

East Channel of the Coville (which would be a violation of the setback) and just 690 feet from Armstrong's estimated bank of the Kachemach.³⁹

The Draft EIS itself acknowledges (at page 3-184) that building DS2 in that location would violate the mandatory setback. Armstrong's state leases prohibit the siting of facilities within ½ mile of the Coville unless the lessee "demonstrates to the satisfaction of the Director [of DOG], in consultation with ADF&G, that site locations outside these buffers are not practicable or that a location inside the buffer is environmentally preferred."⁴⁰ The lease buffers for the Kachemach and Miluveach Rivers are smaller, at 500 feet each, which Armstrong appears to have maintained (albeit by less than the length of a football field).

Even so, the Draft EIS does not provide any detailed justification for locating these drill sites so close to these three important rivers, and certainly contains no indication that Armstrong has consulted with ADF&G for the purpose of determining (and persuading the Director of DOG) that siting DS2 outside the setback is impracticable or environmentally preferable as required by the state lease. Instead, the setback requirement is summarily rejected in a copy and pasted, one sentence explanation that is also used to reject two other alternative drill site concepts identified in the "alternatives not carried forward" section.⁴¹

Far from concluding that siting the project inside the buffer is environmentally preferable, the Draft merely states—without any support whatsoever—that "Relocat[ing] Drill Site 2 Further East" is "not feasible" because "use of two drill sites would require well lengths in excess of 45,000 feet to produce the Project's target resources,"⁴² and because "locating the drill site 2 pad any further east" would not allow the applicant to produce the resource to the "maximum extent possible."

As to the 45,000 foot claim, it is simply and purely nonsense. It's not clear how Armstrong came up with the 45,000 foot well length (cited throughout the summary of rejected alternatives), but plainly that distance would not apply to any reasonable assessment of alternative DS2 locations. Forty-five thousand feet is over 8 ½ miles, or double the distance from current D2S to the edge of the reservoir depicted in Figure 2.2-1. The maps show that

³⁹ Draft EIS, p. 3-165. Just finding this specific measurement is a challenge, being as it is, buried deep in the "Hydrology and Food plains" section where the odds of any casual reader seeing it are pretty low. It's not included in the Executive Summary or any of the other sections that attract the most attention and discussion (like subsistence), which certainly makes us wonder whether no one really wants to talk about how close this drill site is to the rivers.

⁴⁰ SOA North Slope Areawide Mitigation Measures, Section A(1)(c).

⁴¹ Draft EIS, p. 2-7 (Option No. 7E).

⁴² Id.

portions of the reservoir DS2 would target are 4 to 4 ½ miles away, not 8 ½. The furthest edge of the reservoir DS2 is targeting is at most 23,760 feet from DS2, not 45,000 feet.⁴³ Even allowing for the vertical portion of each well, and the Nanushuk reservoir's approximately 4,100 foot depth, there is simply no way that DS2 would need to be 45,000 feet long to reach any of the oil it expected to access unless it was several miles farther east. No one is asking Armstrong to move that far. Note that wells of 26,000 to 28,000 feet are increasingly common on the North Slope.

If that 45,000 foot claim doesn't seem to make sense, you're right: as noted above, it was copy and pasted directly from the rationale for eliminating two different drill site alternatives, which each involved only two drill sites. Presumably someone was supposed to change this text to something that at least matched the text of Option 7E, but that apparently did not happen.

Kuukpik doesn't begrudge the drafters of the EIS a typo here—it happens—but the fact that this alternative was rejected in this manner pretty clearly demonstrates that no one gave it any meaningful analysis. That is unacceptable. Armstrong needs to offer an extremely compelling reason to locate the drill site within the half mile setback. This cursory rejection would not cut it even if the text actually matched the option being rejected. In fact, Armstrong is legally prohibited from locating the drill site just 2,200 feet from the Colville unless they persuade ADF&G and DOG that putting it outside the setback is not practicable or is environmentally preferable. So the question is not what rationale there is for *eliminating* alternative site locations farther east; the question is whether Armstrong can justify locating the facility inside the setback by showing that doing so is necessary or environmentally preferable.

1. The Draft EIS fails to demonstrate that locating DS2 farther away from the rivers is not practicable.

The most likely justifications for violating the setback are going to be cost and squeezing more oil out of the ground. The first of these, cost of drilling, simply is not particularly relevant because higher costs do not mean a project is not "practicable"; it just means it is more expensive. Under the Corps' regulations, that is not determinative, or even particularly relevant, to determining the LEDPA. Unless Armstrong provides concrete and verifiable data showing that moving the drill site farther east is *prohibitively* expensive (as opposed to just "more expensive"), the Corps should analyze the full range of impacts likely to be caused and avoided by doing so, and then compare that to the cost difference of constructing it. Only that comparative analysis will allow the Corps to determine whether decreased impacts resulting from moving DS2 farther from the river(s) (if any) justifies increased cost (if any).

⁴³ See, the more detailed discussion at IV(B)(1), below.

But Armstrong also seems to be suggesting that they cannot access all the oil from anywhere farther east. Since there is absolutely no substantive analysis of this point, there is no way to determine whether that holds up to technical scrutiny. So at the very least Armstrong needs to provide the data and calculations demonstrating that moving the drill site east will cause them to leave oil in the ground.

The limited information in the Draft EIS suggest that it *is* possible to locate the drill site farther east—the question is really just how much farther. Figure 2.2-1 shows the proposed drill site locations (and some alternates considered) overlaying the reservoirs to be targeted. DS2 is depicted as being right on the estimated edge of the Nanushuk Reservoir, which extends 2.5 miles due west and about 4 miles to the northwest to the farthest point it would be expected to access. No doubt this is a preferred location for DS2 because it is closest and will allow Armstrong to drill the farthest into the reservoir. But the question is not whether it is preferred, but whether it is necessary to put the site so close to reservoir (and therefore the river).

The information available in the Draft EIS suggests it is *not* necessary. Notice first that DS3 is located about a mile outside the reservoir, and about 4.5 miles away from the farthest edge of the reservoir it would be expected to access (to the southwest). As a common sense matter, if DS3 can be located outside the reservoir, and still access oil at approximately 4.5 miles away, why can DS2 not also be located outside the reservoir and reach oil that is likewise about 4 to 4.5 miles away? In other words, if Armstrong can drill from DS3 to access oil about 4.5 miles away, they should be required to explain why they cannot move DS2 at least a half mile farther east, which would likewise be approximately 4.5 miles from the farthest estimated edge of the reservoir. There may be a valid explanation, such as the slope or other characteristics of the reservoir, but there is no information provided to check and confirm that.

Kuukpik is not suggesting a re-design of the whole DS2 facility, or a massive move. We are talking about moving DS2 1,000-2,000 feet—just enough to get it out of the flood plain, and out of close physical and visual proximity to the river.

2. Locating DS2 farther from rivers is environmentally preferable and safer.

There would be several substantial benefits to even such a limited relocation. One of the main reasons for the lease setback is to provide wildlife (particularly caribou and raptors) with a buffer around the major water bodies that serve as their primary travel corridors to access food and water and for migration. Respecting the setback helps achieve that goal. Similarly, moving these facilities away from the rivers will help minimize erosion and runoff that increase turbidity and other water quality impacts. In some respects, this is no different from the typical “greenbelt” you probably expect to find along any urban river or creek. Just move DS2 on the

east side of L9211, or to proposed alternate sites DS2-A3 or A1, and the setback will serve its purpose.

Locating drill sites too close to a water body is also reckless. Nuiqsut residents have pointed out that even if these sites are designed at a height of “the most conservative elevation of 1 foot above the 200-year flood level or 1 foot above the highest observed historical level”,⁴⁴ an ice jam anywhere downstream from the project would cause unpredictable and potentially higher flooding. In other words, those historical “flood levels” are not necessarily reliable because of the random nature of flooding caused by ice jams. The Draft EIS even shows that ice jams are likely to occur in the exact area of DS2, as well as up and downstream.⁴⁵

Kuukpik also seriously questions how much historical flood data exists at the proposed drill site locations. We are not aware of any long-term hydrological observations and studies *at* the proposed drill site locations (and we would know since it is our land).⁴⁶ And though there is publicly-available data regarding historical flood levels on the Colville, there is much less such information for the Miluveach and Kachemach Rivers as far as we know. Section 3.6 of the Draft confirms this by silence: despite including a fair amount of detailed, first-hand information on discharges, flood levels, and other characteristics of the Colville, there is almost no comparable information on the Miluveach and Kachemach Rivers. Rather, what information there is is based upon modeling and comparisons to other North Slope Rivers (such as the Ublutuoch), which may or may not be good enough when the details matter as much as they do here.

In fact, it appears that Armstrong is relying on one year of monitoring data to determine the maximum “Historical monitoring peak discharge” on those rivers. That’s not a “historical level”; it’s a random one-time sample.⁴⁷ So is Armstrong’s plan to build its drill sites one foot

⁴⁴ Draft EIS, p. 3-26.

⁴⁵ Draft EIS, p. 3-138; Figure 3.2-6.

⁴⁶ If Armstrong has such data, Kuukpik expects to see it and analyze it for itself.

⁴⁷ The one time sample would be suspect in any event, but it’s particularly so here because it appears to have been taken when river conditions were far from normal and probably in the middle of an active flooding period (in July 2015). See Table 3.6-10 and Table 3.6-3, footnote e. Taking a measurement on two days during breakup simply is not good enough to establish the baseline. Nor should the Draft dismiss this obviously suspect data by calling it “conservative.” It appears the river was actively backing up at the time the measurement was taken. How do we even know if this sample captured the peak level? Far from reassuring us that this data is an aberration, it suggests even more caution is needed. There is no way to know whether that flooding was any more or less extreme than any other year, or than the average, or that the

above that? That seems as dangerous as it does foolhardy, especially since climate change is expected to increase flood frequency and levels in the future. The Corps must exercise caution by building in additional safety margins to account for the unknowns, and by removing the drill site from the flood plains and farther back from these unpredictable rivers.⁴⁸

3. Moving DS2 farther away from the rivers will reduce subsistence impacts.

As the Draft EIS acknowledges, the area around DS2 is among the most highly concentrated subsistence use areas for Nuiqsut residents.⁴⁹ The DEIS estimates up to 20% of Nuiqsut caribou were taken in the eastern CRD (the general region where Nanushuk would be located), with a “moderate to high concentration of harvests near Pisiktagvik or along the eastern bank of the Colville River, between the Miluveach and Kachemach rivers.”⁵⁰ This is right where Armstrong wants to build DS2 and DS1. Pisiktagvik is a large island directly across the East Channel from the proposed DS2 location that extends downstream to around DS1. It is not only an important area for caribou attempting to cross the Colville (and therefore for hunters), but also an island of immense cultural importance. First, it is the site of an historic battle fought and won against Athabaskan intruders by Inupiat ancestors. Second, it is also one of the few locations available for eider hunting for the *Nalukataq*, the spring whaling festival.⁵¹

As noted at the outset, Kuukpik is not unmindful of the practical realities of building oil facilities. We understand that location is important. But the Corps and Armstrong need to understand that location is important to us too. Putting this drill site right across the river from

measurement can even plausibly be called “conservative.”

⁴⁸ Relocating the sites away from the river would also likely reduce potential impacts to wetlands during construction and normal operations, and would help limit the damage from a spill or other unforeseen release during operations. While we generally believe the risk of a major spill is low, it is a bit surprising to see the Draft EIS calling the risk of a spill up to 1,000 gallons “likely.” Draft EIS, p. ES-57. The more detailed data is also somewhat suspect, calling a “very small to small” (less than 100 gallons) spill “unlikely,” while medium to large spills (between 100 and 1,000 gallons) are listed as “unlikely to probable.” The same rating is given to “large to very large” spills (greater than 1,000 gallons). Draft EIS, p. 3-449. These seem backwards, at least, since minor spills will undoubtedly happen due to leaks, minor spillage, etc., but a major spill is less likely (though still possible of course).

⁴⁹ Draft EIS, p. 3-619.

⁵⁰ Draft EIS, p. 3-619.

⁵¹ Draft EIS, pp. 3-575 and 3-611.

this culturally important subsistence area is bound to affect both the productivity and the sanctity of the area to some degree, but putting it within the buffer zone where it will have the most impacts and be seen at all times by subsistence users is practically a slap in the face.

Moving DS2 away from the river would go a long way in reducing the direct impacts of siting a facility in this area. The closer this (and any other) facility is to the rivers, the more likely it is that subsistence users will avoid both this area of the Colville and the lower reaches of the Kachemach. The reasons are both practical and cultural. From a practical standpoint, a large drilling site close to the river decreases the likelihood that caribou will cross the river in that particular location. That is of particular concern at the DS2 location because caribou often cross the East Channel of the Colville between proposed DS2 and Pisiktagvik where the river is somewhat more narrow than the main channel to the south and much of the East Channel to the north. A large drill pad in this area is almost certain to disrupt that traditional crossing route and deflect animals somewhere else (probably to the north, farther away from Nuiqsut).

This deflection, in turn, makes it less likely that Nuiqsut hunters will be successful hunting along the usual river channels. Nuiqsut hunters have been using many of the same general hunting areas for generations because the elders have taught each new generation where caribou can most often be found at any given time of year. When caribou are deflected from their usual routes, it leads to lower success rates and longer, more expensive and dangerous journeys to find game.

In short, disrupting the animals' usual migration routes has direct tangible impacts on our pocketbooks and, potentially, our safety. The vast majority of hunting in the area that will be directly affected by Nanushuk occurs by boat. Subsistence hunters quite literally cannot afford to take unsuccessful trips, or to just keep driving in hopes of finding something farther away.⁵² Not only does that likewise increase the costs of practicing subsistence substantially, it increases the likelihood of encountering some type of trouble, such as running out of gas or getting stranded or lost in an unfamiliar area. Those are the kinds of mishaps that can have very serious consequences on the North Slope.

Moving the drill sites away from the river channel is one way to encourage caribou to continue using more of their traditional crossing areas because there will be a much larger "greenbelt" on the shores of the river. This should facilitate greater movement up and down stream by caribou on the east side of the Colville, particularly in the area where the Kachemach

⁵² The Draft seems not to recognize that this is a problem all subsistence users face, not just a few "if harvesters have limited resources (e.g., time or money) and are concerned their hunting effort would not result in a successful harvest." Draft EIS, p. 3-633. There is no "if" here: this is one of the main points we have been making for the last 20 years. All harvesters have limited time and money, and Avoidance has serious impacts on both.

meets the Main Channel. Similarly, setting the facility farther back from the river will make it less visible to caribou crossing from west to east (towards the facility), which should have less of a deterrent effect on where and whether they choose to cross in this area.

In addition to the actual physical benefits from relocating the drill site, setting DS2 farther back should reduce the effects of Avoidance because the facility will not be perceived as being such an intrusion. A facility that is not as visible from the river is not as likely to serve as a *de facto* barrier against using an area. This is critical here because DS2, as presently proposed, may very well dissuade a large percentage of hunters from going not only to that location specifically, but also from going both farther downstream on the Colville or upstream on the Kachemach (because people will not want to drive right past the drill site in order to get to other hunting grounds). But if that drill site was set farther back a few thousand feet, where it would not be quite so “in your face,” people probably would not be so wary of it.

The DEIS acknowledges how important the East Channel, Kachemach, and Miluveach Rivers are for practicing subsistence in this area. It even suggests that the East Channel has received more use and become more important over the last ten or so years.⁵³ We agree with that assessment. This area is accessed almost exclusively by boat during the open water season. Anything that prevents or dissuades people from traveling here will significantly reduce their useful range.⁵⁴ Again, this doesn't mean Armstrong needs to move a mile; it does mean that Armstrong needs to observe the legal setback at the very least, and preferably be required to move DS2 a few thousand additional feet east.

V. The Draft EIS Avoidance and subsistence analysis is outdated and arbitrary.

The Draft EIS is all over the map when it comes to analyzing Nanushuk's likely impacts to subsistence, particular with respect to Avoidance. A barrage of information (some of it wrong), coupled with a lack of clarity regarding what is actually being done with that information, combine to make this a difficult analysis to follow and use. The result is an analysis that provides a host of information, some of it seemingly conflicting, but which ultimately concludes that there will be major subsistence impacts with respect to caribou, less impacts with respect to other species, and that none of these alternatives would meaningfully reduce those

⁵³ Draft EIS, p. 3-619.

⁵⁴ See discussion below at page 40 regarding the need for at least 13 feet of clearance between the highest reasonably expected river stage and the bottom of all bridges in order to allow safe passage by boaters.

impacts.⁵⁵ This again only confirms Kuukpik's point that not enough effort has gone into developing meaningful alternatives.⁵⁶ But it may also suggest that the analysis as currently presented is missing certain differences between alternatives, and is probably equally incapable of measuring the positive impacts that certain mitigation measures would have. It would also mean the Corps needs to pay particular attention to the public testimony and comments by Kuukpik and the other residents of Nuiqsut to help identify the differences that the Draft EIS overlooks.

A. Updated information on Avoidance is needed.

The Draft EIS analysis seems to find Alternative 5 preferable in quite a few respects. That makes sense: it requires the least gravel, the least miles of roads and pipelines, and moves some of the infrastructure (the CPF and the road connecting DS1 and DS2) farther away from the river. Obviously those are positives that Kuukpik supports, so far as they go. Minimizing infrastructure and rerouting roads to avoid corralling and "dead end" effects of roads and pipelines is critical if caribou are to continue moving through this area.

But the Draft seems to overestimate the impact that the differences between Alternative 5 and the others will have on subsistence users themselves, as opposed to the impacts they will have on caribou movement and habitat use. The Draft claims that Alternative 5 would reduce user Avoidance because it "moves most infrastructure farther inland...." We question whether that is actually true.

First of all, the main driver of Avoidance in this project is likely to be the drill sites, which Alternative 5 does nothing to address. As long as those drill sites stand within just a couple thousand feet from the rivers people use so much for subsistence, Avoidance may not be meaningfully reduced. The Draft EIS acknowledges as much by concluding (contrary to the summary conclusion above) that none of the alternatives have any appreciable differences in subsistence impacts because they all include the same project components and different drill sites

⁵⁵ Draft EIS, p. 3-643: "Although there are differences among the action alternatives in terms of Project footprint (e.g., locations, area of impacts), the nature and overall likelihood, magnitude, and duration of impacts for subsistence would not vary substantially by alternative."

⁵⁶ Draft EIS, p. 3-643: "The lack of variation of impacts among alternatives is because of the large areas harvesters cover for certain resources (e.g., caribou, wolf, wolverine) and the relatively minor shifts in Project footprints in relation to overall subsistence use areas. Furthermore, because the action alternatives have the same components (i.e., roads, pipelines, three drill sites, CPF, and operations center) and similar schedules, the likelihood and duration are also similar for each alternative. The differences among them are based on the differences in component locations and the resulting effects to different resources and subsistence activities."

were not even analyzed.⁵⁷ Besides, all the alternatives move the CPF farther inland than Armstrong's proposal. So the CPF location can't be the determinant factor in whether Alternative 5 reduces impacts to subsistence either (or if it is, and that conclusion is based on the specific location or distance where the CPF has been moved, the reasons need to be explained in the Final EIS).

The only other infrastructure that has been moved farther inland is the road between DS1 and DS2. If moving that road away from the East Channel alone is meant to account for and justify a conclusion that Alternative 5 will reduce Avoidance, Kuukpik disagrees with that conclusion. Our tentative preference for the Alternative 5 road layout has nothing to do with its impacts on Avoidance, and everything to do with reducing the amount of road and pipeline running parallel to the river. So while we agree this road layout is preferable, the benefit is to the health and long term success of the caribou herds that must have access to and use the river corridor, not because it will significantly reduce Avoidance (except to the extent that such usage is based on more caribou continuing to use this area, of course). Drill sites that will tower over the river would generate enough noise and activity to disturb users on and along the river. Roads would have impacts on boaters, but less impact.⁵⁸

That said, the question of whether and how Nuiqsut subsistence users are using or avoiding industry roads would benefit from further study. Kuukpik sees a much more complex link between Avoidance and roads than is reflected in the Draft EIS. Not all roads are equal, and we do not agree that they all, by definition, cause Avoidance, as the Draft EIS suggests (when it suggests Avoidance impacts will be reduced simply by moving the road farther away from the river). In fact, the recently-completed Nuiqsut Spur Road is a prime example of a well-placed road that has had the effect of expanding subsistence access rather than reducing it. Recent studies by Stephen Braund confirm that areas alongside the Spur Road, and possibly by extension the CD5 Road, have become more attractive caribou harvest areas even just in the past 1-2 years.

Those studies also suggest that the traditional data on Avoidance is evolving (as Kuukpik has long argued and urged studies to confirm). This is not surprising considering how old much of the data relied upon in the Draft EIS is. Most of the data relied upon is from 1995-2006, which is over ten years (and almost half a dozen major oil developments) ago.⁵⁹ The Draft EIS

⁵⁷ Draft EIS, p. 3-643.

⁵⁸ The Draft EIS may be reaching a contrary conclusion in part because its data regarding traffic noise seems somewhat suspect. Page 3-533 suggests that traffic noise is more audible than blasting at a distance of almost 10 miles. See also Draft EIS, p. 3-536. That is just plainly wrong.

⁵⁹ Draft EIS, p. 3-586.

even acknowledges that newer studies (relying on 2008–2014 data) are available, but apparently does not use them because they are not publicly available.⁶⁰ It's not even clear how the Corps reaches that conclusion since BLM and others have these studies too. But even if that were true, it seems like a poor justification for not relying on data that the Corps and Armstrong (and Kuukpik) all have access to. If these studies are not going to be utilized for public decision-making processes, the Corps needs to immediately initiate public studies that *can* be used.⁶¹

As more such studies are undertaken, we expect they will document, as Mr. Braund recently has, “a slight uptick in the number and percentage of caribou harvested within 2.5 miles of infrastructure.”⁶² Like Mr. Braund, we attribute this increase primarily to the success of the Spur Road in encouraging residents to use areas that are accessible by road despite their relative proximity to oil developments. This increase may suggest that Nuiqsut hunters may be growing more accustomed to hunting near facilities (though we will need to know more about what qualifies as a “facility” for purposes of this study and other details), but public studies will be needed to confirm whether that is true.

It is depressing, year after year, that oil developments are keeping Inupiat hunters from using land that should be perfectly usable. The Spur Road was itself an attempt to DO something about the Avoidance effect, rather than just study it. Our experience suggests it is working for the Spur Road to at least some extent: we have seen caribou pouring across the Spur Road and caribou harvested right beside it. But that may be primarily because it is a Kuukpik-managed road, not an industry road.

⁶⁰ Draft EIS, p. 3-587. The Draft EIS is unclear regarding exactly how and whether this newer data is being used, or if it being used at all. The paragraph attempting to explain how or why the more recent information is used needs to be re-written to more clearly explain this point.

⁶¹ Multiple studies would be preferable anyway in order to avoid the “single source” problem that has crept into Nuiqsut research in the past couple of years. Table 3.17-1 shows Mr. Braund (sponsored by CPAI) as the only researcher who is currently active in caribou studies on the North Slope. We respect Mr. Braund and his efforts to study our community, but multiple sources are always better than one.

⁶² Before everyone gets too carried away with this “slight uptick,” recognize that the amount of caribou harvested within 2.5 miles is still small, ranging from 3% - 22% (the highest and most recent year, after completion of the Spur Road). The recent increase also raises an interesting question of whether (1) hunters are perhaps getting more comfortable hunting around oil facilities, (2) whether they're just more comfortable hunting around the Kuukpik-owned Spur Road specifically, or (3) whether the influx of construction in the last decade simply means they have no choice because so few areas are as far removed from facilities as they once were.

B. Armstrong's Avoidance radius is not supported by any scientific studies or traditional knowledge.

Of course, the changing attitudes and shortage of extremely recent studies does not mean all the historic data can simply be disregarded. As noted above, the most commonly accepted information Kuukpik is aware of shows that almost no game is harvested within 2 miles of facilities, dramatically reduced amounts are harvested out to 6 miles, and still limited out to a distance of 16 miles. These statistics have been cited in nearly every EIS affecting Nuiqsut for years and are familiar to everyone with any experience in this area.

It thus came as quite a surprise to see the Draft suggesting an entirely new standard that we have never seen in an EIS before and which is not scientifically supportable. Rather than use the data generated for decades and recognized by federal and State agencies in prior EIS processes,⁶³ the Corps has apparently adopted the (bogus) conclusion Armstrong included in its earlier EED that the Avoidance effect is actually limited to just 1-2 miles, a distance that "depend[s] on the resource targeted and the type of firearm."⁶⁴ It apparently reached this conclusion based on interviews with a handful of residents (EED, p. 231), some of whom "stated that they are comfortable discharging firearms approximately 1 mile from infrastructure and development. However, two harvesters estimated 2 miles as a safe distance to target caribou...."⁶⁵

⁶³ NPRA IAP/EIS 2012, V.1, p. 400 - 402:

Pedersen and Taalak (2001) conducted a survey of Nuiqsut households during June 1999 through May 2000. Caribou were the most widely used terrestrial big game resource in Nuiqsut, with an average of four caribou per household when averaged for all community households. According to their report, 75 percent of the 371 caribou harvested by Nuiqsut hunters from June 1999 through May 2002 with known harvest locations were harvested west of Nuiqsut, 11 percent were harvested in the immediate vicinity of the community, and only 14 percent were harvested to the east. Seventy-eight percent of all known caribou harvests occurred away (6 to 16 or more miles) from oil production facilities in 1999-2000.

...

In addition, 51 percent of the 1999-2000 harvests occurred greater than 16 miles from the Alpine field development, while 27 percent occurred 6 to 15 miles from the Alpine field development.

⁶⁴ Draft EIS, pp. 3-588 and 3-599.

⁶⁵ EED, p. 260.

We don't understand why we have to repeat this point: Being "comfortable" discharging a firearm within 1 or 2 miles does not define the Avoidance effect. There are many other considerations besides the range of a firearm that go into the decision of where to practice subsistence, such as likelihood that game will be using an area, past issues with local oil field security personnel, concerns about the health of subsistence resources, recent road or air traffic, risks of contaminated resources near oil facilities, *etc.* We are unaware of any other studies showing that the impacts of oil facilities in that calculus is limited to 1-2 miles. The use of that measurement is unsupportable and must be changed.

In an ironic twist, the Draft EIS backs off of its 1-2 mile "direct effect" by citing 5 miles as a "conservative" Avoidance radius around facilities.⁶⁶ The irony is not only that this is still below the commonly accepted Avoidance radius of at least 6-16 miles, but also because the Draft EIS goes out of its way to claim—multiple times—that Kuukpik's 2012 Draft NPR-A IAP/EIS Comment Letter is the source of that measurement.⁶⁷

That is not what we said. Kuukpik's comments cited the exact same statistics we have used throughout this letter (see in particular Section B(1)(a) and footnote 29 of our 2012 letter), which show that up to six miles (not "five") in every direction of a facility is "effectively off-limits to us, and that access is affected up to sixteen miles from a facility."⁶⁸ Even more ironically, Kuukpik was citing that data to illustrate a different instance of an agency under-estimating Avoidance. Five miles is not a "conservative" estimate of Avoidance; it is below the minimum estimate. And it is one that fails to even account for or consider the wider-ranging effects that occur on lands that are not "effectively off limits" but are nevertheless less used than they historically were.

But even if 5 miles were an acceptable "conservative" estimate, the Draft EIS does not appear to actually incorporate that distance into the subsistence analysis. The Draft states

⁶⁶ Draft EIS, p. 6-591 ("A conservative 5-mile human avoidance radius of all Project infrastructure to account for any potential user avoidance due to presence of facilities as noted by Kuukpik (Nukapigak 2012) and MMS (2007b)."); p. 6-637 ("[T]he subsistence impact analysis also considers a conservative 5-mile avoidance radius to account for potential user avoidance due to the presence of facilities as noted by Kuukpik (Nukapigak 2012) and MMS (2007b)"); p. 6-588 ("The analysis also considered a conservative 5-mile avoidance radius to account for potential user avoidance due to the presence of facilities (Nukapigak 2012; MMS 2007b).").

⁶⁷ Id.

⁶⁸ Kuukpik and City of Nuiqsut Joint Comment letter, NPR-A FEIS/IAP 2012, pp. 5 and 17.

multiple times that this radius is being “considered” in the subsistence analysis.⁶⁹ Where, and how? Table 3.17-12 (which is repeatedly referenced as the lynchpin of the subsistence analysis) relies on a 2 mile radius (per page 3-623). Figures 3.17-6 through 3.17-9, and Figures 3.17-13 through 3.17-18 all depict just a 2 mile Avoidance radius around project infrastructure. The only time the 5 mile radius is referenced at all appears to be when the Draft informs us that it is being “considered,” which is coupled with a less-than-helpful conclusion:

As discussed in Section 3.17.4, Analysis Area and Methodology, the subsistence impact analysis also considers a conservative 5-mile avoidance radius to account for potential user avoidance due to the presence of facilities as noted by Kuukpik (Nukapigak 2012) and MMS (2007b). This avoidance radius would affect a greater number of harvesters than those identified in the subsistence project area in Table 3.17-12 and possibly affect additional resources.⁷⁰

Two things stand out here. First, this is the epitome of “stating the obvious”. It hardly qualifies as “considering” a 5 mile Avoidance radius to say that 5 miles of Avoidance “would affect a greater number of harvesters” than would 2 miles. Second, the Draft cannot claim to be considering a 5 mile Avoidance radius when every single graphic and summary table depicts a 2 mile radius instead. If the Draft wants to take credit for analyzing a 5 mile Avoidance range, it needs to actually analyze that amount, not just pay it lip service.

C. *Implementation of real mitigation measures may reduce Nanushuk’s impacts.*

Armstrong proposes to lay gravel for as many as three years and to carry out construction activities for as many as five.⁷¹ That contributes to a finding that impacts to subsistence during construction will be “medium term.”⁷² But it is quite possible logistically to lay all the gravel Armstrong needs in one season.⁷³ This will not only reduce construction-related impacts to subsistence and the environment, but also reduce the impacts to the village residents who have to

⁶⁹ Draft EIS, pp. 6-588 and 6-591.

⁷⁰ Draft EIS, p. 3-637.

⁷¹ Draft EIS, pp. 2-25, 2-34, and 3-633.

⁷² Draft EIS, p. 3-633.

⁷³ Kuukpik has seen 7 million total cubic yards of gravel laid in a single season, so acquiring and laying less than 3 million in that amount of time should not be difficult as long as the work is planned and carried out properly. In addition to reducing impacts, this plan would avoid the cost and expense to de-water the mine site after it (typically) floods at breakup each year.

live with the blasting that's required in order to mine all that gravel. If the reaction to this past year's gravel mining is any indication, the village will not accept three consecutive years of blasting at the ASRC Mine. Armstrong needs to plan to acquire and lay their gravel in a single season in order to reduce these impacts to both subsistence users and the village itself.⁷⁴

Bridge height and location also need to be designed in a way that will guarantee year round safe passage underneath them. The Draft states that all bridges will be constructed with a minimum height of 3 feet above the highest predicted elevation of a 200 year flood event or the maximum observed elevation plus 3 feet, whichever is greater.⁷⁵ Elsewhere, it claims that there will be 9 feet of clearance between "normal" spring break up levels and the lowest point on the bridge.⁷⁶ As discussed above, we are not sure the existing data is even accurate enough to determine what those heights would be on the Kachemach and Miluveach Rivers. Even if it is, 13 feet is a safer clearance amount. These bridges need to be elevated as much as reasonably possible in order to allow users to travel as far upstream as possible during high water conditions (activity which is acknowledged repeatedly throughout the Draft EIS.)⁷⁷ The spans of these bridges may also need to be expanded to account for increased water flows and unpredictability caused by climate change.

These river accessibility issues could be of increasing importance if a boat ramp is ever constructed on the Kachemach near Drill Site 2, as Kuukpik and Armstrong have discussed. No such ramp is included in Armstrong's plans, but such a road, coupled with the proposed Colville River Access Road, could eventually provide access between Nanushuk and Nuiqsut by boat. It might also increase overland subsistence usage in the immediate Nanushuk area, and would certainly be expected to affect or increase boat usage in the Kachemach area, mostly downstream of the proposed bridge but potentially upstream as well as people increasingly use that area because of the ramp.

⁷⁴ As a side note on gravel, the Draft EIS has very little information on the proposed new Mine Site D. Although this site is apparently on State and Kuukpik-owned land (Draft EIS, p. 2-35), this is the first we recall hearing about it. What, if any, preliminary work has been done to survey and evaluate this area or obtain the appropriate permits? We note that the proposed area is just 2 or so miles farther away from Nuiqsut than the ASRC Mine, so this site would likely be quite disruptive and objectionable to the village (especially in light of the unhappiness with the blasting this year at the ASRC mine). Kuukpik would need considerably more information in order to even consider a gravel mine in this location.

⁷⁵ Draft EIS, p. 2-28.

⁷⁶ Draft EIS, p. 3-638.

⁷⁷ Draft EIS, pp. 3-608-09.

Better planning of pipeline construction could also reduce potential impacts. The Draft EIS calls for pipelines to be a minimum of 7 feet above the tundra except when they are within 100 feet of existing pipelines less than 5 feet high.⁷⁸ But all pipelines should be 7 feet high everywhere except for road crossings. The past mistake of building 5 foot high (or less) pipelines should not be used to justify installation of new pipelines lower than 7 feet. Building to 7 feet—and even raising other pipelines that Armstrong comes in proximity with—would raise the bar (so to speak) by setting a trend that anytime a pipeline is installed or replaced, it will adhere to the current 7 foot standard.

Kuukpik wants to see Armstrong design a project that can co-exist with other users in this area, and even provide offsetting benefits. So far, we're not sure if this project achieves that, and the Draft EIS's conclusions mostly confirm that. But meaningful changes and mitigation measures can perhaps change that if they actually reduce the impacts.

VI. The subsistence impacts analysis is confusing and seemingly arbitrary in important respects.

We have studied the subsistence analysis in detail. Compared to many other analyses we have seen over the years, the approach is an improvement in some ways. In particular, separating impacts into the “resource importance” and “harvester importance” categories is a reasonable effort to attempt to analyze aspects of subsistence that frequently elude easy analysis, even though it is not entirely clear how these categories are ultimately used.⁷⁹ And while the overlap approach is not perfect, we understand it has a certain appeal to agencies and is being relied upon more and more. Therefore, we have identified some information in the analysis that we feel is inaccurate or misleading, but also some suggestions that we believe will make this analysis more accurate, understandable, and useful.

First and foremost, the analysis needs to explain, specifically, how the overlap percentages are being calculated. The Draft contains quite a bit of qualitative information explaining the Corps' rationale on various factors, and noting caveats and uncertainties, but does not describe how the ultimate conclusions (*i.e.*, percentages) were calculated. What are the

⁷⁸ Draft EIS, pp. 2-37 and 3-409. The Final EIS should identify the locations where this would occur.

⁷⁹ At first glance, we thought (or hoped) the newly created categories (“resource importance” and “harvester importance”) were going to be used to help address some of our concerns with the overlap approach by “weighting” impacts to certain areas or resources in the impact calculation. That turned out not to be the case exactly, as best we can tell. Instead, these categories are themselves being evaluated (which is good), but are not necessarily being used to “weight” or influence the broader analysis.

numerators and denominators that were used to generate the overlap percentages in Table 3.17-12, for example?

Portions of the Draft EIS suggest that the denominator is “all lands used by the community of Nuiqsut,” and that this is considered to be one (or both?) of the areas depicted in Figures 3.17-1 and/or 3.17-2.⁸⁰ If that’s the case, we refer back to our scoping comments where we explained in detail the problem with using Nuiqsut’s entire range as the denominator.⁸¹

Explaining the Corps’ computations is important because portions of the Draft suggest that the category “levels” (*e.g.*, probable, possible or unlikely) are being used a bit cavalierly or even as a shortcut for conducting a more detailed analysis. For example, when discussing harvester impacts during the *construction* phase, the Draft concludes that impacts to caribou and eider harvesters would be “probable,” impacts to fish harvesters would be “less likely

⁸⁰ Draft EIS, p. 3-587:

The analysis area for subsistence and traditional use includes all lands used by the community of Nuiqsut for subsistence and is based on the most recent comprehensive subsistence mapping study conducted for the community (SRB&A 2010b). This study documented Nuiqsut subsistence uses from Barrow and Atkasuk in the west, Camden Bay to the east, the foothills of the Brooks Range to the south, and up to 50 miles offshore from Cross Island (Figure 3.17-1).

⁸¹ See Kuukpik’s Scoping Letter, p. 26:

If “available use area” includes every acre of land that Nuiqsut users have crossed, scouted, or otherwise used over the years, then the number of acres is likely so large that nothing short of a Prudhoe Bay-sized development would exceed 25% (assuming that arbitrary number determines the difference between minor and moderate impacts). In any analysis, the acres available for subsistence use need to be realistically assessed and the assumptions underlying the assessment/calculation need to be very clearly identified.

The other problem with this “overlap approach” is that it distorts the analysis by suggesting that all subsistence lands are basically the same as long as they are “available.” It assumes that it doesn’t really matter what subsistence lands are impacted as long as the total acres impacted does not exceed a certain arbitrary percentage. It also assumes that subsistence uses that are prevented in one area can simply be made up on an equal basis elsewhere.

(possible),” and that impacts to all others would be “unlikely”.⁸² Addressing the same topic during the *drilling and operations* phase, the Draft states “impacts to harvester access would be lessened from harvester access impacts under *construction* activities due to the reduction in overall activity levels. Therefore, the likelihood of harvester access impacts related to *drilling and operations* activities would be possible for caribou and eider harvesters, and unlikely for the remaining resource harvesters.”⁸³ This implies that the assignment of “possible” and “unlikely” ratings were based more on a perceived need to express a distinction between the two phases than a detailed calculation or analysis that would actually justify the lower ratings. Here, we know that reducing harvester access impacts from “probable” to “possible” is not justified because all the studies cited in the Draft EIS show that Avoidance will happen during all phases of this project. It’s the magnitude or extent that will change, not the probability. There is thus no justification for reducing the level of probability from anything below the highest level just because the Corps feels the need to show that there will be some difference at each phase of the project.

Another suggestion flows directly from this point. We have previously expressed our discomfort with trying to reduce impact descriptions to percentage-based “levels” at all, but if the Corps insists on doing it, the analysis may benefit from additional “levels” in each category. Using, for example, 5 levels in each category instead of just three would allow more precise expressions of the likely impacts and capture more nuanced differences between alternatives. The conclusion referenced above, for example, would be more accurate if it concluded that Avoidance was “certain”, rather than “probable.”⁸⁴ We therefore recommend the Corps use more, and more precise, levels in these analyses so that the differences between these alternatives can be more correctly identified.

VII. The Final EIS must analyze additional options to reduce air emissions impacts in Nuiqsut.

As the Corps and Armstrong know based on extensive public testimony, the community of Nuiqsut has grown increasingly concerned about the adverse impacts to air quality caused by

⁸² Draft EIS, p. 3-634.

⁸³ Draft EIS, p. 3-637.

⁸⁴ We understand the reluctance of any scientific analysis to reach absolute conclusions, but in this case, all the evidence supports the conclusion that harvester access will be interfered with to some degree—the question is really just how much, which is expressed under a different category than “likelihood”. Even Spur Road-related changes to caribou harvest near the Road don’t change the inevitability of Avoidance impacts at drill sites and other oil industry facilities.

oil and gas projects near the village. Previous analyses by BLM and others support these concerns:

The primary sources of airborne emissions include construction dust, road dust, vehicle and machinery emissions, flaring and venting of gas, burning of refuse, and emissions from power generation as well as other sources. The air pollutants emitted by these activities include a number of Environmental Protection Agency (EPA) criteria pollutants such as nitrogen oxides (NOX), sulfur dioxide (SO₂), particulate matter (PM, including both PM_{2.5} and PM₁₀), carbon dioxide, and ozone. These substances have been linked with a range of health effects, the most notable of which are asthma, chronic bronchitis, decreased pulmonary function, cardiovascular events, increased hospital admissions, and increased mortality (EPA 2014a)....

In addition, other hazardous air pollutants may also be emitted, including benzene, toluene, ethylbenzene, and xylenes. Chronic exposure to hazardous air pollutants has been associated with irritation of the skin, eyes, and lungs; the development of some cancers; neurologic effects; reproductive effects; and gastrointestinal effects (EPA 2000a, 2000b, and 2000c).⁸⁵

The paragraphs above suggest that the exact contaminants being released as a result of oil and gas production are “linked” to various common ailments on the North Slope.⁸⁶ It’s therefore disappointing to see the Draft EIS seemingly downplaying the impacts that oil and gas production are having on air quality in the region.⁸⁷

Even more recently, BLM concluded (in 2014) that “The cumulative impacts of all projects affecting the North Slope of Alaska in the past have caused some deterioration in and contributed to increases in criteria pollutants, hazardous air pollutants, hydrocarbons, and

⁸⁵ NPR-A FEIS/IAP 2012, pp. 346–47. “Benzene, toluene, ethylbenzene, and xylenes are common hazardous air pollutants associated with volatilization of oil and gas resources, as is formaldehyde from compressor engines.” *Id.*, p. 73.

⁸⁶ NPR-A FEIS/IAP 2012, p. 492.

⁸⁷ See, e.g., Draft EIS, p. 3-90, where the Draft refers to wildfires, dust storms, and “land clearing” in a manner suggesting that these are the same as oil and gas related pollution sources. There has not been a wildfire of any significance in the Nuiqsut area for many years, nor would such a fire have long-term impacts anyway. We are also not aware of any “land clearing” of a scope significant enough to contribute to air quality problems that are not related to oil and gas projects, and dust storms only contribute particulate matter, so cannot be responsible for the other pollutants that have been identified.

greenhouse gases.”⁸⁸ BLM even acknowledged the link between these pollutants and various health problems that are widespread on the North Slope, stating that “Episodes of poor air quality associated with dust or emissions will pose a health hazard for at-risk populations such as those suffering from chronic obstructive pulmonary disease or asthma.”⁸⁹

In light of these new conclusions and residents’ own experience, Nuiqsut residents—and Kuukpiik—expect Armstrong to take every reasonable precaution to reduce Nanushuk’s contribution to air quality degradation on the North Slope and in Nuiqsut specifically as much as reasonably possible.

Here, yet again, because the components of this project are identical among all alternatives, it is not possible to draw comparisons or choose between alternatives to achieve those reductions. This is still another example of the Draft failing to consider options outside of Armstrong’s preferred alternative, and it significantly undercuts the value of providing alternatives at all.

The Draft makes no bones about that: it only analyzes Armstrong’s proposal, using that as a “proxy” for all the other alternatives. We don’t know whether that is appropriate because no evidence is provided to support the Corps’ decision to do it. That said, the Draft suggests that the *only* substantial point source variable that changes in each alternative—the location of the CPF—is also the one most likely to affect emissions in the immediate vicinity.⁹⁰ This is not consistent with the conclusion elsewhere in the Draft that there are “no differences” between alternatives.⁹¹

⁸⁸ GMT-1 SEIS, p. 515. “Emissions from sources have contributed to increases in criteria pollutants, hazardous air pollutants, hydrocarbons, and greenhouse gases.” NPR-A FEIS/IAP 2012, vol. 4, p. 72.

⁸⁹ GMT-1 SEIS, p. 461.

⁹⁰ Draft EIS, p. 3-95 (“[U]nder Alternative 2, the CPF and DS1 would be colocated, which would result in greater maximum pollutant impacts in the immediate Project vicinity when compared with other alternatives for which the CPF and DS1 emissions sources would be on individual pads.”).

⁹¹ Draft EIS, p. 3-95. Later the Draft backtracks on this, saying that the differences among alternatives “are not substantial enough to create notable differences among the action alternatives.” Id.

Furthermore, Armstrong and the Corps know this is a huge issue in the community.⁹² Not only would Nanushuk be the largest oil development in twenty years, and be far closer to Nuiqsut than any comparable facility, the prevailing winds (which blow from northeast to southwest) basically run from DS3 to Nuiqsut.⁹³ A processing facility that lies roughly on this same prevailing wind line (*i.e.*, just beyond DS3, where it is proposed in Alternative 5) will therefore be perceived in the village as having cumulative effects on top of DS3 and as not being located in a way that reduces the likelihood of emissions drifting straight towards Nuiqsut.⁹⁴ So even though the prevailing winds are not uniform, and even though Armstrong and the Corps keep saying there will not be any negative impacts, the community will not support a project that is perceived as not doing everything it can to minimize emissions impacts.⁹⁵

We see a couple of options. First, the Final EIS needs to consider an alternative location for the CPF that is located slightly north of the location proposed in Alternative 5. Even moving the CPF 1-2 miles north (to a location between the infield road and the western side of Lake MC7903) would move the facility that people are most concerned about slightly farther from the village and farther out of the path of the predominant prevailing winds. Preliminary discussions indicate that Armstrong would be willing to move the CPF to this proposed location. Whether Oil Search as the successor Operator is uncertain, but the NEPA analysis and the Final EIS should cover this possible shift in the CPF location.

Second, alternative power options need to be explored. Armstrong's permit applications call for diesel rigs, diesel generators, combustion heaters and other machinery—in short, the highest-emitting (legally permissible) options available for building and operating an oil and gas

⁹² Draft EIS, p. 3-118 (“The location of the CPF in relation to Nuiqsut was a concern raised during public scoping.”).

⁹³ Draft EIS, p. 3-88–3-89.

⁹⁴ The Draft notes that each project facility can be permitted separately for federal air quality purposes if they are more than a quarter mile apart and do not share a power source. Draft EIS, p. 3-78. Even so, just because a federal rule allows Armstrong to dis-aggregate these facilities for the purpose of air quality permitting, that most certainly does *not* mean the community will view them as any less connected or cumulative from an emissions perspective.

⁹⁵ One thing that might help residents understand and use the air quality data in the Final EIS would be to provide a chart showing projected pollutant levels in Nuiqsut compared to other areas like Fairbanks and Anchorage to show how Nuiqsut's air compares with other communities. The presentation could be limited to just a few major pollutants so people are not overwhelmed with information or by supplementing an existing chart like Table 3.5-13.

facility.⁹⁶ There is no mention, or apparent consideration, of lower impact options like running drill rigs from high line power when it becomes available. Using electrified rigs is not even mentioned as a possible mitigation measure.⁹⁷ Tier 4-compliant generators and dual fueled turbines should also be used for power generation rather than ULSD-fired generators.⁹⁸ Tier 4 generators should be the minimum requirements, not an afterthought, but likewise are not even listed as a mitigation measure. All power generators and plants should have dual fuel capabilities so they can primarily be run on **natural** gas from the project when it becomes available, using diesel only as a backup.

Additional information is also needed on Armstrong's flaring plans and the anticipated design of the flare stacks. Nuiqsut residents strongly oppose flaring, both for aesthetic purposes (when it is visible from the village) and because of concerns about the resulting emissions.⁹⁹ Armstrong's permit application states that the "height and width of the flare stacks have not yet been determined."¹⁰⁰ The Draft EIS does not elaborate on this either, so we do not know whether a single or dual flare will be necessary, or the size. Since these flares will almost certainly be visible from Nuiqsut and will, depending on the location of the CPF, contribute to emissions in

⁹⁶ Draft EIS, p. 3-98.

⁹⁷ Draft EIS, p. 3-121.

⁹⁸ The Draft contains conflicting information about what power options will be used for different purposes. Page 3-99, for example, states that operations would utilize RICEs (reciprocating internal combustion engines) or turbines for powering crude production activities. This statement conflicts with the applicant's proposed mitigation measure Number 67 on page 6-16 (and page 3-121), which calls for use of natural gas fired turbines for power generation or compression. These need to be harmonized.

⁹⁹ See quotations at Draft EIS, p. 3-93. As a side note, the Draft EIS does not comment on these "traditional knowledge" quotes, so it is not clear whether the Corps is providing them just to check a box or whether this traditional knowledge is being factored into the analysis. The Draft EIS in fact confirms that Nuiqsut residents's concerns are valid when it notes that "Flaring results in emissions of criteria pollutants, such as NOX, PM, and CO." Draft EIS, p. 3-100. Frankly, whether or not the Corps believes these pollutants are causally related to the health concerns expressed by Nuiqsut residents, it needs to pay heed to Nuiqsut's concerns and traditional knowledge, and err on the side of caution if it wants the residents of Nuiqsut to buy-in to this EIS process and feel like their voices have been heard.

¹⁰⁰ Nanushuk Development Project, *Revised Project Description* (July 2017), p. 8.

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some manner, details on the flare stack designs should be provided in order to properly assess the impacts of flaring.¹⁰¹

CONCLUSION

For all these reasons, Kuukpik cannot support the Nanushuk Project as currently proposed. Kuukpik hopes that by incorporating meaningful design changes into its proposal, and making a commitment to avoiding and reducing impacts as much as possible, Armstrong and Oil Search will be able to develop a plan that Kuukpik and Nuiqsut can support.

Sincerely,

KUUKPIK CORPORATION

By 

for Joe Nukapigak
President

cc: Mayor North Slope Borough
North Slope Borough Planning Department
Native Village of Nuiqsut
City of Nuiqsut
Kuukpik Board Members

¹⁰¹ See Draft EIS, pp. 2-21 and 3-508 for a description of the amount of flaring that is expected to occur at the CPF.

TECHNICAL ATTACHMENT

1. Page ES-40 states Nuiqsut has 345 residents (based on the North Slope census). This number is not accurate. There are around 450 people in Nuiqsut, which the document acknowledges at page 3-502.
2. Page 1-4 states that the State of Alaska operates the airport in Nuiqsut. The NSB operates the airport in Nuiqsut.
3. Page 1-12 defines reasonably foreseeable future actions as limited to actions known and/or likely to occur with 5 years. However, there is no identification of the geographic area (*i.e.*, within X miles of the project area).
4. Pages 1-25–1-26, Table 1.8-1 defines legal authority for USFWS but does not list DOI requirement/policy on consultation with Alaska Native corporations issued by Ken Salazar on August 10, 2012.
5. Page 2-19 leaves open options for use of sandbags, concrete block revetment, grass seeding, *etc.* as options for erosion protection. This passage does not cite rip-rap. Rip-rap will almost certainly (and should) be required for erosion protection.
6. Page 2-22 references a need for marine transport for the life of the project. What is this need? After the various modules are sealifted, there should be no need for marine transport. All equipment and materials can then be transported by truck.
7. Page 2-29 cites a design criteria of a 50 year flood event with a headwater elevation not exceeding the height of the culvert. This criteria seems to be low. ADFG will make the call on whether this is sufficient, but a higher criteria (*e.g.*, a 75 year flood or more) is likely appropriate, particularly in light of uncertainty with average water levels and the increasing flooding caused by climate change in the future. The locations should also be determined by a hydrologist, not just located every 500 feet. This same section on Page 2-30 references fish passage culverts being “inverted” at least 20% below grade. It should state culverts will be “embedded” at least 20% below grade.
8. Page 3-6, Table 3.1-1 summarizes past, present, and reasonably foreseeable future actions considered for Nanushuk. What criteria were used to classify items as past or present? For example, the Moose Pad at Milne Point has been constructed but is shown as “future.” Also, the Nuna 1 pad has been constructed but is listed

as future. Figure 3-1.1 (Page 3-9) does not show the GMT-1 road, and Willow and Placer looks to be in the wrong area.

9. Page 3-185, the last bullet on abandonment should also reference consultation with Kuukpik as surface landowner.
10. Page 3-230 states there are 601 acres of non-jurisdictional uplands. Where are these uplands? Page 3-243, Table 3.8-4 states there are 525.3 acres of uplands in the West Analysis Area, and page 3-245 states there are 340.1 acres in the East Analysis Area. The upland total of East and a West Analysis Areas is greater than the 601 acres cited on Page 3-230. Why?
11. Page 3-288, Table 3.8-17 (Past, Present, and RFFAs within the Cumulative Effects Analysis Area for Wetlands) includes large amounts of “unknown” acreage. This leads to a much lower total of impacted acreage than actually exists.
12. Page 3-503 states there is little recreational use of the area and cites around 40 people engage in recreation activities per season. If the “per season” qualifier is correct, then about 160 people use the area annually, representing about 1/3 of the Nuiqsut population. Even if that is not what this passage means, Nuiqsut residents recreate throughout the area affected by the project. This should be noted at pages 3-14 and 3-499 as well.
13. Page 3-508, second passage, provides information on flaring events and times. Where did this data come from?
14. Page 3-510 states pipeline crossings of Kachemak and Miluveach Rivers would be about 1,000 feet from the road crossing. This info needs confirmation and clarification. Why are the pipelines so far from the road at these locations?
15. Page 3-571, last sentence, references project components exceeding 200 feet in height having possible indirect impacts to cultural resources within 3/4ths of a mile. How is this? Also, what project components are higher than 200 feet? Most drilling rigs are less than 200 feet high.
16. Pages 3-595–7, Tables 3.17-5 through 3.17-7 fails to appreciate the relative cultural importance of the bowhead whale as a subsistence resource. Although Nuiqsut subsistence users use approximately similar amounts of meat from whales as from caribou resources, there is far more sharing of whale products than other resources, including caribou, which contributes to its overall cultural importance. There are no blanket tosses or similar festivities related to harvests of other food

sources like fish, waterfowl, or even caribou. So while each of these is important, the importance of the bowhead whale to Nuiqsut should not be underestimated.

17. Page 3-642, third passage, states that there are no recorded instances of catastrophic pipeline failure on the North Slope resulting in large or very large spills. BP had a 212,525 gallon or 5,053 barrel spill from a Prudhoe Bay pipeline in March 2016 that was caused by a corroded pipeline. This spill is even referenced later on Page 4-7.
18. Page 3-647, Table 3.17-6 Summary of Additional Past, Present, & RFF Actions in Cumulative Effects Area for Subsistence and Traditional Use. Why wasn't this info included in Table 3.1-1 on Page 3-6? Also, why isn't Pt. Thompson marked with a "x" for present? Additionally, BP sold Badami to Savant in 2010 so their inclusion as an owner needs revision.
19. Page 3-671 states that a few hundred workers are present at Prudhoe Bay at any time. This is plainly inaccurate. When the numbers housed at BP's BOC & PBOC (West and East camps) and associated camps like the MCC (Main Construction Camp in the Eastern Operating Area) and other similar facilities are included, it is easily a few thousand workers.
20. Page 4-3, first bullet, states that nearly 7,000 wells have been drilled on the North Slope without reservoir blowouts. This is false. The ARCO NGI # 7 well blowout in 1976 was a reservoir blowout.¹⁰²
21. Page 5-5 does not cite the July 11, 2016 Kuukpik-hosted tour of Nuiqsut and Alpine (with CPAI assistance).

¹⁰² Here's a link to an ADN article that cites blowouts:
<https://www.adn.com/economy/article/details-alaska-blowouts/2008/12/19>