuk Project: Resource Assessment." (Tr. 232-33; Ex. 1147.) He also testified that there were no public documents indicating that the Lisburne, Raven, or West Niakuk accumulations were considered to be part of the Niakuk Project until 1998, when the AOGCC included West Niakuk within the Niakuk pool rules, and after all of the lease amendments were signed by the plaintiffs. (Tr. 380; Ex. 1609.) Finally, Mr. Wondzell testified that BPX has never publically identified "Raven" as part of "Niakuk." "Raven has always not been part of [the Niakuk Project]

because of the references early on to the Niakuk [P]roject, . . . they didn't say the Kuparuk River and other formations. It just said Kuparuk River formation." (Tr. 390-91.)[22]

On cross-examination, Mr. Wondzell was presented with a number of documents written by BPX between 1989 and 1994 that indicated BPX's interest in developing oil and gas from areas outside of the Niakuk accumulation. For example, Mr. Wondzell was shown a 1988 submission by BPX to the USACE, in which BPX noted that an onshore drill site would allow BPX to access "additional potential resources in the area . . . . to the north and west of the Niakuk 4 Island . . . ." (Tr. 262; Ex. 3155.) Mr. Wondzell agreed that this showed BPX's interest in areas to the west, in the direction of the ARCO and Exxon West Niakuk leases. (Tr. 262-63.) The same document stated that "a [Heald]

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[22] At the conclusion of Mr. Wondzell's testimony, counsel for the defendant-intervenor objected to Mr. Wondzell's testimony as an expert capable of giving an expert opinion on either FSAs or surface leases.

> We object to his testimony as to [the] meaning of Niakuk [P]roject as used in the lease between the Oengas and BP. To the extent that's based on him interpreting a lease. . . . And to the extent he was doing more than just setting the [FSAs] before you, and was actually interpreting or talking about sort of industry practice regarding the use of [FSAs], we object to that testimony as well.

(Tr. 241-43.) Mr. Wondzell clarified that he has no particular experience with either FSAs or surface leases and was not offering himself as an expert as to either of these. (Tr. 346, 438.) The defendant-intervenor further objected to Mr. Wondzell's experience in naming projects, though not to his regulatory experience in naming pools. (Tr. 372.) Mr. Wondzell clarified, "The projects are named by the companies . . . what the regulators name, and normally it is the operator proposes, [is] the field and the pool, and [they] describe the pool, and put a name to it in declaring the formation." (Tr. 373.) The court accepted Mr. Wondzell as an expert in this regulatory function. (Tr. 373.) The court has addressed the defendant-intervenors' motion to strike Mr. Wondzell's testimony regarding environmental permitting, FSAs, and directional drilling in a separate order. <u>See</u> Appendix A.

Point development would enhance the attractiveness of . . . additional Lisburne wells." (Tr. 263; Ex. 3155.) Mr. Wondzell was also presented with the 1991 status report to the heirs, which as noted above identified "other development" and stated that BPX was talking with its Lisburne partners:

> Key issues that will help to determine the viability of onshore development are expected to be resolved within the next 12 months. They include facility sharing and joint Alapah development agreements with Lisburne partners and ongoing preliminary engineering. The company will continue to explore means of recovering remaining proven reserves and other offshore resources.[23]

(Tr. 265-66; Ex 1509.) Mr. Wondzell agreed this was relevant. (Tr. 264.) However, on redirect, Mr. Wondzell reiterated his contention that the 1991 letter indicates that the Niakuk Project is separate from Lisburne.[24] (Tr. 267-68.) Mr. Wondzell was also presented with the original 1989 lease, which in the attachment entitled "Niakuk Project Location Map" shows only surface facilities, rather than subsurface accumulations. (Tr. 269-71; Ex. 1506.) Mr. Wondzell maintained that this attachment did not in fact show the true Niakuk Project, which in the end goal was intended "to recover the reserves." (Tr. 272.) Shown another BPX submission to the DNR which indicated possible exploration of the adjacent leases in 1986, (Tr. 277-282; Ex. 3040), Mr. Wondzell stated that there

[23] Mr. Wondzell explained that in the oil industry, "reserves are what's known to be in place and resources are what's possible." (Tr. 266.)

[24] During his redirect testimony Mr. Wondzell reaffirmed his earlier statement that in listing "Niakuk Project" and "other potential development opportunities" separately, BPX was "specifically calling them out [as] two separate things." (Tr. 383.)

was no indication that this exploration would take place on Heald Point.[25] (Tr. 283.) Mr. Wondzell admitted, as he had in his deposition, that in the oil and gas industry, once a company identifies and develops a target accumulation, it will "branch out to secondary targets." (Tr. 285-86.) However, Mr. Wondzell said, this branching out would be limited: "certainly not away from your own leases . . . ." (Tr. 288.) When asked about BPX's testimony at the AOGCC hearing in 1993 on the application of Niakuk pool rules to leases west of BPX's Niakuk leases, in which BPX noted that there might be other related pools, Mr. Wondzell agreed that BPX noted in 1993 that it might have to integrate its interests with other companies.[26] (Tr. 295-97; Ex. 3241.) Mr. Wondzell also acknowledged that during the 1994 lease discussion, BPX informed the BIA about possible scenarios wherein third parties might become "involv[ed] on [sic] Heald Point."[27] (Tr. 301-04.) Specifically, Mr. Hirsh, a representative of BPX, told Ms. Sam:

> The most likely scenario for third party involvement on Heald Point would be for one or more of the following to occur: 1.) BP assigns an interest in its Niakuk oil and gas leases to a third party; 2.) the Niakuk [PA] is expanded to include oil and gas leases owned by parties other than BP and their leases are

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[25] It was later clarified that some, but not all, of this document would have been confidential despite its submission to the AOGCC. (Tr. 384; 396-97.)

[26] In his redirect testimony, Mr. Wondzell explained that the AOGCC decision that established Niakuk pool rules that did not include ARCO and Exxon's leases was the outcome of the 1993 hearing. (Tr. 387; Ex. 1532.)

[27] During his redirect testimony, Mr. Wondzell explained that he didn't give weight to this in considering what was included in the "Niakuk Project" because of "the uncertainty" in this language. (Tr. 389-90.)

> developed from Heald Point or 3.) BP enters into a production facility sharing arrangement with one or more third parties.[28]

(Tr. 300-301; Ex. 3272.)

The plaintiffs' final witness on liability was Tony Delia, the grandson of Andrew Oenga. Mr. Delia testified that on November 18, 2008, the family sent a letter to the BIA requesting that the BIA take steps to stop BPX from using the allotment to drill for oil from the Raven PA:

> 1) declare BP's production of oil from the Raven PA through the facilities on the above Allotment to be an unauthorized trespass, 2) demand th[at] BP immediately halt the trespass, and 3) collect from BP damages, penalty, and interest for all past trespass, and for all future trespass until this practice is halted.

(Tr. 411; Ex. 1561.)

2. Defendant and Defendant-Intervenors' Witnesses

The defendant-intervenors' first witness on liability was James Eason, who was offered as an expert in the development and regulation of oil production on the North Slope, and the history, geology, and geography of the North Slope. Mr. Eason worked for 38 years in the area of petroleum geology. (Tr. 416.) From 1973 to 1974 he worked with Amoco Production Company as an exploration geologist in Louisiana. (Tr. 417.) From 1974 until 1977 he worked as an exploration geologist for the Atlantic Richfield

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[28] As noted above, the Niakuk PA in fact was expanded to include West Niakuk in 2007. There is no evidence that BPX assigned an interest in its Niakuk oil to a third party. And as discussed infra, BPX entered into multiple FSAs with ARCO and Exxon, but not all of these FSAs involved development of oil other than "[BPX's] Niakuk oil."

Company in Alaska, during which time he began working on the North Slope. (Tr. 417.) From 1977 through 1989 Mr. Eason worked for the Conservation Division of the U.S. Geological Survey, leading a team responsible for evaluating offshore acreage. (Tr. 418.) He went to the Alaska DOG in 1980, eventually becoming the Director of that Division in 1986, a position he held until 1995. (Tr. 418-19.) In that position he had access to geophysical information and well data, which the office analyzed to identify prospects available for leasing to developers. (Tr. 419.) In addition to leasing, DOG was responsible for approving and administering unit agreements and collecting royalties from developers, as part of the DOG's responsibility in establishing "participating areas." (Tr. 419-20.) He has been a consultant since 1995. (Tr. 420.) Much of Mr. Eason's testimony dealt with geological complexities of oil field formation and development which was not directly relevant to this case and is not summarized here.

Mr. Eason testified that a unit, such as the PBU, is:

> a joining of lease interest so that they may be operated as if it was a single lease . . . . And the unit operating agreement is simply the producers' agreement among themselves rendered on paper as to how they're going to operate . . . . It defined how facilities would be shared, who would pay for what, and then how the resources were going to be divided.

(Tr. 439-40.) Next, Mr. Eason explained that the state's DNR, as distinguished from the AOGCC, acts as a landowner that has an economic interest in the production of oil because of the royalties that are collected. (Tr. 446.) He explained that when the state issues a lease, the lease is not limited to development of only certain accumulations within

the lease area. "[Y]ou don't issue a lease to develop the Niakuk accumulation. You issue a lease–in most cases, you're not even aware of what's there. . . . You have the right to explore and develop, and it extends to all oil and gas from the surface of the ground to as deep as you drill." (Tr. 456-57.)

Mr. Eason testified that in his experience "the names that are applied to fields and field area units are coincident with where the field or unit is . . . located geographically." (Tr. 427.) For example, the Niakuk accumulation is located proximate to the Niakuk Islands. (Tr. 427.) Mr. Eason testified that different oil accumulations have different "signatures," allowing a geologist to distinguish oil from one accumulation from that of another. (Tr. 432-33.)

Mr. Eason stated that BPX's "Niakuk [P]roject" progressed in a way typical for North Slope projects. (Tr. 475.)

> [P]rospective areas around were identified. Exploratory wells were drilled. They provided the broad resource estimates . . . . [T]his process has a narrowing of focus over time so that . . . [BPX could] prioritize for potential development, and in this case BPX acquired its surface lease for the construction of facilities and followed the typical path for permitting and regulatory approval for those facilities.

(Tr. 476-77.) During this process, companies will be "generally very close-mouthed" in their communications. (Tr. 478.)

> Internally, of course, they've got to be very candid because they depend upon from bottom to top convincing the next person up the line . . . that you know what you're doing, and you've looked at the risk, and you know the money and what's going to be involved. So every effort is made to be as precise and

> probably as thorough as you can in internal things. But there's a lot of reasons that you don't [in your] external communications.

(Tr. 478.) For instance, Mr. Eason explained, there is always continuing competition for leases and resource information. (Tr. 479.) "[C]ompanies don't usually say a lot more than they have to unless they're talking to their partners and the people that they have to explain things to in order to get the permits and things they need." (Tr. 480.) Even when communicating with regulators those communications would be kept confidential. (Tr. 480.)

Mr. Eason testified regarding a number of internal and external BPX communications concerning the Niakuk Project that he thinks indicate BPX's understanding that oil might be found in accumulations other than the Kuparuk, which is the geologic formation associated with the Niakuk' PA.[29] The first, entitled "Niakuk Project Resource Assessment" and dated September 1986, includes in its conclusions section the statement, "Hydrocarbon-in-place estimates are decreased in all recognized potential reservoirs at Niakuk . . . ." and then goes on to list oil-in-place estimates for the Kuparuk River, Ivishak, Sag, Lisburne, and Kekituk formations. (Tr. 483-84; Ex. 3076.) Mr. Eason stated that this confidential internal document shows that BPX was at that time considering development of other accumulations. (Tr. 486.) A 1987 document entitled

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[29]Not discussed here are three exhibits that were discussed at some length during Mr. Wondzell's testimony. (See Exs. 3040, 3155, 3241.) Mr. Eason suggested that all three evidenced BPX's interest in exploring oil accumulations beyond the Kuparuk. (Tr. 481, 489, 493.)

"Niakuk Review," which appears to be slides from a presentation by BPX to the AOGCC, includes the statements, "Kuparuk sands are primary target. . . . Upside resources can be delineated as part of development."[30] (Tr. 488-89; Ex. 3088.) A 1989 letter from BPX to the USACE submitting additional information in support of its permit application includes the heading "Additional Unproven Resources." (Tr. 490-91; Ex. 3177.) The letter states, "Further recent study of available . . . data has increased our confidence that additional well resources are to be found farther North of the Niakuk #4 island. . . . A large portion would be undevelopable if drilling were restricted to onshore at Heald Point. The resources are far from proven . . . ." (Ex. 3177; see also Tr. 491-92.)

Mr. Eason summarized his opinion as follows:

> What is the Niakuk Project? Based on oil industry context and all the documents I've reviewed, it was not a subsurface feature. It was not a regulatory construct for governing the production of specific subsurface resources. Generally speaking, it was the project to drill the wells and construct the facilities necessary to find and produce all commercially recoverable oil resources in the area around the Niakuk Island from whatever formation and whomever's leases. . . . The records show that the term was used in different ways in different times depending on the phase of the project and the context. Numerous resource assessment documents discuss the Niakuk Project in terms of multiple oil accumulations within the five formations in the Niakuk area. Some regulatory filings contain a narrow statement of the project's purpose because that increased the likelihood of regulatory success. . . . In the context of a surface lease, the Niakuk Project is a surface construction activity in need of permitting. . . . The lease says a longer term is contingent upon the Niakuk Project being permitted. . . . In this context the only thing regulators permit is surface activities. . . . [I]t's my

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[30] On cross-examination Mr. Eason clarified that this document, although a presentation to the AOGCC, appeared to have been restricted and not generally available to the public. (Tr. 561, 571.)

> belief that the attempt by the plaintiffs to restrict BPX's production from the Niakuk Project to a particular reservoir is . . . unique in my experience which spans the entire period of North Slope production and development . . . .

(Tr. 493-96 (emphasis added).)

During cross-examination, Mr. Eason went through a set of maps showing wells drilled from the allotment at various points in time along with the State oil and gas leases and accumulations into which they were drilled. The 1993 map shows a number of wells producing oil from the Niakuk Reservoir through the allotment prior to the 1994 creation of the Niakuk PA. (Tr. 514-16; Ex. 1.) Mr. Eason explained that a lease-holder has the right to drill and explore its leases even prior to the creation of a PA. (Tr. 515.) The 1994 map shows several new Niakuk wells from the allotment along with a single well, labeled "NK-26," drilled into the Lisburne accumulation. (Tr. 518-19; Ex. 1.) The 1995 map shows additional Niakuk wells on BPX's leases plus a new well drilled to the west of the Niakuk PA into a state lease belonging to ARCO and Exxon. (Tr. 520; Ex. 1.) The 1997 map shows the new separate West Niakuk PA on the ARCO and Exxon leases to the west of the Niakuk PA, with new allotment wells going into both of those PAs. (Tr. 521-22; Ex. 1.) Additionally, the 1997 map shows a new well, labeled "NK-25," drilled to the east into the Lisburne PA. (Ex. 1.) The 2007 map shows the newly-created Raven PA and the integration of the Niakuk and West Niakuk PAs into a single Combined Niakuk PA. (Tr. 528; Ex. 1.)

Mr. Eason acknowledged during cross-examination that "identifying prospective areas, doing exploration wells, prioritizing potential development and then later looking at other areas to develop," which Mr. Eason had identified as steps in the typical progression of North Slope projects, all deal with "development of oil and gas reserves." (Tr. 544.) He would not, however, characterize these steps as "sub-surface functions," rather than "surface functions," stating instead that "they were all things that preceded the construction and building phase of the project." (Tr. 543, 544.) He further acknowledged that the confidential presentation given to the AOGCC by BPX in 1987, memorialized in a document entitled "Niakuk Review" on a page titled "Niakuk Project Introduction," includes matters dealing with reservoirs and oil fields. (Tr. 561-63; Ex. 3088.) Further, a map in that presentation titled "Niakuk Project Location Map" shows both surface and sub-surface features. (Tr. 563-64; Ex. 3088.) Similarly, he agreed that the 1986 "Niakuk Project Resource Assessment" addresses "oil reserves and sub-surface potential." (Tr. 568; Ex. 3076.) He agreed that an internal 1986 BPX memo entitled "Niakuk Project Summary" addressed both surface and sub-surface matters. (Tr. 570-72; Ex. 1206.) He also agreed that BPX's internal "Niakuk Project Review" from 1986 includes numerous sections addressing sub-surface, in addition to surface, matters. (Tr. 573-76; Ex. 1147.) Mr. Eason testified that he believed he reviewed all of the relevant documents in forming his opinion for this case, but that he reviewed only the documents "that I was presented." (Tr. 577-78.) He was unable to say what "independent work [he]

did on this issue to form these opinions," other than "I think that my independent work consists of my entire background and my familiarity with the facts . . . ." (Tr. 579.)

Further, Mr. Eason admitted on cross-examination that he was not sure whether he had reviewed a number of documents relied upon by Mr. Wondzell in forming his conclusion that Niakuk project had a specific meaning during the period of the lease negotiations. Specifically, Mr. Eason could not recall whether he reviewed BPX's 1988 USACE permit application or the 1991 status report sent by BPX to the Oengas. (Tr. 548, 549; Exs 1521, 1509).

However, Mr. Eason did not read the 1991 report to suggest that the Niakuk Project was something different from the "other potential development opportunities." (Tr. 553-54; Ex 1509.) Likewise Mr. Eason did not agree that the January 1994 AOGCC order establishing Niakuk pool rules limited to BPX's leases and the March 1994 DNR decision establishing a Niakuk PA solely for BPX's leases indicated that the Niakuk Project dealt only with BPX's Niakuk oil accumulation. (Tr. 558; Exs. 1532, 1537.) Rather, he stated:

> There was no discussion of the Niakuk [P]roject. It dealt with the Niakuk [PA] and the Niakuk pool rules. And it's correct I think to say that [DNR] agreed with the [AOGCC] that the boundaries were appropriately drawn where they were without the West Niakuk there. . . . The requirement is that . . . the PA encompass the limits of the reservoir. And the reservoir appeared at that time to extend no further than the area [under BPX's leases].

(Tr. 558-59.) He stated that the fact that there was a separate PA for West Niakuk is not significant in determining what is meant by the "Niakuk Project," because "as I

understand all major development projects, it's the construction and building and producing. It certainly colored my view of what people's perception of the extent of the reservoir was at that time." (Tr. 560.) He did not give weight to BPX's 1993 letter to BIA stating that "[T]he lease provided authorization for BP to construct production facilities to support the development of, and production from, our Niakuk oil accumulation," in part because the letter was written by "a landman who was using language, perhaps artfully and perhaps not." (Tr. 580-81; Ex. 1510.)

Mr. Eason acknowledged that his opinions do not necessarily reflect the understanding of the Oengas regarding the Niakuk Project. (Tr. 581-82.) He was focused on "the development issues that . . . bore some light on the . . . project. . .[and] the language that would typically be of concern in an oil and gas setting . . . ." (Tr. 581-82.)

The defendant-intervenors next called George Ahmaogak, former five-term Mayor of Barrow, Alaska. Mr. Ahmaogak explained that he has also at times worked for the North Slope Borough, various native corporations, including the Arctic Slope Regional Corporation, and Shell Oil. (Tr. 586-588.) He held the position of Mayor during the period the Oenga's original lease was being negotiated and signed in 1989. (Tr. 587, 595.)

Mr. Ahmaogak explained that he first learned of BPX's interest in the Oenga allotment from Andrew Oenga, from whom he understood that BPX was interested in

building a road with a right-of-way. (Tr. 589-90.) "Andrew sought my advice in how to go about the whole process . . . because there was no other assistance available to him at that time." (Tr. 590.) Mr. Ahmaogak explained that his family's native allotment is the site of the West Dock, which was the first of three of four docks now existing on the North Slope. (Tr. 590, 592-93.) Mr. Ahmaogak "pretty much negotiated the lease" of his family's allotment to ARCO in addition to instituting legal action against the company for its prior use of his allotment without permission, which resulted in "a lot of surface damage" and construction of a road. (Tr. 591-92.) His family retained legal counsel for the trespass action. (Tr. 593.) Mr. Ahmaogak stated that the only difference between his family's circumstances and the Oengas's was that his family's allotment had "more substantial damage" because of the previous trespass. (Tr. 608.)

Mr. Ahmaogak explained that Mr. Oenga approached him because he "wanted advice, fair advice," regarding "[BPX's] interest with the right-of-way and the road," and that Mr. Oenga wanted his opinion because of his experience with his family's allotment. (Tr. 591.) A BPX internal memorandum regarding a January 1988 meeting between Mr. Ahmaogak and BPX states, "The Mayor wanted to make it clear that he was interested personally regarding Mr. O[e]nga's land claim. He wanted to make sure we were fair and would negotiate in good faith with Mr. O[e]nga." (Tr. 595; Ex. 3107.) Mr. Ahmaogak testified that his immediate concern was that Mr. Oenga be treated fairly and

get a fair price for the allotment, because "the project cannot go through or become a reality unless he was treated fairly." (Tr. 596.)

> The borough would have never benefitted unless . . . Oenga was treated fairly, compensated for whatever efforts that BP had tried to do. . . . The borough would later on, of course, reap the benefits if the project did come to fruition. . . . [T]he borough would tax that particular infrastructure that BP had put in. But it wouldn't be a project unless all parties come to a solution . . . .

(Tr. 596-97.) He explained that he did not think the borough would have received more money if the Oengas had received less money for their allotment. (Tr. 597.) He perceived no conflict of interest between the borough and Mr. Oenga. (Tr. 627.)

Mr. Ahmaogak explained that he was not directly involved with Mr. Oenga's lease negotiation, nor did he "get into the details of the lease . . . terms." (Tr. 598.) He said that Mr. Oenga alone, with help from interpreter Rex Okakok,[31] decided on the amounts he would request from BPX, and that he only discussed the negotiation process with Mr. Oenga, "several" times over a one-year period. (Tr. 600-01.) He said he explained that "the processes that we went through, the [BIA] needs to conduct an appraisal of fair rental value . . . . And I'm sure BP would have to conduct their own appraisal processes, too, and take the two and declare a value from there." (Tr. 624-25.) He also testified that he advised Mr. Oenga to consult with a lawyer several times. (Tr. 602, 605-06.) Mr. Oenga did appear to retain the services of attorney Glenn Feldman in August of 1988 but discontinued that representation less than a month later, stating

[31] Mr. Okakok also served as the Mayor's special assistant at that time and was assigned to help Mr. Oenga by Mr. Ahmaogak. (Tr. 606.)

instead that, "Mayor George Ahmaogak has been my confidant[] and has been assisting me personally and I wish that to continue." (Tr. 601-03; Exs. 3136; 3142.)

On cross-examination, Mr. Ahmaogak explained that ARCO had drilled an exploratory well on his family's allotment prior to the signing of the lease for that allotment in 1982. (Tr. 611-12; Ex. 3006.) He testified that he is not aware of any other drilling on his family's allotment since. (Tr. 613-14.) Mr. Ahmaogak stated that in his view his family was entitled to more compensation than Mr. Oenga because of the damage to his family's property, although the parties settled the trespass before they negotiated the lease terms. (Tr. 614.)

Mr. Ahmaogak testified that he was not aware in 1988 that the USACE had denied BPX's permit for a causeway and that BPX had identified construction of a drill pad on the allotment as an alternative. (Tr. 614-15.) He testified that he did not understand that the Oenga allotment was uniquely situated for accessing oil accumulations, "That is something that we didn't know particular[s] about [in] those days, because there's no information in existence. . . . We didn't know any other potential off-shore reservoirs or reservoirs that were at or near Oenga's property at all. That was totally non-existent. . . . We all didn't know anything." (Tr. 616.)

The government called Kathleen Dickinson, a former employee of the BIA, who was serving as the BIA "trustee" for the Oengas during the lease negotiations in 1989 and again in 1994. (Declaration at Ex. 2019; deposition at 2365.) Ms. Dickinson was a

realty specialist for the BIA from 1983 until 1995, when she went to work for the ASNA as land director. (Tr. 654.) She was hired by BIA to "straighten out easements that [USACE] had obtained for an underground gas line in Barrow," and in that capacity her duties were to "provide assistance to the restricted landowners in the management of their land, and . . . to get the easements corrected so they reflected where they actually were on the restricted property."[32] (Tr. 654-55.) She was assigned to the lease negotiation regarding the Oenga allotment because BPX initially requested only a right-of-way. (Tr. 655.)

Ms. Dickinson testified about a letter in May 1988 from BPX to David Scott, her supervisor at the BIA, regarding BPX's interest in a right-of-way over the Oenga's allotment. (Tr. 657-58.) She explained that rights-of-way expire with non-use, and "that wasn't what BP intended . . ." so "that is what made them decide that a lease was more appropriate for their purposes." (Tr. 658-59.) She explained that it was after the BIA and BPX had discussed the applicable regulations concerning allotment leases, she and Mr. Scott advised Mr. Oenga of BPX's interest in leasing part of the allotment. (Tr. 658.)

Ms. Dickinson explained that she used the lease for the Ahmaogak allotment as a template for drafting the lease for the Oenga allotment, although she acknowledged that

[32]Ms. Dickinson explained that a restricted allotment is one in which the owner is restricted in his or her uses of the property. In the case of the Oenga allotment, the restriction was that the subsurface was not conveyed to the Oengas. (Tr. 655, 688.)

the purposes were quite different. (Tr. 660; Ex. 2003.) Ms. Dickinson's January 1989 "Report of Investigation" regarding the Oenga lease states, "[BPX] submitted a draft lease (based on the Walton Ahmaogak Lease at West Dock) to our office on June 27, 1988. After review, several changes were suggested which were complied with by [BPX]." (Ex. 2006; see also Ex. 3130.) Ms. Dickinson met with Oenga family members and representatives of BPX on September 26, 1988.[33] (Tr. 660-61; Ex. 2005.) At this meeting, Andrew Oenga was given a copy of the proposed lease for the first time, and he and Ms. Dickinson "went over the terms of the lease, and the map, and the exhibits they had provided . . . ." (Tr. 661-62.) BPX representative Terry Obeney presented an aerial photo and drawing showing the route of the proposed road, pipeline, and causeway. (Tr. 662, 697.) Her contemporaneous memorandum shows that there was discussion about whether BPX would be able to obtain all necessary permits for its planned construction because of environmental concerns, and that the lease would be year-to-year until the permits were either secured or BPX scrapped the project.[34] (Tr. 698-99; Ex. 2005.) The memo also shows that they spent a considerable amount of time discussing the January 1988 appraisal that had been submitted by BPX and reviewed by a BIA appraiser. (Tr.

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[33]She testified that Wallace Oenga was not present at this meeting nor other meetings during the negotiation of the initial lease. (Tr. 673.)

[34]A November 29, 1988 memorandum Ms. Dickinson drafted for the superintendent described the "Niakuk Project" as "expanding an existing gravel island, constructing a 1 1/4 mile gravel causeway from shore to the island and the construction of a 1 3/4 mile gravel road from the point of landfall of the causeway to an existing production pad." (Tr. 708-09; Ex. 3160.) She testified that she took this language from BPX's environmental assessment. (Tr. 709.)

702; Ex. 3145.) The BIA appraiser had informally recommended a higher amount for the low end of the market value range than had the BPX appraisal, and Ms. Dickinson told the Oengas that this number, $15,000 per year, was the least they should accept because that was the least the BIA could approve.[35] (Tr. 702-03; Ex. 3145.) She stated that Mr. Oenga asked questions of both BPX and herself, but there was no discussion of the particular oil and gas leases BPX owned, "only that they had oil and gas leases." (Tr. 663, 669.) "Our focus was more on what the impact would be to the allotment from [the Oengas] perspective. . . . What impact the lease would have on the allotment, and what they could and couldn't do . . . ." (Tr. 670.) There was no discussion of renegotiating the lease later once improvements were made to the allotment. (Tr. 706.) After the meeting, the Oengas had the opportunity to request changes in the lease, and some changes were made. (Tr. 792-93.)

Ms. Dickinson testified that she explained to Mr. Oenga that Paragraph 10 of the lease meant BPX "could do what they wanted with those 10 acres" leased. (Tr. 664-65; Ex. 2007). Andrew and Leroy Oenga's concern with leasing only ten acres of the allotment was that "they wanted to reserve the right to use what wasn't under the lease"; BPX at that point was only interested in leasing what they needed for the initial phase of its project. (Tr. 666-67.) A BPX representative contacted Ms. Dickinson in mid-October 1988, advising her that BPX's USACE permit for causeway construction had been

[35] The BPX appraisal had indicated market rent of $14,000 to $18,000 per year. (Tr. 781-82; Ex. 3167.)

denied and that the lease with Mr. Oenga would be on hold. (Tr. 668-69; Ex. 3167.) BPX contacted her again in mid-November, advising her that BPX intended to go ahead with the lease and would pay $1600 per acre plus $25,000 up front. (Tr. 669; Ex. 3167.)

She testified that "[BPX] kept [BIA] in the loop as to their conversations with Mr. Oenga. They knew that they needed BIA approval . . . ."[36] (Tr. 670.) After the September 26, 1988 meeting, Ms. Dickinson's superiors at BIA reviewed the lease, which was then forwarded to Mr. Okakok and Mr. Oenga and signed in January at a meeting in Barrow. (Tr. 671-72.)

Ms. Dickinson described her responsibilities to an allottee as follows:

> Our responsibility would be to notify the allottee that an oil company had an interest in leasing his allotment, and advising him of what that meant, and the terms, and in this case, we had a draft to review, and there are Federal Regulations for the lease of restricted lands.
> . . .
> [W]hile an allottee can negotiate it, the BIA actually has to approve the lease.
> . . .
> [This] is to make sure they don't dispose of the interests in their land for less than fair market value.

(Tr. 676-77.) The BIA's day-to-day role in overseeing the lease changed, however, in 1993, when the Barrow-based ASNA became the "Indian self-determination contractor"

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[36]Ms. Dickinson did admit to not having previously seen the letter from Mr. Oenga to BPX regarding non-retention of attorney Glenn Feldman as his advisor. (Tr. 671.) Mr. Oenga had retained the services of Mr. Feldman, an attorney for the Ukpeagvik Inupiat Corporation in August of 1988 but discontinued that representation less than a month later. The Oenga heirs also apparently worked sporadically with Mr. Feldman during lease negotiations in 1993.

for some of BIA's realty functions.[37] (Tr. 678.) "[W]e proceeded to bundle up all the files we had in [the BIA office in] Fairbanks at that time, and submit them to the Barrow office, [which] had recently hired Diane Stevens, who is now Diane Sam." (Tr. 678.) It was during this time, she said, that she received a call from ARCO expressing its interest in leasing a portion of the Oenga allotment. (Tr. 678-79; Ex 2036.) After reviewing the Oenga lease she informed ARCO that BPX had the right to lease the whole allotment. (Tr. 679.) She also contacted BPX around that time and was told that ARCO could not lease any portion of the allotment because BPX was planning to lease additional acres for construction of a pad at the tip of Heald Point. (Tr. 680; Ex. 2036.)

Ms. Dickinson testified that she never had a discussion with the Oengas about the provision in the 1994 lease amendment allowing BPX to enter FSAs without notice to the Oengas. (Tr. 684.) She likewise stated that from the signing of the original lease in January 1989 through her departure from ASNA in 2000, the Oengas never raised any issue with her with respect to the particular oil and gas deposits or PAs that could be developed under the lease. (Tr. 695.)

On cross-examination, Ms. Dickinson testified that she had never personally handled any lease of allotted lands for the BIA prior to the Oenga lease. (Tr. 718.) She stated that she had received annual training that involved the general leasing

[37]During cross-examination, Ms. Dickinson clarified that BIA provided the money and training for ASNA but the trust responsibility remained with BIA. (Tr. 753-55.) BIA maintained an "advisory" role over ASNA, ensuring that BIA's trust responsibility was properly carried out through leasing or amendment of leases. (Tr. 755.)

requirements but the training did not include anything specifically concerning oil development in Alaska. (Tr. 718-19.) In her dealings with the Oenga lease, she did not speak with anyone from the Minerals Management Service[38] ("MMS") nor was she in touch with anyone from the DOI Solicitor's Office beyond that office's review of the lease. (Tr. 720.)

Ms. Dickinson explained that the BIA did not conduct its own appraisal prior to approval of the original lease in 1989, but instead reviewed an appraisal prepared for and submitted by BPX. (Tr. 721.) The BIA's appraiser approved the BPX appraisal in January 1989; Ms. Dickinson acknowledged that this meant that when she met with the Oengas and BPX on September 26, 1988, she had not yet received final approval of the BPX appraisal.[39] (Tr. 722.) She had not before that meeting given the Oengas a draft lease, nor did the Oengas have a copy of the BPX appraisal going into that meeting.[40] (Tr. 725-26.) While she characterized that meeting as "preliminary" and "informational," it was to her knowledge the only meeting between the Oengas and BPX prior to the

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[38]The Minerals Management Service was recently reorganized and renamed but was named "Minerals Management Service" at the time relevant to this opinion.

[39]In redirect, Ms. Dickinson indicated that she had, at the time of the September 1988 meeting, received "input" from the BIA appraiser, who suggested $15,000, rather that $14,000 as the floor for annual rental of the allotment. (Tr. 785.)

[40]Ms. Dickinson implied during cross-examination that she did not feel this put the Oengas at a disadvantage. However, in her memo written immediately after the September meeting, she stated, "[N]either [Andrew Oenga] nor Rex Okakok had seen the proposed lease nor the appraisal prior to this meeting which put them at a disadvantage." (Tr. 727; Ex. 3145.)

lease. (Tr. 726-27.) Ms. Dickinson admitted that during her deposition she said that a lease should not be negotiated until BIA has a certified appraisal in hand and that in the Oengas' case the only meeting discussing price between potential lessors and lessees occurred before any appraisal had been certified. (Tr. 738.)

Ms. Dickinson stated that she does not believe she had heard the word "Niakuk" prior to the September lease negotiation. (Tr. 723.) She admitted during cross-examination that the allotment could have strategic value for the purposes BPX described because "[i]t's close to where they wanted to be." (Tr. 734.) But, she also testified that she "didn't see it any different than other allotments out there or any other land out there." (Tr. 742.) She did not, however, make any investigation at the time of the lease negotiation as to who owned the oil rights in the area around Heald Point or Niakuk Island #4 and testified that she did not view that as part of her responsibility. (Tr. 735.) She also did not at that time obtain a copy of BPX's USACE permit application. (Tr. 736.) She stated that she conveyed any information she had about how the allotment was to be used by BPX to the BIA appraiser. (Tr. 738-40.) "I would provide the information . . . . It was [the appraiser's] job to investigate the comparables, the use." (Tr. 744.) In the case of the USACE 1988 permit application and denial, no information was forwarded to the appraiser because Ms. Dickinson was not aware of it. (Tr. 744-46.) Ms. Dickinson testified that if she was aware of these events, she would have thought them relevant and passed them on to the appraiser. (Tr. 746-47.) Nor was she aware of

the 1989 re-opening of consideration of the permit application, Congressional hearings regarding the application, and 1990 denial of the permit. (Tr. 747-48.) She was aware of the 1992 USACE approval of the permit for construction of a drill pad at Heald Point but does not remember whether she actually received a copy of it. (Tr. 748-49.) Further, in July 1993 when BPX notified BIA of its desire to increase acreage from ten to twenty acres and plans to construct a Heald Point drill pad, Ms. Dickinson did not see this as something that might make the allotment more valuable nor did she feel that she had any role in trying to negotiate for higher rents for the Oengas. (Tr. 761-62.) She does not remember whether this July 1993 notification from BPX was forwarded to the BIA appraiser, from whom she had requested a reappraisal in June of the same year. (Tr. 765-66.) Ms. Dickinson testified that her lease negotiation training suggested that it was her role to try to maximize rents for allottees in lease adjustments. (Tr. 769.)

Ms. Dickinson admitted that at the time of the 1993-1994 lease renegotiations, she had no idea what a facility sharing agreement was. (Tr. 773.) Her explanation during cross examination was that she did not speak to anyone at MMS, the Solicitor's Office, or the Bureau of Land Management ("BLM") to find out what a FSA was because a FSA "wasn't allowed" under the lease.[41] (Tr. 773-74.) She further admitted that because she

[41] After repeatedly maintaining during cross-examination that FSAs were not allowed under the lease amendment, on redirect, after reading the 1994 amendment in conjunction with the original lease, Ms. Dickinson revised her interpretation of the FSA clause in the amendment to allow FSAs without notice to the Oengas. (Tr. 774-75, 789-90.)

did not know what a FSA was, she did not know how BPX might want to use a FSA. (Tr. 775.)

The government called Diane Sam,[42] who was a realty officer and land manager at ASNA beginning in mid-1993. (Tr. 1109.) She confirmed that she worked with Ms. Dickinson during the transition between BIA's performance of native allotment realty functions and ASNA's performance of the same. (Tr. 1110.) She testified that it took some time for her to become familiar with the case files and that there was "tremendous activity" in the first year of ASNA's handling the contract. (Tr. 1110-11.) She stated that she first became familiar with the terms of the Oenga lease around the fall of 1993, and that her first contact with the Oengas regarding the lease was that summer. (Tr. 1112-13, 1118.)

Ms. Sam testified regarding her January 1994 "Report of Investigation" that detailed the period leading up to the 1994 lease amendment. (Ex. 2082.) The report included descriptions of the heirs' growing concerns regarding the lease following the August 1993 expansion of BPX's allotment acreage from ten to twenty acres. (Tr. 1120-21; Ex. 2082.) Leroy Oenga requested in late August that she set up a meeting with BPX, which was held in October 1993. (Tr. 1122-24; Exs. 2082, 2065.) After that meeting, in late October, Ms. Sam drafted proposed lease amendments which she sent to

[42]Ms. Sam's maiden name, Stevens, appears in documents from the period of time relevant to this case, but she is referred to by her married name, Sam, here.

the heirs, from whom she then received commentary. (Tr. 1127-29; Ex. 2068.) She also sent the proposed amendment to Glenn Feldman, an attorney who was working with Leroy Oenga at that time. (Tr. 1129-30; Ex. 2066, 2078.) She testified that she believes she received feedback from the heirs and Mr. Feldman. (Tr. 1160, 1169.) She sent the finalized proposal to BPX on November 10, 1993. (Tr. 1131; Ex. 2067.) "[T]here [were] . . . vast disagreements on what the lease covered or didn't cover. This was an effort to describe some possible lease amendments that I thought BP would be willing to entertain." (Tr. 1137.) Her November letter stated that she had reached out to "appraisers, an attorney, the regional solicitor, BIA Realty, DNR, ARCO, and senior land professionals" and had become convinced that "valid concerns regarding the lease were raised and merited discussion." (Tr. 1165-66; Ex. 2067.) Ms. Sam explained that she made these contacts because "I didn't think there was enough information in the file, or I wanted to get more . . . experts to talk about whether they thought the lease merited reopening." (Tr. 1166.) BPX's response, later that month, was a rejection of the proposals and an assertion that the lease was fair in substance and had been negotiated fairly. (Tr. 1133-34; Ex. 2079.) As noted above, BPX stated in that response:

> The most likely scenario for third party involvement on Heald Point would be for one or more of the following to occur: 1.) BP assigns an interest in its Niakuk oil and gas leases to a third party; 2.) the Niakuk [PA] is expanded to include oil and gas leases owned by parties other than BP, and their leases are developed from Heald Point or 3.) BP enters into a production facility sharing arrangement with one or more third parties.

(Tr. 1174-75; Ex. 2079.)

She explained that the heirs' motivation for trying to negotiate this lease amendment was a result of their not having been involved in the 1993 lease amendment, through which BPX expanded its acreage on the allotment and announced a changed purpose for the allotment. (Tr. 1135-36.) She stated that they were also motivated by financial considerations and felt they were not being fairly compensated. (Tr. 1136.) The heirs, she explained "felt that the lease was only for the purpose of the road corridor, and pre-production and exploration . . . ." and thus the 1993 amendment went beyond the scope of the original lease. (Tr. 1138, 1157.) She testified that she does not, however, remember the heirs expressing their belief that certain oil and gas accumulations were beyond the scope of the lease. (Tr. 1137-38.) She further explained:

> [T]here are various interpretations of the lease, and some would read the lease and interpret that to mean it did limit being able to access deposits, and that it was just specifically for a road corridor. And then others have interpreted the lease to say it was all-encompassing, including anything and everything, related to oil and gas development.

(Tr. 1138-39.) Her records of phone conversations confirm that she understood BPX's position regarding the use of the allotment by other companies to be that "they could do anything, and enter into any agreements and that . . . wouldn't necessarily require a lease amendment." (Tr. 1142; Ex. 2080.) This phone record represents that a BPX representative told her BPX was willing to pay for the entire forty acres of the allotment dating back to the date of ARCO's first inquiry regarding use of the property, but not

before that. (Tr. 1170; Ex. 2080.) BPX also informed her that well slots were being reserved for ARCO to develop Lisburne to the east and drill another well to the west, though it was unclear when this might happen. (Tr. 1170-71; Ex. 2080.) Ms. Sam also noted in her phone record that BPX would likely enter an agreement with ARCO to "attempt to recover a portion of the capital costs, and to cover operating and maintenance costs. They won't make money off the deal." (Tr. 1171; Ex. 2080.) BPX's representative also stressed that he wanted "to be sure that the heirs won't view this as a door for additional compensation." (Tr. 1171; Ex. 2080.)

Ms. Sam likewise explained that the counseling record signed by the heirs prior to their signing the 1994 lease amendment was not meant to represent the heirs' agreement with the statements contained in it, but rather to "document[] some of the discussions."[43] (Tr. 1143-44; Ex. 2072.) She testified that she believes the heirs understood the statements contained in the document, including, "BP may enter into any agreement with ARCO to develop this property," to be the position of BPX at that time. (Tr. 1144-45; Ex. 2072.) The heirs also signed statements saying that they understood that it was unlikely any further amendments to the lease would be made, that it was important that they not sign an amendment they were not comfortable with, and that they were signing the amendment of their own free will. (Tr. 1178-82; Ex. 2072.) She testified that she

[43]Ms. Sam explained that counseling records were used frequently in substantial property transactions "because often in property transactions, where there [are] complex legal concepts . . . things can get kind of lost in translation. . . ." (Tr. 1143-44.)

believes BPX was "aware that the heirs disagreed that the lease cover[ed] anything other than just a road corridor and exploration and pre-production." (Tr. 1154.) Regarding specific oil fields, however, Ms. Sam testified that she has no memory of the heirs ever mentioning the West Niakuk PA, the Ivishak or Sag River oil formations, nor the Raven PA. (Tr. 1145.)

Ms. Sam also testified that regarding her understanding of the third lease amendment, which was signed in 1995:

> BP . . . even by the second amendment . . . felt like there was closure and it was done. The heirs at that point didn't and were continuing to try to rectify what they thought was an unfair lease. . . . [T]here were many, I think, conversations directly between the heirs and BP, and [BP] basically . . . wanted that to stop. They just wanted all the communications to go through [ASNA].

(Tr. 1151-52; Ex. 2018.) The amendment contained a provision requiring the heirs to only contact BPX by way of ASNA. (Tr. 1151; Ex. 2018.) She testified that she did not feel the 1994 amendment was "that great a deal," and that the heirs were unable to achieve "hardly any" of their objectives, so "it was not a good result." (Tr. 1177.) She was ready to keep negotiating. (Tr. 1177.)

During cross-examination, Ms. Sam testified that when she came to ASNA, she had not had any specific training on lease negotiation and had done no work dealing with oil properties. (Tr. 1184.) She explained that the transition from the BIA to ASNA involved some friction, because "a lot of Native organizations were . . . pulling functions away from BIA, and reducing funding from BIA. So there wasn't necessarily a lot of

effort to . . . train the new contractors, or make sure they were up to speed on certain things." (Tr. 1185-86.) She testified that while her relationships with Ms. Dickinson and the Solicitor's Office were professional and courteous, she found the staff at the BLM to be "discourteous " and opposed to the allotment program. (Tr. 1187-88.) Ms. Sam explained that there was a period of overlap during which both she and Ms. Dickinson were working with the Oenga lease; by the fall of 1993, she had taken full responsibility for the lease dealings, though the trust responsibility remained with the BIA. (Tr. 1189-90.)

Ms. Sam explained that she agreed with the heirs that the lease was not fair, stating, "I don't think I would have put that much effort into [having the lease amended] if it was something that didn't merit doing that." (Tr. 1192.) She explained that she did not understand why the DOI Solicitor's Office was not representing the heirs to make sure they got the best lease possible, as state attorneys will do with leases in the state context. (Tr. 1193.) Instead, she testified, it seemed as though the Solicitor's Office was only interested in defending the BIA. (Tr. 1193.) Her phone log described Roger Hudson of the Solicitor's Office has having a "curt" response, as "[i]t was very obvious that they weren't entertaining any discussion in reopening the lease." (Tr. 1194; Ex. 2080.) The Solicitor's Office provided neither her nor the Oengas with legal advice regarding the lease amendment, something she feels would have been helpful, and could have allowed the Oengas to get a better deal if they'd received legal advice from people

familiar with oil and gas properties. (Tr. 1195-96.) In title recovery cases, Alaska Legal Services would often become involved, but in the leasing context, there was little legal advice provided to allottees. (Tr. 1193-94.)

She testified that she does not remember whether the USACE permit denials from 1988 and 1990 were in the Oenga lease file, and does not remember if she was aware at the time of the USACE's approving construction of a pad for directional drilling at Heald Point in 1992. (Tr. 1197-98.) She does not remember anything in the file regarding the reach of directional drilling at that time. (Tr. 1198-99.) She testified that she remembered a conversation with a land professional or appraiser about setting a rental rate based on the cost of an alternative, which she learned was a valid method of valuing land where the cost of an alternative property from which the activity could be conducted was much higher. (Tr. 1199.) The 1993 appraisal that Ms. Dickinson had requested during the transition period contained nothing about use of a such a valuation method or about the unique location of the Oenga property, nor, she thinks, about the changed use of the property from a right-of-way to an oil production facility. (Tr. 1200-01.)

Ms. Sam testified that by approving the 1993 change of use, "[BIA] basically showed their position was that they felt the lease covered anything and everything related to oil." (Tr. 1201.) She testified that she didn't have much leverage in trying to negotiate with BPX because BIA, the Solicitor's Office, and BPX had all shut the door to further negotiations, and she was "just trying to crack the door open a little, and get the

foot in." (Tr. 1202-03.) She wanted the amendment to include an assurance that the heirs would receive notice of any subleases, which was the default term as set by the Federal Regulations. (Tr. 1205-06.) She testified that she did not know what a FSA was at the time of the proposed amendment, but gained some understanding after talking to DNR staff. (Tr. 1207.) She explained that while there was a reference to ARCO in the counseling records, she does not remember having a specific understanding of what ARCO wanted to do with the allotment. (Tr. 1207-08.) The Solicitor's Office, she agreed, could have provided some help in working through the subtleties of the lease negotiation, just as she and the heirs "should have had assistance from somebody that had oil and gas experience," such as someone from MMS. (Tr. 1208-10.)

She testified regarding the heirs' signed counseling records:

> I knew 100 percent that they did not agree with BP's position regarding that lease. . . . Native people have a certain position of what they feel is owned and what they should have control over, and that may or may not be recognized in the legal process or in any other processes. . . . [S]o the way Native people view it is . . . you're getting what you can at that particular point. But that doesn't mean . . . that it's resolved. . . . [I]n the view of the Native people, that was their original property, and it always will be. . . . So to me, when they signed that counseling record, they did not agree that this was a fair and just lease, or that the lease amount made it fair or just. It was just what could be done at that particular point in time.

(Tr. 1217-18.)

Ms. Sam explained that during the 1995 lease amendment, ASNA's legal counsel, Sonosky, Chambers, Sachse, Endreson & Perry, LLP, became involved. (Tr. 1210.) Ms. Dickinson had told Ms. Sam that it was the Solicitor's trust responsibility to represent the

heirs, and the ability to provide legal counsel was not contracted to ASNA, but remained with BIA. (Tr. 1211-12.) ASNA's role was more technical than legal. (Tr. 1215.) However, in the case of the Oenga lease, BIA had a position that seemed contrary to the heirs. (Tr. 1212-13.) Around that time BPX had approached the Oengas about purchasing the allotment outright,[44] but Ms. Sam decided it would not have been in the best interest of the heirs. (Tr. 1220.) The 1995 lease amendment did not, in her view, address the core fairness issues with the lease. (Tr. 1220.)

The defendant-intervenor next called Cindy Bailey, a BPX employee, who was present at the September 26, 1988 lease negotiation meeting to testify. She testified that she recalled nothing being discussed at that meeting related to oil and gas, but rather the discussion was "primarily about what was going to be done on the surface." (Tr. 802.)

Next, the defendant-intervenor called Dr. Amy Frankenburg. Dr. Frankenburg is a geologist who has spent her entire career at BPX, beginning in 1989. (Tr. 807.) She worked as a petrophysicist, production engineer, and production engineer supervisor on the North Slope and elsewhere from 1992 through 2003, but specifically in the Niakuk area beginning in 1994. (Tr. 807-08.) She worked in business development, negotiating operating agreements for BPX from 2003 to 2006. (Tr. 809.) Since 2006 she has worked as a team leader, resource manager, and management team leader, working with a number of the oil and gas fields involved in this litigation. (Tr. 809-10.) Her position

[44] A January 4, 1995 letter from BPX to Ms. Dickinson shows that BPX offered $600,000 to purchase the allotment. (Ex. 2039.)

involves both technical and financial aspects, and she interacts with DNR, AOGCC, and other oil companies on the North Slope. (Tr. 810-12.)

Dr. Frankenburg explained that the essence of her job is working to move the company's oil resources from non-proved to proved, which BPX does by applying new technologies, entering FSAs, and expanding lease ownership, among other things. (Tr. 813-14.) Development of oil resources progresses through a number of phases: (1) identification of resource potential, (2) exploration and appraisal, (3) prioritization and economic analysis of different ideas, (4) development, and (5) optimization. (Tr. 814-15.) The first two phases are about estimating the oil in place and conceiving of development scenarios. (Tr. 817-18.) The company will drill through many different horizons to try to gauge where resources lie. (Tr. 825-26.) In the case of the Niakuk area, BPX drilled its "discovery well" into the Kuparuk formation, later known as the Niakuk pool, in 1985. By 1986 the company estimated that the formation held 333 million stock tank barrels of oil in place, with an additional 166 million in other formations. (Tr. 829-30.)

In the third phase, the company considers the risk and reward of different development ideas; this may involve negotiating a FSA if that would facilitate the project, and also involves securing whatever permits and surface and sub-surface agreements necessary for development.[45] (Tr. 818-21.) In the Niakuk area this phase

[45] A FSA, she explained, can be an agreement related to any kind of sharing of a surface facility, such as a drillslot, a production facility, or a pipeline. (Tr. 819-20.) Companies often

lasted from 1986 until 1993, as BPX did further resource appraisal, engineering studies, cost estimates, and risk and feasibility studies on various development options, worked with USACE to secure permits it needed, and leased the Oenga allotment. (Tr. 832.)

In the development phase, the company tries to recover as much oil from as many different oil pools as it can from existing infrastructure. (Tr. 821-22.) "It's always more cost effective to tap into different and new pools . . . from existing infrastructure. You maximize the return of your capital invested . . . ." (Tr. 822.) The company will also try to acquire new leases if possible and may expand facilities. (Tr. 822.) Here, Dr. Frankenburg explained, this phase began in 1993, with BPX making a "go" decision for the development plan, which was "anchored by the Kuparuk[46] . . . by far the largest accumulation there." (Tr. 832-33.) "And then there was . . . upside potential in the Sag and the Ivishak and the Lisburne and Kekituk."[47] (Tr. 833.) Accordingly, the final design of the Heald Point facility included slots for Kuparuk drilling, with extra slots for the other "upside" formations. (Tr. 833.) "[H]aving multiple opportunities for each of

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have sub-surface arrangements, but these agreements are not FSAs. (Tr. 820.)

[46]As stated above, the Kuparuk is the formation later encompassed by the Niakuk PA.

[47]Dr. Frankenburg explained that while development and investment decisions are made on the best available technical estimates, these estimates are not always accurate and can result in pool decisions. (Tr. 833-34.) "The local case in point is the Lisburne reservoir. Originally estimates were . . . two to three billion barrels in place with . . . a recovery factor . . . [of] 30 to 35 percent." (Tr. 834.) The company later realized that the reservoir is highly fractured and they resultantly might only able to recover ten to fifteen percent of the original billion barrel estimate. (Tr. 834.) "So we completely over[]capitalized that project." (Tr. 834.)

these drill sites you built is very good, because your initial assessments may not be correct." (Tr. 834.)

Dr. Frankenburg explained that the reason ARCO was unable to have its West Niakuk leases included within the Niakuk pool rules and PA was because as of 1994, ARCO had not drilled any wells on its acreage and thus had failed to prove it had any recoverable oil. (Tr. 837-38.) During the optimization phase of BPX's work in the region, which began in 1994 and continues today, BPX entered into its FSAs with other companies.[48] From 1995 through 1999, BPX, Exxon, and ARCO were involved in equity negotiations to determine which company owned which proportion of the Kuparuk oil; Dr. Frankenburg testified that it was the slow pace of these negotiations that resulted in the Niakuk and West Niakuk PAs remaining separate for so long. (Tr. 860-61.) BPX bought ARCO in 2000, but was forced to divest ARCO's Alaska properties, which became ConocoPhillips. (Tr. 861.) Dr. Frankenburg also explained that in 2000 an agreement called the "2000 Superalignment" was entered into with all of the oil companies involved in the PBU. The superalignment agreement determined that all oil, facilities, leases, and PAs were co-owned in certain percentages by all companies in the Unit.[49] (Tr. 863-64.) This was a private agreement among the oil companies.

[48] Dr. Frankenburg explained these agreements in some detail, confirming Mr. Wondzell's previous explanation of them, which is summarized above in Part II.A.1. (Tr. 850-58.)

[49] Each company was still responsible for payments related to its state oil and gas leases.

The defendant-intervenors' final liability witness was Terry Obeney, a former BPX engineer who worked on a number of different Prudhoe Bay projects from the late 1970s through the mid-1980s, before working on the Lisburne and Niakuk accumulations from 1987 until 1994. (Tr. 959.) He continued working for BPX on other projects elsewhere in Alaska and then in other parts of the world until he retired in 2003. (Tr. 959-60.) He explained that he was principally involved in projects from the late exploration through post-production phases, and in connection with Niakuk he led a team of engineers and geologists aimed at developing the Niakuk resources. (Tr. 960-61.) Mr. Obeney explained that he "was responsible for all aspects of the development, and involved in all major internal and external interactions, including interactions with Federal, State, and local agencies, partners . . . and internally with all authorizations and funding." (Tr. 961.)

Much of Mr. Obeney's testimony overlapped with Dr. Frankenburg's testimony regarding the phases of oil field development, from identification to optimization. He explained that once BPX commits to a project, BPX begins "testing, appraisal, and development of adjacent shallower or deeper horizons . . . ." (Tr. 964-65.) He testified that every project he has worked on has reached this stage, in which the company is committed to keeping the facility in which it has invested running at or above design capacity. (Tr. 965.)

Mr. Obeney testified that BPX used the word “project” in different ways depending on the audience with which it was communicating. With an internal audience, “project” would refer to “all reserves, all resources, all options, facilities development, drilling . . . .” (Tr. 981.) In communicating with competitors, “it tends to be very narrowly focused” and limited to public data, so as to avoid exposing sensitive data. (Tr. 982.) In communicating with permitting agencies, “we are talking to them about thing[s] which affect their arena, which principally relates to the project surface construction and operations.” (Tr. 982.) When communicating with landowners, BPX likewise would talk about “surface activities, the project construction, terms and payment, i.e., things that will affect their rights and interest as holders of surface interests.” (Tr. 983-84.)

Mr. Obeney produced a number of documents directed toward each of these audiences. First, he presented a number of documents to demonstrate that BPX’s internal discussions in 1985 and 1986 regarding exploration in the Niakuk area included the exploration of leases not owned by BPX.[50] These documents, he explained showed that

[50]These included a 1985 “Cost Estimate: Niakuk Development,” (Tr. 966; Ex. 3017); a 1985 document titled “Niakuk Year-End 1985 Gross Resources: Kuparuk & Ivishak Horizons,” (Tr. 967; Ex. 3012); a 1986 memo titled “Kuparuk River Formation Volumetrics for Individual Development Scenarios,” (Tr. 968-69; Ex. 3068); a 1986 “Niakuk Project Summary,” (Tr. 970; Ex. 3075); a 1986 memo titled “Ivishak/Sag Formation Volumetrics for Individual Development Scenarios,” (Tr. 973-74; Ex. 3067); a 1986 “Niakuk Project Review,” (Tr. 975-76; Ex. 3073); and a 1986 “Niakuk Project Resource Assessment,” (Tr. 976-79; Ex. 3076.). Each includes a discussion of or reference to exploration of accumulations other than BPX-owned Kuparuk oil. Mr. Obeney confirmed on cross-examination that these documents would not have been available to the Oenga family. (Tr. 1043.)

BPX "continuously looked at the Niakuk [P]roject as encompassing all Horizons and adjacent acreage." (Tr. 981.)

He next discussed a number of previously-admitted external communications, including a 1986 letter to the Commissioner of DNR that included reference to "adjacent leaseholder drilling," (Tr. 986-88; Ex. 3040); a 1987 presentation to the AOGCC showing potential Niakuk reservoir limits extending onto non-BPX-owned acreage,[51] (Tr. 988-89; Ex. 3088); and BPX comments regarding its 1988 USACE permit application, including reference to "additional resources," (Tr. 989-90; Ex. 3155), all of which, he testified, "illustrate[] that there is public knowledge and awareness of the potential future developments from those areas, and more generally, there is public knowledge that developments may evolve to incorporate additional [h]orizons and reservoirs, and adjacent leases." (Tr. 990.) He also referred to his own testimony before the AOGCC in 1993, which included statements regarding BPX's anticipation of future requests to expand the Niakuk pool area, stating that this testimony shows BPX's continuing strategy of looking to other areas to develop. (Tr. 1040-41.)

Mr. Obeney explained that the reason BPX's permit application to the USACE includes the statement, "[BPX] is the sole owner of the lease tracts to be developed," is because BPX was merely trying to "constrain the conversation about what the agencies cared about, which was the placement of gravel . . . ." (Tr. 1013-16; Ex. 3116.)

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[51] While external, this presentation was confidential.

Similarly, Mr. Obeney explained the phrase, “the Niakuk Project, and perhaps other development opportunities,” in its 1991 status report to the Oengas, saying “we wanted to make sure that these reports contained a discussion of those things that we thought would be of interest to the lessor.” (Tr. 1037-38; Ex. 3195.)

Mr. Obeney explained that during the 1980s, BPX’s “preferred option” for Niakuk development was evolving. (Tr. 992.) Drilling from Niakuk Island #4 became the preferred option not necessarily because it was the cheapest, easiest, or most easily permitted option, but because of its “ability to access future potential reservoirs and adjacent leases.” (Tr. 993.) Once BPX had decided on its “optimum development sequence and plan,” it set out to seek access to the allotment and USACE permits needed for placement of fill for the causeway. (Tr. 993-94.) BPX assessed the potential cost of access to the allotment in part using an appraisal it commissioned in January 1988 that provided a market rental price of $14,000 to $18,000 for ten acres. (Tr. 995; Ex. 3106.) BPX also evaluated its best alternative to a negotiated agreement (“BATNA”) for use of the allotment, which, at the time of the lease negotiation, was construction of a gravel bypass road just off the western shore of Heald Point from which the causeway to Niakuk Island #4 would extend. (Tr. 996-97; Ex. 3109.) BPX determined that the cost of such a bypass road would be between $3.85 and $5.3 million in 1988 dollars because of the large amounts of gravel that would be required for the roadway. (Tr. 997; Ex. 3109, 1013, 1019).

Mr. Obeney stated that BPX did not want any restrictions on use of the allotment. (Tr. 1003.) "[G]iven that [the] BATNA . . . would have no restrictions whatsoever . . . it was very important that the lease also contain no restrictions on use." (Tr. 1003.) Mr. Obeney and other BPX representatives attended the September 26, 1988 meeting with the Oengas and Ms. Dickinson, which he says is accurately described in Ms. Dickinson's contemporaneously-prepared memorandum. (Tr. 1003-04; Ex. 3145.) He did, however, disagree with Ms. Dickinson's characterization of this meeting as involving "negotiation," stating instead that BPX's presentation was "much more a presentation by us aimed at answering potential questions about the land use, and as such no negotiation actually took place." (Tr. 1005.) He testified that "further negotiations were through correspondence and basically focused on price rather than activities." (Tr. 1005.) He testified that the source of future production was never discussed at that meeting nor in any subsequent negotiations with the Oengas. (Tr. 1005.) He felt that there was "no need to discuss subsurface uncertainty given the intentionally broad lease terms of Paragraph 10 . . . which spoke to any and all [exploration] and production uses." (Tr. 1006.) In other words, in its communications with the Oengas, BPX's use of the term "Niakuk Project" "was to describe the surface construction activities that would impact the lessor's property, and the need to be permitted as a conduction of the term of the lease, changing from a year-to-year lease to a five[-]year term lease." (Tr. 1006.)

Mr. Obeney summarized his understanding of BPX's intentions in signing the lease as follows:

> First, we believe that we were acquiring full access and flexibility in any and all exploration development activities . . . . Second, we would not have accepted anything less than unrestricted activities given [that] the BATNA . . . would have no such restrictions . . . . Third, we fully understood the resource definition and economics of reservoir development would change over time . . . . And lastly we were . . . aware of resource potential both on and off BP's leases in multiple formations, and the need to be able to develop them.

(Tr. 1007.) He testified that his perception of the Oengas' intent in leasing the allotment was to convey all of their rights, short of ownership, to all of the acreage. (Tr. 1007.)

During cross-examination Mr. Obeney conceded that the term "project" is sometimes used to refer to sub-surface accumulations in the context of internal communications, with competitors, and with regulating agencies, though it is "typically not." (Tr. 1045-56.) He confirmed that there is no actual BPX policy regarding the use of the term in various contexts, but instead his testimony regarding the different meanings of the term in different contexts was a reflection based on his career in the oil industry. (Tr. 1044.)

It became clear in cross-examination that although BPX, in its responses to comments on its USACE permit application, referred to "possible resources . . . in an area to the north and west of the Niakuk 4 island," BPX at that time owned lease acreage immediately north and west of the island, so the reference was not necessarily to oil owned by other companies as Mr. Obeney originally maintained. (Tr. 1047-50; Ex.

3155.) When asked about the AOGCC's January 1994 decision regarding the Niakuk pool rules, which included the conclusion, "[BPX] is not proposing to develop the ARCO/Exxon leases," Mr. Obeney explained that indeed "[BPX] had no plans at that time of the pool rules to explicitly develop the [ARCO]/Exxon leases." (Tr. 1073.)

Mr. Obeney stated that he was personally involved in requesting the 1988 appraisal of the Oenga allotment, but that he did not make the appraiser aware of the extent to which Heald Point provided access to the Niakuk oil that was not accessible from other land sites, because "[i]t wasn't deemed relevant." (Tr. 1051.) He maintained that the reason the USACE in its 1990 permit denial decision stated that "the native allotment on Heald Point . . . is essential for access to the field under all development scenarios except the island to island sub-sea pipeline scenarios," was because that was correct based on the information USACE had. (Tr. 1064-65; Ex. 1524.) He confirmed that generally BPX could determine what was and was not submitted as an alternative to the USACE, and also confirmed that there was no requirement that BPX make the formal statement that it was "the sole owner of the lease tracts to be developed . . . ." (Tr. 1066-67; Ex. 1067.)

B. The Scope of the Lease: Liability Conclusions

The court finds based on the testimony and evidence presented that the plaintiffs reasonably understood that the lease for their allotment authorized BPX to use the property to develop and produce oil from the Niakuk accumulation only. The court

agrees with the plaintiffs that the Niakuk Project was consistently described publically as a project to develop only BPX's Niakuk oil accumulation from the Kuparuk formation. BPX identified only its Niakuk oil accumulation in its application to the USACE for the environmental permits necessary for the right-of-way and causeway project. This focus on developing oil and gas from the Niakuk accumulation is reflected in the original language of the lease and was never changed.

The 1989 Lease contained the following language regarding the Niakuk Project and use of the allotment: Paragraph 1 states, "The first ten years of the lease term shall constitute a period within which the Lessee shall attempt to obtain required permits for the Niakuk Project. . . . If Lessee serves written notice that it intends to proceed with the Niakuk Project, then this lease will be deemed to have been taken for consecutive five year periods . . . ." (Ex. 1506 ¶ 1.) Paragraph 10 provides, "The lessee may use the leased premises for any and all oil field exploration, development, construction, facilities, production and support purposes, and for any other uses and purposes reasonably or conveniently related thereto." (Ex. 1506 ¶ 10.) Paragraph 11 provides, "The lessee may construct any facilities (pipelines, access roads, causeway approaches, drilling pads, a construction staging pads [sic] or any other required facilities) on the leased premises as long as construction is limited to the 10 acres as herein described on Exhibit A." (Ex. 1506 ¶ 11.) Exhibit A was made up of two pages. The first page, identified as the Niakuk Project Location Map, identifies the Oenga allotment, the proposed road and

pipelines, the proposed causeway bridge, causeway and pipelines, and the proposed Niakuk Production Island and the L-5 drill site. (Ex. 1506 Ex. A.) The second page, identified as the Niakuk Onshore Access Road and Pipelines Section C-C, includes a drawing depicting the access road and proposed pipelines on the Oenga property. (Ex. 1506 Ex. A.)

The dispute in this case has its roots in BPX's inability to secure the permits necessary to build the Niakuk Island #4 causeway for the Niakuk Project as depicted in Exhibit A to the lease. This led BPX to find another option for developing its Niakuk oil accumulation, which meant finding a location within directional drilling reach of BPX's Niakuk oil accumulation. Because the Oenga property juts into the Beaufort Sea and was within reach of the Niakuk accumulation by directional drilling, BPX decided to turn the Oenga's allotment from a right-of-way into a drill site for the development of oil and gas. While the 1989 Oenga lease authorized use of the ten leased acres for development, it is clear that when BPX wrote to the BIA in 1993 invoking its right to convert the lease to a long-term lease for twenty-five years in order to develop its "Niakuk oil accumulation," neither the plaintiffs nor the BIA fully understood that the nature of the project had changed and that the property had become critical to BPX's development of the oil it had discovered in the Kuparuk formation.[52] In its communications with the BIA and the

[52]BPX argues that the language in Paragraph 10 of the original lease, which was never amended, is rendered superfluous if it does not mean that BPX could use the leased premises to develop oil and gas from any accumulation without limitation. The court disagrees. The Federal Circuit has made clear that when interpreting a contract, courts consider the contract as a whole and interpret it in such a way that harmonizes and gives meaning to all terms, rather than leaving

plaintiffs BPX was careful not to reveal its precise plans for the allotment. Although it is true that in 1991 BPX wrote to the Oengas and BIA to say that it was considering use of the allotment for a drilling site to develop the Niakuk accumulation and possibly the Lisburne oil accumulation, the status report makes clear that BPX had not settled on a specific option and that the Niakuk Project was in flux. The status report states:

> Prospects for a Facilities Sharing agreement with Lisburne have improved, and a joint development opportunity with the small Alapah accumulation at the eastern boundary of the Lisburne field could further reduce capital costs for Niakuk. . . . The company will continue to explore means of recovering remaining proven reserves and other offshore resources in the Niakuk accumulation that are unreachable from shore.

(Ex. 1509.)

Thereafter, in 1993, after BPX received permission from the USACE to build the drill site, BPX was no longer vague about its plans for the Naikuk Project, but instead affirmatively stated in the official "Notification of Niakuk Project Commencement: Request to Amend Surface Lease F89-01," that the Niakuk Project, for which the lease

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a portion of the contract useless, inexplicable, void, or superfluous. NVT Techs., Inc. v. United States, 370 F.3d 1153, 1159 (Fed. Cir. 2004). The defendant-intervenors argue that reading "Niakuk Project" as a limitation on the scope of the lease renders superfluous the broad language about the activities allowed under the lease in Paragraph 10. The court finds, however, that the defendant-intervenors' suggestion that Paragraph 10 controls the scope of the lease would render void the limitation imposed by the reference to "Niakuk Project." The purpose of the lease is for oil and gas development in connection with the "Niakuk Project." The court finds, as it has previously ruled, that "Niakuk Project" is a limitation. The language of Paragraph 10 stating that BPX may use the ten initially-leased acres "for any and all oil field exploration, development, construction, facilities, production and support purposes" is not rendered superfluous or useless by the "Niakuk Project" limitation. Rather, the language in Paragraph 10 authorizes BPX to use the allotment for any and all oil field exploration and development in connection with BPX's "Niakuk Project." There is nothing in Paragraph 10 to suggest that it should be read separately from the rest of the lease.

had been granted, was now for a drill site to develop BPX's "Niakuk oil accumulation." It was approval of this "Niakuk Project" that gave BPX the right to convert the lease from a year-to-year lease to a twenty-five-year lease. Importantly in the 1993 Notification BPX did not mention that it intended to use the allotment to develop Lisburne or to allow other oil companies to develop oil from their accumulations for a fee. Thus, unlike the 1991 letter, which mentioned BPX's potential plans with regard to other accumulations, BPX's official Notification regarding its decision to proceed with the Niakuk Project stated unequivocally that the Niakuk Project was for only the construction of development and production facilities for "[BPX's] Niakuk oil accumulation." (Ex. 1510.)

The term and new description of the "Niakuk Project" was never changed in subsequent amendments to include a broader range of uses. When BPX decided to expand its holding of the allotment from twenty to forty acres in order to prevent ARCO from also leasing the allotment,[53] BPX never revealed to the plaintiffs during the lease negotiations that BPX was also negotiating a $1.70 per barrel access fee with ARCO and Exxon for use of the allotment to develop oil from West Niakuk. As a consequence, Ms. Dickinson, the BIA representative and trustee, was unaware that BPX believed the Niakuk Project gave BPX the right to develop oil and gas from non-Niakuk accumulations without violating the scope of the lease. The scope of the lease was never

[53]BPX apparently needed only twenty acres to conduct its development activities on the allotment.

discussed because there was no reason to assume that BPX intended to use the Oenga property to develop non-Niakuk oil, nor oil owned by ARCO/Exxon.

In this connection, the court finds that the counseling letter signed by the plaintiffs does not, as the government and BPX argue, prove that the plaintiffs agreed or were aware that the Niakuk Project was not limited to oil and gas development from BPX's Kuparuk oil accumulation. Ms. Sam, the person given responsibility for helping the Oengas with their negotiations in mid-1993, was not the trustee. She had no experience with leasing property for oil and gas development and production and had no understanding of what was involved in BPX's FSAs with ARCO and Exxon. Ms. Sam had enough experience, however, to suggest that a new appraisal should be conducted based on the changed use of the allotment from a right-of-way to a drill site to ensure that the plaintiffs were receiving fair market value as required by the regulations. Her efforts to help the Oengas were rebuffed by the BIA.

The evidence established that in agreeing to certain language in the 1994 lease amendment regarding BPX's right to enter into FSAs without notice to the plaintiffs, the plaintiffs did not agree to authorize BPX to allow other oil companies to develop oil and gas from other than BPX's Niakuk accumulation. The plaintiffs negotiated for a change in the 1994 amendment to make clear that they wanted to receive notice of any subleases of their allotment. BPX agreed, but added language to allow them to enter into FSAs without triggering the sublease notice. It was clear from the testimony that the plaintiffs,

Ms. Sam, and Ms. Dickinson did not understand that BPX would now have the right to allow other companies to develop their own oil and gas reserves from other non-Niakuk accumulations. Indeed, Ms. Dickinson was confused about whether BPX could even enter into FSAs under the terms of the 1994 amendment to the Oenga lease.

The fact that the counseling letter signed by the plaintiffs noted that BPX and ARCO may enter into agreements to "develop the property," does not invalidate the plaintiffs' contention that the Niakuk Project was limited to the development of oil from BPX's Niakuk accumulation. The counseling letter says that BPX "may enter into any arrangement with ARCO to develop this property." This language did not broaden the scope of the lease. The fact that the plaintiffs learned that ARCO might help BPX "develop this property" does not imply that the plaintiffs understood that ARCO would be developing its own oil accumulations from the plaintiffs' property. Indeed, at least one FSA concerning use of the allotment did not involve production of oil from another accumulation: the evidence established that the FSA allowing BPX to use ARCO's LPC was necessary for the development of the Niakuk oil accumulation. (Ex. 1534.) Nothing in the 1994 lease amendments changed the scope of the lease to include development outside the Niakuk accumulation.

Finally, internal BPX documents demonstrated that when BPX entered into the original 1989 lease it had sufficient knowledge to identify the oil and gas potential of several additional formations and of other non-BPX leases; however, BPX elected not to

specify its intent and negotiate for the right to develop these other formations and non-BPX mineral leases. As Mr. Obeney explained and Mr. Eason confirmed, keeping BPX's plans for use of the allotment for development beyond the Kuparuk accumulation secret or at best vague was part of an intentional corporate strategy to tailor information sharing to different audiences. Clearly, BPX did not wish to share much with the plaintiffs. In addition, it was clear from these same internal documents that BPX, contrary to its arguments here, did not view the Niakuk Project as only a surface project. Rather, the evidence established that internally the Niakuk Project was always designed for developing the Niakuk oil accumulation and that use of the plaintiffs' allotment as a backup directional drill site to reach the Niakuk accumulation was always understood by BPX, but never shared with the BIA or plaintiffs.

The court agrees with the plaintiffs that the scope of the lease is limited by the term "Niakuk Project" and that Niakuk Project does not include BPX's right to use the allotment to develop oil and gas from accumulations other than the Niakuk accumulation. However, to the extent the term "Niakuk Project" is not a limitation on BPX's use of the allotment and can be reasonably read to include BPX's right to use the plaintiffs' allotment to develop oil from other accumulations, such as West Niakuk and Raven, the term is ambiguous. The court further finds that the ambiguity, to the extent it exists, is a latent ambiguity and must be construed against the drafter and in favor of the plaintiffs.

The Federal Circuit has explained that "[w]hen a dispute arises as to the interpretation of a contract and the contractor's interpretation is reasonable, we apply the rule of contra proferentem, which requires that ambiguous or unclear terms that are subject to more than one reasonable interpretation be construed against the party who drafted the document." Turner Constr. Co. v. United States, 367 F.3d 1319, 1321 (Fed. Cir. 2004). However, this rule only applies to ambiguities that are latent, as opposed to patent. See id.; Metric Constructors, Inc. v. Nat'l Aeronautics and Space Admin.,169 F.3d 747, 751 (Fed. Cir. 1999); Triax Pac., Inc. v. West, 130 F.3d 1469, 1474 (Fed. Cir. 1997). A patent ambiguity is one that is "obvious, gross, glaring" or "an obvious omission, inconsistency, or discrepancy in significance," such that the error is readily apparent. West Bay Builders, Inc. v. United States, 85 Fed. Cl. 1, 15 (2008) (quoting H & M Moving, Inc. v. United States, 499 F.2d 660, 671 (Ct. Cl. 1974); Beacon Constr. Co. of Mass. v. United States, 314 F.2d 501, 504 (Ct. Cl. 1963)). A latent ambiguity, in contrast, is a "hidden or concealed defect which is not apparent on the face of the document, could not be discovered by reasonable or customary care, and is not so 'patent and glaring as to impose an affirmative duty on plaintiff to seek clarification.'" Diggins Equip. Corp. v. United States, 17 Cl. Ct. 358, 360 (1989) (quoting Avedon Corp. v. United States, 15 Cl. Ct. 771, 777 (1988)). A latent ambiguity generally "'arises only once the contract is applied.'" West Bay Builders, 85 Fed. Cl. at 16 (quoting Travelers Cas. & Sur. Co. of Am. v. United States, 75 Fed. Cl. 696, 711 (2007)).

The court finds that the ambiguity in the Oenga lease was latent because it was not obvious from the face of the lease that BPX intended to use the property for oil and gas development beyond "[BPX's] Niakuk oil accumulation." In such a circumstance, "[w]hen there is a latent ambiguity, the rule of contra proferentem 'puts the risk of ambiguity, lack of clarity, and absence of proper warning on the drafting party which could have forestalled the controversy . . . .'" Metcalf Constr. Co. v. United States, 53 Fed. Cl. 617, 629 (2002) (quoting Sturm v. United States, 421 F.2d 723, 727 (1970)). Therefore, under these established principles of law discussed, the lease must be construed against the drafters, BPX and the BIA, and in favor of the plaintiffs.

Having concluded the lease does not authorize oil development from oil accumulations outside the scope of the lease, the court now turns to its conclusions regarding the extent of unauthorized activity by BPX. We begin with oil and gas development from the Raven PA. The evidence established that oil from the Raven PA is taken from the Sag and Ivishak formations and is thus wholly separate from the oil and gas taken from the Niakuk accumulation, which comes from the Kuparuk formation. Therefore, all of the oil and gas production from the Raven oil accumulation is outside the scope of the Oenga lease, as amended.

The extent to which oil and gas development from the West Niakuk PA is outside the scope of the Oenga lease presents a more complicated question. In 1998, BPX and the AOGCC recognized that ARCO and Exxon's West Niakuk oil and BPX's Niakuk oil

flowed from the same Kuparuk formation. However, the West Niakuk PA and the Niakuk PA did not become part of a single Combined Niakuk PA until December 21, 2007. Thus, from 1994 to 2007, oil from the West Niakuk PA was not considered part of "[BPX's] Niakuk accumulation." Because the lease only authorized use of the allotment for oil and gas development from "[BPX's] Niakuk oil accumulation," the lease did not authorize use of the allotment by ARCO and Exxon to develop their West Niakuk leases until the West Niakuk and Niakuk were combined into a single PA.[54] Therefore, use of the allotment for oil development and production from West Niakuk between 1994 and 2007 was outside the scope of the lease and unauthorized.[55]

[54]The government's suggestion that this reading of the lease would lead to a violation of Alaska law is unfounded. The government argues that once oil and gas is found to come from the same accumulation, the pooling rules require that it be developed together. Therefore, the government argues, BPX had to develop its Niakuk accumulation together with the West Niakuk accumulation following the 1998 pooling rules set by the AOGCC. Contrary to the government's contentions, nothing in the lease prohibited coordinated development. The lease simply did not allow BPX to use the allotment for oil and gas development from a separate PA. ARCO and Exxon were free to develop the West Niakuk oil and gas resource from another surface location in coordination with BPX. Indeed, as discussed infra, there were available locations for such development. However, in order to use the plaintiffs' location for development of the West Niakuk PA, the defendant-intervenors needed to obtain the plaintiffs' permission. Without permission, the defendant-intervenors were acting outside the scope of the lease.

[55]The court previously determined that because the government's breach began in 2001, a claim filed by or on behalf of the plaintiffs at that time would have resulted in recovery for BPX's breach dating back six years–to 1995. Oenga v. United States, 91 Fed. Cl. at 647. Thus, damages are due for the government's breach beginning in mid-1995. Id.

III. PRESENT FAIR ANNUAL RENTAL: DAMAGES FINDINGS AND CONCLUSIONS

The plaintiffs offered the testimony of three witnesses in support of their claim for damages, Mr. Wondzell, Dr. Thomas Power, and Michael Truax.[56] As discussed in detail below, the plaintiffs sought to establish that under a variety of appraisal techniques the fair market rental for the unauthorized use of the plaintiffs' allotment resulted in approximately $25 million in damages. The plaintiffs' main valuation witness was Dr. Power, a research professor and professor emeritus in the Department of Economics at the University of Montana. (Tr. 1355.) Dr. Power received his masters degree and Ph.D. in economics from Princeton University, with a focus on resource economics and regional economics. (Tr. 1356.) Dr. Power based his valuation opinion on the application of three appraisal approaches, which he opined led him to similar conclusions regarding PFAR for the allotment. In this connection, he acknowledged that he valued the allotment at a much higher rental rate than had the BIA in the past, but explained that the BIA valuations were flawed and did not adequately reflect the allotment's unique

[56]The defendant and defendant-intervenors have moved to strike portions of Mr. Wondzell's and Mr. Truax's testimony on the grounds that they offered opinions outside their areas of expertise. The defendant and defendant-intervenors have also moved to strike all of Dr. Power's valuation testimony on the grounds that he is not qualified to offer an opinion on PFAR and failed to use a reliable methodology for arriving at his value conclusion. For the reasons set forth in the attached rulings on the motions to strike, the court has granted-in-part and denied-in-part the motions to strike the testimony of Mr. Wondzell, and will not consider his testimony regarding environmental permitting. App. A. The motions to strike the testimony of Mr. Truax and Dr. Power are denied. The court has also denied the motion to strike the testimony of Mr. Morse, an appraiser and the plaintiffs' rebuttal witness, who testified as to the problems with the appraisals performed in the past by BIA appraisers.

location that had enabled BPX, ARCO, and Exxon to produce more than $2 billion worth of oil through the allotment, productivity that has not been reflected in the $2.1 million in rents the Oengas have received to date. Dr. Power opined that if the allotment is correctly valued at its highest and best use as a directional drilling site the rents due on the allotment are far greater.

The defendant and defendant-intervenors called ten witnesses to rebut the plaintiffs' testimony. The witnesses were Mr. Obeney, Arnold Tesh, Michael Miller, Eric Reinbold, Dr. Frankenburg, Leon Barry, Richard Marchitelli, Dr. Kenneth Vogel, Steve Carlson, and Dr. John Hekman. They provided testimony and evidence challenging various aspects of Dr. Power's opinion, Mr. Wondzell's assumptions and Mr. Truax's review of Dr. Power's work. The substance of the testimony and evidence regarding damages is summarized below.

A. Summary of Damages Testimony and Exhibits

1. The Plaintiffs' Valuation Witnesses

The plaintiffs presented the testimony of Mr. Wondzell, who offered his opinion as to the cost savings or costs avoided by BPX by using the Oenga allotment as a drill site. Mr. Wondzell explained that he looked to BPX's cost savings by evaluating the two economically feasible alternatives BPX had presented to the USACE when BPX was seeking approval for the causeway project in 1988 and 1990. The two alternatives were use of Niakuk Island #4 along with a subsea pipeline or use of Heald Point as the site of

directional drilling. (Tr. 1244-45; Exs. 1522, 1524.) Thus, Mr. Wondzell testified that it was his opinion as a regulator that if the Oenga allotment were not available, BPX's best option for developing oil from the Niakuk accumulation would have been drilling from Niakuk Island #4 and bringing the oil ashore south of the allotment via a subsea pipeline. (Tr. 1244-48.)

Mr. Wondzell explained that he determined the cost savings associated with using the allotment compared to the subsea pipelne based on the cost information BPX had provided to the USACE in its 1988 and 1990 applications for the Niakuk Island option. (Tr. 1250-51; Ex. 1522, 1524.) Mr. Wondzell explained that the USACE calculated the cost of a subsea pipeline from Niakuk Island #4 to the tip of Heald Point to be $31 million. (Tr. 1250-51.) Mr. Wondzell testified that he calculated the increased cost of extending the pipeline to come onshore south of the allotment (thus avoiding the allotment) to be an additional $19 million. (Tr. 1251.) From these amounts, Mr. Wondzell subtracted the cost of the roads and pipelines that BPX would have needed to build had the pipeline crossed the allotment. (Tr. 1251.) However, he also added in an additional operation and maintenance cost of $1 million per year to cover the cost of maintaining the subsea pipeline. (Tr. 1252.) Mr. Wondzell testified that after taking all costs into account the allotment provided a $14 million capital cost savings to BPX plus an additional $1 million per year maintenance cost savings.[57] (Tr. 1261-62.)

[57]Mr. Wondzell also testified about BPX's calculations regarding the cost of constructing the Heald Point facility. (Tr. 1258.) BPX's cost of construction figures were used by Dr. Power

Anticipating testimony from BPX employees regarding possible other alternatives to use of Niakuk Island #4, Mr. Wondzell testified that he believed that certain alternative sites would not have been available in the 1992 to 1994 time frame because of the limits on directional drilling at that time. (Tr. 1252-53.) Mr. Wondzell pointed to BPX representative Stu Hirsh's declaration that stated that when BPX was deciding whether to drill onshore, technology was such that it could drill 13,000 to 15,000 feet. (Tr. 1254; Ex. 1078.) He presented a chart from one of the defendants' experts' reports that confirmed that in 1994 departure distance was around 16,000 feet and in 1995 around 17,500 feet. (Tr. 1254; Ex. 1563.) Thus, Mr. Wondzell concluded that the allotment, which juts into the Beaufort Sea was the only location available to plaintiffs after Naikauk Island #4.

Mr. Wondzell also challenged BPX's claim that it could have constructed a facility on a causeway immediately adjacent to the Oenga allotment. Mr. Obeney had testified that BPX had considered this alternative as its BATNA. However, Mr. Wondzell stated that a parallel causeway would not have been approved by the USACE, because "the [USACE] strongly disfavored causeways in 1992." (Tr. 1256.) Mr.

in his income approach valuation of the allotment. The income approach valuation, as discussed above, required Dr. Power to separate out the cost of the drill site from the value of the allotment. To do so, Dr. Power relied upon the data Dr. Frankenburg had provided to the plaintiffs in her declaration. At the time of Dr. Frankenburg's declaration, she produced a spreadsheet showing that BPX had spent $47 million to build the facility, but during her deposition, she produced a another spreadsheet showing that the total was around $58 million. (Tr. 1259-60; Exs. 2138, 3424, 1170, 3511.) Mr. Wondzell testified that he was troubled by Dr. Frankenburg's second calculation and concluded that the $47 million figure was the better figure because he could not figure out how to reconcile the data on the spread sheet which included $58 million. (Tr. 1261.)

Wondzell testified that the concerns that led the USACE to disapprove the causeway to Niakuk Island #4 would have likely kept the USACE from permitting a short parallel causeway along Heald Point.[58] (Tr. 1256-58.)

On cross-examination, Mr. Wondzell conceded that his experience with environmental permitting was more than 40 years old and he was not sure whether his experience was based on the same statutory or regulatory scheme at issue in this case. (Tr. 1264-68, 1334-38.) Mr. Wondzell also testified that the last time he had estimated the cost of constructing a subsea pipeline was when he worked for the DOG around 1977 and that he has no personal experience costing pipelines. (Tr. 1322-23.) He explained that his knowledge of subsea pipelines on the North Slope came from information he had read. (Tr. 1324, 1341-42.)

Mr. Wondzell also conceded on cross-examination that BPX had never presented, and thus the USACE had never considered, any alternatives to use of the allotment. (Tr. 1275-76.) He further agreed that at the time of BPX's 1992 USACE application, BPX already had control of Heald Point and thus had no reason to propose alternatives that avoided use of the allotment, and that BPX could have proposed other alternatives had it not controlled Heald Point. (Tr. 1275-76.)

[58]As discussed above, the court in its order on the defendant-intervenors' motion to strike determined that Mr. Wondzell did not have permitting experience and therefore it could not rely upon Mr. Wondzell's testimony regarding whether any particular alternative would or would not have been permitted. See App. A.

Mr. Wondzell agreed on cross-examination that BPX had studied other alternatives to use of the allotment, including, in 1988, the use and cost of building a bypass roadway next to the allotment, as Mr. Obeney explained in his testimony on the BPX "BATNA." (Tr. 1282-83; Ex. 3109.) However, Mr. Wondzell testified that he believed BPX's analysis of the cost associated with building a road adjacent to the allotment was "too low." (Tr. 1283.) He testified that given the gravel needed to construct a road of the width and height identified by BPX, he believed the cost would have been "considerably higher." (Tr. 1284-85.) During further cross-examination, however, Mr. Wondzell admitted that there were certain details regarding the construction of a short parallel roadway adjacent to the allotment that he was unaware of, such as the lower height of fill that would have been required for a drill pad on such a roadway as compared to the drill pad on Heald Point. (Tr. 1289-91.)

Upon further questioning regarding a possible bypass roadway-drill pad alternative, Mr. Wondzell testified that he believed that even a small roadway "in the shadow of" Heald Point–one that did not protrude north of Heald Point but that had a drill pad at the tip–would present permitting issues for the USACE. (Tr. 1294-96.) His testimony at trial conflicted with his deposition testimony, during which Mr. Wondzell apparently did not foresee the same environmental issues. (Tr. 1296-97, 1301, 1304.)

Mr. Wondzell agreed that, because of advances in directional drilling during the 1990s, BPX would have had more drill site location options for accessing the area's oil

accumulations in the later years. (Tr. 1308-10.) Mr. Wondzell testified that he "look[ed] at the cost of drilling the West Niakuk wells from Heald Point, and south of Oenga's allotment, and L-5, and frankly they were all pretty close, all within about a million dollars." (Tr. 1313-14.) He acknowledged that he had not previously given an opinion that production from West Niakuk could have only been achieved from Heald Point. (Tr. 1327.) He also acknowledged that he had not previously given an opinion that Heald Point was the only place where oil from the Raven accumulation could have been developed. (Tr. 1327-28.)

The plaintiffs next called their valuation expert, Dr. Thomas Power. Dr. Power explained that resource economics is the analysis of the "role of gifts of nature [(natural resources)] in determining well-being as well as . . . supporting the economy." (Tr. 1356.) He has published numerous books, book chapters, book reviews, and articles on his topics of study. (Tr. 1358.) As part of his consulting work, he has worked for a variety of federal and state energy regulatory agencies and a number of Indian tribes. (Tr. 1358.)

Much of Dr. Power's tribal work has been in the context of valuing tribal land for federally-licensed hydroelectric projects located on tribal land. (Tr. 1358-59.) Under the Federal Power Act, he explained, tribes are entitled to "fair annual payment for the use of their land." (Tr. 1359.) "[F]or decades the rental value of the Indian land underneath these hydroelectric projects was estimated . . . by looking at . . . alternative subsistence

uses . . . .” under the theory that the tribe had no other option had the hydroelectric utility not been interested in siting a dam there. (Tr. 1359-60.)

> [The Federal Energy Regulatory Commission (“FERC”)] and the Courts ultimately said that is simply unacceptable. You have to look at the highest and best use of the land, and when there’s a potential for a hydroelectric site, the highest and best use is hydroelectric purposes and . . . the property . . . should be valued on that basis.

(Tr. 1360.) In that connection, he explained, FERC has developed over the last forty to fifty years a “cost savings approach” in which it attempts to determine the value of the advantage that a particular hydroelectric site provides by looking at what the cost of electricity would be from an alternative source, such as a coal or nuclear plant, and subtracting from that the cost of the electricity from the potential hydroelectric plant. (Tr. 1360-61.) “The difference between those two costs . . . is taken to reflect the rental value of the land and is used to determine what the tribe should be paid.” (Tr. 1361.) This means, he explained that even though the tribe had not invested money for the project nor born its risk, the rental value “always involves a substantial share of the value of the electricity being produced,” and is determined using “the highest and best use and the contribution that land . . . makes” to the project. (Tr. 1361.) However, because FERC has the statutorily-defined objective to keep electric costs low, “they do not assign the full rental value to the tribe. Typically they assign half of it to the tribe and half of it to the electric developer. . . .” (Tr. 1362.)

Dr. Power testified regarding the historic and continuing connection between the fields of economics and appraisal, explaining that economics has always focused on rental values since the beginning of the profession. (Tr. 1364.) Economists are concerned with a wide range of factors influencing our economy and well-being, "[b]ut the first one that's always listed in an economics textbook is land." (Tr. 1365.) "[T]he way economists approach problems and the way appraisers approach problems are often very similar. And appraisal techniques are tied back to the underlying economics." (Tr. 1369.) The appraisal technique of using comparative sales, he explained is a good example of this. (Tr. 1369.) "Economic theory provides the basis for appraisal tools." (Tr. 1371.)

Appraisal, he explained, involves the application of tools to produce a value judgment that is as objective and transparent as possible. (Tr. 1371.) When a competitive market exists, as reflected by a large number of comparable sales, "what the appraiser is trying to do is let the market speak for itself," because "competitive markets lea[d] prices to accurately reflect both the cost of producing a particular product . . . and . . . the value to consumers of the product . . . ." (Tr. 1371-72.) For most appraisals, a competitive market exists and an appraiser can apply routine appraisal tools to determine a value. (Tr. 1372.) "The problem comes up when . . . you don't have a large number of comparables." (Tr. 1372-73.) The Oenga allotment, he testified, is such a case, because it has "relatively unique characteristics associated with [it] as a directional drilling site

for oil production," and provides a convenient transportation corridor to that site. (Tr. 1373.) Further, the USACE determined that there was "no alternative to the use of Heald Point as a directional drilling site that could reach the intended oil." (Tr. 1373.)

Dr. Power pointed to the expert report by the government's expert, Richard Marchitelli, in which Mr. Marchitelli acknowledges the limited universe of market data available for the Oenga property and the fact that there is little privately owned land on the North Slope. (Tr. 1374; Ex. 1234.) Rather, the State of Alaska and other government entities are the dominant land owners in the area. (Tr. 1374; Ex. 1234.) Dr. Power explained that Mr. Marchitelli also acknowledged that the Oenga allotment was difficult to appraise because there is not an active real estate market, particularly one involving properties sharing common attributes. (Tr. 1375; Ex. 1234.) Dr. Power also testified that the limited number of potential users of the allotment and the uniqueness of the allotment as a drilling site "makes it very difficult to apply the conventional appraisal techniques." (Tr. 1376.)

Dr. Power quoted the 13th edition of The Appraisal of Real Estate, which states that the subject property's highest and best use provides the basis for researching comparable properties.[59] (Tr. 1376 (quoting The Appraisal of Real Estate 299-300 (13th ed. 2008).) Dr. Power said that while some of the previous appraisals of the Oenga allotment have defined its highest and best use very broadly, such as land supportive of

[59]The use of comparables is also called the "principle of substitution."

oil production, Mr. Marchitelli defined the highest and best use as oil exploration, extraction, and transmission and as a staging area for such activities. (Tr. 1376-79; Ex. 1234.) Dr. Power felt it was appropriate to define the highest and best use even more specifically, as a site for directional drilling, not just oil production. (Tr 1377.) Thus, he testified, the comparables that are appropriate to consider are "directional drilling production sites that also provide a convenient cost saving transportation corridor." (Tr. 1378.) The previous appraisals of the allotment had not focused on these factors. (Tr. 1378.)

The fact that meaningful comparables do not exist for this property meant that he had to look to other economic tools to determine fair market value. (Tr. 1378.) In this connection, Dr. Power explained that he used techniques that are used by appraisers to determine value where there are limited comparable properties as demonstrated by appraisal texts. (Tr. 1378-79.) Dr. Power quoted The Appraisal of Real Estate:

> Although the principle of substitution [(involving the use of comparable sales)] applies in most situations, sometimes the characteristics of a product are perceived by the market to be unique . . . . For example, a market may not have ready substitutes for special-purpose properties . . . . In those situations, the appraiser may have to research substitute properties in a broader market or employ analytical techniques appropriate for limited-market properties.
> . . .
> When sales of similar parcels are not plentiful enough for the application of sales comparison, alternative techniques such as market extraction, allocation and various income capitalization techniques may be used.

(Tr. 1379 (quoting The Appraisal of Real Estate, supra, at 39).)

Dr. Power used a variety of techniques to determine fair rental value where comparables do not exist. He prepared a report and testified about 3 techniques: cost savings, income, and comparative royalties as a proxy for rent for mineral producing properties. Starting with the cost savings approach, Dr. Power's opinion testimony can be summarized as follows: In his expert report Dr. Power explained:

> One way of determining the rental value associated with the particular location advantages a site has for a particular commercial use is to estimate what the alternative cost would be of pursuing the same commercial values using the next best location . . . . If the values produced, in this case the development of the oil pools in the Beaufort Sea, are approximately the same, but the costs associated with the alternatives are different, that difference in costs reflects the site advantage in terms of costs savings and, therefore, provides a measure of the rental value of the site.
>
> This approach is not based on some obscure economic theory . . . . BPX . . . carried out exactly that type of economic analysis as it tried to determine how it could most profitably access the oil in its Niakuk lease.

(Ex. 1286.)

In his testimony, Dr. Power explained that the cost savings approach involves looking to alternatives for generating the same revenues and calculating the difference in cost between use of the allotment and other alternatives, indicating the site rental value as the cost advantage of use of the allotment. (Tr. 1420-21.)

In explaining his conclusions regarding the cost savings approach, Dr. Power referred to Mr. Wondzell's testimony that at the time BPX decided to use the allotment for a drill site, the USACE had denied the permit for the causeway to Niakuk Island #4. Because the USACE would not authorize a causeway between Heald Point and Niakuk

Island #4, Dr. Power accepted Mr. Wondzell's testimony that if BPX could not use the allotment as a drill site or transport route, BPX's next-best alternative would have been to drill at Niakuk Island #4 and use a subsea pipeline to bring oil to L-5. (Tr. 1422.) As summarized above, Mr. Wondzell calculated the initial capital cost savings and yearly operations and maintenance cost savings that BPX received by the use of Heald Point. Dr. Power, took Mr. Wondzell's analysis and, after amortizing the initial investment over the life of the project (using a 7% nominal discount rate, meaning inflationary expectations are built in), he calculated that use of the forty-acre allotment provided BXP with $15 million dollars in capital cost savings over the sixteen year period BPX estimated was the life of the project. (Tr. 1422.) Thus BPX saw an annual real capital cost savings of $1.29 million. (Ex. 1286.) He added to this $1.07 million for operation and maintenance costs, for a total annual real cost savings of $2.35 million. (Tr. 1422; Ex. 1286.) The $2.35 million in 1988 dollars would then have to be escalated each year between 1995 and 2009 under terms of the lease, which provided for rent increases to adjust for inflation as measured by CPI, amounting to an average of to 2.88% per year. (Tr. 1422-23; Exs. 1506 ¶ 5, 1286.)

Dr. Power then explained that the total annual rental value can be allocated among the accumulations of oil. He allocated this land rent to the users of Heald Point based on oil production for the period of 1995 to 2009, at $2.1 million for Lisburne, $16.4 for West Niakuk, and $4.61 for Raven, for a total of $23.17 million in fair market rental

value damages. (Tr. 1425; Ex. 1286.) He concluded that if the property continues to be used for oil production, rents based on this approach would continue. (Ex. 1286.).

Dr. Power explained that he assigned the full amount of the cost savings to the allotment owners, as opposed to sharing the cost savings between the Oengas and BPX, because, while there was a limited market, it was clear that both ARCO and Exxon were interested in the allotment. (Tr. 1423-24.) "[M]y understanding is that we're supposed to be looking for a competitive outcome . . . . [T[he competition would force the rental payment to approach the full cost savings. The Landowner would get almost all of the cost savings." (Tr. 1423-24.) "We're talking about what does . . . the land itself[] contribute to the . . . economic activity taking place there, and assigning that contribution that the land makes to the land." (Tr. 1425.) As Dr. Power explained in his rebuttal report, "BPX was able to use its lease agreement with Mr. Oenga to block ARCO/Exxon from bidding for an additional drill site on the Oenga allotment." (Ex. 1284 at 41).

Dr. Power testified, as did Mr. Wondzell, about his reasoning for using the subsea pipeline alternative rather than a bypass road with a drill site adjacent to the allotment or some other alternative location for drilling. Dr. Power stated that he had no knowledge of BPX ever considering, at the relevant time, using the bypass road as drill site alternative, and that he understood that alternative to be "just a slight variation of the causeway the Corps of Engineers had already turned down." (Tr. 1427-29.)

Dr. Power testified that reports he had read by witnesses for the defendant-intervenors to the effect that ARCO had other available surface location options for accessing Lisburne and West Niakuk oil did not alter his conclusions. Dr. Power rejected the notion that Heald Point provided zero cost savings associated with the production of oil from these accumulations, because ARCO had available to it the L-5 drill site not far south of the allotment. Indeed, Dr. Power opined that the internal analysis prepared by ARCO in 1995 indicated that, to the extent ARCO believed it could save $38 million by using its L-5 site to produce West Niakuk oil, the fact that ARCO rejected that option and decided instead to use the allotment demonstrates that the allotment had some greater advantage or ARCO would not have wasted its money. (Tr. 1431-33; Ex. 1169.) Dr. Power explained:

> ARCO/Exxon did all of this analysis, showing that L-5 was as good or better than Heald Point, but then proceeded to choose Heald Point. . . .
>
> So in that sense, the economic analysis they did didn't actually guide the decision they made, except insofar as they were able to negotiate that fairly large cooperative agreement with BP. . . . [G]iven the new agreement, Heald Point was the attractive location from which to develop its West Niakuk resources.
>
> . . .
>
> My point is that whatever the analysis showed about [how] they could . . . use L-5, what actually happened was that they made use of Heald Point and the Oenga allotment to pursue their West Niakuk resource, except for one of the wells.

(Tr. 1432-33.)

Dr. Power also addressed criticisms that he had read in the defendant-intervernors' expert report regarding his decision to use CPI to increase the rent owed from 1988

dollars. Dr. Power explained that the lease required rent increases based on CPI.[60] (Tr. 1423; Ex. 1506 ¶ 5.) Dr. Power also explained how he used a 7% discount rate to convert his projected cost savings into an annual rental value, Dr. Power explained that he chose a 7% nominal rate based on what BP was actually earning on its investments from 1985 to 1995 rather than "what investors wished or expected the oil companies to be earning in the future." (Tr. 1413-14.) He noted that oil companies were not making much more money than other businesses during that ten-year period, and the argument that the discount rate should be higher because oil production is a risky investment is inapplicable to Heald Point, where BPX had already done exploration and had a "pretty good feel" for how much oil it could produce. (Tr. 1414-15.) Dr. Power also testified that the criticism of his discount rate by Dr. John Hekman, who argued that a more appropriate number would be one tied to U.S. treasury bonds, was based on incorrect financial data from Amoco rather than BP and used an incorrect correlation coefficient.

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[60] Paragraph 5 of the lease provides:

> Rental payments may be increased at [certain] intervals . . . . Such adjustments will be based upon either the fair market undeveloped rental value for the property established by a [BIA] appraisal . . . or the adjustment will be based on the application of a "Cost Adjustment Factor"; which[]ever is greater. . . . "Cost Adjustment Factor" shall mean the ratio of (i) the most recently public [CPI] to (ii) the most recently published [CPI] as of the execution date of this lease. . . . For the second and subsequent rental adjustment, the "Cost Adjustment Factor" shall mean the ratio of (i) the most recently public [CPI] to (ii) the difference between the most recently published [CPI] and the [CPI] upon which the previous rental adjustment was or would have been based. . . . It is agreed and understood by all parties that the rental payment will not escalate by more than 50% in any [adjustment] period.

(Ex. 1506 ¶ 5.)

(Tr. 1415-17.) Dr. Power testified that when he used correct data and the correct coefficient, he calculated a discount rate to be 7.4%, "pretty close to my seven percent." (Tr. 1417.)

Dr. Power concluded his discussion of the cost savings approach in his rebuttal report by noting:

> None of my critics deny that the cost savings that Heald Point provided BPX and other oil companies is relevant to the estimation of the rental value of Heald Point. What is disputed is the appropriate alternative to consider, the actual cost savings associated with that alternative, and what share of those cost savings should flow to the Oengas as rent and what share should be retained by BPX and the other oil companies using Heald Point.

(Ex. 1284.) For the reasons discussed above, Dr. Power asserted that he believed he had addressed the criticisms raised in connection with his cost savings approach.

Dr. Power also offered his opinion as to fair rental value based on an income approach, in which Dr. Power extrapolated the rental value of the allotment based on the $1.70 access fee that BPX charged ARCO/Exxon for use of the allotment in order to develop those companies' West Niakuk oil reserves. (See Ex. 1535.) Dr. Power explained that the PFAR he calculated under this approach was consistent with his rental calculations based on the cost savings approach, suggesting a reliability in these methodologies. (Tr. 1450-51.)

In explaining how he came to his conclusions using the income approach, Dr. Power testified that he had to first separate out the value of BPX's improvements from the value of the Oenga land. Using the market extraction technique of estimating the

contribution that improvements make to a site's value, he then subtracted the cost of those improvements to determine the value of the land. (Tr. 1380.) He explained that in determining the value of the BPX facility he used the $47 million figure Dr. Frankenburg had provided in her declaration on behalf of BPX that purported to show the cost of facility construction at Heald Point. (Tr. 1389-90; Ex. 2186.) Dr. Power acknowledged that Dr. Frankenburg had updated her estimate and had added in additional costs in new spreadsheets, but Dr. Power testified that he rejected the updated spreadsheets on the grounds that the columns in at least one of these spreadsheets did not come close to adding up.[61] (Tr. 1398-99; Ex. 1118.) Dr. Power explained that he found the initial spreadsheet with the $47 million figure to be the most accurate, because BPX's two updated spreadsheets had obvious errors. (Tr. 1399.) Morever, Dr. Power explained that he had confidence in BPX's original $47 million figure because other contemporaneous documents suggested that facility costs were approximately $47 million. (Tr. 1400-01, 1403-05.)

> My point is we have a lot of numbers floating around here as to what the actual costs are. I think that if one narrows in on the costs in a period that are relevant, and [one is] somewhat skeptical of spreadsheets that seem to have errors in them, that my calculations and the calculations using . . . solely BP

[61] Dr. Power also noted that there may be a dispute as to whether, for instance, the cost of injection wells should have been included in this total "common" cost or whether that was a cost to be borne individually by the well users, just as the actual drilling costs of individual wells was paid by the company drilling that well. (Tr. 1396.) However, on redirect, he explained that the 1994 FSA states that the cost of injection wells is not covered by the access fee, but that ARCO would pay an additional charge proportionate to its share of oil production for the use of those injection wells. (Tr. 1642-44.)

> numbers, we get . . . approximately the same [land] rent per barrel as I came up with.

(Tr. 1405.)

In order to extract the $47 million cost of the facility from the $1.70 per barrel fee, Dr. Power amortized the $47 million over sixteen years, which BPX had anticipated was the expected life of the facility. (Tr. 1392-93; Ex. 1524.) This allowed Dr. Power to recognize the expected return on that capital investment over time, even though BPX apparently–at least sometimes--included no rate of expected return in its own internal calculations.[62] (Tr. 1393.) He divided this total cost by the total volume of oil that has been produced through the allotment. (Tr. 1394.) Based on this analysis he concluded that of the $1.70 per barrel access fee, $.85 per barrel of oil produced was attributable to the facility. (Tr. 1394.) This meant that $.85 per barrel was attributable to the land and the advantages it provided. (Ex. 1286.)

In order to determine the fair market rent attributable to the unauthorized use, Dr. Power applied the $.85 per barrel to the amount of oil produced from Lisburne, West Niakuk, and Raven, for the years at issue. (Ex. 1286.) Dr. Power calculated that using this valuation technique the rent owed is $3.1 million from Lisburne, $21.5 from West Niakuk, and $2.1 from Raven, for a total of $26.6 million. (Ex. 1286.)

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[62]Dr. Power's testimony on the particular discount rate he applied and his reasons for doing so are discussed below.

Dr. Power addressed in his direct testimony his reasons for using the $1.70 per barrel access fee set in the 1994 West Niakuk FSA rather than the lower fee negotiated in the 1996 West Niakuk FSA. He explained that the 1994 FSA alone represented a transaction between "commercially oriented competitors." (Tr. 1413.) In 1994 "BP and ARCO . . . were real competitors. There was some friction, some lack of agreement." (Tr. 1406.) He testified that in charging ARCO a fee for access to the allotment facility, BPX was standing in the heirs' shoes as landlord. (Tr. 1406.) In that sense the rate "gives us a snapshot . . . of a negotiated rental agreement between two knowledgeable oil companies." (Tr. 1407.) Dr. Power felt it was inappropriate to use the 1996 FSA, which dropped the access fee to $1.25 for 10 million barrels and $.50 thereafter, because by that time "BP and ARCO/Exxon were moving from being competitors to being partners in the development of the Greater Niakuk area . . . . I don't think [the 1996 agreement] provides any longer evidence of what the rental value associated with Heald Point was." (Tr. 1410-11; Ex. 3300.) This is further established, he testified, by the fact that in 2000 the access fee for West Niakuk was eliminated entirely: "The fact that it went to zero was not a sign that the rent went to zero or the cost went to zero; it was a sign that they had merged their interests." (Tr. 1411.) Similarly, he testified that he did not use the Lisburne FSA because it did not include an access fee, but rather involved "horse-trading" of gas for access, both things of value; plus, Dr. Power explained, BPX was a part owner of Lisburne, so "they were negotiating with themselves." (Tr. 1407-08; Ex.

3262.) Thus, the appropriate FSA to use to determine value was the one that gave the clearest picture of the amount a competitor would pay for access to the Heald Point facility on the allotment. (Tr. 1412-13.) Dr. Power asserted that the Oengas were entitled to the full value of the costs attributable to the land and that he did not believe that the cost attributable to the land would have been allocated between the plaintiffs and BPX, as the defendant and defendant-intervenors' experts opined. (Tr. 1418-19.)

Dr. Power then testified regarding his third approach to valuation, which he called his "Comparable Rental Approach: Rental Values to Surface Owners Based on a Percentage of the Value of Oil Production" or "royalty approach." (Ex. 1286.) This approach involved looking outside the immediate limited market for other "indicators of what might be a reasonable way of getting the cooperation of the landowner who controls a site that can reduce your costs, or controls a site that, at least at one point in time, provided the only access to part of the resource you were trying to get." (Tr. 1434-35.) He explained that when parties negotiate, they can negotiate any kind of rental arrangement. (Tr. 1435.) He explained that percentage income (or royalty) arrangements are also sometimes used in agricultural and commercial settings. (Tr. 1436-37.) "And in usual circumstances, where mineral developers are seeking access to minerals that the surface owner does not own or control or have an interest in . . . percentage royalties are . . . sometimes paid." (Tr. 1437.) He maintained that he did not believe this is "what usually happens when land is leased for oil and gas development in the competitive

market setting," but that it is false to assert that such an arrangement is "never done." (Tr. 1449.)

Dr. Power identified three such rental arrangements in a mining context, which he claimed supported his opinion. He began with the Kuukpik Corporation's arrangement with the Arctic Slope Regional Corporation ("ASRC"). (Tr. 1438.) The Kuukpik Corporation controls the surface rights, but not the mineral rights; however, the ASRC needed the Kuukpik Corporation's agreement in order to take title to the minerals. (Tr. 1438.) This agreement came in the form of a overriding royalty for certain areas. (Tr. 1438-39; Ex. 1580.) ***** Dr. Power explained that this agreement shows the ability of a non-mineral owner to bargain for compensation from both the mineral owner and the mineral lessee. (Tr. 1446.)

In an effort to show that the Kuukpik arrangement is not unique and that other surface landowners without mineral rights have been able to negotiate royalty payments, Dr. Power identified two other agreements where the landowner was able to secure a royalty. One was in Saginaw Bay, Michigan, where the landowner, a non-mineral-owner, received a 4% royalty for mineral production. (Tr. 1446.) The second involved a subsidiary of the Union Pacific Railroad that negotiated a royalty payment under a lease to develop minerals under the Newton Sheep Company's land. (Tr. 1446.) Dr. Power explained that the second case was unusual in that "the railroad company had a right to access the surface. . . . They didn't have to pay the surface owner anything. But they did.

They paid a [2.5%] royalty." (Tr. 1448.) The railroad did this, he explained "to obtain [the landowners'] cooperation, to keep their good[]will, and to prevent any disputes that might arise from uses [of the surface] that someone might consider beyond the scope of our reservation [of rights to occupy the surface to extract minerals]." (Tr. 1448 (quoting Flying Diamond Oil Corp. v. Newton Sheep Co., 776 P.2d 619, 628 (Utah 1989)).)

These three examples, according to Dr. Power, indicate that "a percentage royalty of 1 to 4 percent of the value of the oil produced through a surface point of production not owned by the subsurface mineral owner is a reasonable rent that reflects the assemblage value[63] created by the combination of surface and mineral interests and the contribution of the surface owner due to his or her strategically located land." (Ex. 1286.) Dr. Power selected a number in percentage range he had seen used in these other cases. Using a 3% royalty with the amounts of oil produced from each area produce values of $2.4 million for Lisburne, $17.7 million for West Niakuk, and $4.6 for Raven, for a total of $24.7 million. (Tr. 1450; Ex. 1286.)

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[63]In later testimony, plaintiff's witness Mr. Truax explained:

> Assemblage is basically the integration of two properties or two interests . . . usually done to create a benefit to both. . . . [T]he beneficial value that's created is called plottage value.
>
> It's an economic and practical benefit, usually. It's seen most commonly when you . . . have two small pieces of land that are joined. If you put them both together, you can put a very substantial project on it; but individually, neither could accommodate that project. . . .
>
> [T]here can also be an integration of interests, an assembled interest.

(Tr. 1716.)

Dr. Power concluded his testimony by noting that under each of his three approaches he had achieved similar values for the total non-Niakuk production: $23.2 (cost savings approach), $26.6 (income approach), and $24.7 million (royalty approach), which he stated "suggests that there is some sort of stability or continuity or robustness in the approach." (Tr. 1450-51.) He explained that he was not making a specific recommendation as to which of the three approaches the court should use. (Tr. 1671.) He testified that all three "lead to similar conclusions from a quantitative point of view." (Tr. 1671.) These numbers, however, do not include production for 2010, which meant that the court would have to make an extrapolation of the yearly rental from 2009. (Tr. 1671; Ex. 1572.) He did agree, however, with the defendant and defendant-intervenors' experts that the cost savings approach represents a "cap" on the rent a lessee would be willing to pay to rent property where an alternative is available. (Tr. 2383.)

On cross-examination Dr. Power acknowledged that he had no previous experience valuing land in Alaska, and had never visited the Oenga allotment, although he testified that he did not find this to be a hindrance given the maps, satellite and other photographs, and descriptions of the property available. (Tr. 1455-56.) Generally speaking, Dr. Power admitted he has no prior experience with the oil industry or with valuing oil and gas facilities. (Tr. 1455.)

Dr. Power testified that he understood that his approach could be understood as providing the court with the "economic value" of the land, but explained that where as in

this case there are no market comparables, “market value,” or PFAR, is the same as economic value. (Tr. 1508.) “[I]f what you mean by market rental is only sales comparisons, I think to take that approach is to dis-able the appraiser or the economist, because there [are] situations where . . . significant competition and comparables for the same highest and best use [(as a directional drilling site with access to a transportation corridor)] don’t exist, but rental values still have to be calculated.” (Tr. 1517-18.) For example, in determining “fair annual payment,” the standard in the Federal Power Act that FERC applies when valuing hydroelectric sites, FERC explicitly does not use a sales comparisons approach because it would be inappropriate in the limited market. (Tr. 1517.) Dr. Power acknowledged that “fair annual payment” is not the same as “fair annual rent” under the Federal Power Act because under that statutory scheme, the Native American landowners are not paid the full value associated with the hydro site, but rather are paid 50% of the value. (Tr. 1464-66.) However, he explained that in the context of hydroelectric sites in Canada, where there is no such statutory limitation, the parties negotiate more freely without this limitation. (Tr. 1466.) He explained once again that he studied appraisal texts to ensure that he was applying techniques of land valuation properly, but reaffirmed that in this case the comparative sales approach (which is the most conventional method for valuation) could not be used because of the lack of comparable properties with the same highest and best use, as a directional drilling site with existing transportation corridor to a processing facility. (Tr. 1460-62.)

In response to questions by the government regarding his decision to value the allotment as a whole as opposed to by acre, Dr. Power explained that it was not the acreage of the allotment that contributed to its value, but the unique characteristics providing lower-cost access to accumulations of oil. (Tr. 1476-77.) There are situations where acreage matters, he explained, but in this context, it is geography, rather than size, that provides the property's value. (Tr. 1477.)

Dr. Power clarified on cross-examination that he was not asserting that the oil produced from the allotment could not have been produced from some other drill site, but that given the limits on directional drilling in place in the early 1990s some of the oil produced from that location could not have been produced from other locations and thus the allotment had a unique value. (Tr. 1478.)

Dr. Power agreed that ARCO/Exxon looked at alternatives to use of the allotment for development of their oil accumulations at West Niakuk and Lisburne, but explained that he did not use these alternatives in his cost savings analysis because to determine fair market value it was appropriate to focus on BPX's decision to use the allotment at the time it committed to onshore drilling. (Tr. 1482, 1487, 1534-35.) "That set in motion the advantages that then attracted ARCO/Exxon and led them to ultimately make use of that site." (Tr. 1546.) Dr. Power explained that some of the valuation witnesses for the defendant and defendant-intervenors were "backcasting" (as opposed to forecasting) by projecting costs for alternatives that were never considered at the relevant time. Dr.

Power explained that in order to determine the fair rental value of the allotment Dr. Power had to examine the alternatives available to BPX at the time it decided to lease the Oenga land. It is for this reason that he relied upon Dr. Wondzell's calculation of the cost of a subsea pipeline. The subsea pipeline was, in fact, considered by BPX and thus it was appropriate to consider that cost in comparison to the cost of the Oenga allotment. (Tr. 1473-75; 1538.) Regarding his attribution of 100% of the cost savings provided by the location to the landowners, Dr. Power conceded that he cited no literature to support this, but stated that in a highly competitive market, even if limited between BPX and ARCO/Exxon, the landowner would receive the full value of the land, as rent. (Tr. 1539.) He also agreed on cross-examination that the maximum amount a tenant would pay in rent for a parcel of land identical in revenue production potential to another parcel of land is the cost savings provided by that first property. (Tr. 1522-23.)

Regarding his use of the $1.70 access fee set in the 1994 West Niakuk FSA, Dr. Power explained that this particular FSA was agreed to at "a time when we had a commercial transaction that indicated the rental value." (Tr. 1548.) Other FSAs occurring afterward were unhelpful in this regard, Dr. Power explained, because increasing cooperation between the oil companies meant a lack of truly arms-length commercial transactions, "[s]o we don't have any [other] data points." (Tr. 1548.) While this 1994 agreement was only in place for two years, Dr. Power testified that by the time the 1996 West Niakuk FSA took effect, development of the western leases was

well underway, having reached 52% of the eventual peak volumes. (Tr. 1557.) Further, "the 1996 agreement involved horse-trading over a dozen-and-a-half issues, where the two companies were moving into a cooperative role that was ultimately going to lead to zero access fees." (Tr. 1566.) He did, however, agree that at the time the companies signed the 1996 agreement, they had more information than they had in 1994. (Tr. 1558.) By that time, he agreed, BPX and possibly ARCO were projecting higher volumes than the 54 million barrels included in the early FSA negotiation materials. (Tr. 1558-62.) However, Dr. Power explained that his methodology of extracting the land value from the access fee does not depend on the projected volume of oil; rather it demonstrated ARCO's willingness to pay the $1.70 based on ARCO's calculation of its ability to produce from West Niakuk and maintain a profit. (Tr. 1565.)

Regarding his decision to use a 7% nominal rate, Dr. Power explained that had he used a higher rate, such as a 7% real rate to which a 2.88% inflationary expectation would need to be added, it would increase the measure of costs and thus decrease the measure of rent allocable to the land under his income/extraction approach. (Tr. 1502-03; Ex. 1286.)

Dr. Power explained during cross examination that his goal in finding properties where a surface landowner is compensated based upon a percentage of the minerals produced was to generally support his royalty approach, but was not to show that these types of arrangements are common. He presented the royalty examples, to demonstrate

that, contrary to the government and government-intervenors' contentions, examples exist. (Tr. 1572.) He explained that he was "simply looking for some examples . . . that more or less matched the Kuukpik example just to the west of Heald Point." (Tr. 1572.) He agreed that these examples are highly unusual but also explained that the site of the Oenga allotment itself is "an aberration," and so he was looking for other similarly unusual sites with unusual payment arrangements. (Tr. 1576.) These examples, he explained, are not true "sales comparisons" or "comparables" in the appraisal sense. (Tr. 1577.) He agreed that they are remote in both geography and time period of the transaction, and have numerous other differences from the Oenga allotment, but explained these considerations were not relevant to his purpose, which was simply to demonstrate that his examination of the Kuukpik arrangement was not improper. (Tr. 1578-79, 1585-87.) He did not, however, find any examples of a surface owner receiving an overriding royalty. (Tr. 1624.) *****

Dr. Power explained during cross-examination that he did not believe that there were comparables on the North Slope. He explained that he had seen previous BIA appraisals of the Oenga allotment that identify comparable properties in the North Slope market, but that he found none of these properties to be true comparables because they did not offer the same unique oil drilling advantages and the transportation advantages as the Oenga allotment. (Tr. 1603-1623.) The Oenga property's highest and best use is as a directional drilling site with direct access to transportation, it is the "uniqueness in a

particular highest and best use that narrows the number of comparables." (Tr. 1662.) On redirect he further explained that the uniqueness of the allotment was its extension toward multiple oil accumulations, reducing the length of drilling required and thereby reducing costs, and its provision of a land-based transportation corridor to the tip drill site, whereas the other properties relied upon by the BIA did not provide the same cost-saving and access advantages. (Tr. 1644-46.)

Finally, at the court's request, Dr. Power during his rebuttal testimony presented a "Preliminary Land Value Calculation Based on Annual Rental Value" in response to the suggestion of one of the defendants' witnesses, Mr. Tesh (an appraiser) that Dr. Power's rental rate calculation had to be rejected because his income valuation would produce a sale value of $75 million for the allotment. Mr. Tesh claimed that although he had not done an appraisal himself, he knew instinctively that $75 million was not a rational figure. (Tr. 2326-29; Ex. 1700.) Dr. Power explained that the $75 million figure appeared to be based on an assumption that production from the allotment would continue forever, and therefore the Oengas would be receiving rents forever. Dr. Power explained that production is already decreasing and thus the rents associated would be expected to decrease as well. (Tr. 2327, 2329.) He produced a calculation showing a trend line of rent extending out to 2022, totaling $44 million in 1994 dollars. (Tr. 2329; Ex. 1700.) Dr. Power noted that although this value might seem high he did not believe that it undermined the reasonableness of his damage calculation. (Tr. 2329-30.) He

explained that when viewed in the context of the $2 billion of oil already produced from allotment to date, if the property continues to produce oil at a set rate the land could well be worth that much. (Tr. 2329-30.)

Finally, on rebuttal, Dr. Power testified that none of the evidence presented by the defendant and defendant-intervenors had led him to change his mind on the fair market rent for the allotment. (Tr. 2360.) He explained that the two economists testifying for the defense, Dr. Vogel and Dr. Hekman, had assumed that there is a relatively competitive market on the North Slope for properties similar to the allotment and that their criticism of his analysis stemmed from this incorrect assumption. (Tr. 2362.) He reiterated that the Oenga's property is very unique and that there are not other properties on the North Slope with the oil producing attributes of the Oenga property. (Tr. 2362.)

Following Dr. Power's testimony, the plaintiffs called Michael Truax, as a witness. Mr. Truax is an appraiser with thirty-five years of experience who holds multiple professional appraiser designations and is licensed in Louisiana and temporarily in Alaska. (Tr. 1675-78.) Mr. Truax testified that he has worked extensively on appraisals related to the oil and gas industry and has represented numerous oil companies in his consultation practice. (Tr. 1679-80.) The purpose of Mr. Truax's testimony was to address the criticisms made by the defendant and defendant-intervenors' experts regarding Dr. Power's application of appraisal techniques in his report and testimony.

Mr. Truax confirmed Dr. Power's opinion that due to the unique nature of the Oenga property, ordinary appraisal techniques "could not be entirely applied in traditional fashion," but rather "innovation" was necessary to estimate PFAR. (Tr. 1682.) After reviewing Dr. Power's expert reports, he found the principles applied to be valid and the findings produced to be a "reasonable and competent conclusion." (Tr. 1682-83.) Mr. Truax explained that while he is an appraiser and Dr. Power an economist, there is no reason that one needs an appraisal license to properly apply appraisal techniques and principles to reach a sound result on fair market value. (Tr. 1683.) Dr. Power's background as an economist, he testified, gives him the ability to apply appraisal principles. Mr. Truax explained that economic principles "overlie the appraisal concepts almost verbatim . . . ." (Tr. 1683-84.) Mr. Truax testified that both the income and the cost savings approaches employed by Dr. Power involve principles used by both economists and appraisers, and opined that appraisal is "essentially a subspecialty of economics." (Tr. 1691-92.) "With a limited market property . . . you go to the marketplace and you try to find whatever bits and pieces of information you can that help you build your box, and frame it in a way that leads you to a reasonable result." (Tr. 1714.) "Dr. Power did that . . . he looked, as an appraiser would, for all of the methods. He . . . looked at all the information that was reasonable to look at, in terms of estimating fair annual rent and our damages in this case." (Tr. 1714-15.) Mr. Truax testified that he believes Dr. Power's methodology would stand up to peer review by

either appraisers or by economists because the methods he used are consistent with methods appraisers use in the ordinary course of their work. (Tr. 1783.)

Mr. Truax further explained that the regulatory definition of PFAR is equivalent to the general definition of "market rent." (Tr. 1684.) Both definitions encompass the idea that both lessee and lessor are prudent and knowledgeable, are well-informed and well-advised, and are under no duress. (Tr. 1684-85.) The mere fact that a transaction occurred, he explained does not make that transaction a "market-oriented transaction" or a comparable appropriate for use in estimating market value. (Tr. 1685-86.) Mr. Truax explained, as had Dr. Power, that determining the highest and best use of a property is "the most critical aspect of most appraisals," in that it "guides who your market participants are likely going to be" and "what comparables you search for, and then which will or will not be relevant." (Tr. 1686-87.) He explained that even two properties located on the same city block may not be comparables if one is located at a busy corner and the other on a side street, because although their highest and best use may both be generally "commercial" in nature, the busier location will attract a different set of market participants who can afford to pay more for a higher intensity of commercial use. (Tr. 1687-89.) The highest and best use for a particular property is that which is "physically possible, legally permittable, financially feasible, and maximally productive." (Tr. 1689.) With regard to the Oenga property, "the comparables generally just don't have the same [highest and best use]. And so their applicability is a bit

strained in terms of drawing any conclusions at all from that type of information to the subject." (Tr. 1697.)

Mr. Truax testified that the income approach used by appraisers is compatible with Dr. Power's analysis based on the 1994 $1.70 West Niakuk access fee. (Tr. 1698.) He agreed with Dr. Power's method for extracting the land value by amortizing BPX's reported capital costs and deducting that from the total amount paid. (Tr. 1698-99.) "[T]hat is a very reasonable analytical method that appraisers would use. . . . [W]e allocate values routinely in our office between improvements and land." (Tr. 1699.) He explained that BPX and ARCO/Exxon would both have been highly motivated to negotiate a fair deal, which "gives credibility to the notion that the deal . . . had a strong market orientation between two competitors." (Tr. 1700.) He explained that ARCO may well have known how much BPX was paying to rent the Oenga allotment, but ARCO would have made its decision to pay the access fee based on the economic benefits and cost savings that deal provided to ARCO. (Tr. 1702-03.) "[T]hey didn't really care what BP was paying or not paying in rent, or whether they owned it in fee." (Tr. 1702.) Likewise, ARCO did not base its decision on BPX's facilities costs, nor does it matter what the projected costs were at that time, only what they truly ended up being. (Tr. 1784.) What an appraiser or analyst looks to, rather, is the fee that was negotiated and what that fee covered. (Tr. 1784-85.) In this case, he testified, the $1.70 covered both access to the land and the facilities on it. (Tr. 1785.) That fee was market-based, and in

each of the company's business models, "that level of rent worked and allowed them to still be profitable to conduct their business operations." (Tr. 1786.)

Mr. Truax further testified that Dr. Power was correct to conduct his analysis using the $47 million figure, rather than BPX's later higher estimates, because "the appraiser certainly would want to use the best evidence he has in terms of the realities of the circumstance, so whatever evidence he had that gave him the truest picture of . . . the capital cost" was what an appraiser should use. (Tr. 1787-88.) Further, he explained that even though a lower fee was negotiated in 1996, the West Niakuk leaseholders made their decision to drill from the allotment based on the $1.70 fee in the original 1994 FSA. (Tr. 1725.) He testified that it would be "conceptually illogical" that the land value would drop to zero, as one might think based upon the later FSAs. (Tr. 1789.) He considered the $1.70 figure to be the "cleanest data" available because later agreements included other consideration being traded and the agreements became increasingly complex. (Tr. 1789-90.) "[T]hat's the best evidence that we have to use that . . . crystallizes what was likely the contribution of the land in that particular location given all of its unique attributes." (Tr. 1791.)

Regarding Dr. Power's use of three properties outside the immediate market to support his analysis based on royalty payments, Mr. Truax agreed that "there are instances like this that are very unusual, where that method was employed." (Tr. 1694.) He conceded, as did Dr. Power, that these are not direct comparables, but testified that

they demonstrate that a royalty approach has been used to answer the question of how to value access through a surface owner's property to reach subsurface minerals. (Tr. 1695-96.) He explained that he has generally seen percentage rate provisions in the commercial context in circumstances where the parties anticipate very high retail profits. (Tr. 1717-18.)

Mr. Truax acknowledged that a 7% real discount rate is "low," but stated that it is not unreasonable in context. (Tr. 1710.) He stated that he is aware of similar applications of the rate to amortize costs within the oil industry in Louisiana. (Tr. 1711.) Regarding "the use of hindsight data," or the "backcasting" information generated by the defendant-intervenors' witnesses to show that BPX could have developed oil from other locations, Mr. Truax testified that appraisers attempt to avoid using information that was not currently known at the time when trying to set a value at some point in the past. (Tr. 1711-12.) However, he testified that in this case the oil companies involved were "knowledgeable, sophisticated producers" with good information that increased over time. (Tr. 1712-13.) So, he explained, it was appropriate to use actual data about the actual benefits of the allotment in light of the absence of any "really solid source" of evidence showing the companies' "firm estimate" at that time. (Tr. 1713.)

Regarding Dr. Power's conclusion that damages would range be in the range of $23 to 26 million, Mr. Truax agreed that the numbers are very high compared to other sales and rents on the North Slope; however, he testified that the numbers are justified

based in the unique traits of the Oenga property. Mr. Truax stated, "[I]f you don't look at the particular attributes of a given property that are unique and special, you can miss by a mile." (Tr. 1722.) He provided numerous examples from his experience in which sites with unusual location or logistical advantages have commanded prices many times higher than surrounding properties, such as $30 per square foot where surrounding values were $2, or $30,000 per acre where surrounding area sold for $1500. (Tr. 1722-23.) These prices, he explained, reflect the fact that these properties had critical value. (Tr. 1723.)

During cross-examination, Mr. Truax confirmed that he had not himself appraised the allotment and had not developed an independent value opinion. (Tr. 1736.) Rather, he explained that he had evaluated Dr. Power's analysis and was confident in the results that analysis had produced. (Tr. 1736.) He had described some of Dr. Power's techniques as "innovative" but explained that this piece of property "did not lend itself to completely traditional application of the standard approach to value." (Tr. 1776.) Mr. Truax testified that he has never been to Alaska nor appraised any land in Alaska, but stated that he has previously appraised land without visiting it and found nothing wrong with that. (Tr. 1768, 1770.)

Mr. Truax acknowledged that there is a dispute as to whether BPX made a profit from the $1.70 access fee depending upon the actual cost of the facility, but testified that what is important to Dr. Power's analysis was ARCO and Exxon's willingness to pay

that fee because it represented, to those companies, a fair fee for the right to access the property in order to access their West Niakuk accumulation. (Tr. 1738-39, 1772.) He testified that he assumed the parties to that FSA would have negotiated in good faith to their own advantage. (Tr. 1773.) In his view, "[C]learly there was a land component and an improvement component[] at that point in time." (Tr. 1739.)

Mr. Truax testified that he believed it was reasonable for Dr. Power to attribute the entirety of the residual value after subtracting the cost of the facility to the land. (Tr. 1760-61.) He did not know whether Dr. Power's calculation included reclamation costs or the cost of taxes. (Tr. 1792.)

Mr. Truax agreed that the three properties used for Dr. Power's royalty approach did not represent comparables. (Tr. 1748-50.) He explained that other properties on the North Slope, however, were also not comparable because they did not offer the same competitive circumstances as the Oenga allotment. (Tr. 1751-52.)

Mr. Truax agreed that normally when a potential tenant has two identical options, he will choose the cheaper of the two: "[I]n an environment where you had multiple options that are viable, then certainly . . . any reasonable-minded person would . . . generally choose the one that accomplishes the goal that is the least costly . . . ." (Tr. 1758.) When asked whether he agreed with Dr. Power's opinion that the amount of cost savings represented land value rather than the upper end of a negotiating range, Mr. Truax explained:

> [C]ost savings is not necessarily land value, if you will, in and of itself. . . . [I]t is an economic concept and a financial calculation . . . . It is the benefit that flows from one using the one means of accessing the oil over the other.
> . . . .
> If you change the parameters a bit, and . . . said that there's no oil accumulations off Heald Point, my answer would certainly be a lot different.
> . . . .
> [But] in a circumstance where you have a very unique property, with unique attributes, which provides real cost benefits to potential users, and it's competitive, the limited market circumstance, yes.

(Tr. 1761-62.)

Mr. Truax testified that parcel size can, but need not, affect the fair market value of a piece of property. (Tr. 1771-72.)

2. Defendant's Witnesses

The government called Arnold Tesh, a real estate consultant and appraiser, as its first witness. Mr. Tesh has worked as an assessor in the Los Angeles County Assessor's Office, as President of an advisory subsidiary of General Growth Properties, as Director of Real Estate in the Law Department of the United States Railway Association, as a consultant for his own firm, as President of Jackson Cross Real Estate in the mid-1980s, and currently as Senior Vice President of Economics of Network Industries at FTI Consulting. (Tr. 886-88.) In his work for the Railway Association, he was involved in valuing 24,000 miles of real estate in a railroad bankruptcy case, a major issue of which was assemblage. (Tr. 886-887.) During his time at Jackson Cross Real Estate, he valued "every inch" of the Alaska Railroad that was being transferred from the United States to the State of Alaska. (Tr. 888.)

While Mr. Tesh did not perform his own appraisal of the Oenga allotment and did not have an independent view of its rental value, he reviewed Dr. Power's assessment, and Mr. Tesh testified that the methodology used by Dr. Power is "not consistent with real estate appraisal, and it does not produce credible present fair annual rental." (Tr. 889.)

Mr. Tesh agreed that the Oenga allotment is "a unique piece of property," and that "this property is better than many properties, if not all properties in the area." (Tr. 891.) He also testified that the allotment is "one of the toughest properties I've ever seen to value." (Tr. 900.) However, he testified that despite its uniqueness, "there's no conceivable way" that the large value Dr. Power generated could be the true value of the allotment. (Tr. 893-894.) He explained that using Dr. Power's income approach would result in the property being valued at over $70 million. Mr. Tesh explained that this would produce a value of approximately $41 per square foot, as much as property in downtown Anchorage. (Tr. 894, 895.) "It could very well be the most valuable 40 acres in the entire state of Alaska, based on that appraisal." (Tr. 901-02.) If this $70 million figure is correct, Mr. Tesh stated, someone should have been willing to pay that amount to purchase the land. (Tr. 895.) Other properties on the North Slope, by comparison, rent for $3000 to $4000 per acre as compared to Dr. Power's $125,000 per acre rental value. (Tr. 987-98.) Put another way, typical North Slope properties rent for $.20 to $.30 per square foot, rather than Dr. Power's $2.85 per square foot. (Tr. 906-07.) Mr.

Tesh testified that it is important to remember that the allotment is to be valued as vacant tundra, although "[u]niquely positioned, well-located for the purposes it's currently used [for] . . . ." (Tr. 900.)

One problem, Mr. Tesh explained, is that Dr. Power used "data that would not be available on the date that you're . . . trying to determine rent"; or, in other words, Dr. Power was performing a damages calculation rather than a PFAR appraisal. (Tr. 889-90.) Looking backwards, Dr. Power assumed that the lessor had perfect information about the lessee, but "[t]hat just doesn't happen in negotiation." (Tr. 905.) Mr. Tesh explained that "in any negotiation, the lessee also knows what the lessor's alternatives are . . . ." and is able to use that information to negotiate a lower price. (Tr. 898.)

In Mr. Tesh's opinion, additional problems with Dr. Power's methodology included his failure to provide an allowance for restoring the land after use, using the $47 million cost of the Heald Point facility rather than the updated $58 million figure provided in Dr. Frankenburg's later spreadsheets, and using a 7% discount rate rather than a higher discount rate signaled by the stock market and oil prices at the time. (Tr. 903, 908.) The discount rate, he said, produces a residual that "does not represent fair market value or fair annual rent. It represents, at best, that the deal could make sense for BP to enter into."[64] (Tr. 908.) He said during redirect that using an income-based

[64]During his redirect testimony, Mr. Tesh further explained that a higher rate should have been used for the building than for the land in order to achieve a valid residual value for the land.

method for valuation would be the "last choice" for an appraiser valuing a piece of property like the allotment. (Tr. 933.)

Mr. Tesh took issue with the omission of rent that had already been paid to the Oengas from the calculation. (Tr. 908.) He also explained that it was inappropriate to analogize the use of a royalty approach by comparing the approach to the approach used in setting rent in shopping centers. (Tr. 899.) Large, stable stores tend to pay a lower fixed rental rate and not rent based on sales per square foot. (Tr. 899.) And he seemed to have trouble with the fact that Dr. Power's valuation was not tied to the amount of acreage leased, so that the same valuation would apply whether BPX had leased 10, 20, or all 40 acres. (Tr. 907.)

Finally, Mr. Tesh wondered why Mr. Truax, an appraiser, did not perform the appraisal himself. (Tr. 901-02.) Mr. Tesh indicated that using an economist to obtain a value opinion, rather than an appraiser, introduced additional subjectivity. (Tr. 902.) "I'm surprised, and somewhat disappointed . . . that Dr. Power's work was found appropriate by Mr. Truax, who happens to be a very accomplished and qualified professional appraiser." (Tr. 909.)

On cross-examination, Mr. Tesh agreed that the principles used in appraisal are grounded in economics. (Tr. 913.) He testified that his only academic training with regard to economics was with regard to land economics, another word for appraisal,

although various professional appraisal courses he has taken included references to land economic principles. (Tr. 914-15.)

He acknowledged that he did not do an independent analysis of BPX's options for directional drilling into the Niakuk oil accumulation. (Tr. 917-18.) He did, however, testify that he is aware that BPX had options, as shown by Dr. Power's analysis of avoided costs. (Tr. 919.) He agreed that "considering avoided costs is a prudent thing to do," but explained that "when you determine avoided costs and say that . . . the owner of the land gets all of that avoidance, there's nothing avoided. All you're doing is instead of paying the cost, you're paying the landowner in the form of rent" (Tr. 919.) He explained that "in the real world," as to opposed to "a perfect mathematical market," transactions where the landowner recoups the entire cost savings do not happen. (Tr. 920-21.)

Mr. Tesh testified that the best way to value land is through the use of comparable data. Using a residual technique that requires multiple assumptions can lead to a nonsensical answer. (Tr. 921.) "The bottom line is that if the methodology were perfect and the answer made no sense, I would . . . still be concerned. I think the methodology is faulty, and I don't think the answer makes any sense." (Tr. 921-22.) He explained that if there were other sales on the North Slope that were reasonably related to the allotment and were selling for amounts near the value projected by Dr. Power, that valuation could make sense. (Tr. 922.) He testified that while it is difficult to make adjustments to compare one

property to another, it can be done, and has been done with the allotment by BPX and BIA appraisers over the years. (Tr. 923.) He agreed that the allotment, because of its uniqueness, may have a higher value that neighboring property, but also noted that because of its location, it is not well-suited for uses other than oil production. (Tr. 925.) He took issue with the fact that neither Dr. Power nor Mr. Truax had visited the allotment, while other appraisers testifying in the case have looked at the property, looked at comparables, and made a value conclusion on that basis. (Tr. 923-24.)

The government next called Mr. Marchitelli, an appraiser with multiple professional appraiser designations and 40 years of experience. (Tr. 2034-35.) Mr. Marchitelli is the former editor and chief of the Appraisal Journal published by the Appraisal Institute as well as Real Estate Issues, published by the Counselors of Real Estate; he remains on the editorial board of the latter. (Tr. 2035-36.) He was also involved in the publication of three past editions of The Appraisal of Real Estate and supervised production of two editions of The Dictionary of Real Estate Appraisal. (Tr. 2036.)

The government did not ask Mr. Marchitelli to appraise the Oenga property in the first instance. The government hired Mr. Marchitelli to opine on the incremental value of the Oenga allotment attributable to its use for oil production from the Lisburne PA only.[65]

[65] Although he did not analyze the value of using the allotment to access the West Niakuk or Raven PAs, Mr. Marchitelli testified that his approach to valuing that right "wouldn't be any different" than he had employed for Lisburne. (Tr. 2070-71.)

(Tr. 2039; Ex. 2138.) Mr. Marchitelli acknowledged that "the data is imperfect . . . . the market data is limited, and . . . it is a challenging appraisal assignment." (Tr. 2045; Ex. 2138.) Because of this dearth of data, he "could not quantify[] any increment that would be allocable solely to the right to do directional drilling into Lisburne . . . ." (Tr. 2046.) Mr. Marchitelli summarized his major conclusions as follows:

> [T]he existing market data does not provide a reliable basis for determining any increment in the [PFAR] of surface rights to the subject property that are allocable solely to Lisburne. I further concluded that if this increment did exist . . . that it would be de minimis and certainly no more than 10 percent of the rent that was actually being paid.

(Tr. 2038.) In concluding that the incremental value would be no more than "10 percent of the rent that was actually paid," Mr. Marchiteilli did not appraise the market value of the allotment as a whole, but instead he apparently assumed that the rent BPX had been paying the Oengas represented fair rental value. (Tr. 2044.) He testified that he had searched for comparable data that would allow him to draw a conclusion regarding the incremental use of the allotment, but could not find anything helpful. (Tr. 2092.) He was unable to find such data because he could find no other situation where a lease limited the lessee's ability to drill into certain geographic areas. (Tr. 2093.)

He agreed that the highest and best use of the property is for "oil exploration, and production, and transmission, and as a staging area for those activities related to directional drilling." (Tr. 2037.) He also agreed that "if a site has a [highest and best use] for directional drilling it's superior to a site that doesn't." (Tr. 2049.) He testified that

Heald Point is a "more desirable location" than other potential drilling sites, but also explained that because there were a limited number of potential users, the landowner would not have all of the negotiating power. (Tr. 2050.)

He clarified that The Appraisal of Real Estate does not require comparables to have the same use as the subject property, but states that they should have a similar use. (Tr. 2047.) He further explained that this text states that where there are limited sales, there are other alternative appraisal methods other than the valuation methods Dr. Power used. (Tr. 2047-48 (citing The Appraisal of Real Estate, supra, at 169).) He explained the difference between use and market value, stating that use value is "the value of the property to the enterprise . . . . used for accounting purposes," and does not take into account the highest and best use of the property or the amount that the property could sell for in the market. (Tr. 2056-57.)

Regarding Dr. Power's use of the access fee from the 1994 West Niakuk FSA, Mr. Marchitelli explained that the land residual technique, as he called it, is "used very rarely" by appraisers, but quoted The Appraisal of Real Estate to say that "historically the land residual technique was used to estimate land value when sales data on similar parcels of land was not available." (Tr. 2059 (quoting The Appraisal of Real Estate, supra, at 368).) Further, he stated that he did not think the FSA had "anything to do with the value of the property" and was simply a "cost sharing agreement." (Tr. 2069.) Mr. Marchitelli testified that a potential lessee would not pay more than the market rent, as set by

comparable properties, even if that lessee could afford to do so. (Tr. 2050-52.) He stated that Dr. Power had analyzed the "affordability" of the allotment to particular users, rather than the market value. (Tr. 2051-52.)

With regard to Dr. Power's use of the cost saving approach, Mr. Marchitelli testified that his objection to Dr. Power's cost savings method was that Dr. Power attributed the full cost savings to the landowner . (Tr. 2053-54.) He also rejected the conclusion that the royalty approach was an appropriate approach for determining PFAR. (Tr. 2037.) He testified that in his opinion, Dr. Power's economic analysis would not be accepted after peer review in either of the appraisal journals with which he has been professionally involved. (Tr. 2076.)

In response to questioning by the court, Mr. Marchitelli was unable to explain how he arrived at his 10 percent incremental value with regard to use of the allotment for production from Lisburne. (Tr. 2068-69.) Rather, he simply testified, "[I]t's a judgment call . . . . It seems reasonable." (Tr. 2069.)

The government next called Dr. Kenneth Vogel, who holds a JD and a Ph.D in public policy analysis with a specialty in economics from the University of Pennsylvania. (Tr. 2097-98.) Dr. Vogel worked in various capacities for the Department of the Interior MMS from 1988 to 2005, including as the Chief of the Internal Review Division, the Royalty and Management Analysis Division, and the Office of Enforcement. (Tr. 2099.)

Since 2005 he has worked for FTI Consulting. (Tr. 2101.) Dr. Vogel's expert report was not offered into evidence.

Dr. Vogel testified that the Oenga allotment has an advantageous position. (Tr. 2102.) However, even though he did not determine fair rental value for the allotment, he opined that the rent for the allotment has been "pretty close to the fair annual rents for . . . all possible uses at that leasehold," and thus no damages are due for the production from accumulations exceeding the scope of the lease because the rent set over the years has included the right to produce from all formations. (Tr. 2102.)

Dr. Vogel defined fair market rent as "the amount a willing . . . lessee would pay a willing . . . lessor, when both of them are free to enter or not enter the agreement." (Tr. 2113.) Dr. Vogel testified that he believed Dr. Power's analysis was designed to provide a value for "economic rent" as opposed to "market rent" and that economic rent is different from market rent, in that economic rent "is a menagerie of gains to both parties for the use of a scarce resource." (Tr. 2114.) In a market, Dr. Vogel explained, a seller will not sell unless the offer is greater than the higher of either the value that seller assigns to the property or the value of expected competing offers. (Tr. 2115.) Similarly, a buyer will not pay more than the lower of the net cost of an alternative plan or the extra profit expected from the property. (Tr. 2116.) Dr. Vogel testified that Dr. Power attempted to calculate these two values that represent the upper boundary of what a buyer will pay. (Tr. 2116.) However, "[n]o one would give away every penny they expect to earn from a

piece of property, because there's no reason to have that piece of property." (Tr. 2116.) However, he did not say where, within this bargaining range, a willing lessor and lessee would likely negotiate rent. (Tr. 2116.) Land value, he explained, does not depend on the success of the tenant. (Tr. 2117.) Rather, "[t]he market is always based on expectations . . . before you know whether you're successful or not." (Tr. 2117.)

Dr. Vogel also took issue with Dr. Power's technique of determining the total value of the allotment and then allocating that value to the actual uses to which it was put. (Tr. 2122.) Rather he testified that Dr. Power should have valued only the incremental costs based on the cost of alternatives to each. (Tr. 2123.)

Regarding Dr. Power's income approach, Dr. Vogel presented an alternative calculation using an 11% rate of return as compared to the 7% rate Dr. Power used. (Tr. 2135.) This higher rate, he explained, includes expected inflation, so it is equivalent to a 7% real rate as opposed to a 7% nominal rate, which does not include inflation. (Tr. 2135.) Using this higher rate for the amortization of BPX's Heald Point capital costs, and leaving the other parts of Dr. Power's $1.70 access fee analysis the same, Dr. Vogel calculated a residual rent of $.61 per barrel as compared to the $.85 Dr. Power calculated. (Tr. 2135.) He also presented calculations using the $1.25 and $.50 fee schedule from the 1996 FSA, explaining that upwards of 144 million barrels would need to be produced to pay off the amortized facility cost at those rates. (Tr. 2137.)

Finally, the government called Mr. Carlson, the current president of the Alaska Chapter of the Appraisal Institute and the appraiser who conducted BIA's appraisals of the Oenga allotment in both 2006 and 2010. (Tr. 1909.) Mr. Carlson testified that he has experience conducting many market rent assignments for public agencies and that he had bid on and received the Oenga appraisal assignment through a competitive process. (Tr. 1909-10.)

Mr. Carlson testified that use value and market value are different appraisal goals and would be infrequently the same. (Tr. 1916.) Market rent is the "most probable rent that a property should bring in a competitive and open market . . ." while use value or economic value is "the value of a property for a specific use," without regard to any alternative use. (Tr. 1913, 1917.) Mr. Carlson explained that if an appraiser is looking for use value, his inquiry becomes divorced from the market value of the land and may involve looking for similar uses outside the geographic area. (Tr. 1918-19.) Mr. Carlson explained that if an appraiser sees a pattern of value in a market and then comes across a piece of data falling outside that pattern, the appraiser will consider this an outlier and investigate the conditions of the sale to determine whether the higher or lower price was "subject to undue stimulus, or any atypical motivation," in which case it would not meet the market test and would be routinely excluded from consideration. (Tr. 1921-22.)

In conducting his appraisal of the allotment concluded in January of this year, Mr. Carlson explained that he identified two distinct districts in the area: the oil production

district and the Deadhorse Airport industrial district. (Tr. 1923.) The oil district, he explained includes "no recent transactions," leading him to conclude that "the data from that market . . . is inadequate," offering zero comparables from which to draw a conclusion about the market value of the Oenga allotment. (Tr. 1924; Ex. 3429.) The Deadhorse Airport industrial district encompasses land within the airport on the North Slope in which rents are generally set by a fee schedule, but when multiple bidders are involved, actual rents may be much higher. (Tr. 1924-25; Ex. 3429.) Mr. Carlson explained that he identified 13 relevant transactions in this district, of which 4 were set by appraisal, 4 were single-bid new leases ranging from 0% to 53% above the appraised minimum, and 5 were new leases with multiple bids ranging from 16% to 192% above the appraised minimum. (Tr. 1926-27; Ex. 3429.) Mr. Carlson found this set of data to be "marginally adequate" for valuation of the Oenga allotment. (Tr. 1927.) However, he felt that he could overcome this dearth of data, stating that "this problem complicates the proposal, but it doesn't justify abandoning the fundamentals" of the assignment to determine market rent, such as looking instead at use value. (Tr. 1936-37.)

Mr. Carlson explained that the "extreme" bids in the third set of transactions were influenced by "undue stimulus" or "unique bidder requirements." (Tr. 1928; Ex. 3429.) His report shows that these four excluded properties rented for between $20,953 and $29,493 per acre, but were "unreliable as indicators of market rent." (Ex. 3429.) Rather, he explained, the best indicator of market rent is a "new lease off the street." (Tr. 1929.)

Mr. Carlson's report identifies the highest and best use of the Oenga allotment to be "extended reach drilling and production." (Tr. 1932; Ex. 3429.) He admitted that none of the transactions he identified matched this use, nor more generally use for "oil and gas." (Tr. 1938.) However, he justified his use of these transactions because he found that the non-oil and gas properties in the Deadhorse Airport industrial district would likely have a longer life than properties whose value is reliant on continued production of oil, which he believes is in decline in the Prudhoe Bay area. (Tr. 1938-39.) Mr. Carlson testified that he did not use examples of arrangements where surface owners received compensation as a share of production (or the royalty approach) because these agreements "didn't meet the market test," and provided "no meaningful unit of comparison that I could apply to the subject, other than just the percentage itself." (Tr. 1934-35, 2006.)

During re-direct, Mr. Carlson stated:

> [N]ormally the data would tell us . . . how much of an advantage a location would give you. I mean certainly it's important in any appraisal. In this case, I'm not able to get that from the data. I talked about the wide ranges of prices that are reflected. They're all over the board, but in my analysis the way I applied the data in those prices was to recognize that it was strategic. The location was strategic.

(Tr. 2005.) He testified that he accounted for this strategic location not by looking to what potential buyers might be willing to pay, but by looking to other market transactions. (Tr. 2005-06.)

Mr. Carlson further testified that he valued the tip and stem of Heald Point differently, because he considered the tip of the allotment to be the most strategic, while

the lower 30 acres merely "provides access." (Tr. 1940, 1944-45.) He concluded that the 10 acres at the tip were worth $11,000 per acre while the remaining stem acreage was worth $5,500 an acre, providing an overall value of the allotment of $6,875 per acre, or $275,000 per year in rent. (Tr. 1946-47; Ex. 3429.)

During cross-examination, Mr. Carlson admitted that none of the properties relevant to the 13 transactions in his report are used for directional drilling. (Tr. 1967.) "There [are] no truly similar comparables. That's no secret." (Tr. 1970.) The industrial properties, he explained are the "most reasonable proxy," and that he thinks it is more reasonable to look to these properties than directional drill sites outside the geographic area. (Tr. 1970-71.) However, he concurred that if a property has a "distinct market advantage" because of its location allowing access to oil, that would be a relevant consideration in determining value. (Tr. 1983.) He did not think other techniques, such as looking to the cost of the Heald Point facility and alternative sites for drilling, were appropriate, and he did not conduct research that would have supported the application of these methods. (Tr. 1975-79.) However, Mr. Carlson testified that he did contact counsel for BPX during his 2010 appraisal to get background information about the wells and remaining oil near Heald Point. (Tr. 1960-62.) He testified that BPX counsel "just directed me to information that was publicly available on-line." (Tr. 1961.) Mr. Carlson acknowledged that he made no similar contact with the Oengas or their representatives. (Tr. 1961.)

Mr. Carlson explained that his decision to value the stem of the allotment separately from the tip acknowledged the stem's "strategic" offer of access to the tip, but he found that the stem was "less strategic." (Tr. 1985-86.)

3. Defendant-Intervenors' Witnesses

In addition to his testimony on liability, Mr. Obeney, from BPX, also presented testimony regarding the alternatives that were available to BPX when it decided to use the allotment for a drill site. He testified contrary to Mr. Wondzell's assumptions that BPX could have constructed a bypass with a drill pad along the side of the allotment ("bypass drill pad"), which would have involved similar costs to the bypass BATNA he had earlier testified about. (Tr. 1013.) He opined that USACE would have permitted this bypass drill pad option because a bypass without a causeway, specifically a bypass road that did not protrude beyond Heald Point, would not affect offshore currents, salinity, temperature, or fish migration, which were the USACE's main concerns, as shown by its denial of BPX's causeway permit applications and approval of fill at the tip of Heald Point. (Tr. 1022-24, 1028-29; Exs. 3522, 3212.)

Mr. Obeney testified that Dr. Power's assumptions regarding the 1994 West Niakuk FSA and its $1.70 access fee were mistaken. (Tr. 1030.) He testified that these FSAs "were premised on all parties paying their pro rata share of the costs of the capital investment." (Tr. 1030.) "No portion of the access fee . . . was attributed to the location, or the advantage of the location versus someplace else." (Tr. 1034.) The general approach

to negotiating a FSA, he testified, is represented in a 1993 letter to ARCO from BPX's Jack Golden, which Mr. Obeney described as "setting a per barrel price that when multiplied by the expected project throughput would equal the overall shared investment in the project . . . ." (Tr. 1033, Ex. 3243.) In other words, the total cost of the facility including pipeline and injection wells but excluding producing wells would be divided by the predicted reserves, thought at the time to be 54 million barrels; this calculation produced a per-barrel price of $1.76. (Tr. 1033, Ex. 3243.) The actual negotiated cost for ARCO and Exxon's access to the Heald Point facility was $1.70 per barrel per the 1994 FSA. (Tr. 1034-35, Ex. 3263.) He explained that in the Lisburne-Niakuk FSA, no access fees were paid because BPX instead traded Heald Point access for high pressure gas used to aid production. (Tr. 1035, Ex. 3262.)

Mr. Obeney further testified that Dr. Power's use of a 7% discount rate for costing out the $47 million facility was not valid to the extent that it was based on the BP 7% "hurdle rate." Mr. Obeney had previously testified that he had to justify any capital expenditure by showing that it would be profitable using a 7% discount rate. Mr. Obeney testified that BPX used a "7 percent rule discount rate," meaning that a first step to considering projects to be funded would be determining whether the expected return on investment was at least 7%. (Tr. 1095-96.) "That's the threshold to get you in the door to start having a conversation about all the other issues." (Tr. 1097.) In other words, a

project would not be considered unless it would break even, applying this 7% rate. (Tr. 1095.)

During cross-examination, Mr. Obeney confirmed that BPX did not specifically cost an option of a bypass road with a drill pad, as opposed to a bypass road leading to a causeway, but stated that "when we look at the total amount of gravel that would need to have been placed at the tip of Heald Point . . . compared with the amount of gravel that would need to be placed at a drill site at the tip . . . of the bypass road[,] [t] the quantities would not have been . . . significantly different." (Tr. 1056, 1062-63.) Mr. Obeney also confirmed that such a bypass drill pad option had never actually been presented to the USACE, nor even discussed internally at the time of the permit applications, because once BPX had negotiated a lease with the Oengas, it no longer needed to pursue other options. (Tr. 1061-62.) Mr. Obeney admitted on cross-examination that he did not ask BPX's legal department to review the legality of a bypass road off the western shore of Heald Point and in particular whether the bypass option would potentially interfere with plaintiffs' rights of ingress and egress with respect to the allotment. (Tr. 1054.)

On cross-examination, Mr. Obeney was presented with a November 1988 memo he wrote to his boss regarding a $1600 per acre for 10 acres counteroffer from Andrew Oenga, which the memo referred to as "a very favorable counter[]offer" and less than his expected counteroffer of $2000 per acre for 40 acres. (Tr. 1079, Ex. 1621.) The memo also stated, "The BIA offered that Oenga, being an old chap, would prefer to get some of

the rental payments in advance rather than leaving the benefits to his heirs," although Mr. Obeney testified that he had no direct contact with the BIA and must have gotten this tip from someone else within BPX. (Tr. 1079, Ex. 1621.)

He conceded with regard to the discount rate that in BPX's "Niakuk Project Summary," from 1986, BPX used a "net present value assessment in considering the overall economics of the project. . . . The costing is done, the revenues are done, and they are combined, and then the resulting net revenue is discounted." (Tr. 1043; Ex. 3075.) He explained that BPX used a 7% real discount rate. (Tr. 1043.)

The defendant-intervenors next called Mr. Miller, a drilling engineer who has spent 29 years working for BPX on the North Slope in various capacities, to testify about an analysis he had done regarding alternatives to use of the allotment for developing the Lisburne oil accumulation. Most relevant to this case was Mr. Miller's work as drilling engineer at the Heald Point facility from November 1993 to April 1994, during which time he planned the technical design and formed a cost estimate for NK-26, the well drilled from Heald Point into the Lisburne accumulation in 1994. (Tr. 1852.) He also has much other experience designing and costing wells over the course of his career. (Tr. 1854.)

Mr. Miller prepared a report in which he looked at the feasibility and costs of drilling wells NK-26 and NK-25 into West Niakuk from different locations apart from the Oenga allotment. He examined the feasibility of three alternatives: an alternate location just south of the allotment, the L-5 drill site, and a location just west of Heald Point that

could have been the site of a bypass drill pad. (Tr. 1855-56; Ex. 3432.) In addition, Mr. Miller assessed the cost of each of the wells at each of these sites. (Tr. 1855.) To determine feasibility, Mr. Miller first calculated the departure distance from the alternate surface locations to determine whether technology at the time of construction of NK-26 and NK-25, in 1994 and 1997, respectively, would have allowed the companies to reach the same bottom hole locations. (Tr. 1857.) Mr. Miller created a plot showing the departure distance that was possible at different points in time and found that in 1994, when NK-26 was drilled, technology would have allowed that well to be drilled from any of the three alternate locations. (Tr. 1857-59; Ex. 3432.) Similarly, NK-25 could have been drilled from any of the three alternate locations in 1997. (Tr. 1857-79; Ex. 3432.)

Mr. Miller explained that he next used the average cost of all of the Niakuk wells and divided those costs by the measured depth of each well to find the average drilling cost per foot. (Tr. 1860.) He plotted these costs per foot against the total measured depth of each well and drew a line of regression to estimate the costs per foot that would have been expected to occur when drilling from the alternate sites. (Tr. 1861; Ex. 3432.) Mr. Miller explained that these average costs per foot included "trouble time" and "trouble cost," which are incurred when an "event that occurs which is both unwanted and unplanned, which happens on most wells." (Tr. 1859.) In other words, when calculating the expected cost of the hypothetical NK-26 and NK-25 drilled on alternate sites, Mr. Miller used a cost per foot that include an average amount of trouble costs. (Tr. 1861.)

Mr. Miller concluded that when he compared the actual costs of drilling NK-26 and NK-25 with the cost of the pair at alternate sites, he found that a location south of the allotment would have cost $483,000 more, L-5 would have cost $2.43 million more; and a location on a bypass drill pad to the west, would have cost $264,000 more. (Tr. 1864; Ex. 3432.)

During cross-examination, Mr. Miller acknowledged that his cost calculations did not include the construction of the bypass drill pad or the construction of a pad just south of the allotment. (Tr. 1878-79, 1889-91.) He also stated that his figures were calculated in 1994 and 1997 dollars for the two wells, respectively, but he had not calculated what the present value of those figures might be. (Tr. 1888.)

Mr. Miller admitted that the actual NK-26 costs on his cost comparison table include the trouble costs that were in fact "the highest amount . . . of any well in that area."[66] (Tr. 1894-98.) Despite the fact that these actual costs were unusually high, Mr. Miller used an average trouble cost in calculating his numbers to be compared. (Tr. 1895.) The witness explained that using an average number amount of trouble costs is "the normal way to calculate drilling costs" but acknowledged that he could have "compar[ed] apples and apples" by increasing the expected amount of trouble costs for the NK-26 well drilled at alternate locations to reflect the abnormally high trouble costs that increased the figure for the actual NK-26 well. (Tr. 1899.) While he had not done such a calculation, he

[66] During redirect, Mr. Miller testified that, unlike NK-26, the actual cost of NK-25 was slightly lower than the average of other wells in the area. (Tr. 1905-06.)

acknowledged that the if he had done this, the predicted NK-26 drilling costs would be higher than the figures he had calculated. (Tr. 1900.)

The defendant-intervenors then called Mr. Reinbold, a current ConocoPhillips employee who has worked for ARCO and related companies since 1985.[67] (Tr. 1795.) Mr. Reinbold, a petroleum engineer, has worked primarily on the North Slope, and his responsibilities related to the Niakuk Project spanned 1995 to 1998, during which time he was involved in well planing as well as technical and commercial support for access and equity negotiations. (Tr. 1796-97.)

Mr. Reinbold testified about the 1994 West Niakuk FSA; although it was in place when he became involved with Heald Point negotiations, he became very familiar with it as he worked to negotiate subsequent agreements. (Tr. 1798-99.) This FSA, he explained, provided access for only a single well at Heald Point, NK-27, drilled in the spring of 1995.[68] (Tr. 1799, 1800; Ex. 3263.) The FSA "enabled [ARCO] and Exxon to demonstrate an ownership in West Niakuk, and that was very critical to us. We didn't fully understand the geology." (Tr. 1800.) The companies felt they had a contiguous interest in the Niakuk accumulation, but were unable to prove their case before the AOGCC and DNR having not drilled a well. (Tr. 1800-01.) This FSA "provided us an opportunity to . . . get into the game." (Tr. 1802.) Mr. Reinbold explained that the 1993

[67] When ARCO was taken over by BPX in 2000, BPX had to divest the ARCO's North Slope holdings to ConocoPhillips.

[68] This first well was exploratory, but was then used for production. (Tr. 1802.)

letter from BPX's Jack Golden "was indeed the starting point" for the negotiations. (Tr. 1802-03; Ex. 3243.) From this letter, which provided a simple formula of costs divided by the expected 54 million barrels with no discounting, ARCO was able to calculate that BPX was representing its investment costs at about $95 million. (Tr. 1804.) ARCO did not, however, believe this number included any profits for BPX, and was limited solely to BPX's actual costs ("value-based equity"). (Tr. 1805.) "[ARCO] believed very firmly that the concept of . . . value-based equity clearly indicated that BP was not to profit on these facilities . . . ." (Tr. 1805.) Mr. Reinbold stated that ARCO also intended for the $1.70 per barrel fee in this agreement to apply only to the first well, and wanted to reopen negotiations if it wanted to drill additional wells. (Tr. 1805-06.) However, Mr. Reinbold acknowledged that this intent is "not clearly defined in the agreement," and BPX intended the $1.70 fee to apply to all ARCO and Exxon oil produced through Heald Point from West Niakuk. (Tr. 1806; Ex. 3263.) ARCO ended up paying $1.70 per barrel for approximately 2 million barrels that were produced from NK-27 alone. (Tr. 1829.)

Regarding the 1996 FSA, Mr. Reinbold explained that ARCO viewed the newly adjusted fee as a "fair access fee recognizing that now we had a much bigger stake in West Niakuk and the overall reserves for the Niakuk [a]rea were obviously considered larger." (Tr. 1811; Ex. 3300.) Most provisions in the agreement were about establishing good reservoir management practices, but it also provided a foundation for the way the companies involved would share ownership of the oil produced from the accumulation.

(Tr. 1811-12.) By 1996, he explained, ARCO felt its West Niakuk leases were performing better than BPX's eastern leases, so ARCO was no longer interested in integrating its interests with BPX.[69] (Tr. 1812.) "[W]e accepted that we were going to pay a fee because we didn't want to integrate our interest across all of Niakuk." (Tr. 1814.) Mr. Reinbold testified that at this point ARCO's goal was still to help BPX recoup its facility cost without providing a profit. (Tr. 1814.) At the time of this agreement, ARCO thought BPX's facility costs were about $55 million and believed the available resources totaled around 100 million barrels. (Tr. 1815-16.) Given the cost divided by barrels calculation without discounting, this should have provided a fee of $.55 per barrel. (Tr. 1816.) ARCO did its own calculations involving discounting and determined it would be willing to pay up to $1.05 per barrel; the ultimate agreement involved an access fee of $1.25 for the first 10 million barrels produced from West Niakuk and $.50 thereafter. (Tr. 1817; Ex. 3300.) ARCO ended up paying the $1.25 fee for approximately 7 to 8 million barrels of oil produced before the access fee was eliminated in 2000. (Tr. 1830.)

Mr. Reinbold testified that ARCO was able to negotiate the much lower fee structure in 1996 because BPX knew ARCO had the option of drilling from its own L-5. (Tr. 1817.) He presented an evaluation he prepared in 1995 showing the costs for drilling nine wells into West Niakuk from Heald Point as compared to from L-5. (Tr. 1818-21; Ex.

[69]Later, when the Prudhoe Bay companies entered superalignment in 2000, the companies shared all production costs were going forward, but did not equalize their past production going backward in time. (Tr. 1813-14.)

3518.) This analysis shows that the drilling departures from L-5 were slightly larger than from Heald Point and so slightly higher in cost, however other costs were offset because L-5 was underutilized and had space available for additional wells, whereas Heald Point was in higher demand and the facility was tight, making construction difficult. (Tr. 1821-24.) Indeed, the chart shows that the gross drilling and facility costs from L-5 were estimated to be $1.6 million less than from Heald Point. (Ex. 3518.) Adding to this a $1.25 fee per barrel over 54 million barrels[70] for Heald Point access brought the total additional cost of Heald Point to $38.6 million. (Ex. 3518.) Mr. Reinbold explained that he strongly argued to his managers at ARCO that the company should drill from L-5, rather than Heald Point, and save both these additional costs and the access fees. (Tr. 1822.) "[T]hat should have been a strong motivator for [ARCO] to pursue the L[-5] development. This is something that was negotiated well above me, and they realized that BP had made a substantial development at Heald Point, and I think the fairness factor came in and they found some middle ground." (Tr. 1825-26.) The agreement, he explained, did not involve any value trading outside of the access fee. (Tr. 1826.)

Mr. Reinbold explained that ARCO and BPX were in equity negotiations from 1994 until superalignment in 2000, but ARCO still considered other companies in the area to be competitors throughout this period. (Tr. 1828.) The 2000 agreement came about quickly, he explained, with a BPX hostile takeover of ARCO. (Tr. 1828.) Until that point,

[70] ARCO, of course, managed to negotiate a final agreement that applied this $1.25 fee only to the first 10 million barrels. (Ex. 3300.)

"[w]e regarded our job as protecting the shareholders['] interest, and we fought vehemently for every dollar." (Tr. 1828-29.)

During cross-examination, Mr. Reinbold admitted that the 1994 agreement does not include a mention of injection wells being included in the access fee cost. (Tr. 1831-32.) He agreed that the companies' integration of interests was a major issue during the negotiation of the 1996 agreement. (Tr. 1834.)

Mr. Reinbold also acknowledged that had ARCO drilled its wells into West Niakuk from L-5, it would have processed that oil at the Lisburne Processing Center. (Tr. 1836.) To do this, however, ARCO would have needed BPX's consent, because, although BPX only owned a 20% interest in that facility, it had veto power.[71] (Tr. 1837.)

BPX's Dr. Frankenburg also presented testimony relevant to the damages phase of the case. Dr. Frankenburg offered her opinion on the access fees in the FSAs and regarding the costs of the facility. She explained that the monetary considerations in FSAs have two parts: capital expenses and operational expenses. "The capital component can be called either a capital access fee or an equipment access fee. And it's calculated usually on the total cost to build the facility divided by the total projected through-put . . . ." (Tr. 870.) The operations and maintenance fee "is that annual cost to run the facility," which is charged to the oil owners utilizing the facility. (Tr. 871.)

[71] On redirect, Mr. Reinbold testified that BPX could not unreasonably deny access and had suggested in 1993 that it would support ARCO and Exxon's use of the Lisburne processing center if those companies drilled their West Niakuk wells from L-5. (Tr. 1844-45.)

Dr. Frankenburg next testified regarding the total cost of the Heald Point facility construction. Dr. Frankenburg testified that in her February 2009 declaration, she gave a total cost figure of at least $47 million. (Tr. 872; Ex. 3286.) She explained that she used "at least" because she knew she "didn't have complete cost data" at that time. (Tr. 872.) That number was based on a spreadsheet of financial data, which she testified was inaccurate. (Tr. 872; Ex. 3424.) Since her declaration, she had additional data added to the spreadsheet, which produced a total construction cost of $57.9 million. (Tr. 872-73; Ex. 3511.) She also produced a 1994 internal memorandum showing that at that time the total facility forecast cost was $58.4 million. (Tr. 873; Ex. 3271.)

Finally, she testified that the West Dock, the facility built on the Ahmaogak allotment, is similar to Heald Point because of its "very strategic and valuable location." (Tr. 874.)

> [T]here are so many people that want to use it and it's such a limited space and limited amount of time that you can barge things in, that they have meetings twice a year when all the users get together and we try to coordinate the barge season and the winter staging season.

(Tr. 875.)

During cross examination, Dr. Frankenburg confirmed that her erroneous $47 million figure for construction costs was all that had been provided to the plaintiffs when the plaintiffs' experts were preparing reports. (Tr. 881.) Comparing the original summary of costs that had produced the $47 million figure (Ex. 1170) with the updated summary of costs (Ex. 3511), shows figures that she testified had been placed in

incorrect years. (Tr. 881-82.) In fact, Dr. Frankenburg admitted, even the summary sheet produced at her deposition, which was supposed to be a corrected version, had some errors which she was unable to reconcile during her deposition. (Tr. 881-883.)

The defendant-intervenors next called Mr. Leon Barry, an engineer who has worked in various capacities in the oil industry for 32 years, to testify. He is now an employee of ConocoPhillips, but worked for BPX on its Niakuk development from 1987 until 1994. (Tr. 2017.)

Mr. Barry testified that in 1988 he worked under the direction of Mr. Obeney to prepare a cost estimate for a bypass that would parallel Heald Point and connect to a causeway that would extend to Niakuk Island #4, the preferred drilling location at that time. (Tr. 2017.) The purpose of this estimate was to calculate the cost of not using the Oenga allotment and to provide the context for negotiating lease terms with the Oengas. (Tr. 2018.) He explained that his cost estimates for this bypass, not including the causeway to the island, ranged from $3.8 to $5.3 million in 1988 dollars, depending on the width of the road and source of the gravel. (Tr. 2018-20; Ex. 3109.) He did not convert this estimate to present day value. (Tr. 2023.)

Mr. Barry was also involved in preparing BPX's submissions to the USACE for the causeway to Niakuk Island #4. (Tr. 2020.) He testified that based upon the concerns the USACE expressed regarding the causeway, "there was no indication that the [USACE] would have opposed a gravel bypass adjacent to Heald Point," because such a

bypass would not have implicated the particular environmental issues that USACE identified in its decision. (Tr. 2021-23.)

During cross examination, Mr. Barry confirmed that although the bypass was considered conceptually distinct from the causeway, the design was the same for both. (Tr. 2028.) He also confirmed that he had not consulted with BPX's legal department to determine whether there were other considerations, such as the potential of blocking ingress to and egress from the Oenga allotment, that might be implicated by such a bypass option. (Tr. 2029-32.)

The defendant-intervenors' final witness was Dr. John Hekman, who holds an MBA and Ph.D in economics from the University of Chicago. (Tr. 2161.) Dr. Hekman's specialty throughout his academic career at numerous institutions has been the connection of economics to real estate. (Tr. 2161-62.) He stated that the main problem with Dr. Power's opinion was that Dr. Power had not rendered a market rent opinion, but instead had determined use value and economic value to suggest a rent that the allotment could command. (Tr. 2169, 2218-19.) "Any rent opinion that's not based on a market perspective by definition can't be a market rent opinion." (Tr. 2216.)

Dr. Hekman defined economic rent as "value over and above what would be necessary to bring . . . that land . . . to the market." (Tr. 2164.) He explained the difference between use value and market value using the "water-diamond paradox": water has a very low market value, but high use value because of its necessity for life;

diamonds have little use value but very high market value because of their scarcity. (Tr. 2166.) Thus, he explained, neither economic value nor use value are a measure of market value. (Tr. 2166-67.)

Dr. Hekman explained that determining market value for land requires defining the relevant market, both by geography and by the presence of certain buyers or sellers. (Tr. 2168.) The relevant market for the Oenga allotment would be other properties on the North Slope. (Tr. 2202.) Dr. Hekman testified that he concluded that this market is functioning and market prices are responding to supply and demand in the usual way. (Tr. 2204.) He did acknowledge that most of the land is owned by the state and there are few private land holdings. (Tr. 2204.) Prices from outside that defined market are not relevant because different markets determine prices in different ways. (Tr. 2169.) At the core of Dr. Hekman's opinion was his assertion that there are comparable properties to the Oenga property on the North Slope and therefore there was no need to use other appraisal techniques to determine value. Dr. Hekman did not however perform an appraisal of the Oenga property to determine fair rental value.

Regarding Dr. Power's income approach based on the $1.70 per barrel access fee, Dr. Hekman testified that this analysis treats the allotment as a holdout, which is "not really a theory of value of property." (Tr. 2170.) Further, he testified that while it is critical to this theory that there be a residual after subtracting the capital cost from the revenue produced by the access fees, there is no evidence ARCO and BPX intended

there to be any revenue beyond those capital costs. (Tr. 2171-72, 2222.) Rather, relying on the 1993 Jack Golden letter, he testified that the basis of the agreement was that ARCO and Exxon were simply sharing in the capital investment. (Tr. 2172; Ex. 3243.) He agreed that it is conceivable that the parties to the negotiation thought the $1.70 fee would apply for all oil produced from West Niakuk, but stated that the 1994 agreement applies only to the first well drilled. (Tr. 2173-74; Ex. 3263) Similarly, he explained, in the 1993 to 1994 time frame, the best estimate of recoverable reserves was 54 million barrels, but by 1995 the companies believed production would reach 100 million barrels. (Tr. 2176-77.) "[M]y opinion is from the documents that ARCO was willing to pay the $1.70 in order to find out what was there and then to negotiate, all the time holding it to the measure of cost divided by barrels in the reservoir." (Tr. 2178.) Further, he calculated that the fees ARCO actually paid for access to the Heald Point facility totaled only $17 million, far short of the cost of the facility. (Tr. 2223.)

Dr. Hekman further testified that Dr. Power applied the income approach incorrectly because he allocated all of the calculated residual attributable to the land to the Oengas rather than saying that the outcome of a negotiation would be some "indeterminate" amount in the range between what the allotment was worth to the parties. (Tr. 2180-82.) He disagreed with Dr. Power's notion that in a competitive situation the amount paid for the allotment would approach the complete value of its locational advantage. (Tr. 2181.)

Dr. Hekman stated that the most BPX would have been willing to pay for the allotment would be the cost savings afforded to it as compared to other alternatives. (Tr. 2184.) "Therefore any estimate Dr. Power has of his income approach or his royalty approach that result in a value that's greater than the cost savings is irrelevant." (Tr. 2184.) Dr. Hekman took issue with Dr. Power's reliance on the subsea pipeline as the appropriate cost savings alternative. Dr. Hekman testified that a better, less expensive option would have been the bypass road with a drill pad, which contemporaneous evidence showed would have cost $3.8 to $5.3 million. (Tr. 2186-88; Ex. 3110.) Dr. Hekman testified that BPX would have most likely looked to the bypass drill pad alternative if the cost of renting the allotment had been too high. (Tr. 2188) Dr. Hekman did acknowledge in his testimony that it would be proper to allocate the cost savings attributable to use of the allotment over the cost of the bypass based on "output shares," as Dr. Power had done. (Tr. 2188.) Dr. Hekman calculated those shares to be 27.2% for West Niakuk, 4.6% for Lisburne and 2.7% for Raven. (Tr. 2188.) He also discussed the options of drilling from a pad just south of the allotment or from L-5, noting that these costs appear to be $483,000 plus "up to a couple million" for the drill pad south of the allotment, or a zero or even a negative difference as compared to Heald Point for the L-5 option. (Tr. 2188-90, 2205.) Although Dr. Power indicated that the cost savings approach provided an annual rental figure for the life of the project, Dr. Hekman stated that any cost savings provided by the allotment "are one-time events . . . . not an annual

cost savings." (Tr. 2225.) Further, Dr. Hekman stated that "it's incorrect for him to allocate all of what he calculates as being the cost savings . . . to the land, that it's the negotiating range and so it would be somewhere between the minimum and the maximum . . ." (Tr. 2224-25.) Dr. Hekman did not, in his testimony, take issue with Dr. Power's use of a 7% nominal discount rate in his cost savings analysis. Nor did Dr. Hekman fault Dr. Power for relying upon the lease to increase the annual rent based on CPI.

Dr. Hekman testified that Dr. Power's royalty approach was not supported. (Tr. 2169.) Dr. Hekman testified that other royalty arrangements are not relevant because the properties in Michigan and Utah were very different. (Tr. 2212-14.) Dr. Hekman further testified that the only Kuukpik agreement that could be relevant is the surface use agreement. *****

Dr. Hekman testified that the 2006 and 2010 appraisals to which Mr. Carlson testified already include premiums and discounts for special factors in the North Slope market, and so the "Oenga allotment has explicitly gotten a premium for its location and for the factors that make it a drilling location." (Tr. 2214-15.)

During cross-examination Dr. Hekman clarified that the $3.8 to $5.3 million estimated cost of a bypass did not include the cost of a drill pad but explained that the cost would not be different than the construction of a drill pad on Heald Point or elsewhere. (Tr. 2228-29.) He explained that he sees this bypass drill pad as an

alternative to all production from Heald Point, including Raven, West Niakuk and Lisburne. (Tr. 2231, 2235.) However, he acknowledged that he did not analyze whether the bypass drill pad could have been permitted or whether building a bypass so close to the allotment would have been legal. (Tr. 2230.) He testified that a drill pad just south of the allotment was an alternative for production from the Lisburne PA. (Tr. 2233, 2235.) He testified that the L-5 ARCO site was an alternative for production from the Lisburne, West Niakuk, and Raven PAs. (Tr. 2235.) However, Dr. Hekman was unable to identify any expert testimony or document that supports his opinion that production from the Raven PA would have been possible from L-5, nor did he appear to have any understanding of the geography of the various accumulations of oil surrounding the Oenga allotment. (Tr. 2236.) *****

4. Plaintiffs' Rebuttal Witness[72]

The plaintiffs called Edward Morse as a rebuttal witness to testify regarding the correctness of the BIA's previous appraisals of the allotment. Mr. Morse has thirty-seven years of experience as a real estate appraiser, is certified to practice in two states, and holds two professional appraiser's designations. (Tr. 2249-50.) He holds an MBA and JD from Gonzaga University. (Tr. 2249.)

Mr. Morse testified that the particular unique features of the allotment, the small amount of privately-owned land in the area, and the limited market activity mean that

[72] The plaintiffs also called Dr. Power for rebuttal, and that testimony was summarized previously in conjunction with his direct and cross-examination testimony.

"there isn't an active market for the type of use or type of property that is the subject," and makes this "a difficult appraisal assignment." (Tr. 2251-52.)

Mr. Morse addressed each of the previous appraisals and appraisal reviews of the allotment, beginning with the 1988 BPX-commissioned Renfro appraisal and including the 1989 BIA review, the 1993 appraisal, the 1994 Bonnet appraisal, a 1994 review of the Bonnet appraisal, a 1997 appraisal review supplementing the Bonnet appraisal, and the 2005 Guinn appraisal setting rent back to 2002. (Tr. 2254-65.) He addressed each individually, but noted common themes of incorrect methodologies and failure to comply with formal appraisal requirements, including failure to identify the allotment's highest and best use, lack of reference to comparables with the same highest and best use as the allotment, use of dissimilar comparables, failing to recognize the change of use of the allotment from a road to a directional drilling facility, and inappropriate conversions from sale values to rental values. (Tr. 2254-65.) In doing so he used phrases such as "the value estimate is not credible," (Tr. 2258), "the mistakes are substantial," (Tr. 2261), "the value is understated," (Tr. 2262), and "their conclusions are arbitrary and unsupported," (Tr. 2263).[73]

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[73] One "comparable" property defendants' witnesses have suggested should be given weight is a native allotment owned by the Leavitt family. A survey error had led to an encroachment by BPX, and the family and company worked out a price of $150,000 for a perpetual right-of-way to 16.59 acres of the allotment in 1990. (Tr. 1606-07, 1611.) Dr. Power testified that he did not find this to be a true comparable to the Oenga allotment because the oil company in the case of the Leavitt allotment had other readily available alternatives for placement of a drill pad. (Tr. 1713, 2333-34.) Mr. Truax agreed that he understood the "competitive circumstance" involved in the Leavitt allotment to be "not quite identical" to that of the Oenga allotment. (Tr. 1752.) Likewise, Mr. Morse explained that he did not see this as a

With regard to the 2007 Carlson appraisal, Mr. Morse testified that it used no similar drill sites as comparables, but rather used inland sites with different highest and best uses, downplaying or ignoring the physical, legal, and economic attributes of these properties. (Tr. 2265-66.) He testified that Mr. Carlson marginalized many of the attributes of the allotment and stated that at least 75% of the allotment was essentially surplus, "produc[ing] a significant discount even though the whole peninsula contributes to the savings and the reach and the attributes, unlike the inland generic sites . . . ." (Tr. 2266.) He explained that parts of the report states that consideration of directional drilling sites would produce a use, rather than market value. (Tr. 2267.) Mr. Morse testified that this premise is incorrect, stating, "[I]f a directional drilling use is the highest and best use for this, then it's not use value. It is market value because this is a property that is solely and uniquely adapted to that kind of use. It's a peninsula that reaches out toward the oil fields." (Tr. 2267.)

His objections to Mr. Carlson's 2010 appraisal were similar in that the comparables "are inadequate because they are dissimilar." (Tr. 2269.) Again, he testified, the report includes no explanation for the heavy discounting of the stem acreage nor of the highest and best use of that part of the allotment. (Tr. 2269.) "In my opinion,

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comparable because of the lack of uniqueness of the Leavitt location, plus the differences in the type of transaction. (Tr. 2294-95.)

the conclusion for rent is unsupported because the comparable data is all based on different highest and best use." (Tr. 2270.)

Because of the dearth of comparable data, none of these analyses provided an upper or lower range of the market value of the allotment. (Tr. 2272.) He explained that vacant, generic tundra in the area may form the lower end of the range, but no one has been able to bracket the upper end of the range of value because of the lack of sales. (Tr. 2272-73.) He explained that it is inappropriate to use sales with different highest and best use as comparables because "you generally have no basis to understand . . . the degree and the magnitude of the adjustment involved." (Tr. 2285-86.) Mr. Morse agreed that valuations need a "reality test" but where there is no "data that provides the upper end of the range with savings and attributes that matches the subject property," valuation requires other techniques beyond the use of sales comparisons. (Tr. 2274.) He explained that The Appraisal of Real Estate suggests alternative techniques such as market extraction and various income capitalization techniques in such a situation. (Tr. 2282 (citing The Appraisal of Real Estate, supra, at 299-300).) Where there is a problem with the use of substitution, "you have got to expand the techniques and the tools in the toolbox . . . in order to value property or value property components." (Tr. 2282.)

Regarding Mr. Marchitelli's report, Mr. Morse criticized Mr. Marchitelli for concluding that he could not find a reasonable basis for the incremental value of the surface rights at issue in this case and then providing a 10% figure for the value of those

rights. (Tr. 2271.) He also noted that Mr. Marchitelli confirmed that the highest and best use of the allotment is directional drilling and that the comparable data is dissimilar. (Tr. 2271.)

He explained that Mr. Tesh's report is essentially an appraisal review but does not conform with the formal standards for such a review. (Tr. 2276.) He testified that Mr. Tesh apparently did not understand the changed use of the property over time, and that the value of that highest and best use has never been appropriately measured and studied. (Tr. 2277.) He noted that Mr. Tesh acknowledged that the allotment has special attributes making it more valuable than the surrounding property, "and I think that's a telling admission because in the history of appraisals that were performed, it was always compared to generic inland tundra property and treated and valued as though it had no special attributes, and it had no additional value . . . ." (Tr. 2277.)

Mr. Morse testified that the problems with these appraisals are material: "They relate to the actual conclusion that is reached, and . . . in my opinion, destroy the credibility of the value conclusions . . . ." (Tr. 2279.) He testified that these appraisals are not appropriate for use as a damages estimate in this case. (Tr. 2279-80.)

Mr. Morse testified that to appraisers market rent and economic rent are terms that are used interchangeably. (Tr. 2286.) Use value, he explained, is the value of a property for a specified use. (Tr. 2286.) "When that use is the same as its highest and best use, then it will be market value . . . ." (Tr. 2286.)

Mr. Morse admitted during cross-examination that he has never appraised the allotment himself. (Tr. 2296.) He also stated that he has not analyzed Dr. Power's report nor is he in a position to render an opinion about Dr. Power's value conclusions. (Tr. 2315.) Mr. Morse clarified that use value is not measured in terms of value to a particular person, rather it is the value for a specified use, whether or not that use is also the highest and best use of the property. (Tr. 2298, 311-12.)

B. Damages: Conclusions

Based on the testimony and evidence introduced regarding damages, the court finds as follows: First, the court finds that the Oenga allotment is a unique property that by virtue of its location and potential use as a directional drilling site with access to transportation corridors and the ARCO processing facility is difficult to appraise and value because there are no comparable properties on the North Slope with these same benefits. Government experts Mr. Tesh and Mr. Marchitelli both told the court that they believed the property was unique and would be difficult to appraise and value. This was confirmed by Mr. Truax and Mr. Morse, who, testifying on behalf of the plaintiffs, made it plain that appraisals of unique properties are difficult and that fair market valuations of such properties must be made using several appraisal tools.

In this regard, the court finds based on the testimony of Dr. Power, Mr. Truax, and Mr. Morse that the use of the traditional comparables sales approach for determining fair market value was not appropriate in this case. Where, as here, there was uniform

agreement that the highest and best use of the property is for directional drilling and oil and gas development and production, with access to existing transportation and processing facilities, comparisons with other properties in the North Slope that have a different highest and best use are not of much assistance in valuing the subject property. As discussed at length in the court's denial of the motion to strike the testimony of Dr. Power (App. A), it is well settled in the appraisal literature that fair market value must be based on the highest and best use of the property. "[A]n adequately supported determination of the subject property's highest and best use provides the basis for the research and analysis of comparable sales . . . ." The Appraisal of Real Estate, supra, at 299-300; see also Snowbank Enters., Inc. v. United States, 6 Cl. Ct. 476, 484-85 (1984) ("An owner of property . . . is entitled to have the fair market value of his property determined by reference to its highest and best use.") (citing Olson v. United States, 292 U.S. 246, 256-57 (1934)). The principle of using comparative sales for valuation "implies that the reliability of the sales comparison approach is diminished if substitute properties are not available in the market." The Appraisal of Real Estate, supra, at 299; see also Cane Tennessee, Inc. v. United States, 71 Fed. Cl. 432, 438 (2005) ("It is understood that the value of comparable sales data varies directly with the similarity of the comparable properties to the [subject property].") (citing San Nichols v. United States, 617 F.2d 246, 251 (Ct. Cl. 1980)). "Regardless of how physically similar the potential comparable site is to the subject site, the sale property is not truly comparable if

it does not have a similar highest and best use as the subject and should be dismissed from further consideration in the analysis of the subject property." The Appraisal of Real Estate, supra, at 361. In addition, it is well-settled that if there are no comparable properties with which to compare the subject property, other techniques for determining value, such as a cost savings approach or income approach, must be used. Id. at 39; see also id. at 362; 4 Julius L. Sackman, Nichols on Eminent Domain § 12C-[3] (3d ed. 2009) ("[T]here are a number of approaches used in the valuation of condemned properties, namely, the market data or comparable sales approach, the cost approach, and the income approach."). Similarly recognizing the variability in appropriate approaches, the Federal Circuit has made clear that it is "'unwilling to restrict the trial courts to any single basis for determining fair market value.'" Barrett Refining Corp. v. United States, 242 F.3d 1055, 1061 (Fed. Cir. 2001) (quoting Servalli v. United States, 845 F.2d 1571, 1575 (Fed. Cir. 1988)).

In view of the foregoing authorities, the court finds that the testimony of the defendant's and defendant-intervenors' experts, including Mr. Tesh, Dr. Hekman, and Mr. Carlson, who testified that highest and best use is not determinative and that geography is the most important factor in determining value, was not supported by the appraisal literature. As Mr. Truax explained, geography is not the only, nor the most important when dealing with unique properties. He stated, "[I]f you don't look at the

particular attributes of a given property that are unique and special, you can miss by a mile."[74] (Tr. 1722.)

Indeed, the court finds that it was the BIA's failure to appreciate the highest and best use of the Oenga allotment in 1989 that led Ms. Dickinson to mistakenly rely upon the Ahmaogak lease, which involved a property with an entirely different use, as the basis of the Oenga lease. Ms. Dickinson used a lease for land to build a dock as the model for the Oenga lease. She testified that she thought the property was going to be used for a right-of-way. She had no idea that the property had a unique location for directional drilling and was for many years the only surface location available to BPX, ARCO, and Exxon to develop their Niakuk and West Niakuk oil accumulations after permitting for the Niakuk Island #4 causeway was denied. Without understanding the highest and best use of the allotment, the BIA, as trustee, was continually unable to fulfill its trust obligation to ensure that the Oengas received fair rent. The BIA simply did not appreciate the value of the allotment as a directional drilling site with access to transportation and processing facilities.

The court therefore finds, consistent with the conclusions of Dr. Power and Mr. Morse, that the BIA appraisals were fundamentally flawed and cannot be relied upon as the proper measure of fair market rent for either the authorized or unauthorized uses of

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[74] Based on the testimony of Mr. Truax, the court finds that Mr. Carlson's reliance on properties with dissimilar highest and best use, such as airport use, was not appropriate for valuing the Oenga allotment.

the allotment. These appraisals identified "comparable" properties that had highest and best uses that were dissimilar from the allotment's highest and best use as a directional drilling site. The court finds that these appraisals are unreliable because, in the absence of comparables, the BIA appraisals failed to examine other methods of valuation in order to determine fair annual rent. It is for these reasons that the court concludes that Dr. Power's decision to determine PFAR for the allotment without regard to past BIA appraisals was appropriate.

To the extent that Dr. Vogel disagreed and testified that the plaintiffs have been receiving fair annual rent, the court finds his opinion testimony unreliable. Having failed to undertake any independent evaluation of the BIA appraisals or his own valuation of the allotment, his conclusions regarding the correctness of past appraisals and his conclusions regarding the sufficiency of the amounts the plaintiffs have received are simply without support. Dr. Vogel testified that although he did not conduct an appraisal of the allotment, in his opinion the rent paid for the allotment has been "pretty close to the fair annual rents for . . . all possible uses at that leasehold." (Tr. 2102.) He provided no support for this opinion. Similarly, the court finds that while Mr. Marchitelli is a highly regarded appraiser, his conclusion that PFAR for the unauthorized use of the allotment in connection with Lisburne can be determined by simply adding 10% to the total $2.1 million the plaintiffs have received to date as fair annual rent is without any support and is therefore unreliable. In response to questions by the court, Mr. Marchitelli

conceded that the 10% number was a "judgment call" that he arrived at because it "seems reasonable." (Tr. 2069.) Moreover, implicit in his opinion was his assumption that the rents based on prior BIA appraisals were correct, and yet he admitted that he had not reviewed those appraisals nor attempted to determine the fair rental value of the allotment.

In addition, the court finds that it is proper to apportion fair annual rental value based on the relative share of oil produced from Niakuk, West Niakuk, Lisburne, and Raven, as Dr. Power opined. Indeed, the court reads Dr. Hekman's testimony as supporting Dr. Power's methodology in this regard. Dr. Hekman testified that one could allocate the cost savings provided to the allotment "to the West Niakuk, Lisburne, and Raven pools . . . us[ing] their output shares." (Tr. 2188.)

Having concluded that the existing BIA appraisals are unreliable, the court will first determine the PFAR for the allotment and then apportion that value based on the shares of authorized and unauthorized oil produced.

1. Cost Savings Approach

To begin, the court finds that the cost savings approach provides the most reliable method for determining PFAR in this case. The evidence established that the cost savings approach is a well-recognized valuation technique that is frequently employed for unique or special properties, like the Oenga allotment. See, e.g, The Appraisal of Real Estate, supra, at 39, 362; 4 Sackman, supra, at § 12C-[3][a]-[c] (describing the

market data, cost, and income approaches to valuation); Cane Tennessee, 71 Fed. Cl. at 438-49 (describing the income capitalization approach and replacement cost approach).

The court finds that the criticisms of Dr. Power's cost savings approach do not go to the methodology he employed but to the assumptions he used regarding the cost savings alternative. In particular, the defendant-intervenors presented compelling testimony to show that Dr. Power erred in accepting Mr. Wondzell's opinion that BPX would have had to construct an subsea pipeline from Niakuk Island #4 to an area south of the allotment if BPX had not been able to secure a lease of the Oenga property. The evidence established that Mr. Wondzell was incorrect to look only at alternatives presented by BPX to the USACE. There were other alternatives that should have been examined. Based on the testimony of Mr. Obeney and Mr. Barry, the court finds that at the time BPX was negotiating for a lease with the plaintiffs, it was considering construction of a parallel bypass road leading to a causeway as its BATNA and that, had the Oenga lease negotiations failed, BPX would have likely constructed such a bypass road and used it for a drill site when the causeway option was rejected by the USACE. This bypass alternative was not presented to the USACE because BPX had secured a lease with the plaintiffs. However, the court finds that this alternative would have been a real option for BPX given its exploration of a bypass road alternative in conjunction with the planned causeway. In contrast, there is no evidence to suggest that BPX ever seriously entertained construction of a subsea pipeline from Niakuk Island #4 to south of

the allotment, and such an alternative would have been much more costly than construction of a bypass road and drill pad. The court finds the evidence regarding the parallel bypass road and drill pad convincing and concludes that this option, which was estimated to cost between $3.8 and $5.3 million, was the most likely alternative to use of the allotment if negotiations with the Oengas had failed.[75]

The court did not find the defendant-intervenors' evidence regarding use of L-5 or some other new facility south of the allotment to be persuasive. There was no evidence to suggest that BPX ever considered using these locations at the time it was contemplating use of the allotment. The fact that ARCO/Exxon may have been able to use another location for developing West Niakuk or Lisburne does not mean that BPX would have been able to use ARCO's L-5 without significant cost. BPX's ability to use L-5 to drill for oil is purely speculative.

Although the court finds that Dr. Power used an inappropriate alternative for calculating the cost savings provided by the allotment, this does not mean that the court finds that Dr. Power's basic methodology was unreliable. To the contrary, the court is persuaded that Dr. Power's other assumptions in his cost savings approach were correct. The court agrees with the concept that one-time cost savings can be translated into a yearly rental payment through the method used by Dr. Power. The court accepts Dr.

[75]The court has rejected Mr. Wondzell's testimony regarding the likelihood of the bypass drill pad being permitted by the USACE. Mr. Wondzell is not an expert on environmental permitting and his testimony was mere speculation. See App. A.

Power's decision to apply a 7% nominal discount rate[76] over the life of the project and to use the 2.88% average CPI figure to determine rent increases over time, as contemplated by the lease. In addition, the court accepts Dr. Power's conclusion that the fair annual rental set by applying these figures to the correct cost of an alternative yields the PFAR for the allotment going forward, even though this case deals only with the rents owed for BPX's activities outside the scope of the lease. In this connection, the court accepts, as did Dr. Hekman, Dr. Power's decision to allocate the rent for unauthorized uses based on the share of unauthorized oil produced from each accumulation.

On the question of how to allocate the cost savings between the plaintiffs and BPX, the court finds Dr. Power's opinion, as supported by Mr. Truax, persuasive. The court agrees with Dr. Power's decision to allocate the entire value of the cost savings to the plaintiffs. The court finds that in a truly competitive market, the plaintiffs could have negotiated rent up to the full amount of the cost savings provided by the allotment over BPX's best alternative, which was permitting and construction of a bypass roadway with a drill pad adjacent to Heald Point. To the extent that the defendant and defendant-intervenors' witnesses disagreed with this conclusion, the court finds their testimony uncompelling and lacking any explanation of why the heirs would have been limited to less than the full amount of the cost savings provided by the allotment. The evidence

[76]Dr. Power persuasively explained that he used a 7% nominal rate because it reflected the rate of return BPX was receiving from its investments at the time and was therefore justified based on actual data from the relevant time. The court agrees with Dr. Power and finds that his use of a 7% nominal rate is appropriate for use in the cost savings analysis.

established that ARCO/Exxon were willing to pay $38 million more for use of the allotment than they would have spent had they located those West Niakuk wells at L-5. Despite owning the facility at L-5, those companies approached BIA expressing an interest in leasing the allotment. Clearly, the Oenga allotment had a significant value over their existing alternative. Given the estimated oil and gas potential known at the time of the lease negotiations, the court finds that the plaintiffs would have been reasonably able to bargain for the full amount of the cost savings provided by the allotment. Finally, the witnesses for the defense provided no alternative theory for how the court should allocate the cost savings, as exemplified by Dr. Hekman's statements that the amount of rent would be "indeterminate," or "somewhere between the minimum and the maximum." (Tr. 2182, 2225.)

2. Income and Royalty Approaches

Because the court finds that Dr. Power did not use the correct alternative in his cost savings analysis, the court must reject Dr. Power's conclusions based on the income approach and the so-called royalty approach. Dr. Power acknowledged that the cost saving approach sets the ceiling for determining fair rental value. This was confirmed by Mr. Truax and by Dr. Hekman. Because it is clear that the cost savings approach using the far less expensive bypass will necessarily yield a lower PFAR, Dr. Power's

calculations using the income approach or royalty approach do not represent fair rental value.[77]

3. Damages

In view of the foregoing, the court finds that the plaintiffs are entitled to damages based on the fair annual market rent reflected in the cost savings provided by the allotment as compared to construction and use of a bypass road with a drill pad adjacent to the Oenga allotment. The bypass road alternative was estimated to cost between $3.8 to $5.3 million in 1988 dollars. The court finds that for purposes of determining PFAR it is appropriate to use the $5.3 million figure at the top of this range, because, for the above-stated reasons, including the additional permitting costs and approvals required for

[77]Because fair rental value turns on the cost savings approach, it is not necessary to address the numerous disagreements between the plaintiffs and the government and BPX with regard to the income and royalty approaches. While the court agrees with the government and BPX that the royalty approach was not well-supported given the significant differences between the Kuukpik Corporation's and Oengas' situation, the court finds that the income approach is well-recognized in the appraisal literature and could have served as a basis for determining PFAR. Dr. Power and Mr. Truax persuaded the court that the $1.70 access fee BPX charged ARCO/Exxon included a value associated with the Oenga land that could not be attributed to reimbursing BPX for its costs in building the Heald Point facility. Indeed, the court concludes from the testimony of Mr. Reinbold that ARCO was willing to pay that access fee in order to use the BPX facility on Heald Point and presumably save on drilling costs. However, based on the evidence heard at trial, attribution of a particular portion of the ARCO/Exxon access fee to the Oenga land is too speculative to support a calculation of PFAR on this basis. Because the access fee between ARCO/Exxon and BPX was renegotiated and eventually eliminated, the court is unwilling to accept a PFAR calculation based on the assumption that the $1.70 per barrel fee would have remained in place for the entire sixteen-year life of the project as Dr. Power assumed. The court was persuaded by Mr. Reinbold's testimony that ARCO/Exxon were willing to pay BPX $1.70 per barrel for use of the allotment for only a short period of time and that the actual rate ARCO/Exxon were willing to pay long-term was closer to the $.50 per barrel the companies eventually agreed to in 1996. The court finds that until the superalignment agreement in 2000, BPX and ARCO/Exxon were sufficiently competitive with one another to negotiate in their own self-interest.

the bypass alternative, the court is persuaded that BPX would have used the high end of the estimate to determine the amount it would have been willing to pay to rent the Oenga allotment. The use of the 7% nominal discount rate and the CPI applied by Dr. Power to determine PFAR remain unchanged. PFAR for the use of the allotment exceeding the scope of the lease shall be calculated, as Dr. Power determined, by allocating the total cost savings provided by Heald Point using the share of the total Heald Point output from Lisburne, West Niakuk, and Raven at relevant times. Specifically, PFAR shall be calculated based on the portion of total Heald Point oil that was produced from Lisburne from June 1995 until production ceased in 2008, from West Niakuk from June 1995 until mid-December 2007, and from Raven at all times, continuing today. The plaintiffs are entitled to the entire amount determined by this calculation, given the court's finding that, because of competition between ARCO/Exxon and BPX at the time, the plaintiffs would have been able to bargain for all of the cost savings BPX achieved by leasing the allotment.

Faced with a situation where the court accepts some but not all of a plaintiff's expert damage assumptions and accepts some of the defendant's expert assumptions, courts have given the plaintiff the opportunity to redo its damage calculation using the numbers approved by the court. The court has then given the defendant the opportunity to review the plaintiff's calculation and provide its own calculation if it finds the plaintiff's expert has miscalculated the amount.

This approach was recently approved by the Federal Circuit in Precision Pine & Timber, Inc. v. United States, 596 F.3d 817 (Fed. Cir. 2010). In that case, the trial court found in favor of the plaintiff with respect to liability but did not agree with the plaintiff's damages calculation. Precision Pine & Timber, Inc. v. United States, 81 Fed. Cl. 235 (2007). Rather than reopening the record to hear new evidence, the court modified the plaintiff's damages calculation by changing the input values, but left the model for the calculation intact. Id. at 293-94. Further, rather than recalculate the damages itself, the court stated that "the parties are in the best position to recalculate plaintiff's damages consistent with the Court's findings" as set forth in the court's opinion. Id. at 234. The plaintiff was ordered to submit a revised damages calculation and the defendant was afforded an opportunity to respond. Id. The court then made a final damages determination and directed entry of a final judgment. Precision Pine & Timber, Inc. v. United States, 81 Fed. Cl. 733, 740 (2008). The Circuit approved the trial court's approach. Precision Pine, 596 F.3d at 832-33.

Accordingly, the plaintiffs shall file a revised damages calculation consistent with the court's findings by **December 6, 2010**. The defendant and defendant-intervenors shall file their responses to the plaintiffs' recalculation by **December 13, 2010**. As stated above, these calculations shall be based on the cost savings provided by the allotment as compared to construction of a bypass drill pad, using $5.3 million in 1988 dollars as the cost of such an alternative, a 7% nominal discount rate, and the 2.88% average CPI as

discussed by Dr. Power. The plaintiffs shall then allocate the total savings based on the percentage shares of Heald Point production for Lisburne, West Niakuk, and Raven. The plaintiffs are entitled to the entirety of the cost savings attributable to oil produced from these areas during time periods this court has found to be outside the scope of the lease and within this court's jurisdiction.

Upon receipt of the parties' post-trial recalculations of the plaintiffs' damages, the court will make a final determination of the plaintiffs' damages and direct the entry of a final judgment.

IT IS SO ORDERED.

s/Nancy B. Firestone
NANCY B. FIRESTONE
Judge