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RE: Scoping Comments for the Proposed Donlin Gold Mine

Introduction:

These scoping comments are being submitted on behalf of the Donlin Gold Working Group (DGWG), a group of Alaskans concerned with the social and environmental impacts of the proposed Donlin Gold Mine. The DGWG currently includes roughly 25 participants – many of whom live in the Yukon-Kuskokwim Delta – and includes representation from Tribal groups and consortiums, environmental advocacy groups, individual citizens, environmental chemists, biologists, and former mine engineers.

The groups and individuals listed herein as signatories may include additional scoping comments unique to them, as well as reference or cite these comments. But if not, we are requesting that for the scoping record, each group or person listed is recognized as an individual commenter, and that future correspondence and follow up is directed at the contact name provided rather than the administrator of the Working Group.

The DGWG believes that any large scale mine should only be permitted if it can be built without compromising the long term viability of renewable resources such as salmon, clean water, and clean air. With this in mind, our scoping comments are centered on the following issues:

1.) **Mercury exposure pathways, monitoring, and exportation**

2.) **Acid mine drainage/metals leaching, pit lake chemistry and perpetual water**

treatment

3.) **Transparency and information accessibility during permitting**

4.) **Greenhouse gas emissions, climate change, and sustainability issues**

5.) **Pipeline and barge traffic concerns**

We hope that both future scientific study and a better regulatory understanding of the permitting process regarding the issues covered in these comments will greatly improve the DGWG's ability to provide more specific comments upon the release of the Draft Environmental Impact Statement (DEIS) and the alternatives included in it.

Attached to these comments is a CD with references to be considered as part of the comments. We request that all permitting agencies familiarize themselves with the studies and background documents as they are highly relevant to our suggestions for alternatives in the DEIS. Some references also appear as links in the text.

MERCURY ISSUES

The potential for mercury contamination via air emissions as well as surface and groundwater contamination has been one of the main areas of focus of the DGWG in the last few years. Donlin would be dealing with extremely high levels of mercury in ore, at 1-2 parts per million. Based on an estimated mill throughput of about 21.5 million tons per year, roughly 20-40 tons of mercury will be moving through the mill per year. It is critical that the DEIS take into account the tremendous volume of mercury present at Donlin and all the potential exposure pathways it presents.

Past correspondence from the DGWG to the Alaska Department of Environmental Conservation, the Alaska Department of Natural Resources, and the U.S Environmental Protection Agency (EPA) regarding mercury are attached[1]. Although we understand that

[1] The correspondence is also available on the DGWG website here, here, and here.

there may be a separate mercury management document coming later, the following issues should be addressed as soon as possible within the National Environmental Policy Act process. Additional mill engineering and geochemical research may be required of state and federal agencies and by the project proponents to help assemble a wide range of alternatives in the DEIS that sufficiently address our technical concerns. As discussed later in this section, our scrutiny regarding mercury is rooted in the real and serious threat that increased bioaccumulation poses to the greater ecosystem and human health, in particular subsistence food sources.

Overall mass balance approach

Because of the potent neurotoxicity of mercury, it's essential that the mine facilities account for mercury at all stages of mine operations on an ongoing basis. A mass balance approach ensures that operators know how much mercury is entering the mill, how it partitions at capture equipment, how much is released at the stack, and how much goes to the tailings facility. To begin with, the concentration of mercury in the core assays drilled during production should be analyzed to understand how much mercury will soon be entering the mill in order to detect any unusually high levels and prepare accordingly. The crushed and pulverized mill feedstock should be analyzed as well to obtain accurate numbers of the volume of mercury entering the mill. Mercury abatement units should be monitored closely, capturing ongoing data (at least daily) of how much mercury is captured and how much is emitted per the 2010 EPA regulations for stack emissions of mercury to air. Efficiency rates for thermal capturing technologies should be maximized, as they greatly determine the amount of actual emissions rather than the projected emissions. Finally, the slurry pipe to the tailings impoundment facility should be monitored regularly to determine if or how much mercury is entering the tailings pond, where it is subject to methylation and off-gassing and potentially, later groundwater contamination.

In a 2001 draft report prepared for EPA, contractor Booz Allen & Hamilton, Inc. evaluated the range of possible mercury loading and partitioning for each process involved in gold ore processing.[2] The report demonstrated that a mass balance approach is feasible, as it identified "[e]missions factors and mass balance evaluations . . . based on source testing data, process engineering information on mercury concentrations and behavior in the processes and control technologies, and estimates derived from mercury emissions and

[2] Booz, Allen and Hamilton Inc., "Draft Mercury Mass Balance and Emissions Factor Estimates for Gold Ore ProcessingFacilities," (2001).

controls from other industrial processes with similar emission types."[3] The report also flagged the need for site-specific assessments, observing that "individual site evaluations should include mass balance evaluations that measure mercury concentrations in the solid phases (process input and output streams) and treatment residuals (adsorption media and scrubber solutions)."[4]

Full, ongoing accountability for the flow of mercury is a feasible and appropriate requirement, and should be incorporated into the DEIS analysis. A mass balance approach will provide detailed information on mercury throughout the process and allow mill engineers, regulators, and the Donlin environmental team to better understand how mercury may go unaccounted for – allowing for a faster and more informed mitigation response in the event of unexpected problems with contamination. The information gathered should be publicly accessible online, at any time, and independently reviewed by third-party inspectors.

Fugitive emissions

Mercury from non-thermal sources, particularly wet tailings, can be a significant source of mercury air emissions. A recent paper by Mathieu Miller and released by the Air and Waste Management Association indicated that non-point sources at open pit gold mines can be between 14-56% of the total mercury emissions from a mine.[5] Unfortunately, EPA does not regulate non-point sources under its 2010 ruling: National Emissions Standards for Hazardous Air Pollutants for Gold Ore Processing and Production Facilities[6]. However, the rule notes that "fugitive emissions may be occurring at these facilities from large non-point sources such as tailings ponds, leach fields, and waste rock piles."

Research conducted by Mae Gustin at the University of Nevada, Reno found that mercury air emissions from mining disturbances were approximately 20 percent of the total mercury emitted at the two gold mines studied, with total nonpoint emissions at the Twin Creeks Mine of 105 kg/year (231 pounds/year) and 19 kg/year (41 pounds/year) at the

[3] Ibid. p. 13.

[4] Ibid.

[5] Miller, et al., "Testing and modeling the influence of reclamation and control methods for reducing non-point mercury emissions associated with industrial open pit gold mines," Journal of the Air and Waste Management Association, December 2012, p. 4.

[6] https://www.federalregister.gov/articles/2010/04/28/2010-9363/national-emission-standards-for-hazardous-air-pollutants-gold-mine-ore-processing-and-production

Cortez Mine.[7] In fugitive emissions alone, these two mines combined produced 3.8 times the amount of known mercury air releases in all of Alaska, from all sources, according to the 2010 EPA Toxics Release Inventory.

Fugitive mercury air emissions analysis, from simulated wet tailings like those Donlin will produce, from the effects of ultraviolet light on tailings and waste rock, and from any other potential non-thermal sources should be provided as part of the DEIS. This analysis should be made publicly available as soon as possible and well before the comment period begins for the DEIS.

The DEIS also should evaluate the need for, and feasibility of, mitigation measures to limit fugitive mercury air emissions should they unexpectedly become problematic. The Miller study found that fugitive mercury emissions can be significantly reduced by post-mining capping and reclamation, and possibly by chemical treatments of leach ore and tailings waste." According to the study:

> "Results showed that capping mining waste materials with a low-Hg substrate can reduce Hg emissions from between 50 to nearly 100%. The spraying of typical dust control solutions often results in higher Hg emissions, especially as materials dry after application. The concentrated application of a dithiocarbamate Hg control reagent appears to reduce Hg emissions, but further testing mimicking the actual distribution of this chemical within an active leach solution is needed to make a more definitive assessment."[8]

In addition to the approaches considered in the Miller study, the DEIS should also assess the feasibility of enclosing any leaching processes or tailings ponds. These control approaches were suggested to EPA for its recent rulemaking on gold ore processing but rejected by the agency as beyond the scope of the rulemaking.[9]

We believe we have shown more than adequate evidence in these comments that fugitive emissions are proven to be an issue elsewhere, and will be a larger issue at Donlin due to the size of the mine and the high concentrations of mercury in source rock and ore. The DEIS should reflect this reality through rigorous study and analysis and consider all

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[7] Eckley et al., "Measurement of surface mercury fluxes at active industrial gold mines in Nevada (USA)," Science of the Total Environment, 409 (2011) p. 514-522.

[8] Miller, M. and Gustin, M., "Testing and modeling the influence of reclamation and control methods for reducing non-point mercury emissions associated with industrial open pit gold mines," (submitted Dec. 17, 2012) manuscript p. 3.

[9] *See* 76 Fed. Reg. 9,450, 9,457-58 (Feb. 17, 2011).

potential outcomes. Finally, it should include methods for monitoring and mitigation should problems arise, as well as a closure plan if mercury levels become a threat to human and ecosystem health.

Air emissions monitoring

The DEIS should specify how air emissions will be monitored during mine operations and post-closure. Federal regulations require mercury capture controls to be monitored more than once per month, but only to ensure that capture equipment is operational (flow, pressure, temperature, etc.). There is no requirement to monitor and quantify the amount of liquid mercury captured at each source (autoclave, kiln, electro winning, carbon absorption plates), or to monitor and quantify the actual amount of gaseous emissions from each source or at the central stack(s) to which all these sources are routed. Current regulations only require an annual emissions test from the main stack(s) after the mercury abatement process. During operation of the mine, any stack that vents to the atmosphere should be monitored on a frequency sufficient (preferably daily) to provide statistically reliable data to determine the total amount of mercury released into the atmosphere. One testing event a year – the current plan – has no statistical significance. It does not provide for accurate, timely or credible information, or provide accountability to the public.

In addition to point sources, passive air monitoring for fugitive emissions around the mine site from many monitoring stations should also be part of the mine operations plan, and the results for both passive and stack emissions monitoring should be publicly available online, at any time. Passive monitoring should be conducted both during thermal mill operations as well as when thermal processing is not operating; this will allow for a better understanding of fugitive emissions, as emissions detected during a mill shut down would indicate fugitive emissions. Passive air monitoring should be conducted at least once a month, and the results of the monitoring should be compared to the modeled predictions from the mass balance analysis and exposure pathways modeling data. A mine closure plan should be implemented if exceedances occur.

The problem associated with inadequate monitoring is illustrated by a recent situation at the Twin Creeks mine in Nevada, where significant uncontrolled emissions occurred from the carbon kiln due to a failure in the control equipment – the hypochlorite scrubber. The equipment failure wasn't identified until the annual emissions test, allowing

unauthorized mercury releases for a significant period of time.[10]

Similarly, the Jerritt Canyon mine failed to operate and maintain pollution control devices for a significant period of time, resulting in excess emissions and failure to report those excess emissions.[11] This problem wasn't confirmed until the annual emissions testing event occurred – at least a full year later.

> "A meeting with Queenstake held on August 24, 2004, and again on December 15, 2005, focused on maintenance issues and problems with the reporting of excess emissions and other permit deviations. During an inspection in October 2005, the NDEP discovered evidence that leaks in ore processing equipment in the dry mill building appeared to have been generating excess emissions (the facility was not operating at the time of the inspection). While inspecting the facility during mercury emissions testing in October 2006, NDEP inspectors confirmed that the generation of fugitive emissions from leaky processing equipment is a recurrent problem. During one of the October 2006, test runs, Queenstake suspended operation of the West Roaster in order to repair major leaks in the ore grinding process system. In December 2006, based mainly on the inspections conducted in October 2005 and 2006, the NDEP issued five Notices of Alleged Violation (NOAVs) to Queenstake for failing to maintain ore processing equipment, which resulted in excess emissions and deviations from permit conditions, and for failing to report these excess emissions. These NOAV's resulted in total penalties of $2,600 and were approved by the State Environmental Commission."[12]

This is a serious failure in the system, including enforcement, particularly given the amount of mercury air emissions generated by the Jerritt Canyon and Twin Creek mines. The Twin Creeks mine was the largest single source of mercury air emissions in the U.S., with 1,837 pounds of mercury released into the air in 2008.[13] Jerritt Canyon was the largest single source of mercury air emissions for many years in the 1990s.

Predicting exposure routes

[10] Nevada Department of Environmental Protection, Stakeholder Meeting, October 7, 2009. Nevada Department of Environmental Protection, Notice of Findings and Order No. 2008-13. Nevada Department of Environmental Protection, Notice of Findings and Order No. 2008-13, March 10, 2008. Finding # 3, page 2.

[11] Nevada Department of Environmental Protection, Notice of Findings and Order No. 2008-13.

[12] Nevada Department of Environmental Protection, Notice of Findings and Order No. 2008-13, March 10, 2008. Finding # 3, page 2.

[13] U.S. EPA Toxic Release Inventory, 2008.

The DEIS should provide modeling data to demonstrate the likely atmospheric and depositional pathways for mercury air emissions from the mine. This should include information on mercury speciation (gaseous elemental, oxidized and particulate) to identify the best control measures.

Mercury capture and transport

The DEIS should include information on how the proposed Donlin mine will dispose of the mercury captured by its control devices, including liquid and gaseous mercury from thermal sources as well mercury captured from the tailings slurry pipeline (if necessary). The mine should not be allowed to dump captured mercury into the tailings pond; rather, it should export all captured mercury to a federally approved permanent storage facility, following the transport protocol used by the Department of Defense[14] and guidelines provided by the Department of Energy [15] – a multiple container approach with several redundant systems for safety.

The Kuskokwim region is one of the most important subsistence rivers in Alaska; in fact it is the largest Chinook salmon subsistence fishery in the state. If mercury is transported by barge, and if there is a spill, the river will be contaminated forever, just as the Carson River in Nevada is currently contaminated from mining-related impacts and is now a superfund site[16]. The DEIS should fully disclose plans for mercury transport, make export manifests publicly available, and provide detailed information for emergency response procedures. The DEIS should also analyze the potential impacts associated with a mercury spill during transport.

Subsistence issues

Mercury exposure is a tremendous public health concern, particularly for children. Exposure to mercury can cause significant neurological and developmental problems such as attention and language deficits, impaired memory and impaired vision and motor function.

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[14] http://www.jmc.army.mil/Images/Hawthorne/HWAD%20Mercury%20Consolidation%20Project%20Fact%20Sheet.pdf

[15] http://mercurystorageeis.com/Elementalmercurystorage%20Interim%20Guidance%20%28dated%202009-11-13%29.pdf

[16] http://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/7508188dd3c99a2a8825742600743735/2380a6ecf1b1731f88257007005e9424!OpenDocument

The communities in the Kuskokwim River watershed rely on a subsistence diet high in fish. On average, Alaska Natives in the region rely on subsistence fishing for approximately 60% of their diet.[17] The allowable point source atmospheric release of mercury from the Donlin mine could more than triple the amount released currently by the entire state.[18] The impact from additional mercury loading in this region is important given that the Kuskokwim River supports one of the largest subsistence fisheries in Alaska. Mercury concentrations in fish tissue are already elevated in this region[19] due to historic mercury mining such as the Red Devil mine.[20] Therefore, new sources of mercury pollution are particularly concerning.

The DEIS should provide comprehensive baseline data of fish tissue concentrations of mercury –particularly for resident fish – in the region, from Crooked Creek and from sites upstream and downstream of the confluence of Crooked Creek with the Kuskokwim. It should also provide detailed baseline data of concentrations in lake and stream sediment upriver and downriver of the confluence of Crooked Creek and the Kuskokwim. Using a comprehensive Health Impact Assessment, the DEIS should fully analyze the potential health risks to subsistence users associated with increased mercury concentrations in fish populations and other exposure pathways, and should analyze the potential cultural and health impacts to subsistence users associated with the perception that subsistence resources may contain mercury, and how traditions may change as a result.

The DEIS should specify what requirements will be put in place to reduce mercury contamination if fish tissue and/or lake and stream sediment concentrations increase, and develop a protocol to track progress in the reduction of both. A temporary closure plan should be established to halt mine operations until the problems are corrected.

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[17] Alaska Community Action on Toxics & Reducing Environmental Destruction on Indigenous Lands, "Mining and Toxic Metals: A case study of the proposed Donlin Creek mine," February 2009, *citing* Alaska Department of Fish and Game, Division of Subsistence, 2001, Alaska Subsistence Fisheries–1999 Annual Report at 154 (2001).

[18] Donlin estimates it will process about 21.5 million tons of ore per year, of which about 17% will be processed in the autoclaves and other potentially mercury-releasing points. Federal law allows 84 lbs of mercury per million tons of ore to be released to the atmosphere from autoclaves. This represents a potential release of 307 lbs of mercury per year. TRI records indicate that in 2008 the entire state of Alaska released only 71 lbs of mercury from industrial processes.

[19] http://www.blm.gov/ak/st/en/prog/fisheries/rdm_fish.html

[20] http://www.blm.gov/ak/st/en/fo/ado/hazardous_materials/red_devil_mine/rdm_cercla_remedial.html

The DEIS should include information on streams in the area that are listed on the 303d list as mercury impaired under the Clean Water Act, and analyze whether contamination from the mine will increase concentrations in these streams.

Mercury concentrations increase by a factor of ten or more at each level of the food chain. The EPA calculates bioconcentration factors of 1,000 for aquatic plants, 10,000 for saltwater fish, 63,000 for freshwater fish, and 100,000 for marine invertebrates.[21] The DEIS should fully evaluate the health risks associated with increases in mercury concentration in all exposure pathways, as seemingly small amounts of mercury in the environment can result in exponential rates of bioaccumulation.

Mercury concentrations in wildlife

The DEIS should fully analyze the potential impacts of mercury emissions to non-fish species, including waterfowl, particularly those that are consumed for subsistence. Waterfowl consumption advisories have been issued in Utah due to elevated mercury concentrations in three species – northern shovelers, cinnamon teal and common goldeneyes.[22] In addition to mercury, baseline data should be collected for waterfowl in the region for selenium levels, which could increase over time.

Worker Health

According to the U.S. Mine Safety and Health Administration, mercury hazards traditionally have been associated with the gold mining industry, and continue to pose hazards to miners today. A 1997 report documented frequent incidences of worker overexposure.[23] Data from the Nevada Division of Industrial Relations indicates that in 2005 airborne mercury concentrations in certain work areas at the Coeur Rochester Mine in Nevada exceeded the Occupational Safety and Health Association safety limits, and health tests conducted on mine workers in 2006 showed problematically high levels of mercury in urine.[24] The DEIS should establish a plan to conduct periodic mercury screenings for mine workers – particularly those working near autoclaves, and should develop a plan to halt mine operations until potential problems are corrected.

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[21] USEPA Technical Factsheet on Mercury http://www.epa.gov/safewater/dwh/t-ioc/mercury.html

[22] http://www.waterfowladvisories.utah.gov/

[23] Mahaffey, KR. 2004. Methylmercury: Epidemiology Update. Presentation at the National Forum on Contaminants in Fish, San Diego, January 28.

[24] US Mine Safety and Health Administration (MSHA). 1997. "Controlling Mercury Hazards in Gold Mining: A Best Practices Toolbox". Draft, September.

Tailings Management for Mercury

Tailings storage would encompass an area of 2,351 acres (951 ha), with a total capacity of approximately 356,714 acre-ft (440 Mm3) for mill tailings, decant water, and flood events. The Donlin Plan of Operations indicates that mercury precipitation reagents will be used to convert soluble mercury to a stable form of mercury (HgS) in the leach tailings filtrate.[25] The DEIS should provide data on the long-term effectiveness of this approach. Does the converted mercury remain stable, and what is the long-term leachability of all forms of mercury? Where is the final repository for this solid mercury, and how will it be transported there?

The plan of operations indicates that tailings liquor will contain concentrations of mercury above drinking water and aquatic life standards.[26] The DEIS should evaluate alternative methods for managing waste liquid flows from the carbon-in-leach tank and other mill processes to the tailings pond. Are there pollution control measures that can be used to reduce the mercury in the carbon-in-leach tailings solution before it gets mixed with the detoxified tails? A full range of alternatives should be considered to preclude placing mercury contaminated tailings solution in the tailings impoundment, where the mercury can be released into the environment from liner seepage, leakage or failure, and off-gassing air emissions. There are ample examples of tailings impoundments that leach contaminants due to liner failures. As mentioned above, off-gassed mercury emissions from the tailings pond is also a concern that can be prevented or at least reduced by using superior control technology during ore processing and through certain reclamation and control methods.

The DEIS should evaluate the impacts of the tailings pond containing potentially unstable forms of mercury in the event of a tailings dam failure. The Plan of Operations indicates the dam height will be 464 feet high near the end of the mine life, posing the potential for catastrophic contamination should volatile forms of mercury be contained in tailings. Many tailings dams throughout the world thought to have been stable have failed, decimating downstream populations, wildlife, and plants with toxic pollution. The DEIS should include alternatives that provide redundant safety systems should a release or dam failure occur.

Waste rock

[25] Donlin Gold Project, Plan of Operations, Volume II Water Resources Management Plan, July 2012, p. 4-23.

[26] Ibid. Table 4-10, p. 4-32

The DEIS should examine the short and long-term impacts to surface or groundwater resources associated with leachate from waste rock. How will the agency ensure that mercury isn't released into surface or groundwater from the waste rock storage facility, particularly post-closure? The DEIS should also examine the potential impacts of mercury air emissions from the waste rock storage facility.

ACID DRAINAGE/METALS LEACHING AND PERPETUAL WATER TREATMENT

In addition to mercury, acid drainage/metals leaching is a major post-closure concern for the Donlin Mine. Currently the POO assumes that the water treatment plant will need to operate in perpetuity (forever) to meet water quality standards.[27] The DGWG and the signatories on these comments believe that no mine should be permitted that is anticipated to require substantial active water treatment beyond a 10 year post-reclamation horizon. Therefore, the DEIS must include alternative engineering plans that would eliminate the need for water treatment beyond this horizon.

There are numerous examples of essential water treatment plants losing funding after a mine closes and greatly jeopardizing fisheries, such as one on the Taku River which flows into southeast Alaska. In fact, at least 26 mines in Canada, as well as Alaska's Red Dog Mine, are expected to generate acid in perpetuity, posing serious long term environmental risk, especially to those living downriver of a mine site.

How can agencies ensure adequate bonding for a mine that will require active water treatment in perpetuity in order to meet water quality standards when the mine itself is no longer producing revenue? How can they ensure that costs will be covered given the uncertainties associated with changes in the economy that can alter return on investments, significant changes in energy costs, unexpected impacts resulting from climate change, large storm events, and the lack of institutions that will be around "in perpetuity" to manage long-term funding needs?

The DGWG has adopted the attached position on perpetual water treatment written by the Center for Science in Public Participation as part of our scoping comments. It is also available online at www.csp2.org.

[27] Ibid. p. 5-3.

In addition to economic uncertainties, there are also serious questions regarding the future climate and precipitation trends at mine sites, further complicating the ability to predict future costs and needs:

http://www.mtech.edu/mwtp/conference/2012_presentations/Dave%20Williams.pdf

The POO indicates that the post closure water treatment plant will not be built until five years before the pit lake completely fills with water, which is expected to occur 56 years after the end of mine life. If Donlin begins operating in 2019, the mine as proposed now would close in 2046, and the water treatment plant needed to treat pit lake water would not be built until 51 years later, in the year 2097. Donlin is therefore proposing that permits be granted now to build and bond a mine that will require a water treatment plant to be built in the year 2097. This water treatment plant would need to treat an average of 2,812 gallons per minute for six months each year, in perpetuity, to remove mercury, antimony, selenium, cadmium and many other contaminants, and to adjust the pH balance before discharge.

The DGWG believes it is wholly unreasonable to permit a major activity now that will require the new construction of increasingly expensive pollution control infrastructure 84 years after the time of writing of these scoping comments. By then, all environmental liabilities will rest on the hope of general, continued economic growth to maintain bond yields into perpetuity. With global and U.S. Gross Domestic Product (GDO) growth slowing in recent decades, energy becoming increasingly costly in real terms (inflation-adjusted), currency inflation, and U.S. public and private debt to GDP ratios approaching unsustainable levels, the long term outlook for continued economic growth required to maintain adequate bond yields needed to build a major water treatment plant nearly a century from now is not promising. Beyond that, into multiple centuries or millennia of anticipated water treatment obligations, it becomes even more unreasonable to expect. These realities must be included in the DEIS.

Pit lake chemistry

Pit Lake chemistry is a major concern, as best evidenced by problems at the Berkeley Pit at the Zortman Landusky Mine in Montana. The former mine is now one of the most well-known superfund sites in the United States and will become even more problematic by 2020 when the pit lake water will reach its maximum level and begin backflowing into groundwater, leaching contaminants into nearby rivers on which rural Montanans depend.

The Plan of Operations indicates that after closure, both tailings pond water (23,920 acre feet) and runoff from the waste rock storage facility will report to the mine pit, which after 56 years will fill with water before overflowing. It is anticipated that the overflow from the pit lake will be the point source of pollutants requiring perpetual water treatment. The DEIS should include a range of alternatives in which the mine pit does not become a lake subject to perpetual water treatment. It should include an alternative for backfilling the pit to the maximum extent practicable with waste rock and overburden and reclaiming it to its original state.

The DEIS should also include an alternative in which tailings pond leachate does not report to the mine pit or any other long term storage solution, but is instead fully treated to applicable water quality standards before discharging into natural waterways immediately after mine life. It should also include an alternative for dry stack or paste tailings, with a comparison of the leachate risks that these would pose relative to tailings stored as a slurry.

New Source Performance Standards

As a new source, the Donlin Mine will be prohibited from discharging any process wastewater to waters of the United States. *See* 40 C.F.R. § 440.104(b)(1). EPA adopted this New Source Performance Standard in 1982 after studying the mining industry nationwide and determining that it was technically and economically feasible to store mining waste in areas that are not waters. 47 Fed. Reg. 54,598, 54,602 (Dec. 3, 1982). Donlin's application materials assert that the mine intends to comply with this requirement. *See* Water Resources Management Plan ("Plan") at ES-2 ("there is no design intent to discharge waste rock contact water or process solution into waters of the State of Alaska, or the U.S.").

Despite this requirement and the stated intent to comply with it, the Plan shows that the mine will actually discharge vast quantities of process wastewater into American Creek after mine closure, in violation of the zero-discharge New Source Performance Standard. Under the plan, American Creek—indisputably a water of the U.S.—will flow into the pit after closure, and Donlin will fill it up with waste rock runoff, water emptied from the tailings pond, and seepage that will continue to be collected from the tailings storage facility. Plan at 6-5. Presumably, the pit will also include many wetlands, springs, and seeps that, like American Creek, are also waters of the U.S. The water and seepage from the tailings pond is, of course, process wastewater, and the proposal to dump it untreated into American Creek and other waters of the U.S. within the pit would violate

the New Source Performance Standard.

Though unexplained in the mining plan, it is possible that Donlin will seek to have American Creek and the other waters within the pit deemed a "waste treatment system" no longer subject to the Clean Water Act. *See* 33 C.F.R. § 328.3(a)(8). Though used elsewhere, this regulatory loophole undermines the Act's goal of stopping polluters from using the nation's waters as disposal sites for industrial wastes. The DGWG would oppose the use of this loophole at the Donlin Mine and encourages the Corps and EPA to revise its regulations to close it. In any event, the DEIS should fully disclose the precise legal mechanism by which the proposed discharges to the mine pit will occur, so that affected members of the public may comment on it.

Contaminants Monitoring

In addition to mercury, a number of other toxic metals, such as arsenic, antimony, manganese, molybdenum, lead, copper, cadmium, cobalt, chromium, iron, nickel, barium and selenium, have been identified as likely to leach from waste rock, the open pit, and tailings. In addition, ammonium nitrate, cyanide and other toxic chemicals used in mining operations may also threaten ecosystem and human health if they are not strictly contained. The DEIS should include a monitoring plan for monthly testing of water, sediment and biota (including benthic community sampling) downgradient of the mine site for all of these potential contaminants. As with mercury, if elevated levels of any of these are found, a temporary mine closure plan should be established to halt mine operations until the source of the problem is located and corrected.

The downgradient monthly sampling should be compared to baseline data for all constituents of concern, and the monitoring program should use the same locations from which the baseline data was originally gathered. A separate, ongoing, off-site data collection plan, using seasonally based quarterly testing, should also be established in order to elucidate long term variations due to climate change. This will help provide a more accurate data set for comparison with downgradient monitoring – one that reflects off-site changes in the environment over the life of the mine rather than simply using a static set of pre-construction baseline data.

Finally, all bond amounts should be increased to include a range of reasonably foreseeable spills and accidents (including those caused by floods and earthquakes), not simply the best-case scenario in which unexpected problems never arise.

TRANSPARENCY AND INFORMATION ACCESSIBILITY DURING PERMITTING

Large mine permitting is a complicated endeavor, involving multiple agencies and dozens of permits on multiple levels of government. Often important stakeholder groups are not trained to provide "substantive" technical comments to agencies, leaving a major deficiency in local input during the most vital parts of a permitting process. For this reason, the DGWG is requesting that simple factsheets be developed and distributed to all known stakeholders before, or at least concurrent with, the release of the DEIS. This will allow stakeholders to understand, in plain English as well as Yupik, the realities of the most current proposal and its alternatives, and provide clearly understandable avenues for comment on the draft EIS.

All agencies involved in permitting, Donlin LLC, and all of their consultants should pool their contact databases to create a master stakeholder database, including but not limited to anyone who was involved with the scoping process or has been involved in other environmental or social correspondence regarding the mine. The factsheets should aim to explain the basics of each alternative, and there should be one for each of the following issues. The DGWG and its colleagues would welcome the opportunity to be a part of the production and distribution of these factsheets.

Finally, all stakeholders should know that a "no action" alternative exists for the project, for which they can advocate during the DEIS comment period. A separate factsheet should clearly describe what a "no action" alternative means, and provide some examples of other industrial projects where a no action alternative was selected based on unacceptable environmental or human health impacts. For example, several proposed Canadian mines – though using a different permitting system – have been publicly vetoed over various indigenous and environmental impacts deemed unacceptable to local communities.

Suggested Factsheets:

- **The risks of mercury contamination for each alternative:** how does each alternative reduce or eliminate the risk of off-gassing and surface and groundwater contamination, as compared to one another? How does each alternative promise to monitor mercury issues, such as an ongoing mass balance analysis approach, ambient air monitoring, stream and lake sediment, and fish tissue? What actions will be taken if mercury concentrations rise?

- **The major non-mercury chemicals of concern for each alternative:** what are the risks to fish, wildlife, and humans from processing chemicals that will be transported (cyanide, sulfuric acid, sodium hydroxide, etc) and from elements likely to leach (arsenic, selenium, etc)? How do the risks change with each alternative?

- **The anticipated cost and duration of perpetual water treatment for each alternative:** how does each alternative reduce or eliminate the need for perpetual water treatment? How does each alternative handle pit backfilling or lack thereof, and what is the anticipated chemistry of the pit lake should one exist post-closure? How does each alternative manage the tailings pond dewatering process and the long term sustainability of the tailings sediment post-closure?

- **A life of mine calculation of anticipated greenhouse gas emissions** for each alternative. These calculations should include emissions associated with the pipeline construction, and an indication of how Donlin's total emissions would compare to Alaska's total emissions.

- **The main construction attributes of the proposed pipeline,** including the scope and scale of the additional airstrips and camps required, the amount and frequency of heavy equipment present in the region, potential impacts from invasive plant species, permanent impacts to hillsides where grading is required, and the duration of the construction period.

<u>Transparency during operations</u>

The DEIS should establish a framework for citizen engagement after mine construction to ensure adequate access to decision makers at Donlin LLC, Barrick, and NovaGold, as well as regulatory compliance officers on all levels of government. This type of "good neighbor agreement" has been signed into legally binding law at the Stillwater Mine in Montana, for example, as well as at other projects. Such an agreement should allow for any private citizen to collect water, soil, and air samples from the mine site for their analysis at their discretion, and should allow for periodic meetings with mine management. Although the DEIS should not seek to craft the agreement itself, it should make the establishment of one a top priority, and help ensure it receives adequate funding for its creation and operation. The DEIS should stipulate that the agreement is not written by those with any ties to the mining companies, but rather independent groups with expertise with similar

agreements and environmental justice in general, much like the Northern Plains Resource Council and its affiliates helped to write and implement the Good Neighbor Agreement regarding the Stillwater Mine[28].

All data from baseline assessments of mercury and other contaminants should be easily and publicly available in electronic format on a project website. This website should be updated regularly with data from ongoing downgradient and air emissions monitoring. All data sets should include quality assurance and quality control methods, blanks used, and detection limits. Publishing this monitoring data supports the "good neighbor agreement" by showing transparency in the aspects of the mining operations most critical to protecting human and ecosystem health.

GREENHOUSE GAS EMISSIONS, CLIMATE CHANGE, AND ENVIRONMENTAL JUSTICE

If built, the Donlin Gold Mine could become the largest single industrial operation in Alaska, and would become the largest single user of energy in the state (not including the cities of Fairbanks and Anchorage), using an average of 153 Megawatts of electricity and roughly 40 million gallons of diesel fuel per year. As currently planned, this will entail a major increase in Alaska's total greenhouse gas emissions, making the Donlin mine one of largest contributors to climate change in the state.

In December 2009, the US Environmental Protection Agency signed the Endangerment Finding under section 202(a) of the Clean Air Act, declaring carbon dioxide and five other greenhouse gas emissions to be a threat to human health.[29] The finding was later upheld by the United States Court of Appeals [30]. Therefore, the DEIS should include alternatives that vastly reduce Donlin's contribution to climate change, and a future Health Impact Assessment should provide detailed analysis of climate change (as well as mercury contamination) and its impacts on human health.

[28] http://www.northernplains.org/the-issues/good-neighbor-agreement/

[29] http://www.epa.gov/climatechange/Downloads/endangerment/Endangerment_TSD.pdf

[30] *See Coalition for Responsible Regulation, Inc. v. EPA,* 684 F.3d 102 (D.C. Cir. 2012).

Donlin has previously studied wind power as an option for powering a portion of the mill. The DEIS should include a wind power option which eliminates the need for the gas pipeline from Cook Inlet to the mine site. With adequate water resources nearby, Donlin could employ a pumped hydro option to store energy for baseload demands, and use liquefied natural gas as a supplemental fuel source instead of the primary source. It should also include other alternatives that substantially reduce the need for fossil fuel generation, such as solar arrays, run-of-river hydroelectric generation, geothermal heat pumps for space heating (if feasible), biofuels, and cutting edge efficiency measures such as LED lighting and motion detectors, reduced exterior lighting demands, and a goal of all buildings to be Platinum certified by the Leadership in Energy and Environmental Design Program. The DEIS should include alternatives that require Donlin to purchase carbon offset credits to reduce the threat to human health posed by climate change per the EPA Endangerment Finding.

Environmental Justice

Alaskans, and in particular Alaskans who rely on subsistence food sources, are well aware of the effects of climate change, and are already feeling the effects of decreased snowfall, lower river flows, permafrost degradation, bank erosion, tree encroachment, and unusual wildlife responses to warmer temperatures. Alaskans on the Kuskokwim River are already disproportionally affected by climate change, and as currently proposed, the Donlin Gold mine will exacerbate the problem. The proposed mine clearly raises environmental justice concerns. These concerns – which include but are not limited to impacts from climate change – should be addressed in the DEIS.

To this end, both in developing the DEIS and throughout the National Environmental Policy Act process, the U.S. Army Corps of Engineers must comply with Executive Order 12,898, titled "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations."[31] The Order specifies that, "To the greatest extent practicable and permitted by law, . . . each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States."

Accompanying Executive Order 12,898 was a Presidential Memorandum stating that

[31] Executive Order 12,898 and the accompanying Presidential Memorandum are attached to these comments. The order is also available at 59 Fed. Reg. 7,629 (Feb. 16, 1994).

"each Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by [National Environmental Policy Act]." The proposed Donlin Gold mine necessitates a full NEPA analysis and, per Executive Order 12,898, this analysis must include more than a general analysis of human health, economic and social effects. The particularized health, economic, and social impacts on Alaska Natives and low-income communities must be assessed.

In response to the President's Executive Order, the Council on Environmental Quality (CEQ) issued guidance for agencies on how to address environmental justice under NEPA.[32] The CEQ Guidance identifies principles for considering environmental justice under NEPA that should be followed by the U.S Army Corps of Engineers in assessing the impacts of the proposed Donlin Gold mine:

- The Corps "should consider relevant public health data and industry data concerning the potential for multiple or cumulative exposure to human health or environmental hazards in the affected population and historical patterns of exposure to environmental hazards, to the extent such information is reasonably available. For example, data may suggest that there are disproportionately high and adverse human health or environmental effects on a minority population, low-income population, or [Alaska Native] tribe from the agency action. Agencies should consider these multiple, or cumulative effects, even if certain effects are not within the control or subject to the discretion of the agency proposing the action."[33]

- The Corps "should recognize the interrelated cultural, social, occupational, historical, or economic factors that may amplify the natural and physical environmental effects of the proposed agency action. These factors should include the physical sensitivity of the community or population to particular impacts; the effect of any disruption on the community structure associated with the proposed action; and the nature and degree of impact on the physical and social structure of the community."[34]

- The Corps "should develop effective public participation strategies. Agencies

[32] CEQ, "Environmental Justice: Guidance under the National Environmental Policy Act" (1997) (attached).
[33] Ibid. p. 9.
[34] Ibid.

should, as appropriate, acknowledge and seek to overcome linguistic, cultural, institutional, geographic, and other barriers to meaningful participation, and should incorporate active outreach to affected groups.[35]

- The Corps "should assure meaningful community representation in the process. Agencies should be aware of the diverse constituencies within any particular community when they seek community representation and should endeavor to have complete representation of the community as a whole. Agencies also should be aware that community participation must occur as early as possible if it is to be meaningful."

Finally, and of particular importance for a proposed project in Alaska, the CEQ Guidance highlights the necessity for the Corps to "seek tribal representation in the process in a manner that is consistent with the government-to-government relationship between the United States and tribal governments, the federal government's trust responsibility to federally-recognized tribes, and any treaty rights."[36]

PIPELINE AND BARGE TRAFFIC CONCERNS

As noted above, the DEIS should include alternatives that reduce the scope and scale of the proposed pipeline, or eliminate the need for it altogether. However, these comments focus on the permanent impacts to the landscape from the pipeline as currently planned.

The Pipeline Plan of Development indicates that an initial 100 foot wide Right of Way (ROW) would be cleared of all vegetation during construction of the pipeline. The DEIS should include an alternative that reduces the initial clearing requirements for the majority of the ROW, preferably to less than 50 feet. It should also include alternatives that do not require re-clearing of vegetation every 10 years, as vegetation reclamation should start as soon as the pipeline is in the ground. The DEIS should also include alternatives that do not require substantial grading of hillsides for the pipeline ROW. Alternatives that leave no permanent surface impacts should be considered, such as trenching on hillsides with the "minimum tool" concept commonly used in wilderness areas – as the proposed ROW is essentially de-facto wilderness and should be treated as such regarding permanent surface impacts. The DEIS should include alternatives that remove gravel used for airstrip construction and camp facilities and return the gravel

[35] Ibid.
[36] Ibid.

back to the materials sites from which they were quarried, followed by full reclamation of all materials sites, airstrips, and camps.

Approximately one hundred miles of the proposed pipeline route roughly follow the Iditarod National Historic Trail. This primitive, largely unimproved winter route provides access to land owners throughout the region, and is a recreational hotspot for a wide range of athletes. Due to the likely outcome of the pipeline becoming a major source of controversy in the region from landowners, lodge owners, casual users, and Iditarod mushers and Invitational athletes, the DEIS should include alternatives that do not degrade the essential primitive characteristics of the trail in terms of widening it, clearing vegetation near it, burying pipe underneath it, and siting maintenance facilities or check valves near it. The DEIS must have alternatives that ensure this national and local treasure remain fully unchanged and unimproved after construction, such as other routing options and using special trenching and logistical techniques near the trail that will eliminate permanent impacts and the degradation of its character.

Increased barge traffic along the Kuskokwim River may pose substantial increases in bank erosion, which must be addressed in the DEIS. It should mandate that baseline data be gathered relating to bank condition, and that studies be conducted before mine construction attempting to simulate the impacts of wake from large, double hulled barges on banks prone to erosion. The DEIS should therefore also include alternatives that do not rely so heavily on barge traffic, such as winter snowcat routes. This could also help to mitigate the serious regional concerns about the impacts of fishing practices being incompatible with the heavy barge traffic currently proposed by Donlin.

Closing comments

The DGWG firmly believes that the DEIS must provide alternatives that eliminate or vastly reduce the risk posed by mercury contamination, acid drainage/metals leaching, greenhouse gas emissions, and the loss of wilderness values along the pipeline Right of Way, regardless of the cost that these alternatives may ultimately place upon the industry.

We recognize that any alternative, including “no action”, will have an impact – whether positive or negative – on the way of life and the health of communities in the region. The required “no action” alternative should be subject to the same level of analysis as the other alternatives so that the benefits of clean water, abundant subsistence resources and

undisturbed wilderness are adequately considered and economically quantified. Studies of the "no action" alternative should include an evaluation (with meaningful local involvement) of the cultural values and community health, and an analysis of "ecosystem services" such as salmon and the avoided health care costs associated with polluted waterways and air.

Donlin has long argued publicly that their mine should only be built if it can be done in an environmentally responsible way. We agree, but we also feel that the phrase "environmentally responsible" has been overused to the point at which it is effectively meaningless in the context of large scale hard rock mines that rely on treating pollutants in perpetuity in order to keep ecosystems in adequate health, that have yet to figure out whether or not mercury contamination will pose serious threats, which will emit as much carbon dioxide as a medium sized city, and that will permanently erode the wilderness characteristics of the one of the largest tracts of undisturbed land anywhere in the United States.

A 27 year mine life represents only a split second in the bigger picture of the ecosystems of southwest Alaska and the people and cultures that depend on them. We certainly understand that any mine will have some impacts, and that some may be realistically manageable during the life of mine and can be successfully reclaimed shortly after the mine ceases to produce revenue. But no mine is "environmentally responsible" if it cannot be built without a clear scientific understanding of how mercury will behave throughout its existence, or clean up after itself when it has exhausted its economic productivity. No mine is "environmentally responsible" if it makes no serious efforts to reduce its massive contribution to global climate change which affects people in southwest Alaska as well as those ten thousand miles away.

For these reasons the DGWG would like to see a full range of alternatives in the DEIS that seriously consider the core issues outlined in these comments. Donlin, Calista, and everyone else involved in the permitting process have the opportunity to hold true to the term "environmentally responsible". The DEIS should provide the alternatives to make it happen, and the permitting agencies should go above and beyond to make sure every known stakeholder truly understands the risks and consequences of every alternative proposed in the DEIS

Sincerely,

THE CENTER FOR WATER ADVOCACY	ONC ORUTSARARMIUT NATIVE COUNCIL
Northern Alaska Environmental Center	ACAT Alaska Community Action on Toxics *Protecting Health, Assuring Justice*
EARTHWORKS™ www.earthworksaction.org	ground truth TREKKING
CLEAN WATER · HEALTHY SALMON INLETKEEPER®	ARM Alaskans For Responsible Mining

CONTACT INFORMATION: electronic and phone correspondence regarding the DEIS is preferred over regular mail. If regular mailing is needed, please obtain the correct address in an email request.

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