



October 5th, 2010

Ms. Serena Sweet
Regulatory Division
U.S. Army Corps of Engineers, CEPOA–RD
Post Office Box 6898
Elmendorf AFB, Alaska 99506–0898.

RE: Scoping Input on the Economic Analysis for the Chuitna Coal Project

Dear Ms. Sweet;

We understand that the Army Corps of Engineers, Alaska District (Corps) has now taken over primary responsibility for completing the National Environmental Policy Act (NEPA) review of the Chuitna Coal Project from the Environmental Protection Agency. Center for Sustainable Economy, as you know, has a long record of involvement in Alaska minerals and energy issues on behalf of our non-profit partners and their members. As on prior occasions, we seek involvement in the planning phases of this project to help shape the scope and substance of the economic analysis the Corps will be conducting to fulfill its analytical duties under applicable federal and state law.

In addition to preparation of an environmental impact statement that addresses the direct, indirect, and cumulative impacts of the mine area, transportation corridor, and coal export facilities, the preliminary NEPA documents prepared for this project indicate that the Corps will have direct permitting obligations under Section 10 of the Rivers and Harbors Act for navigation facilities as well as Section 404 of the Clean Water Act for discharge of mine waste into waters of the United States. As such, it is our understanding that in addition to NEPA, the economic analysis being prepared for this project will be guided by the Principles and Guidelines for Water Resources Engineering Regulation ER-1105-2-100 and other applicable federal and state regulations. Given the similarities of this project with the Delong Mountain Terminal Project, which also involved construction of shoreline export facilities for mine products, we incorporate by reference all of the information and analysis we prepared for that project.¹ The Corps has, on file, hard copies of these materials.

¹ Our filings in the Delong Mountain Terminal Project can be accessed at <http://www.sustainable-economy.org/art?aid=12>.

As you know, the overall goal of this regulatory framework is to insure that the Corp's final permitting decisions and the substance of the EIS demonstrate that the Chuitna Coal Project makes a positive contribution to national economic development and otherwise is beneficial from the perspective of net public benefits. At a time when the effects of global climate change are becoming more acute, a fossil-fuel development project of this magnitude ought to receive the highest level of scrutiny and rigor to insure that national economic development (NED) and net public benefits are of sufficient credibility, magnitude, and certainty to justify the resultant greenhouse gas emissions. As you prepare the EIS, permitting decisions, and supporting economic analysis, we hope you will implement the best available science, sources of information, and methods for documenting NED benefits and costs. We look forward to involvement in this process.

In addition, and as noted in the closing section of this letter, we have made a specific request to the Corps and its partners on the Environmental Markets Team to utilize the Chuitna Coal Project as one of the pilot projects now being considered to demonstrate how ecosystem service values can be incorporated into project-level analysis by federal agencies. Under separate cover, we have sent this request and copies of this scoping input to the Council on Environmental Quality (CEQ), the Environmental Protection Agency, the USDA's Office of Environmental Markets, Office of Management and Budget, and other members of the EMT to call attention to this opportunity. We believe that the Chuitna Coal Project makes an ideal case study, in no small part because the Corps itself has provided leadership in recommending changes to the Principles and Guidelines to incorporate ecosystem service values.²

The remainder of this scoping letter is organized as such. In Section 1, we discuss the net public benefits framework, its applicability, and its components. In Section 2, we discuss how laws, regulations, rules and guidance manuals relevant to permitting decisions for the Chuitna Coal Project shape the scope and substance of the required net public benefits analysis. In Section 3, we conclude with a series of specific requests for the analysis.

1: Net Public Benefits Framework and Key Components

It is clear that development of the Chuitna Coal Project will require considerable involvement by public agencies at the federal, state, and local levels. At least four federal agencies will be participating in project decisions: the Corps, the EPA, the U.S. Fish and Wildlife Service and the National Marine Fisheries Service (Appendix 1). As of yet, it is unclear whether or not the Corps will be providing cost share assistance for the project's general navigation features or whether or not the project will receive other forms of public finance such as support from the Alaska Industrial Development and Export Authority's Development Finance Program.³ Either way, the significant involvement by federal and state decision makers in this project requires that the economic feasibility of the Chuitna Coal Project be analyzed from a net

² See Council on Environmental Quality. 2010. Updated Principles and Guidelines for Water and Land Related Resources Implementation Studies at: <http://www.whitehouse.gov/administration/eop/ceq/initiatives/PandG>.

³ For example, AIDEA owns and operates the Delong Mountain Transportation System, used exclusively by Teck's Red Dog Mine.

public benefits perspective through benefit-cost analysis and not the narrow financial perspective of private investors.

Benefit-cost analysis (BCA) compares the present value of the social benefits of a public policy, program, or project against the present value of social costs. There are two fundamental results from performing a benefit-cost analysis: 1) net present value (NPV); and 2) benefit-cost ratio.⁴ The “present worth” of a project is commonly referred to as its NPV. The standard criterion for deciding whether a government policy, program, or project can be justified on economic principles is net present value -- the discounted monetized value of expected net benefits (i.e., benefits minus costs).⁵ NPV is a measure of the absolute magnitude of the gain or loss to society. As described by the Office of Management and Budget (OMB), net present value is computed by assigning monetary values to all benefits and costs – regardless of who enjoys or incurs them – discounting future benefits and costs using an appropriate discount rate, and subtracting the sum total of discounted costs from the sum total of discounted benefits. Discounting benefits and costs transforms gains and losses occurring in different time periods to a common unit of measurement. Importantly, “[p]rograms with positive net present value increase social resources and are generally preferred. Programs with negative net present value should generally be avoided.” Stated more precisely, projects that attain an NPV greater than 0 are worth investing in – the benefits over time outweigh the costs over the life of the project.⁶

The benefit-cost ratio is simply the present value of benefits divided by the present value of costs. A benefit-cost ratio above 1.0 is indicative of a policy, program, or project that has a $NPV > 0$ and is economically worthwhile from a public perspective. A benefit-cost ratio of 1.0 represents the lowest value that should be considered for public support as long as the analysis incorporates all significant costs and benefits and if uncertainty is relatively low. A benefit-cost ratio below 1.0 is indicative of a policy, program, or project that has a $NPV < 0$ and is not economically viable from a public perspective. Benefit-cost analysis (BCA) can be used as a method to rank different projects or different alternatives for a single project all of which may have NPV of greater than zero and, therefore, are theoretically worthwhile. As explained by the Department of Transportation, “[i]n a capital-constrained situation, it is not possible to invest in every project with a positive NPV, and therefore a way to prioritize is required. The benefit-cost ratio is a measure of return on investment – ‘bang for the buck’”.⁷

The duty to evaluate the economic viability of projects financed or authorized by government entities from a benefit-cost perspective is firmly enshrined in statutes, rules, regulations and guidance manuals for virtually every government agency at the federal, state, and local levels. For example, OMB’s Circular A-94 requirements “apply to any analysis used to support government decisions to initiate, renew, or expand programs or projects which would result in a series of measurable benefits or costs extending for three or more years into the future.”⁸

⁴ Office of the Secretary of Transportation (DOT), 2006. Guide to Quantifying the Economic Impacts of Federal Investments in Large-Scale Freight Transportation Projects. Washington, D.C.: Department of Transportation.

⁵ Office of Management and Budget (OMB), Circular A-94 (Revised), Section 5(a). Available at: <http://www.whitehouse.gov/omb/circulars/a094/a094.html>.

⁶ DOT 2006, note 4, Section 7.2.

⁷ Ibid.

⁸ OMB, note 5, Section 4(a).

Individual federal agencies have adopted the benefit-cost perspective in their individual regulatory frameworks.

For example, benefit-cost analysis and net present values “are key components of EPA's policy development and evaluation process.”⁹ U.S. Army Corps of Engineers (Corps) navigation and civil works projects are justified on the basis of their contributions to NED, discussed below. Contributions to NED are “increases in the net value of the national output of goods and services, expressed in monetary units. Contributions to NED are the direct net benefits that accrue in the planning area and the rest of the nation.”¹⁰ For the Corps to recommend federal cost share involvement in a project, the benefit-cost ratio must exceed 1.0.¹¹ In Alaska, the benefit-cost perspective was recently mandated in the Alaska Gasline Inducement Act (AGIA). AGIA is designed to expedite construction of a natural gas pipeline that “maximizes benefits to the people of the state.” In support of this purpose, the AGIA requires a strict NPV test for all projects as well as ranking of projects based on NPV.¹²

Thus, and the most important point made here, is that as decision makers at both the federal and state levels contemplate decisions to fund, authorize, or otherwise facilitate development of the Chuitna Coal Project those decisions must rest on a determination that Project development is in the public interest through benefit-cost analysis and not narrow assessments of financial viability for potential investors. There are several key components to a rigorous analysis of net public benefits:

Incorporating both market and non-market costs and benefits

In a comprehensive net benefits analysis, everyone’s costs and benefits count. To make the process of determining whether or not a policy, program, or project creates net public benefits “all economic benefits and costs must be described and, where possible, quantified.”¹³ These include costs and benefits that are easy to measure because they have direct effects in the market, as well as costs and benefits that are primarily non-market in nature but may be just as or even more significant economically. Thus, in the net public benefits analysis for the Chuitna Coal Project, it is critical for the Corps to consider all costs and benefits regardless of whether they are easy to measure market effects (i.e., consumer surplus for energy consumers) or more difficult non-market effects (i.e., health and other socio-economic costs of pollution or carbon emissions) regardless of who enjoys or incurs them.

Non-market effects are every bit as important economically, however, they do not manifest themselves in direct market transactions. Rather, they manifest themselves indirectly, through

⁹ Environmental Protection Agency (EPA), 2000. Guidelines for Preparing Economic Analyses. Washington, D.C.: EPA. Page 33.

¹⁰ Water Resources Council (1983). Economic and Environmental Principles for Water and Related Land Resources Implementation Studies. Washington, D.C., Water Resources Council.

¹¹ Principles and Guidelines contained in Chapter 6, ER 1105-2-100, regarding National Economic Development (NED) Benefit Cost Analysis.

¹² Alaska Statutes (AS) Sec. 43.90.170.

¹³ Swanson, Cindy Sorg and John Loomis, 1996. Role of Nonmarket Economic Values in Benefit-Cost Analysis of Public Forest Management. USDA Forest Service General Technical Report PNW-GTR-361. Portland: Pacific Northwest Research Station.

changes in home prices, recreational use patterns, subsistence hunting and fishing patterns, and expenditures on pollution control – for example – that are caused by changes in environmental quality associated with a policy, program, or project. Regulatory guidance provides a clear mandate to incorporate non-market effects into project analysis. For example, guidelines for analyzing federal infrastructure investments contain the following direction:

“...all types of benefits and costs, both market and non-market, should be considered. To the extent that environmental and other non-market benefits and costs can be quantified, they shall be given the same weight as quantifiable market benefits and costs.”¹⁴

As another example, the USFWS regulations for issuing incidental take permits require, in part, that the agency determine the “effects on other environmental values or resources” in deciding what level of NEPA analysis to apply.¹⁵ Likewise, in issuing permits for impacts to freshwater wetlands under its Clean Water Act Section 404 Program the Army Corps of Engineers must conduct a public interest determination that addresses all factors which may be relevant to the proposed wetland fill including:

“...conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people” (33 CFR § 320.4).

Clearly, many of these impacts are economic, and non-market in nature, and thus require application of non-market valuation techniques to estimate their magnitude. Fortunately, economists have at their disposal a wide range of tools for measuring non-market effects, including travel cost and random utility models, contingent valuation surveys, hedonic pricing models, benefits transfers, choice experiments, and replacement cost techniques.

One non-market cost of particular concern is the loss of passive use values for Chuitna’s exceptional wildlife habitat. Passive use values represent individual’s willingness to pay for protecting a resource, even if they may never use it in any way. With respect to wildlife, people are clearly willing to pay to protect species – some of them halfway around the world – that they may never even view. Contributions to international wildlife organizations are an example of how that willingness to pay is manifested. Passive use values for Alaska’s wilderness lands, wildlife refuges, and other intact landscapes extend to the entire U.S. population. For example, Colt (2001) suggested that passive use values for 13.2 million acres encompassed by Bristol Bay Wildlife Refuges was in the order of \$2.5 billion a year, or \$3.5 billion in 2010 dollars. This translates into a value of \$268 dollars an acre each year.¹⁶

¹⁴ Executive Order 12893, Principles for Federal Infrastructure Development.

¹⁵ U.S. Fish and Wildlife Service, Habitat Conservation Planning Handbook, Chapter 1, page 1-8.

¹⁶ Colt, Steve. 2001. The Economic Importance of Healthy Alaska Ecosystems. Anchorage: Institute for Social and Economic Research, University of Alaska.

Passive use values can be an extremely important component of total economic value of a resource, and should not be overlooked. They can be quantified through contingent valuation surveys and choice experiments.

As you know, the wildlife and fishery resources of the lands and waters affected by the Chuitna Coal Project are exceptional. The project area supports five terrestrial species with high public interest and ecological values including moose (*Alces alces*), brown bear (*Ursus arctos*), black bear (*Ursus americanus*), trumpeter swan (*Cygnus buccinator*) and lesser sandhill crane (*Grus canadensis*). Aquatic species with the same status include beaver (*Castor canadensis*), beluga (*Delphinapterus leucas*), chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*Oncorhynchus kisutch*), pink salmon (*Oncorhynchus gorbuscha*), and rainbow trout (*Salmo gairdneri*).¹⁷

The exceptional abundance and diversity of wildlife in the Chuitna Coal Project area suggests that passive use values are likely to be significant, and should not be excluded from the EIS and supporting benefit-cost analysis. We look forward to working with the Corp to identify and apply appropriate methods for capturing passive use and other non-market benefits and costs as the EIS process unfolds.

Ecosystem services

Ecosystem services are economic benefits provided by nature free of charge, and represent a unique class of non-market effect. The range of services is immense, and falls into four key categories: provisioning, supporting, cultural, and regulating.¹⁸ Some are more direct than others, such as the provision wild foods that support subsistence-based communities. Others are more indirect, such as carbon sequestration, that helps regulate global climate change. Ecosystem services are a significant source of economic value to nearby communities and the global economic system as a whole.

For example, in the Aleutians East Borough, a recent estimate put the weight of annual subsistence harvest of wild foods near 700,000 pounds.¹⁹ A “replacement cost” value of \$7 a pound implies an annual harvest value of roughly \$4,900,000.²⁰ Colt (2001) prepared an ecosystem service assessment based on Costanza et al. (1997) suggesting ecosystem service values for Alaska marine and terrestrial ecosystems to range between \$1 to over \$76 per acre per year in 2010 dollars (See Table below).²¹ The loss of these services provides one

¹⁷ U.S. Environmental Protection Agency, Region 10. 1990. Diamond Chuitna Coal Project Final Environmental Impact Statement, Volume II – Appendices. Seattle, Washington: EPA.

¹⁸ Millennium Ecosystem Assessment 2005. *Ecosystems and Human Well-Being: Current State and Trends, Volume 1*. R Hassan, R. Scholes, and N. Ash (eds.) Washington, D.C.: Island Press.

¹⁹ U.S. Army Corps of Engineers, 2003. Draft Environmental Impact Statement. King Cove Access Project. Project Application File Number: 2-2000-0300; Waterway Number: Cold Bay 12. July 2003.

²⁰ The replacement cost method and per pound value estimate are described in “Subsistence In Alaska: 1994 Update Division of Subsistence, Alaska Department of Fish and Game.” The 2009 value of the \$5 per pound figure used in that study is \$7.

²¹ Colt, Steve. 2001. The Economic Importance of Healthy Alaska Ecosystems. Anchorage: Institute for Social and Economic Research, University of Alaska.

quantitative measure of non-market costs associated with developing lands in the Chuitna Coal Project area.

Because ecosystem service values generated by wild habitats in the Project area are significant, the Corps economic analysis should address ecosystem service values in a quantitative fashion. In the NEPA context, there are two key approaches. First, because analysis of the “no action” alternative needs to be as in-depth as any of the action alternatives, the existing economic value of ecosystem services should be documented. Otherwise, the NEPA analysis will be arbitrarily skewed in favor of the action alternatives since the economic value of no action alternative will be assumed to be zero. Secondly, action alternatives that adversely affect ecosystem services create economic costs that should be tabulated. Again, failure to do so would skew the analysis in favor of the action alternatives.

Costanza Methodology for Economic Value of Major Ecosystem Services Applied to Alaska Lands and Waters

(millions of 1998 dollars per year)

Biome	Millions of Acres in Alaska	Economic Value by Ecosystem Service (millions of 1998\$ per Year)												Total
		Gas regulation	Climate regulation	Disturbance regulation	Water regulation	Water supply	Erosion control and sediment retention	Soil formation	Nutrient cycling	Waste treatment	Pollination	Biological control	Habitat/Refugia	
Marine														
Open Ocean	128.0	21.4	-	-	-	-	-	-	66.5	-	-	2.8	-	90.7
Coastal	19.2	-	-	7.4	-	-	-	-	310.9	-	-	3.2	0.7	322.2
Terrestrial														
Temperate / Boreal Forest	140.2	-	54.3	1.2	-	-	-	6.2	-	53.7	-	2.5	-	117.9
Grass and rangeland	17.6	0.5	-	-	0.2	-	2.2	0.1	-	6.7	1.9	1.8	-	13.6
Wetlands	10.4	6.1	-	207.9	0.7	174.0	-	-	-	191.3	-	-	13.9	593.9
Lakes & Rivers	13.5	-	-	-	323.7	125.9	-	-	-	39.5	-	-	-	489.1
Tundra	98.1	-	-	-	-	-	-	-	-	-	-	-	-	-
Ice/rock	84.9	-	-	-	-	-	-	-	-	-	-	-	-	-
Cropland	1.0	-	-	-	-	-	-	-	-	-	0.1	0.1	-	0.2
Total	512.8	28.1	54.3	216.5	324.6	299.9	2.2	6.3	377.4	291.3	2.0	10.4	14.6	1,627.6
Marine	147.2	21.4	0.0	7.4	0.0	0.0	0.0	0.0	377.4	0.0	0.0	6.0	0.7	413.0
Terrestrial	365.7	6.6	54.3	209.1	324.6	299.9	2.2	6.3	0.0	291.3	2.0	4.4	13.9	1,214.6

Source: Colt (2001), see footnote 21.

There are many peer reviewed methods available to the Corps to put a price tag on both ecosystem service benefits provided by the no action alternative and the economic costs associated with ecosystem service degradation.²² These methods represent the “best available

²² See, e.g. National Research Council. 2004. Valuing Ecosystem Services: Toward Better Environmental Decision-Making. Committee on Assessing and Valuing the Services of Aquatic and Related Terrestrial

science,” and should be used. This is especially important because the Corps itself has been a leading proponent in revising its guidelines to incorporate ecosystem service values. As noted in the proposed revisions to the Corps procedures for analyzing water resource projects:

“Consideration of ecosystem services can play a key role in evaluating water resource alternatives. Using the best available methods in the ecological, social, and behavioral sciences to develop an explicit list of the services derived from an ecosystem is the first step in ensuring appropriate recognition of the full range of potential impacts of a given alternative. This can help make the formulation and the analysis of alternatives more transparent and accessible and can help inform decision makers of the full range of potential impacts stemming from different options before them. The second step is establishing the significance or value of changes in the quality or quantity of services over time, with and without the effects of proposed alternatives on ecosystem services.”²³

We look forward to working with Corps to apply state of the art methods to incorporate ecosystem service values in the EIS process.

Consumer surplus as the basis for benefit calculations

The basis for all benefit estimates should be changes in consumer and produce surplus, and not simple calculations of revenues, jobs, income and taxes generated from the sale of Chuitna coal. Consumer surplus is the excess amount that purchasers are willing to pay for a good or service over and above the market price (i.e., the area under the demand curve but above the price line). Consumer surplus serves as a measure of the social benefits of producing the good.²⁴ Policies that affect market conditions in ways that decrease prices will generally increase consumer surplus. This increase can be used to measure the benefits of the policy. As OMB recognizes, “[c]onsumer surplus provides the best measure of the total benefit to society from a government program or project.”²⁵

Corps guidance recognizes consumer (and producer) surplus as the required basis for benefit calculations for projects that induce new commodity movements:

“New movement benefits are claimed when there are additional movements in a commodity or there are new commodities transported due to decreased transportation costs. The new movement benefit is defined as the increase in producer and consumer surplus, thus the estimate is limited to increases in production and consumption due to lower transportation costs” (ER 1105-2-100, 3-5).

Ecosystems, Water Science and Technology Board, Division on Earth and Life Studies, National Research Council of the National Academies. Washington, D.C: National Academies Press.

²³ CEQ, note 2, page 5.

²⁴ EPA, 2000, note 9, Page 61,

²⁵ OMB, note 5, Section 4(a).

With respect to coal, the presumed economic benefit is the consumer surplus households will receive associated with Chuitna coal relative to electricity derived from oil, gas, or renewables. This is a proper benefit from a public welfare perspective.

Analysts often confuse economic benefits with economic impacts. Economic impacts are the various local effects of spending and revenues. Economic impacts are described in terms of jobs, personal income, tax revenues, royalties, and rents generated by project spending and the revenues earned by market sales. The reason why these are not considered benefits from a welfare economics perspective is that they merely reflect a reallocation of spending and revenue away from other regions so that from a public perspective the net gain is often quite small or zero. So for example, investment by PacRim and its backers in Chuitna coal would come at the expense of investments in other regions or other energy projects (including renewables) that would confer a similar magnitude of economic impacts elsewhere. The net economic effect of Chuitna relative to these other alternatives is difficult to discern, and so impacts are typically considered a separate kind of analysis and not suitable for use in a net public benefits or benefit-cost framework.

Decision makers often confuse benefits with impacts, erroneously comparing costs of development with economic impacts rather than benefits. This is not merely an esoteric consideration. Economic benefits are often far less than impacts, and so using impacts in a benefit-cost framework can significantly distort results. Thus, the Corps analysis should carefully distinguish between economic benefits in terms of the cost savings consumers receive (here and abroad) from the coal supplied by the Chuitna Mine and the regional economic impacts in Alaska. However, both benefits and impacts should be quantified with equal rigor using standard tools of economic analysis.

With and without framework

To insure that Corps water resources projects contribute net economic benefits to the nation, analysis must be conducted in what is known as a “with and without” framework. This framework requires that the Corps address net public benefits over the long term under two different scenarios: (a) the discounted stream of all market and non-market benefits and costs that can reasonably be expected in the absence of the project, and (b) the discounted stream of all market and non-market benefits and costs that would be generated with the project.

With and without analysis must take a long-term perspective. Typically, the Corps period of analysis extends to 100 years. According to the Corps NED guidance, “with and without project forecasts should be long run forecasts that avoid giving disproportionate weight to short run events.”²⁶ Thus, if a water resource project provides short run benefits to commodity producers but creates long-term costs in the form of damaged marine ecosystems, the long run perspective will insure that the short-term gain is not over-emphasized.

²⁶ IWR. 1991a. National Economic Development Procedures Manual - Overview Manual for Conducting National Economic Development Analysis. Fort Belvoir, VA, U.S. Army Corps of Engineers, Water Resources Support Center, Institute for Water Resources, Page 52.

The without-project scenario is the “most likely condition expected to exist over the planning period in the absence of the plan, including any known change in law or policy.”²⁷ The without-project scenario provides the basis for estimating the benefits of the with-project scenario. In projecting economic conditions in the without-project scenario, the Corps is required to take into account which structural and non-structural measures may be taken by port agencies, other public agencies, or the transportation industry to accomplish the same objectives of the proposed plan as well as changes in technology that may have bearing on the need for the proposed project (Id.).

The without-project scenario has an important parallel in the NEPA process the Corps must complete for every water resource project. In preparing environmental assessments or environmental impact statements pursuant to NEPA, the Corps must carefully consider the “no action” alternative. Moreover, consideration of this alternative must be completed with the same level of rigor applied to any of the action alternatives. Courts have consistently found that federal agencies must conduct “informed and meaningful” analysis of all alternatives, including no action, and specifically address how the no action alternative affects environmental impacts and the cost-benefit balance.²⁸

The with-project scenario is the one expected to exist over the period of analysis if a project is undertaken. As in the without-project scenario, the Corps must project changes in technical, environmental, social, and economic conditions over the life of the project. Various alternative configurations of the project must also be modeled. Forecasts of with and without-project conditions must use the inventory of existing conditions as the baseline, and should consider direct, indirect, and cumulative effects on income, employment, output, population, exports, land use trends, demands for goods and services, and environmental conditions.²⁹

Once completed, the Corps must compare with and without-project scenarios with the same set of criteria. In order to recommend federal approval of a project, the Corps must demonstrate that one of the with-project alternatives is the alternative that maximizes NED benefits. If the without-project scenario maximizes NED benefits, the Corps may not recommend federal involvement.

Externalities

To complete a reasonably accurate NED account, the Corps must provide a full accounting of costs and benefits that would accrue to all parties regardless of whether they are directly affected by a proposed project. As explained by the Corps in its NED guidance manual, “[m]any economic activities provide incidental benefits to people for whom they were not intended. Other activities indiscriminately impose incidental costs on others. These effects are called externalities.”³⁰ The Corps has a mandate to incorporate externalized costs into its NED

²⁷ WRC. 1983. Economic and Environmental Principles for Water and Related Land Resources Implementation Studies. Washington, D.C., Water Resources Council, Page 59.

²⁸ See, e.g. Bob Marshall Alliance v. Hodel, 852 F.2d 1223, 1228 (9th Cir. 1988); Alaska Wilderness Recreation and Tourism Association v. Morrison, 67 F.3rd 723, 729-30 (9th Cir. 1995).

²⁹ WRC 1983, note 27, Page 4.

³⁰ IWR 1991a, note 26, Page 21.

analysis: “[t]he NED principle requires that externalities be accounted for in order to assure efficient allocation of resources” (*Id.*, 23). Tracking externalized costs is a standard requirement for evaluating all public expenditures.³¹ Consideration of externalities, whether they affect marketed or non-marketed goods and services, is a required component of all economic analyses supporting federal infrastructure investments.³² Federal environmental justice guidelines require the Corps to pay particular attention to externalized costs of pollution when subsistence uses by Native Americans is at issue.³³

Marine and air pollution are examples of externalities that must be evaluated in the context of NED analysis. Navigation improvement projects sponsored by the Corps have the potential to contribute both directly and indirectly to greater amounts of marine pollution through dredging, construction of port infrastructure, greater throughput of marine traffic and cargo, and an overall increase in human use. Marine pollution can generally be divided into six major categories – oxygen demanding substances, suspended solids, pathogens, organic chemical and metal toxicants, and solid wastes.³⁴

The presence of these substances in marine environment contaminates marine sediments, aquatic vegetation, benthic organisms, fish, shellfish, birds, mammals, and sea turtles (*Id.*). Contamination of marine ecosystems, in turn, translates into economic costs to humans in the form of adverse health effects, reductions in consumptive and non-consumptive use and enjoyment of marine environments, and adverse impacts to production activities in the seafood, wholesale trade, retail trade, travel, tourism, real estate, and housing sectors (*Id.*, 94-95).

These costs are known as “externalized” costs since they are borne by individuals, communities, landowners and others who are not directly involved with Corps navigation projects.³⁵ In fact, marine pollution is cited by the Corps as the “classic” example of an externality, and externalities of all kinds are “commonly encountered in many of the Corps’ missions” (*Id.*, 22).

Externalized costs of Corps projects that lead to greater marine pollution can be quantified by any of the standard techniques for assessing both market and non-market effects of federal projects. However, the National Oceanic and Atmospheric Administration (NOAA) and the Department of Interior (DOI) have published special guidelines for how to assess the damage caused to natural resources from release of toxic substances.³⁶ In a nutshell, these natural resource damage assessment (NRDA) procedures call for an accounting of damage that reflects the sum three basic components: (a) restoration costs; (b) compensable value; (c) assessment cost. Restoration costs are defined as the costs of restoration, rehabilitation,

³¹ See, e.g. Office of Management and Budget, Circular A-94 at 6.

³² Principles for Federal Infrastructure Investments, Executive Order 12893 at Section 2(a)1.

³³ Presidential Executive Order on Environmental Justice, Executive Order 12898 at Section 4-401.

³⁴ Ofiara, D. and J. Seneca (2001). *Economic Losses from Marine Pollution*. Washington, D.C., Island Press.

³⁵ IWR. 1991b. *National Economic Development Procedures Manual - National Economic Development Costs*. Fort Belvoir, U.S. Army Corps of Engineers, Institute for Water Resources.

³⁶ National Oceanic and Atmospheric Administration. 1996. “Natural Resource Damage Assessment Procedures: Final Rule.” *Federal Register* 61(4), Friday January 5: 439-510; U.S. Department of Interior. 1987. “Natural Resource Damage Assessments: Final Rule.” *Federal Register* 52(54), Friday, March 20: 9042-9100.

replacement, or acquisition of equivalent natural resources and services. Compensable value refers to lost use and non-use values to the public, and assessment costs refer to the costs of conducting the NRDA. Thus, when a Corps navigation project results in a risk of marine pollution, there are many methods available that can be used to assess the likely costs of such pollution under various scenarios.

One scenario that is often required by federal regulations is the “worst-case scenario,” such as a major oil spill. Worst-case scenarios were a required part of NEPA analysis through the mid-1980s, however, the regulations were changed to place limits on when the worst-case scenario must be analyzed. The Supreme Court has interpreted the present NEPA regulations to retain the duty to describe the consequences of a remote, but potentially severe impact in cases where scientific opinion suggest that it may occur.³⁷ Regardless of whether a worst-case scenario is required for all Corps projects, the Corps guidance on how to deal with risk and uncertainty suggests use of a worst-case scenario to establish an upper bound on unanticipated adverse outcomes: “a pessimistic or risk-averse decision maker may be interested in the maximum probable exposure or loss, or the worst-case scenario.”³⁸

Air pollution is another externality often affected by Corps navigation projects because large vessels are often significant sources of pollutants in near shore environments. In fact, according to a recent study by the Natural Resources Defense Council, “U.S. seaports are the largest and most poorly regulated sources of urban pollution in the country.”³⁹ (NRDC, 2004). By far the greatest source of air pollution related externalities associated with the Chuitna Coal project will be carbon dioxide and other greenhouse gas emissions. In December 2009 the EPA issued an Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act: “the Administrator finds that greenhouse gases in the atmosphere may reasonably be anticipated both to endanger public health and to endanger public welfare.”⁴⁰ It is clear that global warming caused by greenhouse gas emissions generates serious economic damage – estimated by one recent study to eventually reduce per capita consumption by 2100 by 20% at an annual cost of over \$9 trillion.⁴¹ While there are no immediate regulatory restrictions related to coal, the fact that greenhouse gases are now formally recognized as air pollutants does require the Corps to address emissions associated with all phases of the Chuitna Coal Project and quantify the magnitude of negative externalities.

Uncertainty, risks, and sensitivity analysis

Navigation projects sponsored by the Corps are planned in an environment replete with risk and uncertainty. As a result, the Corps is required to formally address risk and uncertainty in

³⁷ Robertson v. Methow Valley Citizens Council et al., Supreme Court of the United States, No. 87-1703. 490 U.S. 332; 109 S. Ct. 1835.

³⁸ Males, R. M. 2002. *Beyond Expected Value: Making Decisions Under Risk and Uncertainty*. Cincinnati, U.S. Army Corps of Engineers, Institute for Water Resources.

³⁹ Natural Resources Defense Council. 2004. *Harboring Pollution: Strategies to Clean Up U.S. Ports*. San Francisco: Natural Resources Defense Council and the Coalition for Clean Air.

⁴⁰ Federal Register Volume 74, No. 239, Tuesday, December 15th, 2009.

⁴¹ Stern, Nicolas. 2006. *Stern Review Stern Review on the Economics of Climate Change: Executive Summary*. London: New Economics Foundation.

the context of NED analysis, and to not characterize the benefits and costs of its projects in certain terms. Mischaracterizing uncertain outcomes as certain can result in serious overstatements of project benefits (NRC, 2001, 45).⁴² Likewise, failing to acknowledge and quantify risks can lead to serious understatements of expected project costs.

The Corps defines risky situations as “those in which the potential outcomes can be described in reasonably well known probability distributions.”⁴³ For example, the probability of floods and severe storms occurring within a specified time frame is described reasonably well by a known probability distribution. Likewise, the probability of accidental spills of oil or other hazardous substances from specific types of vessels or port facilities can be calculated from historical records.

In contrast, when potential outcomes cannot be described in objectively known probability distributions they are labeled uncertain outcomes.⁴⁴ Uncertainty permeates navigation planning. Uncertainty clouds commodity demand and price forecasts, predictions of required amounts of dredging, reliability projections for navigation structures and port facilities, transit times for commercial traffic, and many other factors that have bearing on project costs and benefits. Many projected benefits and costs of navigation projects do not have known probability distributions and, thus, are uncertain.

Expected value analysis is one method the Corps has at its disposal to incorporate risk into its NED analyses. Stated simply, expected value analysis requires multiplication of cost and benefit estimates, either point estimates or ranges, by the probability of their occurrence (Boardman, Greenberg et al., 2001, 159).⁴⁵ Expected value analysis, then, deflates benefit and cost estimates to reflect the inherent ambiguity about their future values. Expected value analysis is a rather crude way to incorporate risk, since it does not tell us anything about the specific risk factors associated with various alternatives. Because of this, the Corps has developed much more sophisticated methods to address both risk and uncertainty that fall under the general heading of “risk analysis,” which has three basic components:

- 1) risk assessment, which involves the analysis of the technical aspects of the problem to determine uncertainties and their magnitudes;
- 2) risk communication, which deals with conveying information about the nature of risks to all interested parties, and;
- 3) risk management, which involves decisions on how to handle risks.⁴⁶

The National Research Council (NRC) has also outlined ways in which the Corps should go about incorporating risk and uncertainty into decisions. NRC describes four “state of the art” methods including sensitivity analysis, Monte Carlo analysis, scenario analysis, and the process of finding “robust” alternatives that are immune to the volatility of benefit and cost

⁴² National Research Council. 2001. *Inland Navigation System Planning: The Upper Mississippi River - Illinois Waterway*. Washington, D.C.: National Academy Press.

⁴³ U.S. Army Corps of Engineers, Engineering Regulation 1105-2-100, Appendix E at E-11.

⁴⁴ *Ibid.*

⁴⁵ Boardman, A., D. Greenberg, et al. (2001). *Cost Benefit Analysis: Concepts and Practice*. Upper Saddle River, NJ, Prentice Hall.

⁴⁶ Males 2002, note 38, ix.

estimates caused by uncertain parameters.⁴⁷ Thus, there are a variety of widely endorsed analytical tools the Corps can use to fulfill its obligations to incorporate risk and uncertainty into project planning.

2: Net Public Benefits and the Regulatory Framework for Chuitna

The statutes, regulations, and rules governing analysis of the Chuitna Coal Project underscore the importance of the net public benefits framework in general as well as many of the specific components of a proper analysis, such as benefit-cost analysis, addressing externalities, non-market benefits and costs, and the with and without framework. For example:

Water Resources Development Act

As previously noted, Corps navigation and civil works projects are justified on the basis of their contributions to NED, which is analogous to net public benefits. This requirement is set forth in the Water Resources Development Act (WRDA), the Water Resources Council (WRC) regulations implementing the Act, and Corps guidance manuals. According to the WRC (1983):

“Contributions to national economic development are increases in the net value of the national output of goods and services, expressed in monetary units. Contributions to NED are the direct net benefits that accrue in the planning area and the rest of the nation. Contributions to NED include increases in the net value of those goods and services that are marketed, and also of those that may not be marketed.”⁴⁸

NED analysis provides the basis for identifying appropriate benefits and costs associated with Corps flood control, navigation, hydroelectric, water supply or environmental projects to include in subsequent benefit cost analyses of these projects.⁴⁹ Benefit cost analysis is used to determine whether national economic development effects of a project are positive or negative. In other words, benefit cost analysis is undertaken to assure that the value of the outputs exceeds the value of the inputs.

Principles and Guidelines for Water and Related Land Resources Implementation Studies

The WRDA and NED analysis are implemented under procedures set forth in the WRC’s Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies. The first set of “Principles” was issued in September 1973 to guide the preparation of river basin plans and to evaluate federal water projects. Following a few attempts to revise those initial standards, the current principles and guidelines went into effect in March 1983. As established above, the Principles already provide unambiguous direction for the Corp to conduct economic analysis under the net public benefits framework. This mandate is being amplified and made even more explicit in revisions to the Principles that will likely be completed before the Corps begins analysis of the Chuitna Coal Project.

⁴⁷ NRC 2001, note 42, Page 63-66.

⁴⁸ WRC 1983 note 27, Page 1.

⁴⁹ IWR 1991a, note 26, Page 1.

In the reauthorized WRDA of 2007, Congress instructed the Secretary of the Army to develop a new Principles and Guidelines for the U.S. Army Corps of Engineers (section 2031). In an effort to modernize the approach to water resources development, the Obama administration is expanding the scope of the Principles and Guidelines to cover all federal agencies that undertake water resource projects, not just the four agencies (i.e., U.S. Army Corps of Engineers, Bureau of Reclamation, Natural Resources Conservation Service and the Tennessee Valley Authority) which are subject to the current Principles and Guidelines. The revised Principles include a number of important changes that modernize the current approach to water resources development in this country and underscore the importance of economic analysis under the net public benefits standards.⁵⁰ As explained by CEQ, the revisions address two key considerations: maximizing net public benefits broadly, and incorporating both monetary and non-monetary benefits:

- Achieving Co-Equal Goals: The Administration’s proposal reiterates that federal water resources planning and development should both protect and restore the environment and improve the economic well-being of the nation for present and future generations. While the 1983 standards emphasized economic development alone, the new approach calls for development of water resources projects based on sound science that maximize net national economic, environmental, and social benefits.
- Considering Monetary and Non-Monetary Benefits: The revised Principles and Guidelines shift away from the earlier approach to project selection. Specifically, this revised version will consider both monetary and non-monetary benefits to justify and select a project that has the greatest net benefits – regardless of whether those benefits are monetary or non-monetary. For example, the monetary benefits might capture reduced damages measured in dollars while the non-monetary benefits might capture increased fish and wildlife benefits, or biodiversity.

National Environmental Policy Act

In addition to formal benefit-cost analysis (BCA) required by the WRDA and its implementing Principles all Corps water resource projects that may significantly affect environmental quality must be accompanied by an environmental impact statement pursuant to NEPA (42 U.S.C. § 421 et seq.). While NEPA by itself does not generally require federal agencies to conduct a formal cost-benefit analysis, CEQ regulations for implementing NEPA (40 CFR § 1502.23) set out the requirements for incorporating any BCA that may be prepared into the NEPA process. In addition, NEPA and its implementing regulations guide other components of the economic analysis including establishing a purpose and need, addressing cumulative impacts, and rigorous consideration of the “no action” alternative.

Incorporating BCA into the NEPA process

The CEQ regulations state that, if a BCA relevant to the choice among environmentally different alternatives is being considered for a proposed action under NEPA, it shall be

⁵⁰ See CEQ’s website at: <http://www.whitehouse.gov/administration/eop/ceq/initiatives/PandG>.

incorporated into the EIS as an aid in evaluating the environmental consequences of the project.⁵¹ Furthermore, the regulation requires that any BCA must discuss “the relationship between that analysis and any analyses of unquantified environmental impacts, values, and amenities.” The regulation also provides that, although the weighing of the merits and drawbacks of the various alternatives need not be displayed in a monetary cost-benefit analysis, an EIS must “at least indicate those considerations, including factors not related to environmental quality, which are likely to be relevant and important to a decision.”

The WRC regulations operationalize the CEQ requirement with respect to benefit cost analysis (BCA) prepared for water resource projects undertaken by the Corps and other federal agencies. The WRC regulations require the Corps to maintain four separate sets of accounts that enable Corps decision makers to compare economic values and impacts that are not included in the formal BCA but which, nonetheless, may have significant bearing on a project’s feasibility with those that are included.⁵² The four accounts include:

- The NED account. The NED account describes that part of the NEPA human environment, as defined in 40 CFR §1508.14, that identifies beneficial and adverse effects on the economy.
- A Regional Economic Development (RED) account. The RED account registers changes in the distribution of regional economic activity that result from each alternative plan. Two measures of the effects of the plan on regional economies are used in the account: regional income and regional employment. The regions used for RED analysis are those regions with in which the plan will have particularly significant income and employment effects.
- An Environmental Quality account (EQ) account. The EQ account is a means of displaying and integrating into water resources planning that information on the effects of alternative plans on significant EQ resources and attributes of the NEPA human environment, as defined in 40 CFR § 1507.14, that is essential to a reasoned choice among alternative plans. Significant means likely to have a material bearing on the decision making process.
- An Other Social Effects (OSE) account. The OSE account is a means of displaying and integrating into water resource planning information on alternative plan effects from perspectives that are not reflected in the other three accounts. The categories of effects in the OSE account include the following: urban and community impacts; life, health, and safety factors; displacement; long-term productivity; energy requirements and energy conservation.

Importantly, all four accounts are needed to satisfy the CEQ NEPA obligations: “[t]hese four accounts encompass all significant effects of a plan on the human environment as required by the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.)”⁵³

⁵¹ 40 CFR § 1502.23.

⁵² WRC 1983, note 27, Pages 8-12.

⁵³ *Id.*, Page 8.

Thus, the proper manner in which to incorporate BCA findings into an EIS is to include the BCA in the NED account, and then compare its findings and values with those reported by the other three accounts. In this way, the Corps is able to meet its obligations to discuss the relationship between NED analysis and any analyses of unquantified environmental impacts, values, and amenities or other considerations not related to environmental quality as required by 40 C.F.R. §1503.23. Failure to do this gives too much emphasis to the BCA in the decision making process.

Establishing a purpose and need

The purpose and need section is the most critical section of an EIS. CEQ regulations require federal agencies to “[s]pecify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action” (40 CFR § 1502.13). A precise definition of the purpose and need establishes “why the agency is proposing to spend large amounts of taxpayers' money while at the same time causing significant environmental impacts.”⁵⁴ A clear, well-justified purpose and need section demonstrates why expenditure of public funds and permits or authorizations for natural resource disturbances are necessary and worthwhile and why the project is being prioritized relative to other needed land management, transportation, or infrastructure projects.

In addition, “although significant environmental impacts are expected to be caused by the project, the purpose and need section should justify why impacts are acceptable based on the project's importance.”⁵⁵ As with other aspects of the Corps economic analysis, establishing purpose and need must identify the public benefits (i.e., NED benefits) associated with the project, and not simply report why the project is important to a small number or even a single private entity.

Cumulative impacts

The CEQ regulations require agencies to consider three types of actions when preparing an EIS: 1) “connected actions,” which means they are closely related and therefore should be discussed in the same impact statement; 2) “cumulative actions,” which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement; and 3) “similar actions,” which when viewed with other reasonably foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography.”⁵⁶

Federal agencies must also consider three types of potential environmental impacts or “effects” of their proposed actions and programs in the EIS process: direct, indirect, and cumulative.⁵⁷ The CEQ regulations define “effects” as being synonymous with

⁵⁴ NEPA and Transportation Decision Making: See <http://www.environment.fhwa.dot.gov/projdev/tdmneed.asp>.

⁵⁵ Ibid.

⁵⁶ 40 CFR § 1508.25(a).

⁵⁷ 40 CFR § 1508.25(c).

“impacts.” Direct effects are those caused by the action that occurs at the same time and place. Indirect effects are those caused by the action that are later in time or farther removed in distance, but are still reasonably foreseeable.

Indirect effects include the “growth inducing” effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and natural systems, including ecosystems. Court decisions construing NEPA have recognized that federally-assisted projects which contribute to urban sprawl are required to evaluate the growth inducing effect of additional development.⁵⁸

Pursuant to 40 C.F.R. §1508.25(c)(3), an environmental impact statement must consider a proposed project's “cumulative impact.” 40 C.F.R. §1508.7 defines cumulative impacts as the impact on the environment which results from the “incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from “individually minor but collectively significant actions taking place over a period of time.” (*Id.*)

Court decisions have uniformly construed NEPA's cumulative effects requirement to require Federal agencies to conduct a comprehensive analysis of the impact of connected or cumulative actions in order to prevent agencies from dividing one project into multiple individual actions each of which has an insignificant environmental impact, but which collectively have a substantial impact.⁵⁹ As other Court decisions have recognized, at least some Federal agencies contributing to urban sprawl have a specific duty under their own NEPA regulations to “group together” and evaluate all individual activities that are related on a geographical or functional basis, or are logical parts of a “composite of contemplated actions” as a single project.⁶⁰

The CEQ regulations recognize that evaluation of the “significance” of major Federal actions involves consideration of context as well as the intensity of potential environmental impacts. This means that the significance of proposed actions must be analyzed in several contexts, including “the affected region” and the “locality” of those actions (40 CFR § 1508.27(a)). The CEQ regulations also suggest that, when preparing EIS's on broad federal actions (including proposals by more than one agency), agencies “may find it useful” to evaluate the proposal(s) on a geographical basis, including actions “occurring in the same general location, such as body of water, region, or metropolitan area” (40 CFR §1502.4(c)(1)).

In recent decisions construing NEPA's requirement that agency's evaluate the cumulative impacts of a proposed project, the Ninth Circuit has held that an environmental impact

⁵⁸ See e.g., *City of Davis v. Coleman*, 521 F.2d 661 (9th Cir. 1995) (highway construction); *Carmel-by-the-Sea v. U.S. Dept. of Transportation*, 123 F.3d 1142 (9th Cir. 1997) (highway construction); *Morongo Band of Mission Indians v. FAA*, 161 F.3d 569 (9th Cir. 1998) (airport expansion).

⁵⁹ See e.g., *National Wildlife Federation v. FERC*, 912 F.2d 1471 (D.C. Cir. 1990); *Natural Resources Defense Council, Inc. v. Hodel*, 865 F.2d 288, 297-98 (D.C. Cir. 1988).

⁶⁰ See *Society Hill Towers Owners' v. Rendell*, 20 F. Supp. 855 (E.D. Pa. 1998) (citing HUD regulations).

statement must “catalogue adequately past projects in the area” and provide a “useful analysis of the cumulative impact of past, present, and future projects.”⁶¹

Given these requirements, it is clear that any discussion of economic impacts associated with the Chuitna Coal Project must consider not only the direct costs and benefits associated with the surface coal mine and associated support facilities, mine access road, coal transport conveyor, personnel housing, air strip facility, logistic center, and coal export terminal but also include an analysis of effects associated with increased access to the area, potential for mine expansion, separate future mining activities and other potential induced or connected future actions made possible by the Project’s infrastructure.⁶²

Rigorous consideration of the “no action” alternative

As previously noted, the stream of market and non-market benefits associated with the Project must be compared in a “with and without” context. Importantly, this requires a detailed consideration and valuation of all of the existing beneficial uses of the project area, including subsistence use, passive use values for native wildlife, carbon sequestration benefits, fish production, and other ecosystem services. By doing so, alternatives in the EIS are not improperly skewed towards the action alternatives and the economic benefits of leaving the Chuitna Coal Project area intact are identified and quantified where possible.

Clean Water Act

The Clean Water Act regulates several aspects of the Chuitna Coal Project. The duty to consider economic impacts broadly, from the net public benefits framework is found in multiple sections. For example, Section 404(b)(1) sets forth guidelines for specification of disposal sites for dredged or fill material. With limited exceptions, no discharge of dredged or fill material is permitted which will cause or contribute to significant degradation of the waters of the United States. Guidelines for findings of significant degradation related to the proposed discharge are based upon appropriate factual determinations, evaluations, and tests required by other subparts. Taken together, effects contributing to significant degradation considered individually or collectively, include:

- Significantly adverse effects of the discharge of pollutants on human health or welfare, including but not limited to effects on municipal water supplies, plankton, fish, shellfish, wildlife, and special aquatic sites.

⁶¹ See e.g., *Northwest Environmental Advocates v. National Marine Fisheries Service*, 2006 WL 2422681 (9th Cir. 2006) (noting that the Army Corps of Engineers was required to evaluate the cumulative impacts of a channel deepening project, including disposal of dredged material at a deepwater site, on sediment availability and transport in light of existing projects, and coastal erosion, as well as salinity in light of past actions) citing, *City of Carmel by the Sea*, 123 F.3d 1142 (9th Cir. 1997); *Lands Council*, 395 F.3d at 1027. See also, *Neighbors of Cuddy Mountain v. U.S. Forest Service*, 137 F.3d 1372, 1380 (Ninth Cir. 1998) (ruling that the Forest Service must consider cumulative impacts of a proposed project, and that to “consider” cumulative impacts some quantified or detailed information is required).

⁶² These three cumulative actions were identified in the Scoping Report, page 16.

- Significantly adverse effects of the discharge of pollutants on life stages of aquatic life and other wildlife dependent on aquatic ecosystems, including the transfer, concentration, and spread of pollutants or their byproducts outside of the disposal site through biological, physical, and chemical processes;
- Significantly adverse effects of the discharge of pollutants on aquatic ecosystem diversity, productivity, and stability. Such effects may include, but are not limited to, loss of fish and wildlife habitat or loss of the capacity of a wetland to assimilate nutrients, purify water, or reduce wave energy; or
- Significantly adverse effects of discharge of pollutants on recreational, aesthetic, and economic values.

Clearly, the duty to consider loss of ecosystem service values and other market and non-market effects envisioned by the net public benefits standard are reiterated by the plain language of these Clean Water Act regulations.

Fish and Wildlife Coordination Act (FWCA)

The Chuitna Coal Project will require diversion of a substantial amount of freshwater for dust control, processing of wastes, tailings impoundments, and operations. Under the FWCA, the application must obtain an authorization from the U.S. Fish and Wildlife Service for any water diversions.⁶³ As part of that authorization, the USFWS must estimate “wildlife benefits or losses.”⁶⁴ Wildlife benefits associated with mitigation measures targeted at improved wildlife resources must be compared with the costs of implementing these measures. To be complete, non-market valuation – including estimation of passive use benefits – is an important part of this analysis since the majority of wildlife benefits are non-market in nature.

Solid Waste Management Permit

The mine and infrastructure components of the Chuitna Coal Project could require solid waste disposal or management permits.⁶⁵ The Alaska Department of Environmental Conservation is responsible for issuing waste permits in compliance with 18 AAC 60. These regulations envision a social benefit-cost test to demonstrate that the benefits of constructing and operating the source outweigh its externalized social and environmental costs. An important part of the analysis supporting the permit includes “a demonstration that the benefits of construction, operation, or modification of the stationary source will significantly outweigh the environmental and social costs incurred.”⁶⁶ To secure a waiver of applicable regulations, applications must demonstrate that:

⁶³ Fish and Wildlife Coordination Act, 16 USC 661-666c

⁶⁴ Ibid. 4, at 3..

⁶⁵ The Final Environmental Impact Statement for the Diamond Chuitna Coal Project noted that solid waste disposal permits would be required for the mine and housing units. See U.S. Environmental Protection Agency. 1990. Diamond Chuitna Coal Project: Final Environmental Impact Statement. Available at [http://yosemite.epa.gov/r10/water.nsf/NPDES+Permits/Chuitna+Coal/\\$FILE/1FEIS_DCCPrj_Vol1_Thru_Chapter_1.pdf](http://yosemite.epa.gov/r10/water.nsf/NPDES+Permits/Chuitna+Coal/$FILE/1FEIS_DCCPrj_Vol1_Thru_Chapter_1.pdf)

⁶⁶ 18 Alaska Administrative Code 60

(1) compliance with the identified provision would cost significantly more than the value of the environmental benefit, public health risk reduction, and nuisance avoidance that could be achieved through compliance with the identified provision; or
(2) the proposed alternative action will provide equal or better environmental protection, reduction in public health risk, and control of nuisance factors than compliance with the identified provision.⁶⁷

These provisions underscore the necessity of valuing largely non-market benefits and costs associated with environmental protection, public health risk and nuisance factors.

Marine, Protection, Research, and Sanctuaries Act Section 103(MPRSA)

Dredged material from development of the Ladd Landing Facility and deep draft channels accessing the export facility may be dumped offshore. As such, provisions of the MPRSA may apply. Permits for ocean dumping must be obtained from the U.S. Army Corps of Engineers using environmental criteria developed by the Environmental Protection Agency. The criteria must ensure “that such dumping will not unreasonably degrade or endanger human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities.”⁶⁸ In addition, the criteria must consider the externalized costs of the proposed dumping and specifically include “the effect of such dumping on human health and welfare, including economic, esthetic, and recreational values.”⁶⁹

Dam Safety Certification

Tailings impoundment dams associated with the Chuitna Coal Project would require dam safety certification by the Alaska Department of Natural Resources (ADNR). Issuance of the certificate requires ADNR to classify the dam into one of three hazard types. As part of the hazard classification process, ADNR must consider potential losses or damage to human life, health, infrastructure, commercial and residential properties, anadromous fish and other economic resources should the dam fail.⁷⁰ A consideration of these potential costs should be part of the overall risk assessment for the Project.

Alaska Coastal Management Plan Consistency Review

Because the Chuitna Coal Project lies within the coastal zone and affects offshore areas, estuaries, and wetlands, it is subject to an Alaska Coastal Management Plan consistency review led by ADNR. In the Coastal Zone Management Act (CZMA), Congress created a federal-state partnership for management of coastal resources. Section 307 of the CZMA requires that federally licensed or permitted activities be consistent with state coastal management policies (e.g., land use planning statutes, marine spatial planning, and water

⁶⁷ Ibid. 7, at 131.

⁶⁸ Marine Protection, Research, and Sanctuaries Act. 16 USC § 1431 et seq. and 33 USC §1401 et seq.

⁶⁹ Ibid. 9, at 5.

⁷⁰ 11 Alaska Administrative Code 93.157.

quality standards. A consistency determination is the process used to implement this requirement for federal permits and licenses.

Federal consistency reviews are not performed by one single agency. Rather ADNR's Department of Ocean and Coastal Management coordinates a collaborative process review involving Alaska's natural resource agencies. Participants in the coastal consistency review process include the applicant, state agencies, the affected coastal district(s), interested members of the public, and relevant federal agencies.

As part of the review process, ADNR and its collaborators must determine whether or not the Project impairs management of coastal and offshore habitats and includes mitigation measures that adequately protect competing economic uses. For example, both offshore areas and estuaries must be managed "to avoid, minimize, or mitigate significant adverse impacts to competing uses such as commercial, recreational, or subsistence fishing."⁷¹ Quantifying both market and non-market values associated with these competing uses and predicting how the Project would alter such values is critical for determining whether or not the Project surpasses the significance threshold.

3. Specific Recommendation for the Economic Analysis

Based on the foregoing, CSE and its partners in Alaska have the following specific recommendation to make with respect to the scope and substance of the economic analysis the Corps will be preparing for the Chuitna Coal Project:

- Net public benefits should be the framework adopted for the analysis. The Corps existing NED procedures and guidance should be used in combination with guidance applicable to all federal agencies such as those published by Office of Management and Budget as well as economic analysis guidance contained in the numerous statutes, regulations, and rules governing each of the permitting activities associated with the project (Appendix 1).
- Both market and non-market benefits and costs should be described and quantified to the extent practicable based on the best available sources of information and methods. This includes quantification of negative externalities and the benefits of ecosystem services.
- Original valuation studies should be implemented to develop rigorous values to assign to changes in passive use values, subsistence use, loss of fisheries, carbon emissions damage, and other non-market effects. The costs of such studies are typically a small fraction on what the Corps will spend on other aspects of its feasibility analysis.
- The Chuitna Coal Project is ideal for demonstration of how ecosystem service values can be incorporated into regulatory analysis. As such, we recommend that the Corps and other partners on the Environmental Markets Team adopt this project as pilot. By

⁷¹ 11 Alaska Administrative Code 112.300 (b)1-2.

separate cover, we have notified other EMT participants of this project and the opportunity it presents.

- In accordance with net public benefits analysis standards and NED guidance, potential benefits of the Chuitna Coal Project should be described and quantified in terms of changes in consumer and producer surplus. These benefits should be distinguished from economic impacts, which include jobs, income, tax revenues, and coal revenues. Economic benefits, not impacts, should be used in the formal benefit-cost analysis.

Thank you for the opportunity to participate in the economic analysis for the Chuitna Coal Project. As the project evolves, please keep CSE on the mailing list to receive updates and any documents for which you are seeking public comments. If you have any questions or need clarification about any aspect of these scoping comments, please feel free to contact either one of us. Contact information is provided below.

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Appendix 1: Regulatory and Permitting Requirements for the Chuitna Coal Project

Regulatory process	Agency	Chuitna Coal Mine	Chuitna Infrastructure	Ladd Landing Development
National Environmental Policy Act (NEPA) Supplemental Environmental Impact Statement (SEIS)	US Environmental Protection Agency (USEPA)	✓	✓	✓
Clean Water Act (CWA) National Pollutant Discharge Elimination System (NPDES) permit(s)	USEPA	✓	✓	✓
Air quality permit review	USEPA	✓	✓	✓
Safe Drinking Water Act (SDWA) Underground Injection Control (UIC) permit(s)	USEPA	✓	To be determined (TBD)	TBD
Spill Prevention, Control, and Countermeasure (SPCC) plan	USEPA	✓	TBD	✓
Federal landowner authorization	US Department of the Interior (USDI)	TBD	TBD	TBD
Bald Eagle Protection Act clearance	USDI	TBD	TBD	TBD
Migratory Bird Protection review	USDI	TBD	TBD	TBD
Fish and Wildlife Coordination Act review	USDI	TBD	TBD	TBD
Threatened and Endangered Species Act (ESA) consultation	USDI	✓	✓	✓
Federal landowner authorization	US Department of Agriculture (USDA)	TBD	TBD	TBD
CWA section 404 dredge and fill permit(s)	US Army Corps of Engineers (COE)	TBD	TBD	TBD
Marine, Protection, Research, and Sanctuaries Act Section 103 compliance	COE	✓	✓	✓

Appendix 1: Regulatory and Permitting Requirements for the Chuitna Coal Project (Page 2)

National Historic Preservation Act Section 106 Historical and Cultural Resources Protection review	COE	✓	✓	✓
Rivers and Harbors Act (RHA) Section 10 permit	COE	TBD	TBD	TBD
ESA consultation	National Oceanic and Atmospheric Administration (NOAA)	✓	✓	✓
Marine Mammal Protection Act review	NOAA	TBD	TBD	TBD
Essential Fish Habitat review	NOAA	TBD	TBD	TBD
Fish and Wildlife Coordination Act review	NOAA	TBD	TBD	TBD
CWA section 401 certificate of reasonable assurance of EPA section 402 NPDES permits	Alaska Department of Environmental Conservation (ADEC)	✓	✓	✓
CWA section 401 certificate of reasonable assurance of ACE section 404 permits	ADEC	✓	✓	✓
Solid waste management permit	ADEC	TBD	TBD	TBD
Domestic and non-domestic wastewater disposal permits	ADEC	TBD	TBD	✓
Air quality permit	ADEC	TBD	TBD	✓
Approval to construct and operate a public water supply system	ADEC	TBD	TBD	TBD
Plan review for non-domestic wastewater treatment system	ADEC	TBD	TBD	TBD
Plan review and construction approval for domestic sewage system	ADEC	TBD	TBD	✓

Appendix 1: Regulatory and Permitting Requirements for the Chuitna Coal Project (Page 3)

Stormwater discharge pollution prevention plan	ADEC	✓	TBD	✓
Oil discharge prevention and contingency plan	ADEC	✓	TBD	✓
Monitoring plan (surface/groundwater/wildlife)	ADEC	✓	✓	✓
Landfill permit and bonding	ADEC	TBD	TBD	TBD
Surface coal mine permit	Alaska Department of Natural Resources (ADNR)	✓	TBD	TBD
Right-of-way for access and utilities	ADNR	TBD	TBD	TBD
Millsite lease	ADNR	TBD	TBD	TBD
Permit to appropriate water	ADNR	TBD	TBD	TBD
Dam safety certification	ADNR	TBD	TBD	TBD
Upland or tideland leases	ADNR	TBD	TBD	TBD
Material sale	ADNR	TBD	TBD	TBD
Winter travel permits	ADNR	TBD	TBD	TBD
Cultural resource protection	ADNR	✓	✓	✓
Alaska Coastal Management Plan (ACMP) consistency review	ADNR	✓	TBD	✓

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Fish Habitat title 16 permit(s)	Alaska Department of Fish and Game (ADF&G)	TBD	TBD	✓
Fishway permit(s)	ADF&G	TBD	TBD	TBD
Special area permit(s)	ADF&G	TBD	TBD	TBD
Scientific collection permit(s)	ADF&G	TBD	TBD	TBD
Fish resource permits(s)	ADF&G	TBD	TBD	TBD

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