Appendices: Competitive Coal Lease Sale In the Canyon Creek Area, Alaska
ADL 553937

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Appendix A: Agency Comments and Responses

Agency Comment	DNR Response
ADF&G commented that remote streams in the proposed lease area have not been thoroughly surveyed for fishery information. However, Canyon and Contact Creeks are known anadromous streams, supporting varieties of salmon and resident fish, including rainbow trout, Dolly Varden, and Arctic grayling. (See Chapters 5 & 6 for details) ADF&G recommends that, as a condition of the lease sale, buffers should be implemented on all anadromous streams and major resident fish-bearing waters. Buffers should be a minimum of 100 feet on either side of the stream, and should be delineated in the field to take local topography into consideration.	DNR will require the recommended buffers in any lease issued. DNR and the coal operator will work with DF&G to establish the extent of anadromous and major resident fish-bearing streams, and appropriate buffer widths (100' minimum on each side of stream). (See comment below regarding fish surveys)
ADF&G recommends that a comprehensive fish survey should be conducted before coal development commences.	DNR will require that a comprehensive fish survey be performed to determine fish streams in need of protection prior to coal development.
ADF&G commented that water needs of a mine and potential impact to fish resources should be considered before mine development begins.	Under 11 AAC 90.085 and 11 AAC 90.321 the applicant must provide their determination of the probable hydrologic consequences (PHC) if development and mining within the project area. From this determination the applicant proposes a hydrologic reclamation plan (HRP) that shows how the project will minimize impacts to surface and ground water systems within and adjacent to the permit area, and how the project will prevent material damage outside the permit areas. From the PHC and HRP, the Department develops a Cumulative Hydrologic Impact Assessment (CHIA) for the project. The CHIA is an assessment of the probable cumulative impacts of all anticipated mining in an area to assure the operation has been designed to prevent material damage to the hydrologic balance outside the permit area. (See Water Quality Protection in Chapter 10)

ADF&G recommends that any coal lease in the area contain a provision to reclaim the area in acceptable moose browse.	Performance standard 11 AAC 90.451 provides that the mine operator must establish on all affected land a vegetative cover that is at least equal in cover to the natural vegetation in the area, and which is comprised of species native to the area. The vegetation must be compatible with the plant and animal species of the area, and appropriate to the planned postmining use of the area. Paragraph (e) of 11 AAC 90.423 further requires that, "If fish and wildlife habitat is to be a postmining land use, the plant species to be used on reclaimed areas must be selected based on their proven nutritional value for fish or wildlife, their use as cover for fish and wildlife, and their ability to support and enhance fish or wildlife habitat after bond release.
ADF&G recommends that if coal is transported to the Tyonek/Ladd Landing area, haul routes excluding the Susitna Flats State Game Refuge should be considered. ADF&G believes that coal transport is likely not a compatible use with the Game Refuge.	Coal transport routes will avoid crossing the Susitna Flats State Game Refuge.
DNR/DMLW Water Resource Section commented as follows: There are no active water case files within T19N, R13W, S.M., T19N, R14W, S.M., T20N, R13W, S.M., T20N, R14W, S.M., and T21N, R14W. In T21N, R13W, S.M. Sections 16 and 17, water right case file LAS 9008, Certificate of Appropriation for 75 gallons per day from Carlson Creek has been issued. This certificate is appurtenant to Tract B of Alaska Land Survey No. 76-223. The case file is in Anchorage. The headwaters for Carlson Creek are located within the area noted for the competitive lease sale, thus enough flow must remain in Carlson Creek to provide for the water right Certificate of Appropriation, LAS 9008.	No response necessary.

Appendix B: Public Notice and Comment Under AS 38.05.945

Public notice of the proposed Canyon Creek coal lease was provided in accordance with AS 38.05.945. The preliminary decision was noticed on the Alaska state public notice website on October 16, 2012. The notice was published in the Anchorage Daily News on October 17, 2012, and the Mat-Su Valley Frontiersman on October 19, 2012. The public comment period closed on December 21, 2012. Notice was also posted in the following United States Post Offices: Houston, Skwentna, Wasilla, Tyonek, and Willow. Notice was sent to the Tyonek Native Corporation, the Village Council Native Village of Tyonek, CIRI, Cook Inlet Tribal Council, Matanuska-Susitna Borough, and the Tyonek and Susitna Valley Fish and Game Advisory Committees. Public notice was also sent by mail to 272 property owners in the Canyon Creek-Shell Lake-Talachulitna River area. A public hearing was held in Anchorage on November 13, 2012. Attendees were given the opportunity to provide written and oral testimony at the hearing. A public meeting was held at Shell Lake Lodge on December 17, 2012, at which meeting participants were given the opportunity to provide written comment.

The Department of Natural Resources received comments from 937 commenters. In addition to the individuals who provided comments, comments were received from the following organizations: Alaska Center for the Environment, Alaska Coal Association, Alaska Community Action on Toxins, Alaska Energy Corporation, Alaska Miners Association, Alaska Survival, Alaska Trucking Association, Associated General Contractors, Borell Consulting Services, LLC, Center for Science in Public Participation, Cook Inletkeeper, CREDO Action, Earthjustice, et. al, Friends of Mat-Su, Ground Truth Trekking, Laborers Local 341, Matanuska-Susitna Borough, Resource Development Council. Earthjustice submitted comments on behalf of: Alaska Center for the Environment, Alaska Community Action on Toxics, Alaska Survival, Center for Biological Diversity, Chickaloon Village Traditional Council, Chuitna Citizens Coalition, Cook Inletkeeper, Friends of Mat-Su, Natural Resources Defense Council, and Sierra Club. CREDO Action submitted a comment signed by 347 individuals. Alaska Center for the Environment submitted a petition signed by 85 individuals. Eighteen commenters indicated that they own property in the general Canyon Creek-Shell Lake-Talachulitna River area. The DNR has carefully considered all comments.

A number of comments indicated that the DNR had failed to consider certain issues that are beyond the scope of review required under AS 38.05.035. These issues included: baseline environmental studies, detailed cost-benefit analysis, global climate change, the adequacy of the coal royalty and other taxes on coal mining, and potential future mine employment.

Under AS 38.05.035 (e)(1)(A) the scope of the administrative review and finding may address *only reasonably foreseeable, significant effects of the uses proposed to be authorized by the disposal*. If a potential effect of the proposed action is not reasonably foreseeable, or not significant, then it need not be considered in the review process.

AS 38.05.035 (e)(1)(B)(i) and (ii) provide that the director may limit the scope of an administrative review and finding to "(i) applicable statutes and regulations; and (ii) the facts pertaining to the land, resources, or property, or interest in them, that the director finds are material to the determination and that are *known to the director or knowledge of which is made available to the director during the administrative review*..." Accordingly, issues such as the appropriateness of state statutes and regulations need not be considered, and there is no statutory requirement to conduct detailed studies in preparation for a best interest finding, only a requirement to review available information that is material to the determination of whether the sale will best serve the interests of the State.

Under S 38.05.035 (h), "In preparing a written finding under (e)(1) of this section, the director may not be required to speculate about possible future effects subject to future permitting that cannot reasonably be determined until the project or proposed use for which a written best interest finding is required is more specifically defined, including speculation about (1) the exact location and size of an ultimate use and related facilities;" Thus, the director need not speculate about issues that cannot be determined at the time of the written decision if they will be subject to future permitting. This paragraph precludes speculation about such things as the size of a future mine or its employment.

The following is a summary of the public comments and DNR responses to those comments.

Canyon Creek Public Comments and Responses

Comment #1
Coal mining will destroy Cook Inlet salmon habitat and damage the fishery. Salmon runs have been well below average for the last several years; we have had a very poor salmon run in 2012. The State of Alaska should not risk further damage to salmon runs by issuing coal leases.

Response
This comment is a declaratory statement which provides no information on which the DNR might reassess this decision. The comment does not indicate how coal leasing in the Canyon Creek area will impact Cook Inlet salmon habitat. Salmon runs are affected by a wide variety of environmental factors, including such things as fishing and climate. No mine plan or coal transportation plan has been proposed, therefore it is not possible to predict specific effects that might result from a prospective coal mining operation in the Canyon Creek area. The DNR is prohibited from assuming what those specific impacts might be under the prohibitions of AS 38.05.035 (e) and (h). (See discussion of AS 38.05.035 (e) and (h), above in this Appendix.) There are extensive statutory and regulatory provisions that are applied during the coal permitting and development process designed to avoid, minimize, and/or mitigate adverse impacts to salmon and other resources. These provisions will be applied throughout the permitting process to protect this important state resource. Statutory and regulatory protections are discussed in Chapters 4 and 10 of this decision.

Comment #2
What impact will this project have on anadromous fish streams: What data, baseline data have been collected by your agency for this area?

Response
Coal leasing in itself will have no impact on anadromous fish streams. Depending on the extent of coal mining there may be impacts to fish streams. The ASCMCRA and other state and federal statutes and regulations are designed to avoid, minimize, and/or mitigate effects of mining. However, they do not guarantee that coal development will have no effects on the environment. (See comment/response #1)

No field or baseline data have been collected for the preparation of this preliminary decision. Under AS 38.05.035 (e)(1)(B)(ii) the director's decision may be limited to, "the facts pertaining to the land, resources, or property, or interest in them, that the director finds are material to the determination and that are known to the director or knowledge of which is made available to the director during the administrative review." If coal development is proposed there will be requirements to collect baseline data. At a minimum, environmental studies will include surface and groundwater hydrology, terrestrial and aquatic resources, vegetation, wetlands, soils, meteorologic, cultural and historical resources and lands uses within and adjacent to the proposed coal development. (See Permitting, in Chapter 4, and Potential Mitigation Measures for Mine Development and Mining Activities, in Chapter 10.) In Appendix A the ADF&G requested that before coal development begins a complete study of fish in the area be done. The DNR will work with ADF&G to ensure that appropriate fish studies are conducted.

Comment #3
ADF&G and DNR seem to recognize the impact coal strip-mining has on freshwater salmon habitat. In the proposed Finding ADFG recommended 100' setbacks on salmon streams, and the DNR concurred. A 100' foot setback is appropriate for some development, but it should be noted that many communities require up to 300' setbacks. However, for coal strip-mining, one of the most intensive land uses, a 100' buffer will not protect the groundwater/surface water interactions that are critical to the survival of salmon.

Response
Coal mining may cause impacts to salmon habitat. Statutes and regulations for both the Alaska Department of Fish and Game and the Department of Natural Resources may allow impacts to fish streams. The purpose of this best interest finding is to evaluate the extent of potential impacts and make a decision to lease or not lease. Specific decisions concerning the level of potential impacts cannot be determined until a mine plan is proposed. The final determination of a buffer cannot be determined until approved by the Commissioner of the DNR.

Comment #4
Once destroyed, salmon habitat cannot realistically be rehabilitated. Mine reclamation is seldom, if ever, able to restore mined lands to pre-mining values and uses. Research demonstrates that is simply not possible to fully reclaim a strip mine site. Even reclamation measures taken in compliance with SMCRA leave a devastated landscape that may persist indefinitely. Mitigation for loss of spawning habitat for some species of fish is much more

difficult than for others. Re-establishing spawning habitat for salmonids is difficult, and requires restoring groundwater hydrology that provides a relatively dependable flow of water throughout the winter, supplying oxygen and preventing the eggs from freezing in the spawning gravels. The overall record of mitigation for mines has some weak areas, especially with restoring salmon spawning habitat.

Response
The DNR cannot guarantee there will be no impacts from coal development and mining. The ACMCRA and regulatory programs administered by other agencies provide protections for fish and wildlife, their habitats, and waters. However, there may still be some impacts. The intent of the permitting process is to avoid, minimize and/or mitigate adverse impacts within any proposed project area. The Departments of Natural Resources and Fish and Game evaluate potential impacts to fish and wildlife, habitat, and water bodies. If the impact is deemed too great, then mining will not be permitted. The ASCMCRA and actions by other regulatory agencies provide protections for water quality and quantity, hydrologic balance, fish and wildlife habitat, and vegetation throughout the development process. (See comment/response #s 1, 12, and 39, and Chapter 10 of this decision)

Comment #5
Coal mining will fragment salmon habitat.

Response
ASCMCRA Performance standard 11 AAC 90.423 (a) Protection of Fish and Wildlife states, "An operator shall, to the extent possible using the best technology currently available, minimize disturbances and adverse impacts on fish, wildlife, and related environmental values, and achieve enhancement of such resources where practical." In order to achieve this standard construction should be designed to maintain natural water flow and drainage patterns to the extent practicable. Bridges and culverts should be constructed as necessary to maintain natural flow, while preventing impoundment of water or excessive drainage. The U. S. Army Corps of Engineers (USACE) permits and oversees all fill placement in waters of the U. S., including wetlands. The number, size, and placement of culverts and bridges are determined according to the specific wetlands situation, subject to approval by the Corps.

Comment #6
ADFG has not thoroughly surveyed all the salmon streams in the area.

Response
There is no statutory requirement to conduct detailed field studies in preparation for a best interest finding under AS 38.05.035, only a requirement to review available information that is material to the determination of whether the sale will best serve the interests of the State. See discussion of AS 38.05.035 (e) and (h), above in this Appendix.

Comment #7
Governor Parnell is proposing a $30 million Comprehensive Salmon Research Initiative over the next several years on Chinook populations. This lease is in direct conflict with the Governor's point because the lease goes against maintaining healthy fisheries.

Response
Governor Parnell's Chinook Salmon Research Initiative is intended to increase the State of Alaska's understanding of factors affecting the abundance of Chinook salmon stocks statewide. The goal of the initiative is to develop strategies to enhance viability and increase salmon returns.

Coal mining could affect salmon habitat and fisheries. Both the Alaska Department of Fish and Game and the Department of Natural Resources may allow impacts to fish streams. The purpose of the decision process is to weigh the extent of potential impacts and make a decision to lease or not lease. The ASCMCRA, along with the authorities of other regulatory agencies, provides a wide range of protections to fisheries and fish habitat. See comment/response #s 1, 17, and 39, and Chapter 10 for details of habitat protection under the ASCMCRA.

Comment #8
Any roads built during exploration drilling would have major environmental impacts to the Canyon Creek area. Since exploration will not necessarily lead to mine development, the DNR should stipulate in its decision that road construction will not be allowed for exploration.

Response
It is beyond the scope of this decision to make stipulations concerning the details of exploration and development. These stipulations are more properly dealt with through the ASCMCRA permitting process. Any roads built to support exploration drilling would be reclaimed unless the State decided that is would be in the best interest of the State to maintain the road for future access within the lease area.

Comment #9
Due to coal mining MANY years ago, the salmon runs in the Chickaloon River were wiped out and have not recovered.

Response
According to the ADF&G Anadromous Streams Catalog, the Chickaloon River is an anadromous waterbody up to its confluence with Boulder Creek, approximately five miles above the Matanuska River. The United States Navy, through the Alaska Engineering Commission, operated a coal mine at Chickaloon from about 1918 through around 1922. Between 1913 and 1922 approximately 25,000 tons of coal were mined at Chickaloon. It is unknown how mining and related activities impacted salmon in the Chickaloon River. The commenter does not provide insight into this relationship.

Comment #10
We should develop sustainable energy sources, such as wind, tide, geothermal, and solar energy. Alaska must pursue projects that move to stable green power jobs, low cost power and clean energy solutions only renewables can deliver.

Response
This decision is to determine whether holding a competitive coal lease sale in the Canyon Creek area is in the best interest of the State of Alaska. The development of other energy resources is beyond the scope of this decision. However, the State of Alaska supports and funds significant renewable and alternative energy programs throughout Alaska. The Alternative Energy and Energy Efficiency (AEEE) program of the Alaska Energy Authority (AEA) promotes the use of renewable resources, energy efficiency and conservation measures and improved generation efficiency as alternatives to fossil fuel-based power and heat. In rural areas the program may support developing local sources of coal and natural gas as diesel alternatives. The AEA's Alternative Energy and Energy Efficiency program currently manages over 250 projects and initiatives totaling over $235 million in state and federal funding, including hydroelectric, wind, biomass, transmission and distribution, geothermal, diesel efficiency, and energy conservation. In 2008, the Alaska State Legislature passed House Bill 152 with the purpose of identifying and developing renewable energy resources in Alaska. The bill created the Renewable Energy Fund (REF), administered by the AEA, to award up to $250 million in grants over 5 years for feasibility studies and other groundwork to support development of alternative and renewable energy. Up to $150 million was provided to the fund by the legislature in 2008 for renewable energy projects. In 2012 the REF was extended for an additional 10 years. For Round VI of the REF the AEA has recommended funding 60 projects totaling $56.8 million. Funding includes wind, hydroelectric, biomass, heat recovery, and geothermal projects.

Comment #11
Coal mining and associated heavy industrial activity will ruin/destroy the *wilderness character* of the area. The Canyon Creek area is a beautiful place that would be irrevocably altered by coal mining.

Response
For the purpose of this response, the term "wilderness character" will be assumed to refer to a combination of aesthetic values, remoteness, and lack of human imprints. The area surrounding the proposed lease sale is not totally without imprints of human activity, as it contains a number of cabins, airstrips, and active snowmachine trails. There are also several hundred parcels of privately owned land in the general Canyon Creek-Shell Lake-Talachulitna River area. The current lease area, along with additional ground north of the Skwentna River, was previously leased to Mobil Oil Corporation for coal from 1977 until 1989. Mobil drilled a total of 104 exploratory holes for coal.

The proposed lease area is remote, and it not visible from most nearby locations on the ground. A mine and related facilities would be visible from the air above about 2,000 feet, and noise from the mine may be heard for some distance depending on atmospheric conditions. (See Aesthetic Effects of Future Coal Mining, in Chapter 9 of this decision, and Appendix C: Viewshed Analysis of the Canyon Creek Coal Lease Area) Associated transportation facilities, depending on the nature of those facilities, would be a visible piece of infrastructure. If a public access road were to be built into the area it would, to some degree, alter the remote wilderness nature of the area accessible by that road. Facilities and roads associated with mining would be removed after mining. If a road were built connecting the area with the main highway it would likely be retained after mining.

Comment #12
Coal mining is destructive, even when it is done according to the requirements that might be set by the DNR. Coal mining will destroy land and the environment, and create pollution. The DNR is unable to protect Salmon habitat and relies on ADF&G. DNR, ADF&G and law enforcement fall back on claims of unavailable resources, avoiding remedy. An example is The Knik Process, which demonstrates ineffective habitat protection.

Mining companies do not clean up after themselves. The corporate way is to exploit all resources, sell them off as fast as possible to anyone, to line pockets of a few. In the end, if this coal mine is developed, some outsiders will make a bunch of money and we will be left with a huge unsightly gash in the land and barren streams in the vicinity.

Response
These comments are declaratory statements which provide no new information upon which to base a reassessment of this decision.

All coal mining is regulated under the Alaska Surface Coal Mining Control and Reclamation Act and the attendant regulations at 11 AAC 90. (See Chapter 4: Statutory and Regulatory Background) Both the Alaska Department of Fish and Game and the Department of Natural Resources may allow impacts to fish streams. The purpose of the best interest finding is to evaluate the extent of potential impacts and make a decision to lease or not lease. Specific decisions concerning the level of potential impacts cannot be determined until a mine plan is proposed. See Chapters 4 and 10 for discussion of regulatory protections of the environment, fish and game, and habitat.

DNR has agreed with DF&G to conduct complete fish surveys before coal mine permitting occurs, and to provide for buffers around fish streams. In addition, AS 27.21.160 and 11 AAC 90.201 mandate that before any coal mining permit is issued the applicant must file a performance bond with the commissioner to cover the full cost of reclamation. The amount of the bond shall be determined by the commissioner and shall reflect the probable difficulty of the reclamation considering the topography, geology, hydrology, revegetation potential, and similar factors relating to the area. The amount of the bond must be sufficient to assure the completion of the reclamation plan by the commissioner in the event of forfeiture.

Comment #13
Coal is an extremely harmful, dirty fossil fuel. It has the highest carbon emissions per BTU of any fossil fuel. It is one of the most polluting energy processes leaving lasting irreparable damage to the environment. Coal mining, transport, and combustion emit mercury and other toxic chemicals. Coal ash is one of the most toxic substances known to humanity. The development of coal, especially in sensitive biomes, has a long and treacherous record of despoiling local environments throughout our country and worldwide. The long range health of our ecosystem and communities would be better served by leaving the coal where it is, in the ground. Coal, being mined or being burned, is not healthy for any of us.

Response
This comment is a declaratory statement with no supporting information on which to base a reassessment of the decision. (See comment/response #s 31, 38, 39, 41, and 44)

Comment #14
Even with outstanding reclamation projects (which are not guaranteed), strip mined land would remain unusable for decades, and effects of acid mine drainage, contaminated groundwater, and other potential problems may last forever.

Response
This comment is a declaratory statement. The comment is unclear as to what problems would cause land to remain unusable for decades, or last forever. For protection of water quality see comment/response # 39. For acid mine drainage see comment/response #31. Also see Chapter 10: Potential Measures to Avoid, Minimize, and Mitigate Negative Impacts.

Comment #15
There would be little or no decrease in fish and wildlife populations as a result of coal mining. Extensive history with mineral exploration demonstrates that exploration has little effect on wildlife, with effects being limited to some noise disturbance from helicopter traffic and in the immediate vicinity of drilling operations. A mine would displace wildlife from the area being mined, but only while it is being mined. Coal mines reclaim land back to replacement wildlife habitat within a year or two of mining, so that a mine would have little long-term effect on the amount of available habitat or on wildlife populations. The wildlife habitat in the reclaimed area of the Healy Field, the reclaimed area of the Matanuska Valley coal fields, and the reclaimed test pits in the Chuitna development document this conclusion. The reclaimed areas of the Matanuska Valley Coal Fields are now valued as wildlife habitat in the Matanuska Valley Moose Range.

Response
With proper precautions under the ASCMCRA exploration activities should have minimal effects on wildlife. The ASCMCRA also provides for prompt reclamation of mined and otherwise disturbed lands. The performance standards call for storage of topsoil, recontouring to approximate original contours, compaction of fill, replacement of topsoil, and revegetation using appropriate species according to the approved post mining land use. The performance standards also mandate that damage to fish habitat be avoided, minimized, or (lastly) mitigated. (See Potential Mitigation Measures for Mine Development and Mining Activities, in Chapter 10)

Comment #16
The emissions from mining, transporting, and combusting coal from the proposed lease sale area will not occur or necessarily be replaced by other coal mining operations if DNR decides not to proceed with this project. Coal is a finite resource, and from an economic standpoint, exporting coal to China will only increase coal consumption, not replace other sources of coal. Ex. 81. Power, Thomas M., The greenhouse Gas Impact of Exporting Coal from the West Coast: An

Economic Analysis, available at http://www.sightline.org/wp-content/uploads/downloads/2012/02/Coal-Power-White-Paper.pdf.

Response
The comment states that "exporting coal to China will only increase coal consumption, not replace other sources of coal." The referenced article supporting this statement deals with exports of Powder River Basin coal, and shipping facilities on the west coast which would be expected to export 111 million tons of coal to Asia annually. Ex. 81, Power, does not actually argue that coal exported from the western U. S. will not displace coal mined elsewhere. Rather, the article hinges on the premise that increased U. S. coal exports will lower coal prices in Asia, thereby encouraging greater consumption. The article is not a quantitative market analysis; rather, it is a hypothesis premised on the basic concepts of supply and demand. There is no quantitative analysis. For example, there is no presentation of specific supply and demand curves, on which the article relies heavily, or any of the factors that might influence the shapes of those curves.

As stated in the section of Chapter 8 on Climate Change, it is unlikely that Canyon Creek coal would significantly influence the Asian coal markets. Speculation concerning the effects of future Canyon Creek coal production on global climate change is beyond the scope of this decision.

Comment #17
Mining will destroy fish and wildlife habitat.

Response
This comment is a declaratory statement with no supporting information on which to base a reassessment of the decision. Although a coal mine would cause some loss of habitat and displacement of wildlife in the vicinity of the mine and related facilities, the ASCMCRA contains strict requirements for the protection of fish and wildlife and restoration of habitat after mining (See Chapter 10: Potential Measures to Avoid, Minimize, and/or Mitigate Negative Impacts; and Chapter 4: Statutory and Regulatory Background).

Coal mining could affect salmon habitat and fisheries. Both the Alaska Department of Fish and Game and the Department of Natural Resources may allow impacts to fish and wildlife habitat. The purpose of the decision process is to evaluate the extent of potential impacts and make a decision to lease or not lease. See comment/response #s 1 and 39 for details of habitat protection under the ASCMCRA. See also comment/response #s 3 and 4 for salmon.

Comment #18
Coal mining will turn Alaska into West Virginia, where hundreds of miles of streams have been destroyed and thousands of acres of wilderness destroyed.

Response
This comment is a declaratory statement which offers no new information on which to base a reassessment of this decision.

Coal mining in Appalachia, and particularly West Virginia, is different from coal mining in Alaska due differences in coal rank, topography land ownership and closeness to markets. Due to these differences the number of mines within a given watershed is higher in Appalachia. Mountain top and contour mining (including associated valley fills) are common in Appalachia due to the topography and geology. Multiple mines within a given drainage increase the effects in streams that are downstream of the mining operations. The geology of the Appalachian coalfields is also different from southcentral Alaska. Due to the depositional environment, the coals and the enclosing sedimentary units in southcentral Alaska have less sulfide mineralization (See comment/response #s 61 and 31). The sedimentary units are also more alkaline due to the volcanic component in the sediments. The clays and weathered feldspars in the volcanic materials increase alkalinity, and provide a buffer against acid production.

Comment #19
The proposed lease lands and surrounding area are prime fish and game habitat. The Alaska Board of Fisheries recognized Canyon Creek as waters worthy of special management for trout.

Response
There are no critical habitat areas in or near the proposed lease area.

In 1999 the Alaska Board of Fisheries recognized Canyon Creek as waters worthy of special management designation for trout. This designation perpetuates quality fishing in terms of maintaining historic age, size, and abundance. Because of this designation, special regulations apply to Canyon Creek allowing only one unbaited, single-hook, artificial lure. In addition, the sport fishery for rainbow and steelhead trout in Canyon Creek is catch-and-release only; retention of rainbow/steelhead trout is prohibited. The regulations do not provide any guidelines or restrictions regarding development. Approximately 200 to 400 rainbow trout are caught annually from Canyon Creek (ADF&G 2012). (See Chapter 6: Current and Projected Uses of the Proposed Leasing Area.)

Comment #20
Expressed concern that mineral development must not harm the natural habitat, particularly fisheries. "Please, let us proceed with a great deal of caution and oversight."

Response
See comment/response #s 1, 39, and 41, and Potential Mitigation Measures for Mine Development and Mining Activities, in chapter 10.

Comment #21
What will be the downstream impacts from coal leasing on the federally recognized Cook Inlet Beluga Whale and their Critical Habitat Area?

Response
There is no evidence that coal mining activities within the proposed lease area, properly regulated in accordance with applicable performance standards (including those relating to

protection of water quality), would have any down-stream significant, (or measureable) impact on beluga whales and their designated critical habitat.

The National Marine Fisheries Service (NMFS) listed the Cook Inlet stock of beluga whales as endangered under the Endangered Species Act (ESA) in 2008. This stock of beluga whales had previously been listed by NMFS as depleted under the Marine Mammals Protection Act (MMPA). Following the ESA listing the NMFS delineated critical habitat for the beluga whale within Cook Inlet. This critical habitat covers most of upper Cook Inlet.

In the marine waters of Cook Inlet impacts to belugas associated with operations involving shore-side bulk freighting activities would also likely be minimal. Potential impacts would be addressed on a project-specific basis in a multi-agency State and federal review, including consideration of potential impacts pursuant to NEPA, as well as federal review under the MMPA and ESA.

Comment #22
Transportation and ancillary development will impact the Talachulitna State Recreation River, the Susitna Flats State Game Refuge, and the Trading Bay State Game Refuge.

Response
This comment is a declaratory statement which provides no new information on which to base a reassessment of this decision.

During the Agency review process the ADF&G requested that coal transportation routes excluding the Susitna Flats State Game Refuge be considered. The DNR response was that coal transport routes will avoid crossing the Susitna Flats State Game Refuge. (See Appendix A: Agency Comments and Responses)

Trading Bay State Game Refuge is approximately 44 miles from the nearest point in the proposed lease area, and well to the west of any likely transportation routes.

The Talachulitna State Recreation River is one of six recreation rivers created by the Recreation Rivers Act. The Recreation Rivers Act is clearly intended to allow for multiple uses. Section 41.23.400 (c)(3) states that the primary purposes for management of the six recreation rivers include "multiple use management of upland activities within the recreation river corridor to ensure that mitigation measures to alleviate potential adverse effects on water quality and stream flow will take place." AS 41.23.470 (c) mandates that, "The commissioner shall establish appropriate conditions for permits, operating plans, and leases to mitigate the effects of mineral development activities on the environment and to prevent to the extent practicable degradation of the recreation uses of the river." According to the Areawide Land and Water Management Policies of the Susitna Basin Recreation Rivers Management Plan, uses may include bridges, roads, and utilities that must cross rivers as long as they are constructed consistent with the Upland Access guidelines provided in the management plan. The management guidelines, under Permits for Access to Private Land and Mining Locations, allow the issuance of permits for motorized access across closed areas to private lands or mine operations when there is no

feasible and prudent alternative to provide access for this use. (See Susitna Basin Recreation Rivers Management Plan, in Chapter 2, and Designated Habitat Areas, in Chapter 5)

Comment #23
The proposed lease does not appear to be in an environmentally sensitive area which should enhance permitting for exploration and possibly eventual extraction.

Response
This comment provides no additional information on which to base a reassessment of the decision. The lease area does not contain any critical habitat areas as designated by the Alaska State Legislature. However, the DNR and other permitting agencies will enforce applicable statutes and regulations, such as the ASCMCRA, to protect the environment.

Comment #24
Coal transport ships will travel in the migration routes of most marine mammals. These ships will destroy fragile marine life and habitat.

Response
This comment provides no new information on which to base a reassessment of this decision.

No mine plan or plan for transportation to market has been submitted. The market for any coal mined from the Canyon Creek area is presently undetermined. It is therefore beyond the scope of this decision to predict future shipping routes and possible damage to marine habitat and wildlife. See discussion of AS 38.05.035 (e) and (h), above in this Appendix.

Comment #25
Has an Environmental Impact Report been filed on this project? Commenter believes there are violations of the Clean Air, Water Acts, and Endangered Species Act.

Response
Since this decision is to hold a competitive coal lease sale, no activity has occurred on the ground at Canyon Creek. Therefore, there are no mining or exploration activities that may be violations of the Clean Air or Water Acts, or the Endangered Species Act. Environmental Assessments or Environmental Impact Statements are required under the federal National Environmental Policy Act (NEPA). They are not mandated under Alaska statutes. The best interest finding and decision discusses potential effects of coal leasing and development on, among other things, fish and wildlife, habitat, water (ground and surface), and air.

Comment #26
Many of the studies discussed in these comments focus on Appalachia because of the extensive surface coal mining taking place there. They are relevant here, because West Virginia, Kentucky, and other Appalachian states are subject to the same federal laws that apply to Alaska. If those laws are not sufficient to avoid certain harms in those states, there is no reason to believe they would be any more effective in Alaska.

Response
Coal mining in Appalachia, and particularly West Virginia, is different from coal mining in Alaska. Mountain top and valley fill mining and contour mining are common in Appalachia. There may also be a number of mines within a given watershed. Valley fills and multiple mines within a drainage create effects in streams and hydrology that are difficult to reclaim.
The geology of the Appalachian coalfields is also different from southcentral Alaska. Coals and the enclosing sedimentary units in southcentral Alaska have much less sulfide mineralization. The sediments are also more alkaline due to the volcanic component in the sediments. The clays and weathered feldspars in the volcanic materials increase alkalinity, and provide a buffer against acid production.

Comment #27
Ex. 45 (Epstein, et al. at 93). "Coal crushing, processing and washing releases tons of particulate matter and chemicals on an annual basis and contaminates water, harming community public health and ecological systems."

Response
In Alaska, under the ASCMCRA, any water discharges must meet state and federal water quality standards, and air must meet air quality standards. (See Chapters 4 and 10, and 11 AAC 90.323 and 11 AAC 90.421)

Comment #28
The Clean Water Act and SMCRA have not fully succeeded in protecting water quality from coal mining. Recent studies have: found that emissions and seepage of toxins and heavy metals into fresh and marine water were significant. Elevated levels of arsenic in drinking water have been found in coal mining areas, along with ground water contamination consistent with coal mining activity in areas near coal mining facilities. In one study of drinking water in four counties in West Virginia, heavy metal concentrations (thallium, selenium, cadmium, beryllium, barium, antimony, lead, and arsenic) exceeded drinking water standards in one-fourth of the households. Ex. 45 (Epstein, et al. at 82).

Response
In Alaska, under 11 AAC 90.323 and 11 AAC 90.421 of the ASCMCRA, any water discharges must meet state and federal water quality standards, and air must meet air quality standards. (See Potential Mitigation Measures for Mine Development and Mining Activities, in Chapter 10, and comment/response #s 39 and 44.)

The quote from Epstein, et al. refers to several studies, all in the Appalachia-West Virginia region. Appalachian coals often contain high concentrations of sulfur and trace metals, such as mercury, cadmium, and arsenic. Coals in the upper Cook Inlet are very low in sulfur, and generally low in trace metals. (See comment/response #61.)

Comment #29
Many adverse impacts to hydrology and water quality are simply unavoidable, regardless of regulations, because they are inherent in the process of strip mining. Bernhardt and Palmer explain: Once vegetation is lost and soil is compacted, as occurs on mined and even reclaimed

mine land, hydrological changes negatively affect stream biota and water quality. Second, stream water chemistry is shaped by processes that occur as rainwater infiltrates the ground and moves through pore spaces and soil on its way to streams. Water emerging from valley fills carries with it dissolved constituents that are toxic or damaging to biota…. Third, the downhill movement of water and one-way flow in stream networks means that whatever happens on land or in first- and second-order streams (headwaters) not only determines sediment and water flow in the immediately impacted streams and rivers, but also determines ecological structure and functions of larger waterways into which these tributaries flow. Ex. 28 (Bernhardt & Palmer at 46).

Response
As indicated in comment/response #26, many of the references cited by the commenter are studies of coal mining and its effects in West Virginia and Appalachia, as is Ex 28, Bernhardt and Palmer. Many Appalachian coal mines employ mountain top removal and valley fill. Valley fills in West Virginia have created numerous problems. They commonly fill stream drainages with hundreds of feet of fill material. Valley fills generally have a steep face at the downstream end, so the stream profile is very much changed from the original stream. The end result is a thick pile of replaced material that is built up above the original profile, with a steep gradient at the downstream end. Fill in a strip mine doesn't change the overall profile; the stream can be reconstructed to match the original profile. The substrate will have been removed and replaced, but to some extent the stratigraphy can be reconstructed.

Soil compaction can be avoided using modern methods of reclamation. In the past reclamation was often done using wheeled vehicles, which exert high pressure on the ground. The ground was often compacted during the process of reclamation. Using low-pressure vehicles, such as bulldozers, in the reclamation work helps alleviate the problem. Other methods can also be used to maintain topsoil permeability, such as ripping to loosen the material.

The ASCMCRA provides the following protections to water quality and the hydrologic balance: Under 11 AAC 90.321, Hydrologic Balance. (a) Operations must be planned and conducted to prevent long-term adverse changes in the hydrologic balance in both the permit area and adjacent areas. (b) Changes in water quality and quantity, in the depth and flow patterns of ground water, and in the location of surface and subsurface water drainage channels must be minimized so that the approved postmining land use of the permit area is not adversely affected. (c) The operator shall comply with all applicable federal and state water quality statutes and regulations. (d) Operations must be conducted to prevent or minimize water pollution. 11 AAC 90.323 Water Quality Standards further states that discharges of water from areas disturbed by surface and underground mining activities shall be made in compliance with all applicable federal water quality laws and regulations, with all applicable provisions of AS 46.03 and regulations in effect under that chapter, and with the effluent limitations for coal mining promulgated by the United States Environmental Protection Agency set out in 40 C.F.R. Part 434, adopted by reference in 11 AAC 90.001(b). In addition, any discharge into streams must be permitted under APDES. If a mining operation cannot meet these standards mining will not be permitted.

Comment #30
Several studies have demonstrated substantive differences in benthic macroinvertebrate communities between streams that flow from coal surface-mines and those that do not. Such

biological changes have been attributed to changes in water quality, water quantity, and physical habitat in streams draining mining operations in Appalachia. Ex. 55 (Hitt & Hendryx at 97-98)

Response
The referenced study was done in West Virginia, where mountain top (MTM) and contour mining are common. As discussed in comment/response #29, valley fills associated with MTM have deleterious effects on hydrology and water quality.

The Hitt and Hendryx study has shortcomings in its methodology. While Hitt and Hendryx sampled 4,718 stream locations for the West Virginia Stream Condition Index, stream condition was compared only with coal activity by county. There was no effort to evaluate effects of other potential factors that might contribute to poor stream condition, such as urbanization, other industrial developments, proximity to construction, nearby agriculture, etc. From the maps in Figure 2, eight counties reported to have low coal mining activity also had a low stream condition index.

Comment #31
The Clean Water Act and SMCRA have not succeeded in preventing acid mine drainage from strip mines: Acid mine drainage is a particularly severe byproduct of mining especially where coal seams have abundant quantities of pyrite. The acidity of the runoff is problematic by itself, but it also dissolves metals like manganese, zinc and nickel, which then become part of the runoff. The resulting acidity and presence of metals in the runoff are directly toxic to aquatic life and render the water unfit for use. Ex. 35 (Clean Air Task Force at 2); see also Ex. 28 (Bernhardt & Palmer at 42).

The nearby Chuitna project, located in the same greater coal field, does contain pyrite that could result in acid mine drainage. Ex. 69 (Mine Engineers at Table 2, page 6 of 7).

Acid drainage and other pollutants may also result from waste storage at the processing plant, which is not discussed in the Preliminary Decision at all: "At the preparation plant (which is commonly located at or near the mine), impurities that are removed from the coal by screening and washing are placed in waste piles. As with the mining waste, rain percolates through these piles dissolving soluble components and elevating TDS in local water bodies. This runoff is also acidic and contains heavy metals." Ex. 35 (Clean Air Task Force at 3).

Response
The ASCMCRA provides for protection of both surface and ground water. Under 11 AAC 90.321 Hydrologic Balance, operations must be planned and conducted to prevent long-term adverse changes in the hydrologic balance in both the permit area and adjacent areas. The operator shall comply with all applicable federal and state water quality statutes and regulations. Operations must be conducted to prevent or minimize water pollution. 11 AAC 90.323 Water Quality Standards - Discharges of water from areas disturbed by surface and underground mining activities shall be made in compliance with all applicable federal water quality laws and regulations, with all applicable provisions of AS 46.03 and regulations in effect under that chapter, and with the effluent limitations for coal mining promulgated by the United States Environmental Protection Agency set out in 40 C.F.R. Part 434, adopted by reference in 11 AAC

90.001(b). Any discharge into streams must be permitted through the DEC under APDES. If an operator is unable to meet the standards for water quality, the mining operation will not be permitted.

Coals in the upper Cook Inlet region are very low in sulfur and trace metals. Sulfur contents in Cook Inlet coals have been analyzed as follows: Susitna-Beluga coalfield - 0.1-0.3% sulfur; Chuitna River drainage basin - 0.08-0.18% sulfur; Beluga River drainage basin - 0.08-0.32% sulfur; Capps Glacier district - 0.12-0.33% sulfur (Flores, et. al, 2005). Blumer (1980) reported that analyses from the Mobil Oil drilling in the 1970s yielded sulfur values in the 0.1-0.2% range for Canyon Creek area coals. In 2012 the DNR Coal Regulatory Program had three samples of upper Cook Inlet coals analyzed. Two of the samples came from the Wishbone Hill area, and one came from the Beluga coalfield. Average trace metal values were as follows: mercury - 0.059 ppm; lead - 6.27 ppm; arsenic - 1.4 ppm; copper 21.1 ppm, cobalt - 9.52 ppm; selenium - 0.373 ppm. Averaged metal analyses have been obtained from a data sheet provided by PacRim, PL for the Chuitna coal. Those values are: mercury - 0.06 ppm; arsenic - 2.16 ppm; antimony - 0.35 ppm, cobalt - 0.95 ppm; copper - 7.67 ppm; and lead 3.30 ppm. These low sulfur and metal values, along with proper treatment and handling of coal and waste materials according to the ASCMCRA, should eliminate or minimize any contamination of surface or groundwaters. Ex. 69, Mine Engineers, Table 2 indicates that pyritic sulfur in the surrounding sedimentary strata is 0.01%, a very low sulfur content. (Note that these measurements are for surrounding strata, not the Chuitna coals.) From Ex 69, page 15, "The potential for the formation of acid, due to the presence of sulfides and or organic materials, is very low for the overburden and interburden materials. The acid-base accounting data show mean levels are near +10 tons CaCO3/1000 tons of material or higher, with a range from +1.0 to +35.0 tons CaCO3/1000 tons of material. These values provide a strong indication that the overburden and interburden materials involved in the mining process will not result in the formation of acid in the backfill due to oxidation of sulfides."

Comment #32

The Preliminary Decision omits any discussion of threats and stressors to wood frogs (*lithobates sylvatica*) or their habitat. Wood frogs are threatened by "loss and fragmentation of habitat due to rapid residential and commercial development, particularly in southcentral Alaska. Filling or draining of wetland breeding habitat and alterations to ground or surface water flow from development are potential hazards." (Ex. 8, ADF&G, Wood Frog at 3) Frog populations are declining globally," while several "studies suggest there are more abnormal frogs" than in the past. (Ex. 105, USFWS at 1)" Alaska's wood frog population suffers significantly higher rates of abnormalities than the general population, and these abnormalities are linked to proximity to roads, used as a measure of habitat alteration caused by humans. (Ex. 83, Reeves at 1009, 1012) Numerous reports from the Kenai Peninsula, the Anchorage Bowl, and Talkeetna area that indicate wood frogs are no longer present at historical breeding sites (Gotthardt, pers. comm. 2004). Chytrid fungus, which is lethal to amphibians, was first found in a dead wood frog in Alaska ten years ago, adding another stressor to the population. (Ex. 71, Morton) These population trends and abnormality rates are alarming because frogs are "known as the 'canaries in the coal mine' of the natural world," "alerting humans to dangers in the natural environment[.]" (Ex. 105, USFWS at 1)

Wood frogs have an ability to freeze their bodies during winter. Study of the mechanisms involved in the wood frog's processes of freezing and thawing may prove valuable for managing human diabetes, transporting human organs for transplants, and treating victims of heart attacks and strokes. (Ex. 75, NPS, Biological Miracle at 2-3)

Wood frogs have been reported at the Skwentna Roadhouse and Fish Creek Lake, east of the proposed lease area, and at the Winterlake Lodge, northwest of the proposed lease area. (Ex. 23, AKNHP, wood frog data; Ex. 24, AKNHP, wood frog map) Disruption to vegetation during coal exploration, development, and mining would disrupt habitat suitable for wood frogs, which inhabit "diverse vegetation types from grassy meadows to open forest, muskeg, and even tundra." (Ex. 8, ADF&G, Wood Frog at 2)

DNR may not rely on later restoration of wetlands to mitigate the threats to wood frogs, because studies have found that wood frogs are more likely to be found in natural wetlands than man-made wetlands. (Ex. 32, Brown at 3)

Before leasing, DNR should consider impacts to wood frogs, including restoration of the wetlands at Canyon Creek that account for these specific needs for successful breeding, the displacement of wood frogs due to clearing of vegetation, and the possibility of causing abnormalities in wood frogs.

Response
Although frog populations are declining worldwide, and there are some threats to wood frogs in particular, this comment overstates the issues for wood frogs in Alaska and elsewhere. Ex. 8, ADF&G, describes wood frogs as "[widespread and relatively common in Alaska, especially on mainland, although overall population and trends are unknown. Ex. 8 further quotes MacDonald, 2003, "Wood frogs are the most common amphibian in Alaska." and Hodge, 1976, "Total Alaskan population is unknown but suspected abundant."

Exhibit 32, Brown is a 2012 synthesis of the peer-reviewed literature addressing amphibian use of created and restored wetlands, which focuses on aquatic habitat, upland habitat, and wetland connectivity and configuration. A reading of Brown et al. finds the following: "Amphibian species richness or abundance at created and restored wetlands was either similar to or greater than reference wetlands in 89% of studies." "Of the 13 studies we reviewed that investigated the wood frog, all of them reported wood frog use of created and restored wetlands. Wood frogs were found to rapidly colonize created and restored wetlands. In most studies this species used created and restored wetlands more than natural wetlands, which were typically larger and had longer hydroperiods. However, wood frogs showed a strong aversion to wetlands inhabited by fish, and abandoned created wetlands after fish colonization." "We conclude that creating and restoring wetlands can be valuable tools for amphibian conservation." From the cited reference it appears that the principal concern for the use of restored wetlands by wood frogs is that the wetlands not be accessible to fish, a frog predator. Reclamation under the ASCMCRA should be able to provide suitable habitat for wood frogs.

Ex. 71, Morton states that "Batrachochytrium dendrobatidis (Bd) is the cause of many frog deaths, including wood frogs, and is a type of Chytrid fungus." Most occurrences of Bd in Alaska have been found on the Kenai Peninsula. On the Kenai, many of the contaminated ponds and infected frogs were associated with gravel roads, and it's possible that this may be a mechanism by which Bd is spreading. "If there is to be coal development in the Canyon Creek lease area the DNR should work with the operator to ensure that Bd is not inadvertently spread into the area.

Comment #33

The proposed Chuitna coal mine has been much more thoroughly studied than the Canyon Creek area. Both Canyon Creek and Chuitna would be large strip mines in close proximity to salmon streams. Both projects are located on the northwest side of Cook Inlet, within the same coal field. In 1990 the EPA prepared an environmental impact statement (EIS) for Chuitna. The EPA wrote, "Reduction in fish productivity, especially salmon, in the Chuitna River system due to direct habitat loss during mining would be unavoidable during the mine life, for a period thereafter (greater than [sic] 10 years), and possibly indefinitely." Ex. 104 (Chuitna FEIS at 5-139). The EIS adds that "it would appear unlikely that fish productivity in streams directly disturbed by mining could be restored to premining productivity levels," id. at 5-139 to 5-140, and "fish habitat could be irretrievably lost." Id. at 5-140.

Impacts to groundwater and surface water hydrology from strip mining are severe. "Impacts to the ground-water regime as a result of mining operations would be substantial and would affect recharge and discharge relationships; quantity, quality, and direction of groundwater flows; and quantity and quality of surface water. These impacts are unavoidable . . . ." Id. at 5-16. Surface water hydrology would be even more significant: "One of the most significant physical impacts that would result from development of the Diamond Chuitna project would be alteration of the hydrology of the Chuitna River tributaries in the immediate mine vicinity . . . ." Id. at 5-23.

More recent studies of the proposed Chuitna project confirm and reinforce these predictions: Hydrologic flow paths that currently exist, which are crucial to biological activity, food web productivity, hyporheic processes and exchange of materials with streams will be destroyed in the Chuitna system from the coal mining as proposed, and cannot be recreated. And riverine systems also cannot 'repair' such damage. Ex. 113 (Wipfli at 7) "[I]t is essential that even the smallest tributaries remain hydrologically connected (surface and subsurface) to the larger channels during and after the mining activities. These tributaries are travel corridors and seasonal refugia for aquatic species, including invertebrates and fish, and are key components contributing to the overall health, function, and productivity of the Chuitna system. Id.

See also Ex. 119 (Palmer at 3-4) ("Headwater streams such as those that will be destroyed or impacted by watershed disturbance during mining may be small in size, but they provide habitats for a rich array of species, which enhances the biological diversity of the entire river system."); id. at 10 ("There is no scientific evidence supporting the assumption that restoration of [a stream] channel form will lead to full restoration of function").

Response
This comment emphasizes only selective aspects of the Chuitna Environmental Impact Statement. There is no mention of the mitigation measures or reclamation plan (Chapters 6 and 7) for the Chuitna Project. That portion of the EIS was not included in the excerpted reference. For example, in the paragraph on pages 5-139 and 5-140 the EPA also stated, "Many of the impacts discussed earlier in this chapter would be considered short-term, with many of the greatest impacts occurring during the initial construction and early operational phases of the project. If these impacts were properly mitigated as discussed, adverse impacts on productivity would be primarily short-term. The goal of postmining reclamation would be to return the area to a level of productivity for wildlife and fish which is at least as great as that which existed prior to mining." The EIS analyzed a broad range of alternative actions, including the no action alternative. The preferred alternative was a combination of mining alternatives, meaning that the EPA found that mine development would be in the best public interest. "Since all the options in the applicant's Proposed Project were environmentally and technically reasonable and feasible, all of those options were retained so that the applicant s Proposed Project would constitute a formal alternative to be analyzed during the analysis of alternatives process."

Coal mining may cause impacts to salmon habitat or other environmental resources. The ASCMCRA provides protections for salmon habitat, but does not guarantee that coal development will have no effects on water or habitat. Surface and groundwater can be significantly affected within the mining area. Water leaving the permit area must meet state and federal water quality standards. The intent of the reclamation plan is to minimize long-term adverse impacts. The Departments of Natural Resources and Fish and Game evaluate potential impacts to salmon habitat. If the perceived impact is deemed too great, then mining will not be permitted. Balancing conflicting land and resource uses for the state's benefit is one of DNR's primary missions.

Under AS 38.05.035 (h) "the director may not be required to speculate about possible future effects subject to future permitting that cannot reasonably be determined until the project or proposed use for which a written best interest finding is required is more specifically defined..." Consideration of specific mining scenarios is premature at this time. (See discussion of AS 38.05.035 (e) and (h), above in this Appendix.) The DNR will work with the ADF&G to ensure that a complete evaluation of fish streams is done prior to any development at Canyon Creek, and to establish appropriate buffers around salmon streams. The analysis of effects presented is comprehensive and adequate enough for the director to determine whether this sale, as conditioned with mitigation measures and lessee advisories, is in the best interests of the state of Alaska. DNR has followed the statutory requirements concerning considering and discussing potential effects of coal lease sales. After weighing the facts, including reasonably foreseeable effects, the director has found that on balance, the Canyon Creek coal lease sale is in the state's best interests.

Comment #34
Streams in the area have not been surveyed for fisheries information.

Response
Fish surveys are not necessary at this stage. AS 38.05.035 (e)(1)(B)(ii) requires that the scope of the review may be limited to "the facts pertaining to the land, resources, or property, or interest in them, that the director finds are material to the determination and that are known to the director or knowledge of which is made available to the director during the administrative review..." There is no requirement for extensive studies or field work prior to the decision. As is specified in Appendix A, fish surveys will be completed prior to coal development. (See discussion of AS 38.05.035 (e) and (h), above in this Appendix.)

Comment #35
There has apparently been no delineation of wetlands in the area.

Response
Wetlands delineations are not necessary at this time. AS 38.05.035 (e)(1)(B)(ii) requires that the scope of the review may be limited to "the facts pertaining to the land, resources, or property, or interest in them, that the director finds are material to the determination and that *are known to the director or knowledge of which is made available to the director during the administrative review*..." (emphasis added) There is no requirement for extensive studies or field work prior to the decision. (See discussion of AS 38.05.035 (e) and (h), above in this Appendix.)

A review of the U. S. Fish and Wildlife Service National Wetlands Inventory Mapper shows that wetlands cover approximately 625 acres of the proposed lease area, or 4.7%. (See Wetlands, in Chapter 5)

Comment #36
There has been no survey of historical or archeological sites.

Response
The Alaska State Historical Preservation Office has conducted a search for known historical, archaeological and paleontological sites within the proposed lease area. There are no known historical or archeological sites within the proposed lease sale area. (See Historical and Archeological Sites, in Chapter 2) There is no statutory requirement to conduct further historical or archaeological surveys prior to a lease sale. AS 38.05.035 (e)(1)(B)(ii) requires that the scope of the review may be limited to "the facts pertaining to the land, resources, or property, or interest in them, that the director finds are material to the determination and that are *known to the director or knowledge of which is made available to the director during the administrative review*..." (emphasis added)

Comment #37
There have been no environmental studies.

Response
AS 38.05.035 (e)(1)(B)(ii) requires that the scope of the review may be limited to "the facts pertaining to the land, resources, or property, or interest in them, that the director finds are material to the determination and that are known to the director or knowledge of which is made available to the director during the administrative review..." There is no requirement for

extensive studies or field work prior to the decision. (See discussion of AS 38.05.035 (e) and (h), above in this Appendix.)

Comment #38
Coal mining will acidify the soils around the mine and contaminate them with heavy metals for centuries.

Response
This comment does not explain any mechanism for how coal mining will acidify soils and contaminate them with heavy metals. The comment does not provide any new information on which to base a reassessment of this decision.

Although some coals contain high amounts of sulfur and metals, the coals in the upper Cook Inlet are low in sulfur and heavy trace metals such as mercury ands arsenic. (See comment/response # 31) Furthermore, there are no high sulfur sedimentary units that are also not highly alkaline in the Tertiary sequences of upper Cook Inlet, so reduced pH and metal leachate in ground or surface waters from either coal or other disturbed rock is unlikely. 11 AAC 90.045(b)(4) requires that the applicant provide chemical analyses of each stratum to identify those strata that contain potentially acid-forming, toxic-forming, or alkalinity-producing materials.

If coal or other materials have potential to form acids or other toxic products, performance standard 11 AAC 90.335 mandates that drainage from acid-forming and toxic-forming spoils from coal mining must be prevented from entering ground or surface water by identifying, burying, and treating such spoils where necessary, and by preventing water from coming into contact with acid-forming and toxic-forming materials in accordance with 11 AAC 90.445, and other measures required by the commissioner. 11 AAC 90.445 requires the operator to cover or treat all acid-forming, toxic-forming and other materials specified by the commissioner with a minimum of four feet of the best available non-toxic material. Non-coal wastes must be placed to ensure that leachate and surface runoff do not degrade surface or ground water, and the area remains stable and suitable for reclamation and revegetation compatible with the natural surroundings. (See comment/response #31)

Comment #39
Coal mining and associated infrastructure development will harm water quality and damage watersheds. Coal mining in the proposed Canyon Creek lease area will have significant negative effects on the hydrologic balance. There will be direct disturbance to tributaries from water runoff into Canyon and Contact Creeks. There will be elimination of existing seeps and springs through direct disturbance; loss/reduction of flow due to drawdowns from pit excavation and drainage; changes to groundwater, dewatering of aquifers, and alteration of groundwater recharging; changes in infiltration and runoff; erosion; siltation; and sedimentation associated with surface water chemicals from permitted discharges.

Response
This comment is a declaratory statement which provides no new information on which to base a reassessment of this decision. There is no explanation of the manner in which coal mining will

harm water quality and watersheds, nor is there any supporting evidence. The ASCMCRA and authorities of other state and federal agencies provide protections for surface and ground water quality and watersheds.

At this time no mine plan has been submitted. It is unknown whether mining would occur near any existing fish streams. If mining were to occur near fish streams, there could be hydrologic effects on the stream during mining, although measures can be taken to eliminate or minimize these effects. Before an operator can begin mining they must first obtain a surface coal mining permit from the DNR. If mining could affect a fish stream the operator must also obtain a Title 16 Habitat Permit from ADF&G, and a wetlands fill permit (Section 404 of the Clean Water Act) from the U. S. Army Corps of Engineers. (See Chapters 4 and 10 for discussion of protections provided to water quality and the hydrologic balance under the ASCMCRA.)

Under 11 AAC 90.321 Hydrologic Balance, paragraph (c) the operator shall comply with all applicable federal and state water quality statutes and regulations. Paragraph (d) of the standard stipulates that operations must be conducted to prevent or minimize water pollution. 11 AAC 90.323 Water Quality Standards further states that discharges of water from areas disturbed by surface and underground mining activities shall be made in compliance with all applicable federal water quality laws and regulations, with all applicable provisions of AS 46.03 and regulations in effect under that chapter, and with the effluent limitations for coal mining promulgated by the United States Environmental Protection Agency set out in 40 C.F.R. Part 434, adopted by reference in 11 AAC 90.001(b). In addition, any discharge into streams must be permitted by the DEC under APDES. If a mining operation cannot meet these standards mining will not be permitted. See Chapters 4 and 10 of this decision for more detailed discussion of regulatory protections of water quality and hydrology.

Comment #40
If this mine moves forward, there can be no guarantee that it will never impact the water. There can be no guarantee that it will be safe.

Response
The ASCMCRA does not guarantee that coal development will have no adverse impacts on the environment. Under the ASCMCRA there may be impacts to water quality within the disturbance area of the mine, however, water leaving the permit area must meet state and federal water quality standards. The Act and associated regulations are designed to avoid, minimize, and/or mitigate negative effects. The Departmental emphasis is to first avoid negative impacts. Avoidance is followed by efforts to minimize these impacts, and finally to mitigate any adverse impacts that cannot be avoided.

Comment #41
The record of mining operations for stopping the spread of water contamination at permit boundaries is weak. This record is relevant to coal mining in Alaska. Reference provided: Kuipers, J. R., Maest, A. S., MacHardy, K. A., and Lawson, G., Comparison of Predicted and Actual Water Quality at Hardrock Mines: The Reliability of Predictions in Environmental Impact Statements. September, 2006, 195 pages.

Response
The reference provided by the commenter is a comparison of predicted and actual water quality at hardrock metal mines, not coal mines. The mines studied were sulfide metal ores, many with high percentages of sulfide minerals in both ore and waste rock. After mining sulfide minerals remained in waste piles, tailings, and in material that had not been mined, but remained in the ground exposed to water.

Although some coals contain high amounts of sulfur and metals, the coals in the upper Cook Inlet are low in sulfur and heavy trace metals such as mercury and arsenic. (See comment/response #61) Furthermore, there are few high sulfur sedimentary units in the upper Cook Inlet Tertiary stratigraphic sequence, and those strata that do contain relatively high amounts of sulfur are also highly alkaline, so reduced pH and metal leachate in ground or surface waters from either coal or other disturbed rock is unlikely.

The ASCMCRA provides penalties and requirements to repair offsite impacts. In Alaska, past violations of water quality at coal mines have been few, minor, and have not contributed to downstream water contamination. (See comment/response # 39.)

Comment #42
All discharges must meet all applicable state and federal water standards and any discharge into waters of the US must be permitted by the ADEC under the APDES program.

Response
Comment acknowledged. These conditions are requirements under the ASCMCRA and APDES. See Chapters 4 and 10 for discussion of the ASCMCRA and APDES.

Comment #43
Near-term activity would consist of helicopter-supported drilling and mapping. This activity has limited impact. Drilling causes no discharge to streams or wetlands, causes minimal and temporary habitat displacement, and causes only short-term noise increases in the immediate vicinity of activity. Exploration drilling throughout Alaska illustrates that drill holes are extremely hard to find even a year after they are finished. The only noticeable impact on wildlife is likely to be noise from helicopter traffic. Exploration that follows best management practices causes only limited impact on wildlife.

Response
The protections for water quality and wildlife habitat afforded under the ASCMCRA and other permitting agencies are discussed in Chapters 4 and 10 of the Decision.

Comment #44
Coal mining will harm air quality.

Response
This comment is a declaratory statement, with no indication of what harm to air quality might occur, or what might cause that harm. The comment provides no new information on which to base a reassessment of this decision.

Performance standard 11 AAC 90.421 regulates dust control and stipulates that the mining operation must comply with all state and federal air quality laws and regulations, and requires that fugitive dust control measures are to be an integral part of operations. 11 AAC 90.151 (a)(4) provides that all applications must contain plans for monitoring air quality. (See Air Quality Protection, in Chapter 10)

The DEC issues two basic types of air quality permits, the Prevention of Significant Deterioration (PSD) permit, and a Minor Permit. The PSD permit is issued under authority of AS 46.14.130 (a) and (b) and the associated regulations at 18 AAC 50.302-306. The Minor Permit is issued under AS 46.14.130 (c) and 18 AAC 50.502-560. The PSD permit is based on national air quality standards, which the State of Alaska has adopted. There are two types of standards, the National Ambient Air Quality Standards (NAAQS), and incremental standards. The National Ambient Air Quality Standards are applied to six principal pollutants: carbon monoxide, lead, nitrogen dioxide, ozone, sulfur dioxide, and particle pollution. No emissions are allowed that might cause levels of any pollutant to exceed the NAAQS.

The intent of the incremental standards is to prevent serious deterioration of air quality in a region relative to a base level of air quality measured over the region. Incremental standards are established for each pollutant for a given region. The baseline concentration of a pollutant is the ambient concentration existing at the time that the first complete PSD permit application affecting the area was submitted. The increment is the amount of increase allowed for the particular pollutant. These incremental limits apply to all emitters combined. If a new pollutant emitter is expected to cause any pollutant to exceed the incremental standard no permit can be issued, even where the incremental standard is below the NAAQS.

In addition to the above, DEC requires an air model which incorporates mine equipment and processes. Based on that air model the DEC will impose air quality limits at the permit boundary.

Comment #45
Coal reserves in the Canyon Creek area are extremely low in sulfur content. Previous drilling indicates a sulfur content of 0.15%, in comparison to the nearly 5% being used for power generation in much of Asia. Canyon Creek coal will likely be exported to Asia, and could help decrease sulfur emissions worldwide. The estimated 258 million tons of low sulfur coal, located in the Mat-Su Borough is a source of low-cost energy for Alaska and our export recipients.

Response
Upper Cook Inlet coals are very low in sulfur. Blumer (1980) reported that analysis of Mobil Oil samples in the Canyon Creek area yielded sulfur values in the 0.1-0.2 percent range. (See Quality of Cook Inlet Coals, Chapter 10) The DNR does not have data regarding the sulfur content of coals being burned in Asian power plants. It is beyond the scope of this decision to speculate on the markets for Canyon Creek coal. (See also comment/response #s 31 and 61.)

Comment #46
Coal mining will cause noise pollution.

Response
A coal mining operation would produce noise from blasting, equipment operation, and any transportation facilities associated with the mine. It is difficult to assess the level of impact and how sound will travel over varied terrain and under different weather conditions. Topography and weather conditions have a strong effect on how sound carries. During a temperature inversion these sounds can carry over considerable distances. (See Aesthetic Effects of Future Coal Mining, in Chapter 9)

While there is no guarantee that there would be no impacts to the sound shed around the lease area, as part of the permitting process the Coal Regulatory Program would work with any coal operator to minimize noise pollution and its negative impacts on local residents and other people in the area.

Comment #47
The Castle Mountain Fault crosses the general Canyon Creek area. This means earthquakes could impact future coal mining infrastructure such as a slurry pipeline.

Response
The Castle Mountain Fault passes south of Mount Susitna, approximately 30-35 miles southeast of the proposed lease area. Geologic evidence of four events in the past 2,700 years indicates an average recurrence interval of about 700 years for significant (magnitude 6-7) earthquakes on the fault. Considering that it has been 600-700 years since the last event, an event of this magnitude may be likely on the Castle Mountain fault in the near future (See Geologic Hazards, in Chapter 2. also Haeussler et al., 2002). Any transportation route from the lease area to tidewater or the Rail Corridor would have to cross the trace of the fault. Any design for a mine or transportation corridor will have to consider the potential earthquake magnitude in their proposed designs.

Comment #48
Bald eagles may reside in the lease area. There needs to be eagle nest survey data.

Response
There is no statutory requirement to conduct bald eagle nest surveys prior to coal leasing. (See discussion of AS 38.05.035 (e) and (h), above in this Appendix.)

If coal development is proposed there will be requirements to collect baseline data, which may include a bald eagle nest survey. Under 11 AAC 90.423 (c) An operator must comply with the provisions of the Bald Eagle Protection Act as amended (16 U.S.C. 688, et seg.). The operator shall promptly report to the commissioner the presence of any golden or bald eagle nests within the permit area of which the operator becomes aware. The commissioner will then determine whether and under what conditions the operator may proceed.

Comment #49
There are four state Species of Concern potentially present in the lease area. These are the Olive-sided Flycatcher, the Blackpoll Warbler, the Gray cheeked Thrush, and Townsend's Warbler. The conservation concern is habitat loss due to nesting and wintering areas due to logging, fire

suppression, road building, pesticide contamination, and increased predation as a result of habitat fragmentation.

Response
As of August 15, 2011 the Alaska Department of Fish and Game no longer maintains a Species of Special Concern list. The list has not been reviewed and revised since 1998 and is out of date and no longer considered valid by the DF&G. The four species listed in the comment were nominated to be considered for potential planning targets in the Alaska Wildlife Action Plan, published by the ADF&G in 2006. The list of nominee species (Appendix 7 in the Plan) was primarily a compilation of species identified as "at risk" by various conservation plans and organizations. In particular, the blackpoll warbler and olive-sided flycatcher were listed due to steep population declines. However, both these species are wide-ranging, migratory birds subject to effects in other parts of the world not within Alaskan control. For example, regarding the olive-sided flycatcher the Wildlife Action Plan states that: "On wintering grounds, forests favored by this species have been one of the most heavily altered habitats in South America. Andean valleys are almost completely deforested, and 85% or more of montane forests have been cut."

Potential impacts to these species of concern would be addressed during the permitting process. The intent of the permitting process is to avoid, minimize, and/or mitigate impacts within any proposed project area. The Departments of Natural Resources and Fish and Game evaluate potential impacts to fish and wildlife, habitat, and water bodies. If the impact is deemed too great, then mining will not be permitted. The ASCMCRA and actions by other regulatory agencies provide protections for water quality and quantity, hydrologic balance, fish and wildlife habitat, and vegetation.

Comment #50
What are any and all possible impacts to the following: all Native plants growing in the region (I would like a botanist's report), all wildlife, including, but not limited to brown bear, black bear, mountain goat, red squirrel, wolverine, ground squirrel, marmot, lynx, fox, wolf, coyote, and voles. What information do you have on waterfowl usage and potential impacts? How will insects and any other wildlife, unmentioned above, be affected?

Response
The preliminary best interest finding discusses potential effects of coal leasing and development on fish and wildlife, habitat, water (ground and surface), and air. (See Chapters 9 and 10 of the decision) Without a specific proposal for a mine project it is not possible or practicable to predict all possible impacts. Under the ASCMCRA and other government regulatory programs (ADF&G, ADEC, EPA, USACE) impacts are to be avoided, minimized, and/or mitigated.

There is no statutory requirement to conduct detailed field studies in preparation for a best interest finding under AS 38.05.035 (e), only a requirement to review available information that is material to the determination of whether the sale will best serve the interests of the State. (See discussion of AS 38.05.035 (e) and (h), above in this Appendix.) Prior to mine permitting detailed reports on fish, wildlife, and habitat will be prepared.

Comment #51
The following comments were submitted regarding the efficacy of reclamation:

- You cannot reclaim wetlands to be the same as they were before.
- Research demonstrates that it is simply not possible to fully reclaim a strip mine site. Even reclamation measures taken in compliance with SMCRA leave a devastated landscape that may persist indefinitely.
- ADNR should not obscure the fact that it is not likely that mitigation will prevent existing fisheries and recreational resources from being significantly impacted.

Response
These comments provide no new information upon which to base a reassessment of this decision. The DNR cannot guarantee there will be no negative effects from coal development and mining. The ACMCRA and regulatory programs administered by other agencies provide protections for fish and wildlife, their habitats, and waters. However, there may still be impacts. The intent of the reclamation plan and bonding is to minimize long-term adverse impacts. The Departments of Natural Resources and Fish and Game evaluate potential impacts to fish and wildlife, habitat, and water bodies. If the impact is deemed too great, then mining will not be permitted.

All coal mining is regulated under the Alaska Surface Coal Mining Control and Reclamation Act and the attendant regulations at 11 AAC 90. (See Chapter 4: Statutory and Regulatory Background of this decision)

Comment #52
The DNR should consider the long term and large area (cumulative) impacts of development projects. Various entities have proposed numerous significant resource development projects in the vicinity of the proposed Canyon Creek lease. They include: the Chuitna coal mine; the natural gas pipeline proposed for the Donlin gold mine; the Port MacKenzie rail spur and associated port expansion; the Chakachamna hydro project; the Mt. Spur geothermal project; and the Whistler gold mine. Each of these projects would bring in associated new infrastructure and access, including roads, rail lines, and transmission lines. The Preliminary Decision acknowledges some but not all of these developments, but fails to consider in any meaningful way the enormous change they would, in combination, bring to the remote rural character of the area or the loss of fish, wildlife, clean water, clean air, and solitude.

Response
Unrelated, future potential development projects are beyond the scope of this decision. When determining whether a lease sale is in the best interest of the State, the legislature provided for DNR to limit the scope of its administrative review and written finding. The scope of review and the finding may address only *reasonably foreseeable, significant effects of the uses proposed to be authorized by the disposal*. AS 38.05.035(e)1)(A). Further, the DNR is not required to speculate about possible future effects subject to future permitting that cannot be reasonably determined until the project is more specifically defined. AS 38.05.035(h). (See discussion of AS 38.05.035 (e) and (h), above in this Appendix.) The DNR is not required to speculate about "enormous change" that may occur through future unrelated development.

Comment #53
Coal mining and the resultant coal fired power generation will result in exacerbating global warming/climate change. The development, production, transportation, and use of the coal mined from the Canyon Creek area will release millions of tons of greenhouse gases and other climate-forcing agents into the atmosphere, a reasonably foreseeable and significant effect of the use - coal mining - authorized by this disposal.

Response
The issue of global climate change is beyond the scope of this decision under AS 38.05.035. (See discussion of AS 38.05.035 (e) and (h), above in this Appendix.) Global coal consumption in 2010 was approximately 8 billion short tons. Asian consumption for that year was 5 billion tons. (Index Mundi - http://www.indexmundi.com/energy.aspx?product=coal) Any amount of coal that might be produced from a lease at Canyon Creek would be a very small fraction of this total. For example, if Canyon Creek were to produce 8 million tons of coal per year, that would amount to 0.1% of world consumption. This level of coal production is unlikely to significantly alter global coal markets. It is probable that Canyon Creek coal would replace other coal in the markets, and not cause the burning of additional coal. (Also see comment response #16)

Comment #54
Many people are under the impression that mining Canyon Creek coal would increase the global tonnage of coal use. This conclusion is not supported by the facts. The coal from the lease area would most likely be shipped to China and would displace higher sulfur coal that would otherwise be burned there. Chinese coal frequently has relatively high concentrations of sulfur - up to 5%, and frequently has a significant concentration of mercury. As China addresses their air pollution problems, it will need to substitute lower sulfur coal for some of their domestic high sulfur coal.

Canyon Creek coal will compete with other potential sources in Australia, Indonesia, and China for part of the Chinese coal market, and possibly for market share elsewhere in Asia. If Canyon Creek coal cannot win that market competition, it will not be produced. If it does win that competition, it displaces coal produced elsewhere.

Response
See comment/response #53.

Comment #55
The preliminary decision fails to mention how climate change factors will affect the local and regional ecosystem. Specifically, how will the water and forest resources be affected?

Response
Although there are climate models available (see comment/response #57), estimating the effects of climate change on the proposed lease area is speculative, and beyond the scope of this decision. Estimating the effects of climate change on the ecosystem is not required under AS 38.05.035. (See discussion of AS 38.05.035 (e) and (h), above in this Appendix.)

Comment #56
The State has no statement of climate change.

Response
The issue of global climate change is beyond the scope of this decision under AS 38.05.035. See discussion of AS 38.05.035 (e) and (h), above in this Appendix. Also see Climate Change, in Chapter 8, for discussion of the State position on climate change.

Comment #57
Science is available today to assess potential impacts on mining projects from global warming, and should be included both as a part of the general leasing assessment (on a more generic scale), and then on a project-specific basis if a coal lease is approved. (Reference provided: Documentation Report, development and Application of an Integrated Hydrologic Model to study the Effects of Climate Change on the Chuitna Watershed, Alaska, 2012. Prepared by the Wilderness Society and Integrated Hydro Systems under a cooperative agreement with the U. S. Fish and Wildlife Service.)

Response
Conducting studies of future effects of climate change is beyond the scope of the present decision. AS 38.05.035 (e)(1)(A) the director's written finding may address only reasonably foreseeable, significant effects of the uses proposed to be authorized by the disposal, and under (B)(ii) of that subsection the scope of the finding may be limited to the facts pertaining to the land, resources, or property, or interest in them.... that are known to the director or knowledge of which is made available to the director during the administrative review.

The reference provided by the commenter deals primarily with modeling of the hydrologic effects of climate change on the Chuitna watershed; the article gives little if any information concerning the effects of climate change on the proposed Chuitna coal mine. The USFWS had peer reviews done by three expert reviewers. Reviewer #2 for the article states, "It is not clear to me how these results will be used in evaluating the proposed mine and the effects on salmon, especially given the uncertainty among the scenarios." Reviewer #3 stated: "While one of the objectives of the study was to "develop an approach where integrated hydrologic modeling can be used to assess effects of the climate change and land-use modifications, such as mining, on other hydrologic systems throughout Alaska", nevertheless the report has not shown any attempt to address the effects of the land-use modifications, such as mining. Even if section 6.2 claims to present the results of the climate change, mine reclamation and combined climate change and reclamation scenarios, mine reclamation scenarios were no where to be found." Author Response: "We have removed language that suggests that the secondary objective of this work was to develop a framework for addressing mining impacts. We clarify that the second objective is to demonstrate how an integrated hydrologic model can be used to explore scenarios of climate change or land use change and the types of data that are needed to develop a site-specific model."

Comment #58
Summer stream temperatures in the Cook Inlet watershed now routinely exceed the maximum temperatures required for juvenile salmon to survive. (Reference: Kyle, R.E. and T.P. Brabets.

Water Temperature of Streams in the Cook Inlet Basin, Alaska, and Implications of Climate Change. USGS Water-Resources Investigations Report 01-4109)

Response
The comment and supporting reference do not detail the manner in which a coal lease and development near Canyon Creek will affect salmon survival.

The referenced study does the following: compiles all available water temperature data in Cook Inlet Basin; analyzes those data to determine differences between individual streams; tests accuracy of a water temperature model; uses the model to simulate future trends in water temperature; and describes how predicted future trends might affect fish habitat. According to the reference, water temperature data, specifically long-term data, for the Cook Inlet Basin are sparse.

Temperature data reported in the study do not indicate that "Summer stream temperatures in the Cook Inlet watershed now routinely exceed the maximum temperatures required for juvenile salmon to survive." The DNR and DF&G are unaware of any other data that clearly indicate Cook Inlet stream temperatures are regularly exceeding safe levels for salmon.

The Kyle and Brabets study used a non-linear regression model developed by Mohseni and others (1998, Cited in Kyle and Brabets) to model future stream temperatures as a function of air temperatures. The study relied on projected air temperature models that assumed a doubling of atmospheric carbon dioxide by the year 2100. Results of the referenced study indicated that 15 of 27 sites had a predicted water temperature change of 3° C or more by 2100. The study authors made the following comment regarding fish health and mortality. "It is unlikely that fatal temperatures for salmon will be reached in the Cook Inlet Basin with a doubling of carbon dioxide, but the incidence of infection within salmon fisheries may rise. It should be noted that water temperature changes would be gradual and fish might adapt to the 3° C change or might move to a cooler portion of the stream." Alaskan salmon live in approximately the northern third of the range for Pacific salmon, which may indicate a greater likelihood that Alaskan salmon will adapt to somewhat higher temperatures.

Comment #59
When it was proven that "global warming" is not outside the normal range of expected values, phraseology of the debate was changed to "climate change." When "climate change was shown to be a trend that has been happening since the last ice age, the debate was re-formatted as a "greenhouse gas/carbon dioxide" problem. When "carbon dioxide" was shown to be a very minor, and beneficial, contributor to "greenhouse gases," the debate phraseology was changed to stop coal mining and any form of coal use. DNR must be on guard to not become caught up in the environmental NGO game.

Response
The issue of global climate change is beyond the scope of this decision. See comment/response #53.

Comment #60
Coal mining causes ocean acidification, thereby harming sea life and harvestable fish.

Response
The issues of global climate change and ocean acidification are beyond the scope of this decision. See discussion of AS 38.05.035 (e) and (h), above in this Appendix for the statutory requirements of a best interest finding.

Comment #61
Burning coal causes the release of mercury, lead, arsenic, and other poisonous substances into the atmosphere.

Response
Coals in the upper Cook Inlet area are cleaner than most coals around the world. The upper Cook Inlet coals are very low in sulfur, and low in trace toxic metals such as arsenic, mercury, and lead as well. Sulfur contents in Cook Inlet coals have been analyzed as follows: Susitna-Beluga coalfield - 0.1-0.3% sulfur; Chuitna River drainage basin - 0.08-0.18% sulfur; Beluga River drainage basin - 0.08-0.32% sulfur; Capps Glacier district - 0.12-0.33% sulfur (Flores, et. al, 2005). Blumer (1980) reported that analyses from the Mobil Oil drilling in the 1970s yielded sulfur values in the 0.1-0.2% range for Canyon Creek area coals. In 2012 the DNR Coal Regulatory Program had three samples of upper Cook Inlet coals analyzed. Two of the samples came from the Wishbone Hill area, and one came from the Beluga coalfield. Average trace metal values were as follows: mercury - 0.059 ppm; lead - 6.27 ppm; arsenic - 1.4 ppm; copper 21.1 ppm, cobalt - 9.52 ppm; selenium - 0.373 ppm. Averaged metal analyses have been obtained from a data sheet provided by PacRim, PL for the Chuitna coal. Those values are: mercury - 0.06 ppm; arsenic - 2.16 ppm; antimony - 0.35 ppm, cobalt - 0.95 ppm; copper - 7.67 ppm; and lead 3.30 ppm.

Comment #62
There is evidence that coal mining activities may trigger earthquakes by changing the pressure exerted on the fault lines through the removal of rock, coal, and water or the storage of water removed during mining.

Alaska's risk of earthquakes may already be higher due to climate change. According to the National Park Service, "[rapid glacial retreat can leave unstable hillsides that are susceptible to collapse, and can increase the likelihood of tectonic activity capable of triggering such movement." Changing pressures on fault lines due to coal mining and climate change resulting from coal burning may increase the likelihood of a major earthquake that may have far-reaching effects in the most heavily populated areas of Alaska.

Response
From the Preliminary Decision, the Castle Mountain Fault crosses the area about 30-35 miles from the Canyon Creek lease area. Although there is a possibility that an earthquake could occur along the Castle Mountain Fault during the life of a mine at Canyon Creek, mine activities will not precipitate an earthquake from that distance. Earthquakes happen in the course of geologic

history. Whatever effects arise from glacial retreat will occur with or without a mine at Canyon Creek.

Comment #63
While the lease sale area is "not closed to mineral entry or coal leasing," the area is presently classified as "Wildlife Habitat Land and Public Recreation Land." The effect of the proposed best interest finding is to change the defacto best-use of the area from wildlife habitat land and public recreation land to natural resource extraction. ADNR should explain why it is in the best interest of the public to change the designation of this area from Wildlife Habitat Land and Public Recreation Land to coal development. ADNR should also explain how the change in designation of this particular parcel of land will impact the overall management focus of state lands in the Mount Susitna Region of the Susitna Matanuska Area Plan, and how the resource values associated with wildlife habitat land and public recreation land will be protected, or conversely will be changed.

Response
There was an error in the preliminary decision; Subunit M-06 is classified only as Public Recreation Land. None of the area is classified as Wildlife Habitat Land.

The preliminary best interest finding does not change either the land use classification or designation. According to the Alaska Constitution, state lands are to be managed for multiple uses. The DNR, in its planning process, assumes that most lands are amenable to multiple uses. Land use designations and classifications represent preferred uses for a given unit within an area plan. They are not intended as the sole land use. The current lease area was previously leased to Mobil Oil Corporation for coal from 1977 until 1989.

Comment #64
I object to the State's Preliminary Decision to hold the referenced coal lease sale due to the lack of a realistic plan of development of the proposed mineral extraction and transportation to end use prior to issuance of exploratory leases.

Response
This decision is to determine whether holding a competitive coal lease sale in the Canyon Creek area is in the best interest of the State of Alaska. Therefore, this review does not discuss specific mine plans, transportation routes, or transportation facilities. If an actual mine is proposed it will require numerous engineering, environmental, and other planning studies. Development of a mine and coal transport plan is beyond the scope of this decision. See discussion of AS 38.05.035 (e) and (h), above in this Appendix for the statutory requirements of a best interest finding.

Comment#65
Commented about DNR's inability to manage the project and deal with non-compliance issues in a remote area.

Response
Under the ASCMCRA the DNR Coal Regulatory Program is required to inspect all active surface coal mines and exploration areas at least once a month (AS 27.21.230 (c)). Coal Regulatory personnel take whatever measures are necessary to travel to the mine site or exploration area for monthly inspections, and for any other inspections or enforcement actions that may be required to administer the ASCMCRA.

If a violation of the ASCMCRA is found, a notice of violation is issued. DNR also has the authority to immediately shut down the entire mine operation by issuing a Cessation Order., Until the violations are corrected the mine cannot resume operations. The ASCMCRA also authorizes the commissioner to require various monitoring equipment and procedures as needed (See AS 27.21.230).

Comment #66
Underground coal fires are not addressed and there would be no means of suppression or protection for the loss to public land or private structures

Response
Naturally occurring coal fire are common within Alaska and are generally started by lightning strikes. Fires started by these naturally occurring coal fires are not fought unless they threaten property. Coal fires may spontaneously start within coal stock and waste piles. An operator would be required to monitor and extinguish any such fires. If these coal fires cause surface fires outside the project area they may be suppressed by local, state or federal fire crews and the cost of fighting the fire may be billed back to the company.

Comment #67
If exploration proves viable resources and a mine is eventually proposed, stringent state and federal standards require the utmost care for the environment and reclamation following any mining. Mining will not take place if there is risk to fish, wildlife, or human health. A surface coal mine is Alaska is subject to ASCMCRA, which combined with other state and federal regulations protects the environment, water and wildlife. Bonds will be posted to provide for reclamation of surface disturbance. ASCMCRA performance standards provide for protection of the hydrological balance through the scientific determination of the probable hydrologic consequences (PHC)of exploration, development and mining within the proposed area. A Cumulative Hydrologic Impact Assessment (CHIA) for the project will assess the probable cumulative impacts of the anticipated mining.

Modern mining has an excellent record in Alaska. There is no large modern mine that has had a long-term adverse impact on fish habitat in the last few decades of Alaska's history.

Response
The ASCMCRA, along with other regulatory agencies such as the Alaska Department of Environmental Conservation and the U. S. Army Corps of Engineers, provide regulatory protections for fish and wildlife, the environment, and human health. The ASCMCRA and departmental policy are intended to first avoid harmful effects of mining. Avoidance is followed

by efforts to minimize impacts, and finally to mitigate any negative effects that cannot be avoided. (See Chapters 4 and 10 of this decision)

Comment #68
The Canyon Creek area is well suited to multi-use management, and should be further explored to assess the full potential for resource extraction.

Response
This comment is a declaratory statement in support of coal development. The State of Alaska manages most of its General State Lands for multiple uses, including the Canyon Creek lease area. The purpose of this decision is to decide if it is in the best interest of the State to hold a competitive coal lease sale in the Canyon Creek area.

Comment #69
After a lease sale potential mine development remains years away, and would be subject to additional permitting requirements and opportunity for public input.

Response
Chapter 4 of the decision, Statutory and Regulatory Background, discusses future permitting requirements under the ASCMCRA and other permitting agencies.

Comment #70
Effects of coal development, including coal dust and water contamination, will threaten human health.

Response
This comment is a declaratory statement which does not provide any specific threats to human health. No information is given that might support a reassessment of the decision. (See comment/response # 71 which considers health concerns.)

Comment #71
Coal mining on public land is not in the best interests of Alaska's people because of the severe costs to human health at every step of coal development, from the mining and transport to combustion in coal-fired power plants. Black lung (coal workers' pneumoconiosis) and related pulmonary diseases are well documented causes of illness and death among coal miners, despite decades of regulations protecting workplace health (1, 2). Pulmonary disease rates have actually increased over the past decade for both surface and underground coal miners (1, 2). Inhalation of coal dust has been linked to higher rates of cardiopulmonary disease, chronic obstructive pulmonary disease (COPD), high blood pressure, lung disease, diabetes, and kidney disease (3, 4, 5, 6). Recent studies have shown higher rates of all these heath problems in people living near coal mines(3, 4, 6). Trains and trucks hauling coal release hazardous air pollutants from both the loose coal dust blowing off the loads and the diesel exhaust from the vehicles.

References provided: [1]National Institute for Occupational Safety and Health (NIOSH), 2011. Coal Mine Dust Exposures and associated Health Outcomes. Current Intelligence Bulletin 64.

[2]Centers for Disease Control and Prevention (CDC). 2012. Pneumoconiosis and Advanced Occupational Lung Disease among Surface Coal Miners—16 States, 2010—2011. Morbidity and Mortality Weekly Report . June 15, 2012.)
[3] Hendryx M, Ahern MM. Relations between health indicators and residential proximity to coal mining in West Virginia. American Journal of Public Health 2008; 98:669–671.
[4] Hendryx M, Ahern MM, Nurkiewicz TR. 2007. Hospitalization Patterns Associated with Appalachian Coal Mining. Journal of Toxicology and Environmental Health, Part A, 70: 2064–2070.
[5] Raloff, J. A Particulate Threat to Diabetics.. Science News. 2011.
[6]Physicians for Social Responsibility (PSR). 2009, November. Coal's Assault on Human Health.

Response
The protections for air and water quality, and for containment and storage of coal spoils provided under the ASCMCRA, as well as regulatory actions by other agencies, should avoid or minimize health problems due to coal development. (see comment/response #s 38, 39 and 44). Miner health and safety is regulated by the Mine Safety and Health Administration (MSHA). MSHA is responsible for updating safety and health protections in coal mining operations, including protection for coal worker's pneumoconiosis.

This comment cited a number of references from the scientific literature. These references are discussed briefly below. Reference #5 is not discussed, because a journal subscription was required.

ACAT references 1 and 2 were reviewed by the DNR. Neither of these references indicated that rates of coal workers' pneumoconiosis (CWP) in *surface coal workers* have increased since 1995. From page 11 of the NIOSH article: "Over time since 1995 it has become increasingly apparent that the observed prevalence of CWP in U.S. *underground* coal miners examined in the Coal Miners' X-ray Surveillance Program (CWXSP) was no longer declining as it had from 1969–1995, but had begun increasing." (emphasis added)

The NIOSH study did not fundamentally distinguish between surface and underground coal mining; it emphasized "coal mine dust" exposure, regardless of mine type. From the article it is difficult to discern the continuing risk to surface mine workers. NIOSH data actually show consistent improvements in miner health over time, mainly due to lower dust exposure. The Coal Mine Health and Safety Act of 1969 mandated lower dust exposure at a concentration of 2 mg/m^3. This apparently has not been sufficient to eliminate health problems among coal miners, and NIOSH recommends lowering the dust limit to 1 mg/m^3.

Figure 9, page 14 of the NIOSH study shows the west and Alaska to have among the lowest incidence of CWP, with miners over the age of 60 having about a 4% observed rate of CWP. The data presented do not indicate any apparent increase in CWP in the western states since 1995. Again, *these data do not distinguish surface coal miners from underground miners*. (emphasis added)

The NIOSH article includes a very brief section on surface mining. It mainly mentions studies published prior to the NIOSH paper showing that "U.S. surface coal miners (particularly workers

on drill crews) were at risk of developing CWP (or silicosis). There was also evidence that ventilatory function was reduced in relation to the number of years worked as drill operators or helpers."

From the CDC study: "With enforcement of the exposure limit, the prevalence of CWP among *underground* coal miners declined from 11.2% during 1970–1974 to 2.0% during 1995–1999, before increasing unexpectedly in the last decade, particularly in Central Appalachia." This statement concerning increases in CWP is only in regard to underground miners, not surface miners, and is primarily for Appalachia, not western coal mines. To assess the prevalence, severity, and geographic distribution of pneumoconiosis among current surface coal miners, CDC obtained chest radiographs of 2,328 miners during 2010–2011 through the Coal Workers' Health Surveillance Program of the National Institute for Occupational Safety and Health (NIOSH). Of these miners, 1,424 were from outside central Appalachia. Fifteen (1.1%) of the non-central Appalachia miners had CWP, and 2 (0.1%) had progressive massive fibrosis, an advanced stage of CWP. The data from the CDC article indicate that there is risk of lung disease among surface coal miners, but that it is relatively low. Certainly, mine operators should monitor coal miner exposure to coal and silica dust carefully to ensure that risk is avoided.

Reference 3, the Hendryx and Ahern article, was an ecological epidemiological study. That is, a study that aggregates measures summarizing group characteristics and exposures. The Hendryx study compared coal mined per year by county with health outcomes by county. The study did make some effort to control for variables such as obesity, smoking, and education level, but only at the county level. There were no data to relate specific incidence of disease to other factors that could contribute to disease. Also, since coal mining was only accounted for by county, there was no relationship built between incidence of disease and distance from the nearest coal mine. From the Hendryx article: "Limitations of the study included the ecological design and the possibility that unmeasured variables confounded with coal mining, such as individual smoking behavior or occupational exposure, contributed to poorer health… county of residence provides an imperfect estimate of people's proximity to mining sites." In recent CDC Chronic Disease Indicators, West Virginia ranked first in age-adjusted diabetes mortality and third in adult overweight/obesity and diabetes prevalence. According to the Centers for Disease Control 2008 Behavioral Risk Factor Surveillance System (BRFSS, http://www.cdc.gov/brfss/index.htm), West Virginia also has the nation's highest smoking rate, the most important risk for lung cancer and other chronic cardiopulmonary diseases. Some of the subjects questioned in the survey were likely coal miners, resulting in a "miner's effect" within the data. From the Hendryx article: "The finding for black lung disease likely reflects a miner's effect, supported by the result that women are at lower risk. The only other illness for which men as a group had higher risk was the general cardiopulmonary category."

Reference 4, Hendryz, Ahern and Nurkiewicz, examined the pattern of 2001 hospitalizations for "coal-sensitive" conditions, such as COPD, Lung cancer, hypertension, and kidney disease, as they related to coal production by county in Kentucky, Pennsylvania, and West Virginia. Positive relationships were found between coal production and two diseases, COPD and hypertension. The odds ratios for these relations were very low; both were 1.003. Negative correlations were found between coal production and lung cancer and kidney disease. The DNR finds the value of this study to be questionable with regards to surface coal mining in Alaska.

Both of the referenced Hendryx articles studied coal miners in Appalachia; neither work dealt with miners in other parts of the United States. As is demonstrated by the references from NIOSH and the CDC, coal mining related health problems are much less severe in other parts of the country. This discrepancy, and with other methodological problems in the Hendryx articles, are expressed in another paper by Hendryx that was not referenced. From Hendryx, M. (2008, Mortality rates in Appalachian coal mining counties: 24 years behind the nation. Environ Justice 1:5-11), "Coal mining areas, however, show elevated age-adjusted mortality both before and after adjustment for covariates. This is the case when Appalachian coal mining is the focus, *but not for coal mining areas outside of Appalachia*." " Causes of elevated mortality in coal mining areas may reflect behavioral, cultural, and economic factors only partly captured through available covariates, but may also reflect environmental contamination from the coal mining industry. *That effects were found for Appalachian coal mining areas but not coal mining areas elsewhere may reflect the unique relationship of mining activity to topography and population centers characteristic of Appalachia*." (emphasis added)

The Physicians for Social Responsibility (2009) reference builds the argument that pollutants from coal development and use can cause serious health problems. However, the links between coal and health problems are not quantified, and other attributing variables are not well accounted. Much of the article cites literature linking various pollutants to diseases, particularly heart disease, cancer, stroke, and chronic lower respiratory diseases. Because many of the pollutants causing these illnesses can be produced by coal mining, cleaning, transportation, and combustion, the paper links coal development with the diseases. Table ES 1, page X, is a good example. The table lists various diseases and negative health effects, along with associated symptoms, most vulnerable populations, coal pollutants implicated, and total disease burden. (Total disease burden is the total number of cases or mortalities, generally over a year period.) The total disease burden column heading has the following in parentheses: (coal is a suspected contributing factor in an unknown number of cases).

With few exceptions, the link between various aspects of coal development and consumption and disease is not quantified, and there is no apparent accounting of other variables such as distance of populations from mines, transportation facilities or power plants; other sources of the subject pollutants; or other health risk factors such as poor diet or smoking. On page 3 the authors state "In seeking to describe relationships between health and any single pollutant or any single source of the pollutant, notably burning coal, difficulties arise due to multiple sources of the pollutant in question and multiple health impacts. This is a particular issue with regard to SO x, NOx, and particulates, as there are many important sources of these pollutants in addition to burning coal. This is less of a problem in regard to mercury, where coal is the acknowledged largest single source of emissions. Thus, in this report we draw on literature that goes beyond that in which authors limit themselves to coal as the sole source of the pollutant in question."

Although there is some validity to this generalized approach, it does not quantify health effects due to coal development, nor does it make allowances for regulatory oversight and management, or other variables affecting disease rates. For example, on page 6 the authors report that surface coal mining accounts for 69% of the coal mined in the U. S. Of 47 coal mining fatalities in 2006, 37 occurred in underground mining operations. These figures indicate that although there is risk in surface mining, it is considerably less than underground mining. Another example:

"Smoking tobacco is the most important risk factor for the development of COPD. Most authors report that approximately 85% of all cases of COPD can be attributed to this single, preventable cause. Data that have emerged during the past several years have shown that there is a smaller but important link between air pollution, including pollutants produced by burning coal, and the subsequent development of COPD exacerbations."

Comment #72
Health risks of coal miners are severe due to the hazardous conditions of coal mine work. The 2006 fatality rate for coal miners was "49.5 per 100,000 workers, more than 11 times greater than that in all private industry." (Ex. 78, Physicians for Social Responsibility at vi, vii, 7) Mine workers' exposure to coal dust has been linked to coal workers' pneumoconiosis (black lung disease), bronchitis, emphysema, mortality due to chronic obstructive pulmonary disease, and decreases in lung capacity. (Id. at 405, 398) Exposure to silica dust at surface coal mines is also of concern because of its association with pneumoconiosis and silicosis. (Ex. 34, Centers for Disease Control and Prevention at 431)

Van Houtven, et al. , Ex. 110, reported that "workers in Coal mining had significantly higher rates of respiratory illness claims (by 2.1% to 3.3%) compared with other mining, agriculture, construction, and manufacturing. For coal mining workers with respiratory illness, annual medical care costs for these claims were also significantly higher (by $111 to $289)." The costs of these increased rates of respiratory disease, mortality, and higher costs associated with medical care that coal mine workers face must be accounted for when jobs and income from coal mining are assessed. To include only benefits and ignore costs is an incomplete determination of the best interests of the State of Alaska.

Response
See comment/response #71.

Comment #73
Despite decades of regulation under these federal statutes, surface coal mining continues to take a heavy toll on public health. The Epstein study cites a suite of studies indicating that "all-cause mortality rates, lung cancer mortality rates, and mortality from heart, respiratory, and kidney disease were highest in heavy coal mining areas of Appalachia," and decreased in communities that have less mining or are farther from it. Ex. 45 (Epstein, et al. at 82).

A study of coal mining areas found that "[a]s coal production increased, health status worsened, and rates of cardiopulmonary disease, lung disease, cardiovascular disease, diabetes, and kidney disease increased." Ex. 54 (Hendryx & Ahern 2008 at 670) One of the studies in the suite notes, "These illnesses are consistent with a hypothesis of exposure to water and air pollution from mining activities. . . . In the current study, the adjusted [value of statistical life] costs indicate that the potential environmental impacts of mining exceed the economic benefits of mining." Ex. 53 (Hendryx & Ahern 2009 at 547).

Response
This comment regarding effects of coal mining on human health has little bearing on coal mining and health issues in Alaska. The references cited are studies conducted in Appalachia.

The Epstein reference at page 82 cites to the suite of studies by Hendryx and others. These studies all deal with coal mining and its relation to public health in central Appalachia, and particularly to West Virginia. The health issues related to coal mining in this region of the United States are significantly different from the rest of the country. In addition, there are methodological limitations to the Hendryx studies. For a discussion of two of the Hendryx papers, see comment/response #71.

The discrepancy in the health effects of coal mining between Appalachia and the rest of the United States, along with some of the methodological problems in the Hendryx articles, are expressed in another paper by Hendryx that was not referenced in the comment. From Hendryx, M. (2008), Mortality rates in Appalachian coal mining counties: 24 years behind the nation. Environ Justice 1:5-11: "Coal mining areas, however, show elevated age-adjusted mortality both before and after adjustment for covariates. This is the case when Appalachian coal mining is the focus, *but not for coal mining areas outside of Appalachia*." " Causes of elevated mortality in coal mining areas may reflect behavioral, cultural, and economic factors only partly captured through available covariates, but may also reflect environmental contamination from the coal mining industry. *That effects were found for Appalachian coal mining areas but not coal mining areas elsewhere may reflect the unique relationship of mining activity to topography and population centers characteristic of Appalachia*." (emphasis added)

Comment #74
Responsible development includes, at a minimum, a comprehensive Health Impact Assessment to be completed before any permits, including exploration, are considered for the Canyon Creek coal lease.

Response
The requirement for a Health Impact Assessment is beyond the scope of this decision. Under AS 38.05.035 (e)(1)(B)(ii) the director may limit the scope of an administrative review and finding to "the facts pertaining to the land, resources, or property, or interest in them, that the director finds are material to the determination and that are known to the director or knowledge of which is made available to the director during the administrative review..." There is no statutory requirement to conduct detailed studies in preparation for a best interest finding, only a requirement to review available information that is material to the determination of whether the sale will best serve the interests of the State. Federal agencies conducting NEPA analyses may request a Health Impact Assessment, in which case the assessment is generally done by the Alaska Department of Health and Social Services.

Comment #75
Emissions from Asian coal-fired power plants, some of which burn Alaskan coal, are the primary source of mercury contamination in Alaska's fish. These emissions travel to Alaska via air and ocean currents. Mercury is a potent neurotoxin that causes learning disabilities and developmental disorders in infants and children, and also contributes to cardiovascular disease, lung damage, psychiatric disturbance and suppressed immune systems in humans of all ages. Coal development for export to Asia will increase the mercury content of subsistence foods and commercial fisheries throughout Alaska.

Response
Alaskan coals are low in sulfur, mercury, and other trace metals. (See comment/response #61) If these coals were consumed in Asia, there is a possibility that it would replace coal mined in other parts of the world that might not be as clean. Therefore, Alaskan coal consumed in Asia could reduce the amounts of mercury emitted into the atmosphere.

Comment #76
Drinking water contamination is a ubiquitous problem in all types of coal development (8). Exposed rock and mine waste release heavy metals and other pollutants that contaminate drinking water, surface water, and groundwater (3, 6, 8).
[8] Holzman, David C. Mountaintop Removal Mining, Digging into community health concerns. Environmental Health Perspectives. 2011. 19(11): A476-A483.

Response
The cited reference #8, Mountaintop Removal Mining, Digging into community health concerns by David C. Holzman, discusses water contamination and associated health concerns related to mountaintop removal mining in West Virginia. Mountain top mining is removal of mountain tops, and is often associated with valley fill. Only one small valley fill has been done in Alaska. Coal mining in Appalachia is in close proximity to local populations, which is different from Alaska and Canyon Creek, where mines are remote from most of the population. (For discussion of ACAT references 3 and 6 see comment/ response # 71.)

The only active coal mine in Alaska is the Usibelli Mine at Healy. The Coal Regulatory Program within the DNR has water quality results for every discharge point at the Usibelli Coal Mine for the past 15 years. Water discharge quality has not been a significant issue, either from active mine sites or abandoned/reclaimed lands.

See Chapters 4 and 10 of this decision for discussion of regulatory protections for ground and surface waters.

Comment #77
A more thorough and accurate picture of the current land uses in the general area of the proposed lease needs to be documented in the preliminary decision. How many private properties are there in the general area? The preliminary decision should discuss the State land sales projects in the area. It should also discuss the extent of use of the proposed lease area by these people and other members of the public, including traditional uses from Alaska Native tribes in the surrounding area. What is the extent of existing trails besides the trails legally recognized?

Response
In preparation of this final decision the DNR added a new section, Settlement, Access, and Use of the Canyon Creek Lease Area by the Public and Local Property Owners, to Chapter 6. The following is a summary of that section.

The DNR mailed out notices of the Canyon Creek preliminary decision to approximately 270 property owners in the Canyon - Creek-Shell Lake-Talachulitna River area. Most of these properties do not have cabins or other structures on them. For 194 parcels on or near Canyon,

Shell, and Onestone Lakes, 46, or 24%, have structures on them as determined by a search using Google Earth. Parcels farther from lakes generally have fewer structures.

In order to better evaluate access to and use of the Canyon Creek lease area, DNR consulted with two long-time residents of the Shell Lake-Canyon Lake area who have actively guided hunting and fishing trips and trapped the area for many years. Specifically, these individuals were questioned about trails and other access, and use of the Canyon Creek/Dickason Mountain area. Based primarily on these consultations, the Canyon Creek/Dickason Mountain area is not heavily used. There are no summer trails that go all the way up Dickason Mountain and no regular snowmachine routes in winter. The heaviest use of the Canyon Creek/Dickason Mountain area is during the spring bear hunt, when several guides offer hunts in the area. Aside from guided hunts only a few snowmachiners ride up Dickason Mountain or into the Canyon Creek area. A few individuals trap in the Canyon Creek/Dickason Mountain area. Generally, these trappers do not use the area every year, which is not uncommon for trapping. The trapper DNR consulted listed four other trappers who occasionally use the area. Three lodges in the broader Canyon Creek/Shell Lake/Talachulitna River area offer helicopter guided fishing in the Canyon Creek/Dickason Mountain area. One lodge offers heli-skiing in the Tordrillo Range.

Canyon Creek is not navigable through the steep canyon crossing sections 27 and 28, T21N, R13W, SM.

All State brochures for land sales, including subdivision, over-the-counter, and remote cabin staking, contain cautionary statements that surrounding land may be subject to other uses, including mining. These cautionary statements have been included in land sales brochures since the 1970s. From the 2012 Alaska State Land Offering, Auction #470: "In accordance with AS 38.05.125 Reservation of Mineral Rights to Alaska, the State of Alaska retains ownership of oil, gas, coal, ore, minerals, fissionable material, geothermal resources, and fossils that may be in or upon the land that it sells. The State of Alaska and its successors reserve the right to enter onto the land for the purposes of exploring, developing, and producing these reserved mineral resources. In Alaska, this access reservation is superior to any and all surface uses. The State of Alaska may also lease these interests to mineral developers or allow mining locations to be staked. The land sale described in this brochure is only one of the disposals or allowed uses that may occur in any given area. A variety of other authorized uses such as mining or timber sales, commercial or personal recreation, trapping, or resource harvest can and do occur on Municipal, State, Federal, and private lands near the parcels listed for sale. Such uses not only affect adjacent land, but also roads that are intended for access to those areas. Large truck and heavy equipment traffic may occur, and in some cases, noise, dust, or other activities may be perceived as a nuisance to neighboring users. Occasionally, small roads or trails are developed, improved, and maintained to accommodate increased traffic. It is strongly recommended that you take this into consideration when applying to purchase land through these offerings."

Comment #78
How will the area be perceived by those flight-seeing operations, hunting and fishing tour guides and clients?

Response
The lease area is remote, and is not visible from most nearby locations on the ground. A mine and related facilities would be visible from the air above about 2,000 feet, and noise from the mine might be heard for some distance. (See Aesthetic Effects of Future Coal Mining, Chapter 9 of this decision, and Appendix C: Viewshed Analysis of the Canyon Creek Coal Lease Area) Associated transportation facilities, depending on the nature of those facilities, would be a visible piece of infrastructure.

Comment #79
Many property owners chose the area due to lack of roads and difficult access. The idea that a coal road provides a benefit to us that choose to be away from roads is not a true statement.

Response
If a coal mine were developed at Canyon Creek, there might or might not be a road to the mine area. The DNR recognizes that some residents and users of the Canyon Creek-Shell Lake area enjoy the remoteness and lack of other people, and might not find a road beneficial. Others might benefit from increased access. As is stated in Chapter 6, Settlement, Access, and Use of the Canyon Creek Lease Area by the Public and Local Property Owners, many of the privately owned parcels in the area do not have structures. Road access would make building cabins considerably easier and less expensive for at least some property owners. Improved access would also make it easier for other recreational users to enjoy the area. All State brochures for land sales, including subdivision, over-the-counter, and remote cabin staking, contain cautionary statements that surrounding land may be subject to other uses, including mining. These cautionary statements have been included in land sales brochures since the 1970s. (See Response to Comment 77.)

Comment #80
The proposed lease is located in a remote, relatively limited use area. The nearest settlement to the lease area is at Canyon Lake, which is two miles from the closest point of the lease area, and over six miles from the heart of the lease area, where facilities are more likely to be constructed. Other subdivisions are farther away. In addition, the vast majority of the lease area is hidden by terrain from Canyon Lake. Other residential development largely lies across a major river (the Skwentna River) and is largely shielded by topography from the lease area.

The closest known trail system is 4 miles away, and other than an RS 2477 right-of-way six miles away there are no named trails in the area. The Matanuska-Susitna Borough Trail Plan does not indicate any trails in the area. Aerial inspection indicates no airstrips or lakes large enough to land a floatplane. The rivers and streams are not boatable. DNR's navigability project uses 50 feet/mile as the upper limit of likely navigability. Measurement from the 1:63,360 USGS map (Tyonek D-5) shows that Canyon Creek downstream of the lease area has a river slope of 166 feet/mile. Of course, no roads lead to the area. This lack of access leads to little use by Alaskans, and subsequently, there are no close neighbors. In addition the area contains few wetlands, no critical habitat for any species, and no land refuge or preserve designations. Only two small portions of the area have anadromous streams. An area such as this, with little use and no unusual habitat values, is a perfect place to develop coal resources.

Response
As noted in the comment, the area is remote, with very limited access. There are numerous privately owned lots in the broader Canyon Lake/Shell Lake/Talachulitna River area. Most of these parcels do not have structures on them. (See Settlement, Access, and Use of the Canyon Creek Lease Area by the Public and Local Property Owners, in Chapter 6 for a discussion of settlement, access, and use patterns.)

Canyon Creek is not navigable through the steep canyon crossing sections 27 and 28, T21N, R13W, SM. A profile was measured through the canyon using All Topo, a computerized topographic map program. Over a section of the canyon 2.89 miles long the average gradient is approximately 117 feet/mile, with some sections being considerably steeper. A viewshed analysis was conducted for the broader Canyon Lake/Shell Lake/Skwentna River area, and is included in the final decision as Appendix C: Viewshed Analysis of the Canyon Creek Coal Lease Area.

A review of the U. S. Fish and Wildlife Service National Wetlands Inventory Mapper shows that wetlands cover approximately 625 acres of the proposed lease area, or 4.7%. (See Chapter 5, Wetlands)

The lease area does not hold any critical habitat.

Comment #81
Coal mining will harm recreational activities, such as snow machining, hunting, fishing, and recreational cabin use.

Response
The comment does not specify how coal mining might harm the listed recreational activities, or provide any new information on which to base a reassessment of this decision. Any restriction of access would be limited to the immediate mine area and related facilities, and would only be allowed with the consent of the commissioner. Under the ASCMCRA access restrictions are limited to those needed for safety and efficient mine operation. (See Aesthetic Effects of Future Coal Mining, in Chapter 9 of this decision, and Appendix C: Viewshed Analysis of the Canyon Creek Coal Lease Area)

Comment #82
Should coal reserves be proven for development there is potential for added infrastructure and access to a portion of the state that currently lacks good public access. This would help relieve pressure on the limited areas of the state that do have reliable access for recreational opportunities.

Response
If mining were to occur it might prompt infrastructure development in the upper Susitna drainage. A public road into the area would increase access for recreational activities, and ease the expense and difficulty of residential construction. A road and increased recreational use may also attract tourism related businesses and employment. (See comment/response #79.)

Comment #83
Objected to the State's Preliminary Decision to hold the referenced coal lease sale due to incomplete assessment of the impact of ultimate potential development on properties and the public affected by this authorization.

Response
The DNR has reviewed the applicable statutes and regulations, material facts pertaining to the land, resources, and interest in them, and various issues that are determined by the director to be material to the determination of whether the disposal is in the best interest of the State under AS 38.05.035 (e) and (h).

Comment #84
The area around the proposed coal lease sale is currently used primarily for outdoor recreation and residences; development of a coal mine is functionally incompatible with these uses. The state has promoted remote parcel sales in the Canyon Creek-Shell Lake area. Many property owners purchased their lots believing the area would be retained as wilderness. People have gone to considerable expense to build remote cabins in the area. The value of these remote cabins will be destroyed by coal development.

Response
Recreational uses should be little affected by coal development other than in the immediate mine area. Access constraints are limited to those necessary for public and worker safety in and around the immediate mine area. (See Chapters 4 and 10 of this decision) If a road were built into the mine area and open to the public, recreational access could be increased. Aesthetic values would suffer some degradation within the view shed of the mine and related transportation facilities, but the effects would be limited to the period of mining. The State of Alaska manages most state lands for multiple uses, and considers multiple use to be appropriate in most cases. The Susitna Matanuska Area Plan does not close the proposed lease area to coal development. All State brochures for land sales, including subdivision, over-the-counter, and remote cabin staking, contain cautionary statements that surrounding land may be subject to other uses, including mining. These cautionary statements have been included in land sales brochures since the 1970s. (See comment/response #s 77 and 81.)

Comment #85
ADNR should not obscure the fact that it is not likely that mitigation will prevent existing fisheries and recreational resources from being significantly impacted. A finding that the economic benefits of coal development outweigh the existing fisheries and recreational resources could be a legitimate public policy determination if ADNR conducted a complete weighing of all the costs and benefits, but it should not be clouded by an implication that mitigation, through a hydrologic reclamation plan or similar plan, will prevent degradation of existing resources.

Response
This comment is, in part, a declaratory statement concerning the efficacy of mitigation measures. Since there is no mine development plan at this time, there are no specific measures to avoid, minimize or mitigate damage to fisheries or recreational resources. The mitigation measures discussed in the decision are potential actions that might be taken. The comment does not detail

any of the potential measures that might be ineffective, or provide information on which to base a reassessment of the decision.

Coal mining may cause impacts to salmon habitat or recreational resources. The ASCMCRA provides protections for salmon habitat, but does not guarantee that coal development will have no negative effects on water or habitat. Surface and groundwater can be significantly affected within the mining area. Under the ASCMCRA there may be impacts to water quality within the disturbance area of the mine, however, water leaving the permit area must meet state and federal water quality standards. The intent of the reclamation plan is to minimize long-term adverse impacts. The Departments of Natural Resources and Fish and Game evaluate potential impacts to salmon habitat. If the perceived impact is deemed too great, then mining will not be permitted. Balancing conflicting land and resource uses for the state's benefit is one of DNR's primary missions. (See also Chapters 4 and 10 of this decision, and comment/responses #s 1, 39, 46, 51)

A complete cost benefit analysis, including any damage to fisheries or recreational values, is not possible without a specific mining and transportation plan, and is beyond the scope of this decision (See comment/response #108).

Comment #86
If there is a possibility that mining will take place in/through or will move streams, reclamation cannot restore the complex hydrology required for salmon spawning. Appendix A: Agency Comments and Responses states that the DNR and the coal operator will work with DF&G to establish the extent of anadromous and major resident fish-bearing streams, and appropriate buffer widths." If it is the DNR's intent to prohibit mining through salmon streams, then it should explicitly state this.

Response
The ASCMCRA does not guarantee that coal development will have no adverse impacts on the environment. Under the ASCMCRA there may be impacts to salmon habitat. The Act and associated regulations are designed to avoid, minimize, and/or mitigate negative effects. The Departmental emphasis is to first avoid negative impacts. Avoidance is followed by efforts to minimize these impacts, and finally to mitigate any adverse impacts that cannot be avoided. Both the Alaska Department of Fish and Game and the Department of Natural Resources may allow impacts to fish streams. The purpose of the best interest finding is to evaluate the extent of potential impacts and then makes a decision to lease or not lease. Specific decisions concerning the level of potential impacts cannot be determined until a mine plan is proposed.

Comment #87
While it is possible to return mined lands to a "usable" function post-mining, it is not possible to restore the lands to pre-mining functions. ADNR should explain how the relatively short-term economic gains from mining outweigh the long-term sustainable economic values of the existing uses.

Response
Over the short term, coal mining may cause significant impacts to fish and wildlife habitat or other environmental resources. Over the long term, the ASCMCRA provides substantial requirements for the reclamation of coal mining and exploration sites including requirements for the protection of fish and wildlife habitat, water and air quality, and other environmental values. (See Potential Mitigation Measures for Mine Development and Mining Activities, in Chapter 10 of this decision) Reclamation plans are developed based on the approved post mining land use. The intent of the reclamation plan is to minimize long-term adverse impacts. The Departments of Natural Resources and Fish and Game evaluate potential impacts to fish and wildlife habitat. These plans include goals/targets that that are used as a measure of success. For post mining land use that focuses on wildlife habitat these goals are designed to encourage natural succession of reclaimed areas back to their premining plant and animal communities. This type of reclamation planning has been successful in Alaska in meeting the reclamation requirements under ASCMCRA. In the Healy area, ADNR has already granted final bond release on areas that are on a successionary path back to the premining plant and animal communities. In the Matanuska Valley area, DNR has been monitoring reclamation test plots for proposed coal mining operation. These have also show that they are on a successionary path back to premining conditions

The economic effects of a possible coal mine at Canyon Creek are discussed in Statewide and Local Fiscal Effects in Chapter 9 of the decision, and comment/response #s 104 and 106.

Comment #88
Research demonstrates that is simply not possible to fully reclaim a strip mine site. Even reclamation measures taken in compliance with SMCRA leave a devastated landscape that may persist indefinitely: One of the most severe and long-lasting consequences of surface mining is the permanent loss and homogenization of the forest soils. Some mining operations attempt to preserve soil and store it to replace on the mine surface following mining, but even with careful management, a large volume of soil will inevitably be lost via erosion, burial within overburden, and oxidation by soil microbes. What soil remains will be homogenized so that organic and mineral soils are mixed, significantly altering soil horizons that developed over prior centuries. In addition to the significant losses of soil carbon associated with soil removal, soil macro- and micronutrients are also lost. Thus, the surface of a reclaimed mine will at best be covered with a thin layer of very altered soils overlaying crushed and compacted rock. This change in the vertical profile of soils is coupled with massive changes in topography at the scale of the catchment, both of which have important implications for the hydrology and vegetation structure of the recovering watershed and its draining stream; *these changes persist indefinitely*. The landscape left behind after surface mining operations cease must undergo a primary succession sequence similar to that following glacial retreat. *Many decades are required* for forests to reestablish in the thin or nonexistent soils over newly exposed rock. Ex. 28 (Bernhardt & Palmer at 45).

Response
In the enactment of SMCRA by Congress and ASCMCRA by the Alaska legislature it is very clearly understood and acknowledged that coal mining can have a significant impact to the environment. The legislative history and record of both SMCRA and ASCMCRA reflect this.

State and Federal agencies in their review of the projects can recognize that there may be impacts to the environment and may still deem it appropriate to issue decisions, with conditions to avoid, minimize or mitigate impacts, to approve permits. The ACMCRA and regulatory programs administered by other agencies provide protections for fish and wildlife, their habitats, and waters. The intent of the reclamation plan and bonding is to minimize long-term adverse impacts. The Departments of Natural Resources and Fish and Game evaluate potential impacts to fish and wildlife, habitat, and water bodies. If the perceived impact is deemed too great, then mining will not be permitted.

The ASCMCRA and actions by other regulatory agencies provide protections for water quality and quality, hydrologic balance, fish and wildlife habitat, and vegetation. (See Chapter 4: Statutory and Regulatory Background; Potential Mitigation Measures for Mine Development and Mining Activities, in Chapter 10; and comment/response #s 1, 12, 31 and 39)

The referenced paper by Bernhardt and Palmer, The environmental costs of mountaintop mining valley fill operations for aquatic ecosystems of the Central Appalachians, studied the environmental costs of mountain top mining and valley fill in the central Appalachians, not Alaskan coal mining. As discussed in comment/response #29, valley fills have severe negative effects on stream drainages, their hydrology, and water quality.

Comment #89
Due to the significant unavoidable hydrologic changes resulting from surface mining, “mined sites respond to rainfall more like urban watersheds, where impervious surfaces lead to high surface runoff during storms.” Bernhardt and Palmer conclude that “efforts to reclaim vegetation and restore the full diversity of plant species in mined watersheds have not proved successful to date.” Ex. 28 (Bernhardt & Palmer at 45, 53). Another study notes that SMCRA’s reclamation standards do not ensure adequate reclamation: “Poor vegetation development with time was typical of the sites reclaimed after the 1977 SMCRA law." Ex. 51, (Handel at 2).

In a study of impacts to essential fish habitat in Alaska, the National Marine Fisheries Service Alaska Region explained that, “while environmental regulations may avoid, limit, control, or offset many potential impacts, mining will, to some degree, always alter landscapes and environmental resources . . . .” Ex. 72 (NMFS at 3-1). Moreover, there will be significant impacts that will last, for all practical purposes, forever: “Although reclamation efforts and mitigation practices may restore topographic land forms to mine sites, these efforts generally fail to restore natural hydrogeomorphic and aquatic function, and associated water quantity and quality within measurable time frames . . . .” Id. at 3-3

Response
The references cited studied reclamation after mountain top removal with stream valley fills in the Appalachians. They did not study coal mine reclamation in Alaska or other parts of the western United States. Although Alaska has experienced relatively little modern surface coal mining, reclamation results have been more successful that those reported in the cited references. At the Usibelli Mine near Healy bond has been released for some areas. In order to meet the requirements for bond release the recovery of woody plant species had to meet requirements for both diversity and abundance. The bulk sampling site for the Chuitna Project, dug and reclaimed

in 1986, has largely been reclaimed by woody species, with small to medium sized trees presently on the site. (Russell Kirkham, Coal Regulatory Program Manager, personal communication)

Ex. 72, NMFS, Impacts to Essential Fish Habitat from Non-fishing Activities in Alaska, 2011, primarily reviewed the literature for mineral mining, not coal mining. The paper did not discuss coal mining or reclamation in Alaska. In fact, a word search of the paper for the Pogo, Fort Knox, Greens Creek, Kensington, and Red Dog mines found no mention of any of those mines in the text. One EPA Pogo Mine scoping document from 2000 was listed in the references. The NMFS paper did recommend several conservation measures, including:

- Minimize the effects of sedimentation on fish habitat. Use methods such as contouring, mulching, and construction of settling ponds to control sediment transport.
- Treat wastewater and recycle on site to minimize discharge to streams. Test wastewater before discharge for compliance with federal and state clean water standards.
- Minimize spillage of dirt, fuel, oil, toxic materials, and other contaminants into EFH (essential fish habitat). Prepare a spill prevention plan if appropriate.
- Restore natural contours and use native vegetation to stabilize and restore habitat function to the extent practicable. Monitor the site for an appropriate time to evaluate performance and implement corrective measures if necessary.

These recommendations are very similar to requirements under the ASCMCRA. (See Chapters 4 and 10 of this decision for details of requirements under the ASCMCRA)

Comment #90
Reclamation bonds have been found to be inadequate to handle the problem of post-mining acid or toxic mine drainage. Numerous studies have found that upwards of 80% of bond forfeitures in Kentucky did not have adequate bond to complete reclamation. (Ex. 80, Pizarchik, U.S. DOI at 2-3)

Courts may find the State responsible for reclamation in cases where bonding is inadequate. The U. S. Court of Appeals for the Fourth Circuit ruled that the West Virginia Department of Environmental Protection was liable for pollution generated by a mine operator and had to meet Clean Water Act requirements. The Preliminary Decision completely fails to consider the significant risk the state would be taking from inadequate reclamation and the high costs it would impose to the state and its citizens.

Response
The cited failures in bonding requirements are all from Appalachia. Under the ASCMCRA all disturbance activities must be bonded sufficiently to cover all reclamation costs, even in the event of forfeiture. (See Bonding, in Chapter 4 of this decision)

Comment #91
The report contains over-optimistic mitigation measures.

Response
This comment does not indicate what mitigation measures are "over-optimistic," or provide new information on which to base a reassessment of the decision. (See Response #85.)

Comment #92
The mining industry does not pay its full share of the cost of reparations for the damage done by mining.

Response
Under the ASCMCRA mine operators are fully responsible for reclamation of the mine area and any associated facilities, within or outside the permit area. The ASCMCRA provides for complete bonding to cover the total costs of reclamation should the operator fail in its obligations. Bonds are not released until reclamation is complete, and successful. (See Bonding, Performance Standards, and Permitting, in Chapter 4 of this decision; also see Potential Mitigation Measures for Mine Development and Mining Activities, in Chapter 10)

Comment #93
Coal mining will damage subsistence fishing and other subsistence activities. Subsistence Moose hunting will be harmed. I worry about the actions we take that degrade the subsistence lifestyle that has sustained people here for thousands of years. Our salmon catches are smaller, for whatever reason; our rivers are dirtier, for whatever reason; our moose, caribou, and musk ox populations are smaller, for whatever reason. Coal mining would bring benefit in the form of money. But if it further damages the resources which should be present to feed our grandchildren, then no amount of money constitutes a fair price. Coal mining is like a genie in a bottle. Once opened, there's no going back. Conversely, the coal will be there. No harm can accrue to our people or our environment by waiting another 50 or 100 years to make sure we have the right technology to prevent any harm. I'm opposed...Please don't lease any additional Alaska land to energy companies, or permit any new coal mines.

Response
This comment provides no information on which to base a reassessment of the decision.

In preparation of this final decision the DNR added a section to Chapter 6, Settlement, Access, and Use of the Canyon Creek Lease Area by the Public and Local Property Owners. From the information gathered in the preparation of that section of the decision, the Canyon Creek lease area is not heavily used for subsistence activities. Guided spring bear hunts are the heaviest use of the Canyon Creek - Dickason Mountain area.

Comment #94
The impact to the winter subsistence hunt and additional stress on depleted wildlife population during the winter due to increased access and overflights is not addressed in the Reasonable Foreseeable Effects of Leasing (RFEOL). The reduction to subsistence trapping area is not addressed at all in the RFEOL.

Response
Wildlife disturbance by aircraft is discussed in Chapter 10: Potential Measures to Avoid, Minimize, and Mitigate Negative Impacts. Trapping and hunting use is discussed in the added section to Chapter 6, Settlement, Access, and Use of the Canyon Creek Lease Area by the Public and Local Property Owners. If mining were to occur in the Canyon Creek lease area, the actual loss of habitat area would be relatively small, and should have little effect on trapping.

Comment #95
A number of commenters expressed opposition to any coal mining, either in the Canyon Creek area or in Alaska in general.

- I am opposed to all coal mining in Alaska.
- I oppose all Coal Mining in the Cook Inlet Region.
- Just say NO to more coal. Please don't corrupt this beauty by leasing to dirty energy companies, who are not capable of leaving natural places as beautiful and clean as they found it. There is no such thing as clean coal.
- No strip mining of ANY kind! Quite the short sighted unsustainable rape of our land.
- There are already three proposed coal mines in the Mat-Su Valley, enough is enough!

Response
No response necessary. These comments are declaratory statements which provided no new information on which to base a reassessment of this decision.

Comment #96
I'm a retired fisheries biologist and worked for ADF&G for 34 years. I'm familiar with the area under consideration and it would be a great disservice to the people of Alaska and those who visit the state if this mine were to be approved.

Response
No response necessary. This comment is a declaratory statement, and offers no new information on which to base a reassessment of this decision.

Comment #97
Let's start talking in the state government about making a policy to have no more destructive coal mined in Alaska. Advocate for us, or at least, I'm advocating now that you will make this a discussion, if it's not already an active discussion, at the higher levels of government.

Response
Advocating a discussion within the State government to prohibit coal mining in Alaska is beyond the scope of this decision.

Comment#98
A number of commenters expressed general support for coal leasing at Canyon Creek.

- I support the development of Alaska's natural resources, especially coal and methane for local consumption. I believe that modern technology makes our abundant coal resources the fuel of the future without sacrificing environmental concerns. Affordable and reliable energy is Alaska issue #1.

- Oil revenue is declining, developing resources such as coal is one way to overcome this energy and revenue decline.
- I support the Canyon Creek Coal Lease Sale as getting the resources available to Alaskans and to markets is essential to our economy. The prospect of developing resources such as coal across the Susitna River Drainage is a bright spot for our infrastructure. These developments must be done with the necessary permitting and with concern for the environment that will conserve and protect Alaska.
- We support diversity of the energy supply system of the Railbelt and development of the state's energy resources for the betterment of the economy and the people of Alaska. Natural resource development is a basic premise of our Statehood. The State of Alaska has a constitutional requirement to see the responsible development of its resource to help support state functions.
- The State of Alaska has a constitutional requirement to see the responsible development of its resource to help support state functions.
- While our state is rich in coal reserves, it is a very under-developed resource. The potential coal lease at Canyon Creek is an excellent step toward advancing interest in developing our state's coal resources at a higher level. Issuance of a lease is a first step to allow additional exploration in an area of known potential.
- The estimated 258 million tons of low sulfur coal, located in the Mat-Su Borough is a source of low-cost energy for Alaska and our export recipients.
- The economic impact of the lower cost energy source resulting from coal development in the Canyon Creek area will benefit our economy. If coal were used for primarily industrial or electrical generation purposes, maybe other forms of fuel would be more readily available to the consumer or for other uses.
- Considering the vast acreage of Alaska that has been sequestered in federal conservation units, Alaska needs to keep all our lands on the table for viable resource development and not follow suit with the federal government.
- I support the proposed Canyon Creek Coal lease sale. It provides an alternate energy to Natural Gas for both heat and power.
- Coal is a viable energy source and should be developed under the "all of the above" strategy advanced by President Obama and Secretary (of the Interior) Salazar.

Response
The DNR acknowledges these comments. The comments are declaratory statements which provide no new information on which to base a reassessment of this decision.

Comment #99
Big Coal has promised jobs and economic prosperity in West Virginia for a hundred years, yet the coal mining region remains one of the poorest areas of the country.

Response
Mining jobs in Alaska are generally well-paid. Because of the remote location, any coal mine would have to be large enough to support the needed infrastructure. As a comparative example, the Usibelli Coal Mine at Healy currently employs approximately 140 people to mine about 2 million tons of coal annually. According to the National Mining Association the 2011 average wage in the Alaska mining industry was $97,900. The Resource Development Council for

Alaska, Inc. gives a figure of $100,000. The 2010 average annual wage for employees in mineral mining support activities was$86,500. (DGGS Special Report No. 65, Alaska's Mineral Industry 2010). (See comment/response #108.)

Comment #100
The DNR received a number of comments to the effect that jobs created by coal exploration, development, and mining would be a welcome positive effect on the economy, and a benefit for Alaskans.

- The amount of jobs created by further exploration in this area would be an excellent boost to the long-term growth and future opportunities in our area.
- I believe you folks at DNR should go ahead with the coal lease sale at Canyon Creek. My reason is jobs, jobs, jobs in the bush. As you know the bush communities are desperate for good jobs.
- If mines were developed as a result of this lease it would provide a number of good jobs, not only directly by mines but in support industries, scientific and environmental consulting, permitting, and engineering.

Response
These comments do not provide new information on which to base a reassessment of this decision.

The potential for creation of new jobs and job related training were considered by the DNR in choosing the lease sale alternative in this decision. According to the National Mining Association the 2011 average wage in the Alaska mining industry was $97,900. The Resource Development Council for Alaska, Inc. gives a figure of $100,000.

Comment #101
The preliminary best interest finding fails to estimate even order-of-magnitude employment, taxes to the Borough, royalties to Alaska, or wages to workers. We believe the best interest finding should include this information to explain the important positive benefits to the Borough, the State, and to the people.

Response
It is beyond the scope of this decision to estimate the size of any potential mine, employment, or revenues to the State or Matanuska Susitna Borough. Although such benefits are potentially large (See comment/responses #108), Under S 38.05.035 (h) "In preparing a written finding under (e)(1) of this section, the director may not be required to speculate about possible future effects subject to future permitting that cannot reasonably be determined until the project or proposed use for which a written best interest finding is required is more specifically defined, including speculation about (1) the exact location and size of an ultimate use and related facilities;" At this time it is not possible to predict the size of any mine that might be developed in the Canyon Creek lease area, or the number of employees.

Comment #102
The ADNR should qualify its analysis by acknowledging that short term economic considerations are the main driving factors in determining public interest for a coal lease.

Response
The economic benefits to the State of Alaska and its people could be substantial (See Chapter 11 of the Decision, and comment/response # 108). A mine could operate for decades, providing tax and royalty revenues, and jobs for Alaskans. Although eventually any mine will exhaust the resource being mined, a successful coal mine could offer well-paying jobs for decades. The Usibelli Coal Mine near Healy has been in operation since 1943.

Comment #103
Taxes on coal mining are too low.

Response
Taxes and royalties levied on coal mining operations are discussed in Chapter 9 of the decision. Whether those taxes and royalties are at appropriate levels is beyond the scope of this decision. (See the discussion of AS 38.05.035 (e) and (h), above in this Appendix for the statutory requirements of a best interest finding.)

Comment #104
Royalties and other economic gains to the State and people of Alaska from coal will be small. Coal development is short signed and inadequate, and clearly not in the best interest of ALL Alaskans, but rather a few politicians or CEOs of corporations.

Response
This comment is a declaratory statement of opinion. The comment provides no new information on which to reassess this decision. Lease rental payments and royalties are direct financial benefits to Alaska and its people. In 2010 the total income to the state from coal leases, including rent and royalty, was $2,378,860 (DGGS Special Report No. 65, Alaska's Mineral Industry 2010). The amount of royalties depends directly on the amount of coal that may be mined. Royalties and rental payments are not the only potential benefits to Alaska. Among other benefits, coal development could bring well-paying jobs to the state, job related training, and increased opportunities for Alaska businesses. The Mat-Su Borough would also benefit from property taxes. (See comment/response #108.)

Comment #105
The State stands to benefit through taxes and royalties. Coal mines pay the state a 5% gross royalty, a 7% mining license tax and a 9.4% corporate income tax, as well as federal income taxes.

Response
As detailed in Chapter 9 of the decision, if a coal mine were to be developed the state would receive payments through the mining license tax, corporate income tax, and the royalty on any coal production. The Matanuska-Susitna Borough would likely receive property taxes.

Comment #106
The mining company would also be a tax paying entity into coffers of the Mat-Su Borough. The Mat-Su Borough has accepted millions in federal grants in an effort to expand its local economy,

including the development of Port MacKenzie and the Rail Expansion project which is currently underway. This is a clear indication that the Borough has a desire to see commercial industry expand within its boundaries.

Currently, the Mat-Su Regional Hospital has the largest assessed value in the Borough, at approximately $101 million. A mine that develops in the lease area will require a road, railroad, or pipeline to move product to market. The least expensive of these is a road. A preliminary estimate of the cost of a road is well over $100 million. The road alone, without considering the equipment, facilities, and rolling stock, would give a coal mine the largest assessed value in the borough. When the equipment, trucks, and worker housing are considered, it is inevitable that a mine would have a taxable value in excess of any development today in the Borough. (At today's borough tax rate, the mine would be taxed at the rural rate of 11.66 mills.)

Tax payments make funds available for Borough schools, police, and other services. In this way, every citizen of the Mat-Su Borough would benefit from mine development at the Canyon Creek location.

Response
With no mine plan yet proposed, it is not possible to speculate regarding the employment and tax revenues that a mine might provide. A coal mine would be subject to Matanuska-Susitna Borough property taxes, a royalty to the State, the mining license tax, state corporate tax, and federal income tax (See Chapter 9: Reasonably Foreseeable Effects of Leasing). Revenues to state and local government were considered by the DNR in this decision.

Comment #107
There should be a detailed, true cost-benefit analysis of the proposed coal development. One that evaluates all costs and benefits.

Response
At present there is no proposed mine, and no proposed means of transporting coal from any future mine in the proposed lease sale area. An attempt to conduct a detailed cost benefit analysis of coal development would be speculative at best. Under AS 38.05.035 (e)(1)(A) the director's written finding may address only reasonably foreseeable, significant effects of the uses proposed to be authorized by the disposal. AS 38.05.035 (h) further stipulates that the director may not be required to speculate about possible future effects subject to future permitting that cannot reasonably be determined until the project or proposed use for which a written best interest finding is required is more specifically defined, including speculation about (1) the exact location and size of an ultimate use and related facilities. Therefore, a detailed cost-benefit analysis is beyond the scope of this decision.

Comment #108
While the potential "costs" are small, the benefits of developing a mine in this region are large. The mine could, as with every other Borough in the state that contains a large mine, be the largest taxpayer in the Matanuska-Susitna Borough, increasing funds available for schools, public safety, and more. With an industry average of $100,000 annual salary, the mine could provide high-paying jobs for as many as several hundred people. Additionally, mines contribute

to our state's economy through royalties and license taxes, as well as pay federal income taxes. The Alaska Mineral Industry Report for 2010 reported 2010 coal royalties of $2.2 Million for that year. The only active coal mine in Alaska is the Usibelli Mine, at Healy. The Usibelli Coal Mine produces approximately 2 million tons of coal per year. In order to be economically viable a mine in the Canyon Creek area would produce at least the volume of coal produced from the Healy coal field, and therefore at least that level of royalties.

Response
With no mine plan yet proposed, it is not possible to speculate regarding the employment and tax revenues that a mine might provide. A coal mine would be subject to Matanuska-Susitna Borough property taxes, a 5% gross royalty to the State , the mining license tax (7% on net income above $100,000), state corporate tax (9.4% on net income above $90,000), and federal income tax (See Statewide and Local Fiscal Effects, in Chapter 9 for details). Because of the remote location, any coal mine would have to be large enough to support the needed infrastructure. As a comparative example, the Usibelli Coal Mine at Healy currently employs approximately 140 people to mine about 2 million tons of coal annually. According to the National Mining Association the 2011 average wage in the Alaska mining industry was $97,900. The Resource Development Council for Alaska, Inc. gives a figure of $100,000.

Comment #109
The report contains over-optimistic economic cost impacts to the State and local communities.

Response
This comment is a declaratory statement. It does not detail what "cost impacts" are over-optimistic, and gives the DNR no basis or information on which to reassess this decision.

Comment #110
DNR fails to consider climate change in its analysis of potential costs and benefits to the sale of the Canyon Creek coal lease area. Assuming 100 million tons of Canyon Creek coal are ultimately burned, it would produce approximately 360 million tons of CO2 emissions to drive climate change. These emissions are 0.006% of the CO2 emissions from the beginning of the industrial revolution to estimates for 2100 (A1B emissions scenario: IPCC 20011, available at http://www.ipcc.ch/ipccreports/tar/wg2/index.php?idp=154 and http://sres.ciesin.org/final_data.html).

Impacts to Alaska from climate change are projected to be very large, so even the modest portion of the impact due to Canyon Creek coal would be responsible for would have substantial costs. By 2100, over $7 billion in costs to public infrastructure in Alaska are expected as a result of climate change (Larsen et al., 2008), and Canyon Creek would bear over $400,000 in responsibility for this. Alaska's multibillion-dollar-a-year fisheries have a lot more to lose, with many critical stocks in danger of massive declines due to climate change (e.g., salmon – Abudul-Aziz et al., 2011) by 2100. Losses related to fisheries could exceed $50 billion by 2100, putting nearly $3 million in economic impact on Canyon Creek's shoulders.

Additional economic costs from extreme weather disasters, ecological disruption impacting hunting, management of displaced coastal populations, and loss of glaciers as water reservoirs

have not been quantified to our knowledge, but doubtless add to these costs. Intangible cultural and aesthetic costs add further impacts. These estimates extend only to 2100, and negative impacts of climate change are likely to continue beyond this time, when the benefits of Canyon Creek will be long forgotten.

Response
Estimating the effects of climate change on the proposed lease area would be very speculative, and beyond the scope of this decision. (See the discussion of AS 38.05.035 (e) and (h), above in this Appendix for the statutory requirements of a best interest finding.) The mining of coal is an activity that can be authorized and permitted per state policy and state statutes and regulations. Since global climate change is beyond the scope of the decision, any cost benefit analysis of the effects of climate change is also beyond the scope of the decision. (See Climate Change, in Chapter 8. Also see comment/response #s 53 and 57)

Comment #111
Department of Labor statistics show that the mining industry in Alaska employs high percentages of nonresident workers compared to other industries. Ex. 10 (Alaska Department of Labor and Workforce Development 2010 at 3-4). In 2010, the mining industry, exclusive of oil and gas workers and employees in oilfield services, had a nonresident rate of employment of 30.7%, id. at 3, significantly higher than the statewide rate of 19.6%. Id. at 1. Because "[h]igh nonresident hire has typically been found in . . . [jobs at remote worksites," it is likely that the remote location of the proposed Canyon Creek coal mine would employ even more than the statewide average of 30.7% for mining. Ex. 11 (Alaska Department of Labor and Workforce Development 2008 at 7); see also Ex. 10 (Alaska Department of Labor and Workforce Development 2010 at 4, 21). Given these statistics and DNR's various suggestions of how the jobs would be filled, DNR cannot count with any certainty among the lease sale's benefits that unemployment would decrease in the state or region, that residents of Tyonek and Beluga would be able to take advantage of any of these job opportunities, nor that the lessee would institute training programs for Alaskan residents before hiring nonresidents.

Response
Close to 70% of employees in the Alaska mining industry are residents of the state. From Ex. 10 p.3-4, in 2010 nonresident employment in the mining industry was similar to that in the oil and gas industry, which was 30.6%.

The DNR encourages exploration and mining operations to hire Alaskans, but DNR cannot require companies to do so. Some remote mining camps have higher nonresident employment (Pogo Gold Mine, approximately 60% Alaska hire), others have made concerted efforts to boost resident employment opportunities. The Donlin gold project has consistently hired over 85% Alaskans (http://www.donlingold.com/employees). At times, the Donlin project has hired over 90% Alaska Natives (http://www.donlingold.com/about-us). In 2010, 80 percent of Pebble Limited Partnership's workers were Alaskans. Forty-four percent of all workers lived within the Southwest Alaska region, including the communities of Iliamna, Newhalen, Kokhanok, Togiak, and others located elsewhere in the Lake & Peninsula and Bristol Bay boroughs (http://www.alaskaminers.org/mcd11rpt.pdf).

Employment at the Usibelli Coal Mine and Fort Knox Gold Mine are both 100% Alaska residents. From the Alaska Miners Association website, " Newer mines (such as Kensington and Pogo) or mines with recent workforce expansion (i.e., Greens Creek) have comparatively higher non-resident participation because the lack of skilled in-state miners requires that they draw skilled workers from outside the state." However, these mines do have majority Alaskan workforces, including many workers from rural Alaskan communities where employment may be difficult to find. "While most of Greens Creek Mine Alaska employees reside in Juneau, other Alaska employees live in other rural communities, including Angoon, Coffman Cove, Craig, Gustavus, and Hoonah. Along with Greens Creek employee locales, Kensington Mine also employs people from Kake, Angoon, and Metlakatla." From the Department of Commerce, Community and Economic Development Alaska Community Database (2011), the Red Dog Mine in northwest Alaska currently employs over 60% NANA shareholders, who receive wages exceeding $15 million annually.

Comment #112
Studies conducted on the impact of coal on the state budgets of Kentucky, Pennsylvania, West Virginia, and Tennessee found that the coal industry "actually costs more than it brings to the state." Ex. 63 (Konty, Impact of coal on KY at 2); see also Ex. 118 (McIlmoil, Impact of coal on PA at 2); Ex. 68 (McIlmoil, Impact of coal on WV state budget at x, 58-59); Ex. 67 (McIlmoil, Impact of coal on TN at viii).

Response
In 2010 the Mountain Association for Community Economic Development produced The Impact of Coal on the Kentucky State Budget, by Konty and Bailey Ex. 63. Following that publication McIlmoil et al. published a sequence of very similar studies for Pennsylvania, West Virginia, and Tennessee. Briefly, all of these studies compare all state revenues from coal mining, coal workers, and from workers in supporting industries such as equipment suppliers, with total state expenditures to the coal industry, and to coal workers and their families as well as workers and families in support industries. State expenditures to workers and their families were calculated based on coal employment as a proportion of total state employment. That proportion was multiplied by total state expenditures less coal industry expenditures. These expenditures include state programs such as schools, roads, and other services. The studies are flawed in a number of ways:

- There is no direct link to actual expenditures for coal workers or workers in related industries. Well paid coal workers may receive fewer state benefits such as school lunch programs or subsidized health care.
- At least in West Virginia, corporate net income tax and business franchise tax revenues are not reported by industry, therefore, the McIlmoil study estimated those state revenues based on the industry's share of total state gross domestic product.
- The services that the states provide to coal companies, workers, and their families are similar to those provided to other industries and their workers, yet there is no comparison of the coal industry with other industries.
- Although these studies account taxes and state expenditures for workers in supporting industries, they do not account for the revenues those supporting industries pay into state coffers.

- The studies do not address the fate of all the concerned workers if the coal industry did not exist in the various states. Those workers and their families, if they still lived in the state, would still receive state benefits. How many of those workers might be unemployed or employed in lower paying jobs, thus paying less in state and local taxes?

Mining companies in Alaska pay the corporate tax, the mining license tax, and in the case of coal mines, the coal royalty (See Statewide and Local Fiscal Effects, in Chapter 9 of this decision). The mining license tax and coal royalty are not required of other industries in Alaska. According to the National Mining Association the 2011 average wage in the Alaska mining industry was $97,900, well above average wages for the state. (See comment/response #108)

Comment #113
There are many administrative burdens on the State due to coal development. Under ASCMCRA, the burden of reviewing proposed plans and studies, processing permit applications, conducting extensive inspections, and otherwise ensuring compliance with all regulations under ASCMCRA falls on DNR. Other state agencies issue permits as well. Because these regulatory obligations are dictated by law, these and other administrative expenses related to carrying out those duties are reasonably foreseeable and must be analyzed pursuant to 11 AAC §§ 85.200(b)(6) and (b)(7).

Response
An analysis of the costs of monitoring, enforcement, and environmental studies is only meaningful in the context of an overall cost-benefit analysis of a specific coal mining project. Since there is no mine plan available at this time, such an analysis is not possible, and is beyond the scope of review of this best interest finding. Fifty percent of the funding for the Coal Regulatory Program is supplied by the federal Office of Surface Mining.

Comment #114
The State has not made the case that the coal leases will be in the best interest of AK. The State has no figures on what the fish income loss will be at Canyon Creek, so it cannot be said that the income from a few short-term jobs in mining or the low tax revenue will be more than what will be lost. Coal mining may create jobs, but it could/would also eliminate jobs that are supported by salmon runs, such as tourism and fishing. Job losses would affect lodges, guides, outfitters, and air taxi operators. The State of Alaska should consider other, more diverse and sustainable uses of the land, such as subsistence, fishing, hunting, and outdoor recreation.

We need to invest in sustainable businesses that will serve our community for the long term. Coal jobs are short term, and result in a boom and bust economy. Selling more land to coal mining just means instant profit for a few wealthy people, and some extra work for a few people who will be out of work when it is mined out. Coal is an unsustainable business and energy source that does not serve our community. Coal mining in the Susitna Valley is greedy, and for the profit of a few at the expense of the people of Alaska. Please think of the beauty of Alaska first, before the almighty dollar.

Response
It is beyond the scope of this decision to perform a detailed cost-benefit analysis of potential coal development in the Canyon Creek area. (See comment/response #107 and discussion of AS 38.05.035 (e) and (h), above in this Appendix for the statutory requirements of a best interest finding.)

The State of Alaska manages state lands for multiple uses. Management objectives include hunting, fishing, subsistence, and recreation. State objectives also include various types of development, including mining, timber, oil and gas development, coal, and other industries where appropriate. The DNR cannot guarantee there will be no impacts from coal development and mining. The ACMCRA and regulatory programs administered by other agencies provide protections for fish and wildlife, their habitats, and waters. The intent of the reclamation plan and bonding is to minimize adverse impacts. The Departments of Natural Resources and Fish and Game evaluate potential impacts to fish and wildlife, habitat, and water bodies. If the impact is deemed too great, then mining will not be permitted. The ASCMCRA and actions by other regulatory agencies provide protections for water quality and quantity, hydrologic balance, fish and wildlife habitat, and vegetation. (See comment/response #s 1, 12, 39, and 51; and Settlement, Access, and Use of the Canyon Creek Lease Area by the Public and Local Property Owners, in Chapter 6.)

If a lease sale does go forward it is uncertain whether a mine will ever be developed at the Canyon Creek lease area, or what the size and employment of any mine might be. The economic benefits to the State of Alaska and its people could be substantial (See Chapter 11 of the Decision, and comment/response # 108). For 2011 annual mining wages in Alaska averaged $97,900, much higher than the $48,202 median for the State as a whole (National Mining Association and Federal Reserve Bank of St. Louis, http://research.stlouisfed.org/fred2/categories/27281). Mine development could also be beneficial to area businesses. Finally, the combined benefits of lease bonus payments, rental payments, mining license tax, coal royalty, and corporate income tax, plus property taxes to the Matanuska Susitna Borough could be substantial to both the State and the Borough. Although eventually any mine will exhaust the resource being mined, a successful coal mine could offer well-paying jobs for decades. The Usibelli Coal Mine near Healy has been in operation since 1943. Also see Statewide and Local Fiscal Effects, in Chapter 9 of this decision.

Potential degradation of aesthetic/wilderness values is discussed in comment/Response #11, and Aesthetic Effects of Future Coal Mining, in Chapter 9 of this decision. Also see Appendix C: Viewshed Analysis of the Canyon Creek Coal Lease Area.

Comment #115
Surface coal mining will jeopardize the future of tourism in Alaska. An open pit coal mine would destroy the aesthetic value of the area and thereby the fishing lodges. Damage to aesthetic values cannot be mitigated.

Response
The proposed lease area is remote, and it not visible from most nearby locations on the ground. A mine and related facilities would be visible from the air above about 2,000 feet, and noise

from the mine might be heard for some distance. (See Aesthetic Effects of Future Coal Mining, Chapter 9 of this decision, and Appendix C: Viewshed Analysis of the Canyon Creek Coal Lease Area. Also see comment/response #77, and Settlement, Access, and Use of the Canyon Creek Lease Area by the Public and Local Property Owners in Chapter 6 of the decision for a discussion of current uses of the lease area, including commercial uses.)

Public access might or might not be enhanced by coal transportation facilities, depending on the type of facilities and whether the public were allowed to use them. Increased access would be viewed as a positive result by much, but not all of the public. Associated transportation facilities, depending on the nature of those facilities, would be a visible piece of infrastructure. A mine and most associated facilities would be removed after mining.

Comment #116
The renewable resource of fish/salmon is more important than the small, short-term gains of coal development. The profits from coal mining mainly leave the state. The benefits of wild salmon runs accrue to Alaskans.

Response
This comment is a declaratory statement of values. There is no intent to trade off one resource for another. The ASCMCRA and Coal Regulatory Program, as well as other permitting agencies such as DEC (APDES and SWPPP permits) and the ACOE provide protection of fisheries and fish habitat. (See comment/response # 1.)

A mine would provide jobs and work training that could be useful in future work pursuits. Because of the remote location, any coal mine would have to be large enough to support the needed infrastructure. As a comparative example, the Usibelli Coal Mine at Healy currently employs approximately 140 people to mine about 2 million tons of coal annually. According to the National Mining Association the 2011 average wage in the Alaska mining industry was $97,900. The Resource Development Council for Alaska, Inc. gives a figure of $100,000. Other potential benefits to Alaskans include: training opportunities, increased trade for existing businesses and new business opportunities, environmental studies and the possible discovery of cultural and historic sites, and revenue to state and local government.

Comment #117
Alaskans do not benefit from coal production.

Response
This comment is a declaratory statement that does not provide new information as a basis to reassess this decision. The decision lists a number of potential benefits to the people of Alaska, including: employment opportunities, training opportunities, increased trade for existing businesses and new business opportunities, environmental studies and the possible discovery of cultural and historic sites, and revenue to state and local government. (See Chapter 9: Reasonably Foreseeable Effects of Leasing. Also, see comment/response #s 106, and 108.)

Comment #118
This lease sale is being proposed at a time when coal is losing its market everywhere. Just ask the CEO of Alpha Resources, who readily states that they are in trouble because coal has no markets. Add to that the fact that the Marcellus and other shale gas deposits have made gas extremely available and inexpensive, not to mention less polluting, and are replacing coal everywhere, and putting any eggs in coal basket is like investing in buggy whips as the automobile takes over the world.

Response
Any assessment of the viability of coal markets is beyond the scope of this decision. If a future lessee is unable to secure an adequate market, they will be unable to develop a mine.

Comment #119
My concern is transportation into the Canyon Creek area. Road construction with public access simply destroys the wilderness setting, and stresses game and fish populations. Increased access may lead to damage by off road vehicles. I think access into this area for exploration should be by winter ice road or by air. I know there has been much exploration in the past all through this area using helicopters and portable drill rigs... There are drill rigs, barrels, pipes, hoses, in many areas. I'm not against mining. Open pit mines have their place which might be located near tide waters or existing transportation corridors. I am hoping that bridges over the Talachulitna River recreation corridor might be avoided, even though allowed by the state planning in this area.

Response
Chapter 7 of the best interest finding briefly discusses possible routes and modes of coal transportation. Since no mine plan or transportation have been proposed it is speculative to discuss coal transportation in any detail at this time. Transportation could occur over a variety of routes, and by any of several means of transport, as discussed in Chapter 7. Each of these permutations would have different effects on the surrounding area. The ASCMCRA provides protection for fish and wildlife and habitat. (See Chapters 4 and 10 of the best interest finding and comment/response #s 1, 11, 22, 39, and 119)

Mining operations and associated transportation facilities would have some effect on aesthetic qualities. (See Aesthetic Effects of Future Coal Mining, Chapter 9 of this decision; and Appendix C: Viewshed Analysis of the Canyon Creek Coal Lease Area) The extent of these effects would depend on the chosen route and mode of transport. For example, a buried slurry pipeline would have less aesthetic impact than a railroad. Public access might or might not be enhanced by coal transportation facilities, depending on the type of facilities and whether the public were allowed to use them. Increased access would be viewed as a positive result by much of the public, but not by all residents and users of the Canyon Creek-Shell Lake area (See comment/response #79). However, there could be adverse consequences as well due to increased use of the area for recreational activities, improper use of off-road vehicles, etc.

Under AS 27.21.998, Definitions, "surface coal mining operations" means, in part, an activity conducted on the surface of land in connection with a surface coal mine or, to the extent that the activity affects the surface of land, conducted in connection with an underground coal mine.

This definition extends the protections of the ASCMCRA beyond the boundaries of any coal permit or lease to adjacent land. AS 27.21.998 is supported by the regulations at 11 AAC 90.151 Facilities Outside Permit Area, which requires a permit for all roads, transportation, support facilities and utility installations included in 11 AAC 90.491, whether or not these facilities are outside the permit area of any particular mine. These facilities must comply with all performance standards of 11 AAC 90 determined to be applicable by the commissioner and must comply with the appropriate bonding provisions of 11 AAC 90.201 - 11 AAC 90.207. Regulation 11 AAC 90.491 includes the following facilities: roads, railroad loops, spurs, sidings, surface conveyor systems, chutes, aerial tramways, airfields, ports, docks, or other transportation facilities, mine buildings, coal loading facilities at or near the minesite, coal storage facilities, storage facilities, fan buildings, hoist buildings, preparation plants, sheds, shops, and other support facilities.

The Talachulitna River is one of six state recreation rivers within the Susitna Basin established by the Recreation Rivers Act (AS 41.23.400-AS 41.23.510) and managed under the Susitna Basin Recreation Rivers Management Plan. The Recreation Rivers Act provides for the management, protection, and maintenance of the fish ad wildlife populations and habitat on a sustained-yield basis. AS 41.23.410 provides for a range of activities within a recreation river corridor when the activity is compatible with AS 41.23.400 and consistent with a management plan adopted under AS 41.23.440. The allowed activities include mining and mineral development. The management plan allows for bridges as long as they are constructed consistent with the Upland Access guidelines provided in the management plan. (See Susitna Basin Recreation Rivers Management Plan, in Chapter 2; and; and Designated Habitat Areas, in Chapter 5 of this decision)

Comment #120
From Cook Inlet, coal destined for Asia would likely be shipped along the North Pacific Great Circle Route which boarders the Aleutian Islands chain. Ex. 76 (NRC, Transportation Research Board at vii). The chain, which overlaps with the Alaska Maritime National Wildlife Refuge, is considered one of the most important marine ecosystems in the world. Id. at 21. The Refuge provides essential habitat for over 40 million seabirds, representing more than 30 different species. Ex. 117 (Alaska Maritime National Wildlife Refuge). The region is also critical feeding, breeding, and/or rearing habitat for large number of marine mammals, including endangered Steller sea lions and northern sea otters, declining northern fur seals, and several species of whales. Ex. 76 (NRC, Transportation Research Board at 60-61).

A coal spill from a bulk carrier could discharge large amounts of coal into the marine environment with potential adverse effects on marine sediment and organisms. Ex. 70 (Ahrens & Morrisey at 69).

In addition to cargo, bulk coal carriers also carry large volumes of heavy fuels which, if spilled, can have serious adverse effects on the region's birds and other marine life. Ocean vessels burn fuel oil, thus creating air pollution. Any bulk carriers servicing Upper Cook Inlet and Canyon Creek would increase pollution in airsheds in or near the Lake Clark National and Katmai National Parks and the Kodiak, Izembek, Bacharof, and Alaska Maritime National Wildlife Refuges, where heightened Clean Air Act protections apply.

Response
Under 11 AAC 90.155 and 11 AAC 90.491 the state Coal Regulatory Program bears regulatory responsibility for all facilities up to the point where coal is sold or placed on a public mode of transportation. Once coal is loaded onto at seagoing ship it is out of the regulatory jurisdiction of the ASCMCRA. Coal transport vessels would face the same risks and safety regulations/responsibilities as the many other ships in the Aleutian region.

Comment #121
Transportation facilities (roads, railroads) will bisect wetlands, cross rivers, and further expand habitat impacts to important species like salmon, moose, and migratory birds.

Response
All facilities must comply with all performance standards of this 11 AAC 90 determined to be applicable by the commissioner and must comply with the appropriate bonding provisions of 11 AAC 90.201 - 11 AAC 90.207. 11 AAC 90.151 requires a permit for all roads, transportation, support facilities and utility installations included in 11 AAC 90.491, whether or not these facilities are outside the permit area of any particular mine.

A transportation route would likely cross one of the six state recreation rivers established by the Recreation Rivers Act (AS 41.23.400-AS 41.23.510). The Recreation Rivers Act provides for the management, protection, and maintenance of the fish and wildlife populations and habitat for six rivers in the greater Susitna River drainage on a sustained yield basis. (See Susitna Basin Recreation Rivers Management Plan, in Chapter 2; and; and Designated Habitat Areas, in Chapter 5 of this decision. Also see comment/response #22)

Comment #122
There will be no cost effective, environmentally safe, nor practical process to get the coal to market from this location. All transportation routes (any form) will quickly encounter the Skwentna River to the North, the Talachulitna River to the East and numerous creeks and rivers to a Southern route (Friday, Saturday, Coal Creek, Beluga River, etc...) This fact of impossible logistics in transportation must be considered prior to lease sales. Once "exploration" rights are allowed through the lease sale, <u>permanent lands damage will occur, adjacent private property (mine) will devalue, and best benefits of surrounding State lands will be lost</u>. It is disingenuous to proceed with a package lease sale with the knowledge that no minerals will ever leave this site in any significant quantity. *It is impossible to get extracted coal to market!!* Selling leases with any other expectation is irresponsible to potential buyers and the citizens of Alaska.

Response
This comment is a declaratory statement of opinion. See comment/response #119.

Comment #123
Developing transportation infrastructure to the proposed lease area would be expensive, and the costs are difficult to determine. Whether a potential coal project could overcome these economic barriers is difficult to determine.

Response
It is beyond the scope of this decision to speculate about the cost of future coal transportation routes and modes of transport. (See the discussion of AS 38.05.035 (e) and (h), above in this Appendix) Transportation infrastructure costs cannot be accurately estimated at this time. (See Chapter 7: Transportation)

Any future operator will have to evaluate the economics of the mine and transportation project. *Costs of environmental protection, reclamation, and bonding will necessarily be a part of that analysis*. If the operator is unable to develop an economically viable mine plan that satisfies all permitting requirements and is economically feasible, then mining will not occur.

Comment #124
How does the lessee propose to transport coal out of the Canyon Creek area? Who will be responsible for providing a road/waterway for that? Will the coal be removed via ice-road? Does CanAm really know how remote the leases will be?

Response
The mine operator would be responsible for paying for infrastructure to transport coal. However, the Alaska Industrial Development and Export Authority (AIDEA) could be involved. The AIDEA is a public corporation of the State of Alaska, created in 1967 by the Alaska legislature to promote economic development through various forms of funding industrial projects. The lessee could arrange funding and construction through the AIDEA similar to the Delong Mountain Transportation System (DMTS) at the Red Dog lead-zinc mine in northwestern Alaska. (See Truck Road, in Chapter 7 of this decision, and see comment/response #119.)

Comment #125
These impacts result from not only the mining but the transport of coal. "People in mining communities report that road hazards and dust levels are intense. In many cases dust is so thick that it coats the skin, and the walls and furniture in homes. This dust presents an additional burden in terms of respiratory and cardiovascular disease . . . ." Ex. 45 (Epstein, et al. at 84)

Response
The reference cited is referring to coal mining communities in West Virginia. The Canyon Creek lease area is not located within or near any communities.

Under the ASCMCRA, 11 AAC 90.421 regulates dust control and stipulates that the mining operation must comply with all state and federal air quality laws and regulations. Required fugitive dust control measures are to be an integral part of operations. 11 AAC 90.151 (a)(4) provides that all applications must contain plans for monitoring air quality. In addition to the regulations under ASCMCRA, the DEC issues the Prevention of Significant Deterioration (PSD) permit, which is based on national air quality standards which the State of Alaska has adopted. (See Air Quality Protection, Chapter 10 for discussion of the National Ambient Air Quality Standards)

Comment #126
The coal slurry pipeline presents numerous environmental problems: use of groundwater that may lower the water table, proper treatment and disposal of contaminated water, the potential effects of a warm pipeline on surrounding vegetation and wildlife during winter months, and the failures of other coal pipelines used in the United States. Preliminary Decision at 109-11; Ex. 77 (NRDC at 10-11). By lifting the discussion of the Black Mesa pipeline ruptures from a 1983 report, the Preliminary Decision substantially understates the number and magnitude of coal slurry pipeline spills. Compare Preliminary Decision at 110 with Ex. 39 (Cox at 9). A more recent report indicates that the Black Mesa coal slurry pipeline failed 31 times in its 35 years of operation, five of which spilled approximately 565 cubic yards, or about 38 dump truck loads each. Ex. 96 (Black Mesa FEIS Appendix A-2, A-2-14 - 15). The Black Mesa Pipeline was left in place, prompting landowners to petition local government to remove the pipeline because it is falling apart, and has no viable use.

Response
At this time no mine plan or plan of coal transport has been proposed. It is beyond the scope of the decision to speculate about currently unforeseeable effects of coal transportation. However, Chapter 7, Coal Transportation, does briefly discuss several possible methods of transport, one of which is a coal slurry pipeline. See Chapter 7 for a brief discussion of water sources, water treatment, and other potential effects.

The Black Mesa Pipeline was designed in the late 1960s; pipeline design has advanced considerably since that time. For example, since there was no operating history for long-distance coal slurry pipelines ah that time, the designers did not have historical data on which to base their corrosion allowance. Much has been learned about preventing corrosion since the 1960s. (See Ex. 96, Black Mesa FEIS Appendix A-2-13, 14) The average leak from the Black Mesa Pipeline was 100 cubic yards. From the FEIS at A-2-15, "a coal slurry leak results in the release of fresh water and *inert, nontoxic* coal. The water tends to immediately soak into the ground and the coal remains on the surface." (emphasis added) Cook Inlet coals contain low concentrations of sulfur and trace metals, so toxicity would be low. Also, if the pipeline were underground (the most likely case; see Chapter 7), the extent of leakage would be minimal because it would not permeate the surrounding ground easily.

Under the ASCMCRA any coal slurry pipeline would have to be removed after cessation of operations, and the route reclaimed.

Comment #127
Two of the proposed technologies are unproven in this situation: a conveyor system longer than 3.5 km has never been built, Preliminary Decision at 108, and no coal log pipeline has “ever operated commercially,” Preliminary Decision at 111.

Continuous heavy truck traffic would likely impact resources such as moose in the area. Railroad transport of coal is well known to cause serious effects due to the large amounts of coal dust that escape from rail cars. Ex. 43 (dePlace, Sightline Institute at 3-4). Coal transport by rail or road also risks coal spills into lakes and streams along the transportation corridor. Unburned coal can contain various toxins, including hydrophobic organic compounds (HOCs), such as

polycyclic aromatic hydrocarbons (PAHs), as well as "trace metals/metalloids." Ex. 70 (Ahrens & Morrisey at 69); Ex. 1 (Achten, et al.). Coal can also be spilt at loading and unloading facilities, which can result in contamination of marine and estuarine systems. Ex. 70 (Ahrens & Morrisey at 69).

Wind and water can also cause coal stockpiles at port facilities to erode and release coal particles into the environment. Ex. 1 (Achten, et al.); Ex. 70 (Ahrens & Morrisey at 69). In 2010, the Alaska Department of Environmental Compliance fined the Alaska Railroad Corporation and Aurora Energy Services, LLC and required installation of new mitigation systems to control coal dust that was violating air quality standards in Seward. Ex. 116 (Zemach, Seward City News). The DNR must address potential impacts of pollution caused by these modes of coal transport, as well as substantial effects caused by construction and operation of these transportation facilities.

Response
There is presently no proposed mine plan or coal transportation plan. It is beyond the scope of this decision and the statutory requirements of AS 38.05.035 to speculate on unforeseeable details of any possible future transportation routes or methods. Possible coal transportation routes and methods are discussed briefly in Chapter 7: Coal Transportation.

Comment #128
The proposed Canyon Creek coal lease would not be in Alaska's best interests.

Response
The DNR concludes otherwise, as explained in the decision.

Comment #129
The Preliminary Decision argues that despite the lack of information and the long term encumbrance placed on the State, the benefits of jobs and revenue will outweigh any adverse effects.

Response
The preliminary decision was based on extensive information already available regarding the area. (See Chapters 2, 3, 5, 6, 8, 9, and 10) Further, the DNR has concluded that a lease sale is in the best interest of the state, as explained in Chapter 11: Discussion and Final Finding and Decision.

Comment #130
I have reviewed the Preliminary Best Interest Finding and conclude that the benefits of exploration far exceed any risks to either the physical or social environment of the respective area.

Response
This comment does not provide new information on which to base a reassessment of the decision.

Comment #131
Big corporations see only the natural resource, and not the livelihood and overall health of the community in and around that resource. This livelihood and all mining impacts should be taken into serious consideration.

Response
This comment offers no new information on which to base a reassessment of this decision. The scope of review for a written decision under AS 38.05.035 (e) is discussed above in this appendix, and in Chapter 4. In preparing this written decision the DNR has made every effort to incorporate available information and consider the interests of the various stakeholders.

Comment #132
With all the proposed coal mines in Alaska right now, most of which are incredibly contentious, DNR should to wait to make the Canyon Creek coal lease sale. The public needs more time to learn about impacts to watersheds, fish populations, and historic landmarks like the Iditarod Trail.

Response
There is no requirement to wait an unspecified period of time for future information to come available. (See the discussion of AS 38.05.035 (e) and (h), above in this Appendix.)

Comment #133
ADNR's decision not to update the land use plan set the tone of what priority seems to be coming from ADNR (mining above all other uses). If ADNR wants to live by the old land use plan over the objection of the MSB and the normal use life of land plans, then we the public will fight that in alliance with the borough.

Response
The current Susitna Matanuska Area Plan was signed on August 11, 2011. That plan replaced the 1985 Susitna Area Plan. The Susitna Matanuska Area Plan is the operational plan under which this decision has been written. (See Planning and Classification, in Chapter 2 of the Decision.)

The original 1985 Susitna Area Plan generally recognized coal exploration and development as appropriate to the area. "Recognized exploration methods for locatable minerals will be allowed on all state lands unless specifically closed to prospecting and will be subject to the conditions of a land use permit." "Prospecting for coal may be permitted adjacent to anadromous fish streams (other than those protected in specific corridors); however, if a lease is given, the Department reserves the right to restrict surface entry where it determines the surface values are significant enough to warrant such a restriction. Decisions on surface entry for coal adjacent to streams will be made in consultation with the affected agencies." (Page 42)

Comment #134
Thousands of families live within miles of the three proposed mines spanning 20,000 acres of the Matanuska Valley, and will be disturbed by the constant blasting, toxic coal dust, and hundreds of trucks that will congest roads. They have already started to see the negative economic impacts

with banks denying home loans. Coal dust is horrible! I just picked up a brand new travel trailer from a barge in Seward. The trailer sat in Seward for only a few days and it is covered with nasty coal dust.

Response
This comment provides no additional information or data on which to base a reassessment of the decision.

Comment #135
The planet can no longer sustain these decimating environmental assaults without dire consequences as evidenced by the increasing incidents and destructive power of natural disasters occurring throughout the world. It is long overdue for paying heed to their ominous warnings! Keep Alaska Wild. Pristine lands are at a premium so conservation must be preserved for future generations.

Response
This comment is a declaratory statement which provides no additional information or data on which to base a reassessment of the decision.

Comment #136
It is time to wake up and stop burning fossil fuels; we should be good stewards to our Earth. Working together we will find a clean alternative.

Response
This comment provides no new information on which to base a reassessment of the decision.

Comment #137
Lands in the public common should not be used for the financial benefit of the very few, particularly when wild stocks of salmon are at risk of being endangered.

Response
This comment is a statement of opinion, and provides no new information on which to reassess this decision. (See comment/response #s 1, and 39)

Comment #138 – CREDO Action submitted this comment signed by 347 individual commenters.
As an Alaskan, I'm opposed to the Canyon Creek coal lease. Allowing coal mining in this sensitive area would fuel climate change, pollute our air and water and threaten bald eagle, salmon, and trout populations. Please don't lease any additional Alaska land to dirty energy companies.

Response
This comment is a declaratory statement which offers no new information on which to base a reassessment of this decision. Regarding the specific issues listed in the comment, see the following comment/responses: climate change - comment/response # 53; air quality - comment/response #44; water quality - comment/response # 39; bald eagles - comment/response

48; salmon - comment/response #1; and trout and other fish and wildlife - comment/response #17.

Comment #139 – This comment was submitted as a petition by Alaska Center for the Environment, and signed by 85 individuals.
Comment expressed concern about climate change, ocean acidification, and the impacts of coal extraction on small communities. The Canyon Creek lease sale would impact salmon and threaten our Alaskan way of life. For these reasons, the lease sale is not in the best interest of all Alaskans, and shouldn't move forward.

Response
This comment is a statement of concern, and does not present any new data on which to base a reassessment of this decision. The comment does not specify how coal development might impact small communities, or threaten our "Alaskan way of life." Estimating the effects of climate change and ocean acidification from the proposed lease area would be very speculative, and beyond the scope of this decision. See comment/response #s 53, and 60. For impacts to salmon see comment/response #1. Also see Settlement, Access, and Use of the Canyon Creek Lease Area by the Public and Local Property Owners, in Chapter 6.

Comment #140
Coal is a domestic energy source and is not subject to actions of terrorists or foreign governments.

Response
This comment is a declaratory statement which does not provide new information on which to base a reassessment of the decision. Consideration of possible actions by terrorists or foreign governments is beyond the scope of this decision.

Comment #141
In order to assess impacts, what similar coal mining projects were evaluated?

Response
No specific coal mines were evaluated for this preliminary decision. However, the performance standards of the Alaska Surface Coal Mining Control and Reclamation Act, developed under the auspices of the federal Office of Surface Mining Reclamation and Enforcement and the Surface Mining Control and Reclamation Act address the potential impacts of the range of coal mining activities. (See Chapters 4 and 10 of this decision.)

Comment#142
What would "kill" this project?

Response
A decision that holding a competitive lease sale is not in the best interest of the State of Alaska would stop the sale. A future mining project would not be permitted if the project were unable to satisfy any of the performance standards under AS 27.21 and 11 AAC 90, or any other state or federal agency permitting requirements.

Comment #143
Who will determine the feasibility of this project?

Response
The project must meet all permitting requirements under AS 27.21 and 11 AAC 90, as well as other permitting government agencies, such as the USACE, ADEC, ADF&G, and EPA. From a financial perspective, the feasibility will be determined by the lessee attempting to mine coal.

Comment #144
What is the motivation of the project's proponents?

Response
Whoever wins a competitive lease sale will be motivated by the possibility of developing an economically viable coal mine.

Comment #145
Have the agency officials involved in deciding whether to grant leasing been to this site in person? Are they available to be interviewed?

Response
Agency personnel have been to the site.

Comment #146
This action is a lease sale only, and is not an approval for mining. Also, this proposed lease is for leasing ground that has been leased in the past.

Response
See Chapters 4 and 10 for discussion of future permitting for exploration and mining. Mobil Oil Corporation held coal leases for the Canyon Creek area from 1977 through 1989.

Comment #147
Access to the Alaska Railroad would allow energy from this area to be used to generate electricity in the state and allow it to be shipped to either the Port of Seward or the port at Point MacKenzie.

Response
No response necessary.

Comment #148
Commenters oppose the lease of Alaska land to all international corporations, particularly China. They oppose any project that allows for the shipping of our energy sources to be exported to China to compete with Alaska and the US.

Response
This comment is beyond DNR's scope of review for the proposed lease sale.

Comment #149
Since this coal would largely be to power foreign economies, there isn't even a domestic power angle that could make a case for the negative consequences of development.

Response
This comment offers no new information on which to base a reassessment of this decision.

Comment #150
Might the Canyon Creek coal be developed as a coal gasification project?

Response
It is unlikely that coal from Canyon Creek would be used in a coal gasification facility. The coal seams at Canyon Creek are generally too shallow for environmentally safe underground coal gasification (UCG). For UCG the coal should be well below the water table, at depths of at least 500 feet. Depths of 1,000 feet or more are preferable. Coals identified in the Canyon Creek area are generally less than 400 feet, though deeper coal may exist in the formation.

Capital costs for constructing a surface coal gasification require large volumes of gas to be produced in order to be economically viable. Aside from the coal mine, investments for a surface gasification plant are generally on the order of $1 billion or more.

Comment #151
The preliminary decision neglected to mention in the discussion of the past coalbed methane leases in the Matanuska-Susitna Valley the real reason that the leases were dropped, which was very strong public opposition.

Response
The subject of coalbed methane leases were described briefly in Chapter 6: Current and Projected Uses of the Proposed Leasing Area. This description was a part of a broader discussion of land uses in the Susitna Valley. Coalbed methane development is very different from coal mining, and is not a topic of this decision.

Comment #152
How are Alaska Natives tribes and other groups being involved in decision-making? Chickaloon Village Tribal Council, Tyonek Village and Knik Tribal Council should be included in your discussions.

Response
The proposed lease area is entirely on state-owned land. Local native groups were noticed and have had the opportunity to provide comments regarding the decision.

Comment #153
Expressed concerns regarding the negative impacts of the proposed coal mining projects in the Matanuska Moose Range would change the economic opportunities, abundant fishing and recreational access of the Mat-Su Valley.

Response
The Canyon Creek lease area is not within the Matanuska Valley Moose Range. The Matanuska Valley Moose Range is located in the Matanuska Valley. The nearest point of the Matanuska Valley Moose Range is approximately 80 miles from the Canyon Creek lease area.

Comment #154
Diamond Gold Corporation filed a formal written request to lease the Canyon-Contact and Johnson Creek coal deposits in May, 1998. DNR had a ministerial duty to lease the coal to Diamond Gold Corporation in 1998. The best interest finding deliberately ignores Diamond Gold's 1998 request to lease the coal. Diamond Gold Corporation demands that the DNR lease the coal at Canyon, Contact, and Johnson Creeks to Diamond Gold Corporation.

Response
A request to lease land for coal development does not confer a right to a lease. The Division of Geological and Geophysical Surveys evaluates the coal potential for possible coal disposals. If the potential is ranked as moderate or high, the coal must be leased through a competitive bidding process. Chapter 3 of the best interest finding is the DGGS evaluation, performed by Mr. James Clough. The potential is rated as high, so any leasing must be by competitive bid. If there is a coal lease sale Diamond Gold Corporation will have the opportunity to bid on the lease.

Comment #155
The finding fails to identify the hard mineral resource in the Yentna Tertiary Basin coal-bearing formations. Detrital gold, platinum, rare earth oxides and gemstones occur in the Tertiary gravels of the Yentna Tertiary Basin. This mineral resource that cannot, under Article VIII of the Alaska State Constitution, be wasted by coal mining.

Response
The DNR is unaware of any reserves, prospects, or occurrences of the minerals listed in this comment within the proposed Canyon Creek lease area. The commenter has not provided data to demonstrate the existence of such resources.

Comment #156
The coal from the Canyon Creek area should be used for local power generation, including power to operate our large mine projects.

Response
If there is a coal lease sale and resultant coal mining the winning bidder and mine operator will be able to sell the coal to whatever market they find most attractive. It is beyond the scope of this decision to dictate the final disposition of any mined coal.

Comment #157
ADNR is working in secrecy with URS consultants and Alaska Energy Corporation. Apparently, Alaska Energy Corporation paid URS to write the best interest finding. This appears to be another under the table payment/money laundry scheme where "friends" of DNR transfer money and "favors" in secrecy.

Response
Chapter 1 of the decision explains the use of consultants. The DNR employed a consulting firm to prepare initial drafts of four chapters of this preliminary decision. A Memorandum of Understanding was reached with Alaska Energy Corporation under which the corporation agreed to pay the cost of hiring the consultant and certain other costs of preparing the preliminary decision. The consulting contract was offered through a competitive bidding process according to departmental procedures. The DNR was solely responsible for choosing and contracting with the consultant. All work was directed by DNR staff, and all chapters were edited and revised by DNR staff. Alaska Energy Corporation played no role in supervising, editing or approving the consultant's work. Alaska Energy Corporation has had no access to or right to review any of the work involved in writing this decision, and has received only the information that has been released to the public.

Comment #158
The Preliminary Decision indicates that part of the Beluga Indian Trail is located six miles east of the proposed lease area. The Decision does not discuss whether the Beluga Indian Trail has historic importance, but this factor has been found to have significance in determining that a proposed disposition was not in the best interest of the State. See Alaska Supreme Court, Mortvedt v. State, Department of Natural Resources, (6.20.97), 941 P 2d 126.

Response
The Beluga Indian Trail is, at its nearest point, located approximately six miles from the Canyon Creek lease area. A review of known archaeological sites in the lease area was completed by Joan Dale, of the State Historical Preservation Office. No review was done for the Beluga Indian Trail. Although future transportation routes might cross the Beluga Indian Trail, there is no proposed transportation route or mode of transport at this time. If a future transportation route is to cross the Beluga Indian Trail a survey can be conducted at that time, and any historical sites or artifacts can be protected accordingly.

In the Mortvedt v. State, Department of Natural Resources case the site in question was for a personal use cabin permit and negotiated commercial lease. From the commissioner's review the site was located in the middle of a very significant archeological site in the ancient village of Tautittine, and not six miles away.

Comment #159
The preliminary Decision fails to assess possible threats to the Iditarod National Historic Trail. The Iditarod National Historic Trail was established in 1978 to protect "the historic route and its historic remnants and artifacts for public use and enjoyment." 16U.S.C. §§ 1242(a)(3), 1244 (a)(7).

The Legislature has declared that "[i}t is the policy of the state to preserve and protect the historic, prehistoric, and archeological resources of Alaska from loss, desecration and destruction so that the scientific, historic, and cultural heritage embodied in these resources may pass undiminished to future generations." Alaska Historic Preservation Act, AS 41.35.010. The proposed lease sale at Canyon Creek fails to carry out that policy with respect to the Iditarod

National Historic Trail. The Preliminary Decision also neglects to mention possible impacts to the trail or Old Skwentna Roadhouse should development occur in close proximity to it. Impacts to this national historic trail, Alaska's historic and cultural resources, and the important economic benefits of the Iditarod race are reasonably foreseeable and should be addressed at this stage of the lease sale decision.

Response
No transport routes have been proposed, so it is not possible to determine any potential impacts to the Iditarod Trail or the Old Skwentna Roadhouse. If a future transportation route proposal crosses the Iditarod Trail a survey will be conducted at that time.

Comment #160
In addition to potential threats to the Iditarod Trail from development related to Canyon Creek, there are potential cumulative impacts that DNR fails to mention. For example, the proposed Donlin Gold Mine's plans include construction of a natural gas pipeline whose route coincides with parts of the Iditarod Trail.

Response
Consideration of historical or archaeological effects of the proposed Donlin natural gas pipeline is beyond the scope of this review.

Comment #161
The DNR's process has not been sufficient to facilitate meaningful public participation for such a major commitment of state resources. The comment deadline was originally November 21, 2012. Pursuant to numerous requests for extensions and for a public hearing near the proposed lease site, which had not originally been planned, DNR extended the comment deadline to January 18, 2013, scheduled a hearing at Shell Lake Lodge for early January, and posted public notice of the changes on November 20, 2012. Ex. 12 (first extension). Hours later, DNR changed the notice, shortening the time again with a new comment deadline of December 21, 2012, and re-scheduled the Shell Lake meeting to December 17, 2012. Ex. 13 (second extension). These changes have the effect of stymying public participation. Because DNR had posted a public notice stating that comments would be accepted until January 18, 2013, and it is unclear whether everyone who saw that notice also saw the subsequent notice.

Response
AS 38.05.945 requires a 30-day public notice. There is no requirement for public hearings or meetings under that statute, or under AS 38.05.035. The public notice period for the preliminary Canyon Creek decision was 60 days. A public hearing was held in Anchorage, and a public meeting was held at Shell Lake for local residents. Attendees at the Shell Lake public meeting had the opportunity to provide written comment at the meeting, but none did so. Six individuals submitted comments after the close of the public comment period, and these comments were not considered in the decision process. However, the comments all concerned issues raised by other commenters which were considered.

Comment #162
The public hearing held at Shell Lake Lodge on December 17, 2012, did not afford local area residents with a satisfactory opportunity to comment. Unlike the Anchorage public hearing DNR did not take the names of attendees, and commenters were told that their oral testimony would neither be recorded nor included in the administrative record.

Response
The DNR held a public meeting at Shell Lake, not a public hearing, as was held at Wendler Middle School in Anchorage. The meeting was largely dedicated to providing attendees with information, as representatives of DNR spent most of the meeting answering questions from the audience. Meeting attendees were offered the opportunity to provide written comment, but none accepted. All attendees indicated that they had already submitted written comment to DNR, if they desired to do so.

An opportunity for oral testimony was offered at the Anchorage public hearing. However, there is no statutory requirement to provide such an opportunity. The commenter implies that the DNR has a statutory obligation to take all comments made in the Shell Lake public meeting as testimony. However, at the Anchorage Public hearing only the formal comments were taken as testimony, not the exchanges during the question and answer period that occupied a majority of the hearing.

Comment #163
The timing of the Shell Lake hearing left residents only four days to submit written comments after the public hearing, which is not sufficient for a major proposal with enormous potential impacts on their lives.

Response
See above comment/response #s 161, 162 and 163.

Comment #164
The public hearing at Wendler Middle School in Anchorage was inadequate. Many residents of the Skwentna/Shell Lake area were unable to attend. Meetings should be held at Skwentna and Shell Lake at a time when travel conditions are amenable to local residents attending.

Response
The DNR responded to information concerning residents of the Skwentna/Shell Lake/Canyon Creek area being unable to attend a public meeting in Anchorage by arranging a meeting at Shell Lake on December 17, 2012.

Comment #165
Numerous requests were received from the public to extend the public notice and comment period and to hold additional public meetings. There were also comments that the Division of Mining should make presentations about the lease sale to the community councils in the Susitna Valley.

Response
The public notice and comment period was extended for an additional 30 days, to a 60-day total, and a public meeting was held at the Shell Lake Lodge on December 17, 2012. Residents of Skwentna phoned in to the Shell Lake meeting. A public hearing was held at Wendler Middle School in Anchorage on November 13, 2012. AS 38.05.035 (e) and as 38.05.945 require a 30-day public notice. Public hearings and meetings are held at the discretion of DNR.

Comment #166
DNR is not doing an honest assessment of the best interest of this project. It is also lacking in its duty to protect Alaska's Environment, fish and wildlife habitat, people and the health of the people, by listening to the people and the comments they provide.

Response
This comment is a declaratory statement of opinion, and does not provide any new information on which to bases a reassessment of this decision. The commenters do not detail how DNR is failing to protect Alaska's environment, fish and wildlife habitat, or people and the health of the people. All public comments have been carefully considered and responded to in this summary.

Comment #167
The coal lease proposed for Canyon Creek is land owned by the State of Alaska. State land is public land, which in a democratic society means that every Alaska has a shared interest in the management of our land and resources.

Response
The State of Alaska manages its lands to the benefit of all Alaskans. Most lands are managed for multiple uses, which may include mining.

Comment #168
The DNR may not issue a lease of indeterminate duration that includes an exclusive right of exploration for coal. The Alaska statutes and regulations governing exploration rights in coal leases violate Article VIII, Section 12 of the Alaska Constitution. That provision authorizes leases for coal and other minerals and states, "Leases and permits giving the exclusive right of exploration for these minerals for specific periods and areas . . . may be authorized by law." Alaska Const. art. VIII, § 12 (emphasis added). The framers of the Constitution were wary of granting broad, exclusive exploration rights that would commit and tie up valuable state resources. They intended that exclusive rights of exploration be granted only sparingly, "for very limited times," "for the short period of the permit." The statute authorizing coal leases, however, states that "[e]ach lease shall be for an indeterminate period . . . ." AS 38.05.150(e). DNR's regulations, in turn, make clear that indeterminate coal leases under this statute include the right of exploration. 11 AAC 85.215. The "specific periods" provision of the Constitution is an important safeguard of the public interest. It prevents the state from being burdened indefinitely by leases issued before even the earliest phase of the mining process, exploration, has taken place. Leasing at such an early stage, before sufficient information is available, commits the state to development that may prove not to be in the public interest. The "specific periods" provision also prevents a single lessee from tying up state resources indefinitely. The leases at Chuitna and

Wishbone Hill, which apparently failed to heed this safeguard and have consequently languished for decades, demonstrate why it is essential that DNR now begin to comply with it.

Response
State statutes are presumed valid and consistent with the Alaska Constitution unless otherwise determined by the Alaska Supreme Court. The DNR does not have jurisdiction or authority to determine the constitutionality of a statute. Accordingly, DNR will not consider this comment.

Comment #169
Alaska Survival supports the no coal sale alternative. This proposed lease is not in the public's best interest. State policy under AS 46.03.010 (a) is "to conserve, improve, and protect its natural resources and environment and control water, land, and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well being." This proposed lease does not fulfill this policy.

Response
The DNR acknowledges Alaska Survival's support of the “no coal sale alternative.” The State and DNR manage state lands to both develop resources for the benefit of Alaskans and to protect other resources, such as fish and wildlife and their habitat, water resources, and air quality. The purpose of the ASCMCRA is to provide these protections. Other regulatory programs, such as the APDES and USACE wetlands permitting further protect fish and wildlife and the environment. (See Chapter 4: Statutory and Regulatory Background.)

Comment #170
Article VIII, Section 1 establishes the policy that settlement of state lands and development of state resources must be made available for "maximum use consistent with the public interest." Section 2 requires that utilization, development and conservation of all natural resources including land and waters must be for the "maximum benefit of its people." Section 3 "reserves to the people for common use" the fish, wildlife and waters of the state. The Alaska Supreme Court has recognized that the common use clause in Article VIII "strongly protects public access to natural resources" and that the public trust doctrine requires the State to hold in trust fish, wildlife, and waterways for the benefit of all the people of the state. The preliminary decision has not proved that the state's trust resources will not be negatively impacted to the detriment of the public interest. The lease sale is not consistent with the public interest.

Response
Section 1 of Article VIII makes a clear statement that State policy is to encourage development of its land and resources in a manner that recognizes the collective interests of the people of Alaska. Section 2 gives the legislature broad authority to implement the policy enunciated in Section 1. Section 2 also embodies conservation as an objective along with utilization and development. The constitutional delegates understood the term in its traditional sense of "wise use." The DNR endeavors to make decisions based on the best interests of all Alaskans. Balancing conflicting land and resource uses for the state’s benefit is one of DNR’s primary missions.

The legislature has embodied these concepts in AS 44.99.110, Declaration of State Mineral Policy: "The legislature, acting under article VIII, section 1 of the Constitution of the State of Alaska, in an effort to further the economic development of the state, to maintain a sound economy and stable employment, and to encourage responsible economic development within the state for the benefit of present and future generations through the *proper conservation and development of the abundant mineral resources within the state*, including metals, industrial minerals, and *coal*, declares as the mineral policy of the state that
(1) *mineral exploration and development be given fair and equitable consideration with other resource uses in the multiple use management of state land*;" (emphasis added) Other statutes and regulations establish the DNR as a caretaker of these natural resources.

The comment states that the DNR has not proved that the State's trust resources will not be negatively impacted to the detriment of the public interest. The DNR cannot guarantee there will be no negative effects from coal development and mining. Coal mining may cause impacts to salmon habitat or other environmental resources. The ACMCRA and regulatory programs administered by other government agencies provide protections for fish and wildlife, their habitats, and waters. However, there may still be negative impacts. The intent of the reclamation plan and bonding is to minimize long-term adverse impacts. The Departments of Natural Resources and Fish and Game evaluate potential impacts to fish and wildlife, habitat, and water bodies. If the impact is deemed too great, then mining will not be permitted.

The comment also states that the Alaska Supreme Court has recognized that the common use clause in Article VIII (Section 3) "strongly protects public access to natural resources." Coal leasing and development in the Canyon Creek area should have little effect on public access to natural resources. Any restriction of access would be limited to the immediate mine area and related facilities, and would only be allowed with the consent of the commissioner. Under the ASCMCRA access restrictions are limited to those needed for safety and efficient mine operation.

Comment #171
The legislature and DNR must correct these statutes, regulations, and lease forms to bring them into compliance with the Constitution before any coal lease for Canyon Creek may be issued. If the necessary changes are made and DNR still proposes to proceed with a coal exploration lease at Canyon Creek, DNR must prepare a new proposed best interest finding and preliminary decision, with a new public notice and comment period, because the agency would necessarily be proposing a different, more limited lease.

Response
See above Comment/Response #168.

Comment #172
The Preliminary Decision argues that despite the lack of information and the long term encumbrance placed on the State, the applicable statutes do not require DNR to speculate about unforeseeable future effects. Under applicable statutes and constitutional provisions, DNR may

not enter into such a major and permanent commitment of state resources on the basis of so little information.

Response
See Responses #s 173, 174, and 175, below.

Comment #173
While it is true that the statute does not require speculating on unforeseeable effects, the statute allows disposals only if DNR can make a finding that the disposal is in the State's best interests. AS 38.05.035 (e). In the absence of sufficient information, DNR may not be able to make the required finding, and the proposed Canyon Creek lease is clearly such a case.

Response
The DNR determines whether a land disposal is in the best interest of the State based on the information available, or made available to the director during the administrative review. AS 38.05.035 (e)(1)(B)(ii) The DNR is not required to pursue extraordinary studies beyond the scope of review mandate under AS 38.05.035. The finding may only address reasonably foreseeable, significant effects of the uses proposed to be authorized by the disposal. AS 38.05.035(e)(1)(A). (See Response #174, below)

Sufficient information is available to make the decision that offering a coal lease sale is in the best interest of the State. The environmental characteristics, such as vegetation, fish and wildlife populations, and habitat, are reasonably well understood. (See Chapters 5 and 8) If a mine is developed in the Canyon Creek lease area, it will be a surface mine. Surface mining techniques are well understood. Protections to the environment, fish and wildlife, and their habitats will be sufficiently protected under the ASCMCRA and other regulatory programs such as the Alaska Pollution Discharge Elimination System permitting (DEC) and the U. S. Army Corps of Engineers Section 404 permitting under the Clean Water Act. (See Chapters 4 and 10 of this decision) Although there are a number of private properties and some residents in the broader Canyon Creek-Shell Lake-Talachulitna River area, the lease area is uninhabited and lightly used by the public. (See Settlement, Access, and Use of the Canyon Creek Lease Area by the Public and Local Property Owners, in chapter 6) Degradation of aesthetic values due to coal mining should be minimal. (See Aesthetic Effects of Future Coal Mining, in Chapter 9)

The science of mine reclamation has advanced greatly over the past 35 years, and continues to do so. Mining companies, state and federal regulators, and university personnel are constantly researching better methods for all phases of mine reclamation. Since its inception in 1978, comprehensive reclamation has evolved rapidly. The primary impetus for this evolution was the Federal Surface Mine Control and Reclamation Act (SMCRA) of 1977 and State statutes such as the Wyoming Environmental Quality Act (WEQA) of 1973. Alaska adopted the Alaska Surface Coal Mining Control and Reclamation Act (ASCMCRA) in 1983. Successful reclamation is integral with successful mining, not only for release of the large bonds required by State and Federal law alike, but also as a necessary adjunct to continued mining. Reclamation science has responded to legal requirements, reconstruction of endangered habitats, revitalization of damaged environmental systems, and establishment of wetlands. There are many works that suggest technologies of various kinds, report on field trials, and recommend plant species for use

in reclamation. However, almost thirty years after the earliest trial efforts, a considerable body of practical knowledge has been developed by the specialists responsible for compliance with State and Federal statutes and regulations governing reclamation of mined lands. (See Coal Mining and Reclamation, and Reclamation: State of the Science, in Chapter 10: Potential Measures to Avoid, Minimize, and Mitigate negative Impacts)

Through resource planning, DNR works with the public to determine where the important resources are and how the land can be used for the maximum public benefit. From this planning effort, an area plan is developed which identifies designations representing the uses and resources for which the area will be managed. Although under the Alaska Constitution most land is managed for multiple uses, the plan designations delineate those uses which will be emphasized through management practices. It can take two to three years to complete a plan and public input is an important part of the process. The Canyon Creek area is addressed in the 2011 Susitna Matanuska Area Plan which identifies the lease area as open to coal development.

The current lease area and additional acreage both north and south of the Skwentna River were leased to Mobil Oil Corporation for coal from 1977 until 1989. During that time Mobil conducted extensive exploratory drilling for coal, completing 104 test holes. Using the Mobil drilling results and other available information, Mr. James Clough of the DGGS has estimated that the lease area contains approximately 258 million tons of coal resources. (See Chapter 3 of this decision) Coal mining and associated development will provide well-paying jobs for Alaskans, and bring additional opportunities for business in the state, both for existing and new businesses. Mining and related economic development will also provide revenues to state and local governments through the corporate income tax, the mining license tax, the coal royalty, and property taxes. These funds will help provide public services such as schools, roads, and fire and police protection to citizens of Alaska. (See Chapter 9 of this decision)

Comment #174
The Constitution provides that development of the state's natural resources must be "consistent with the public interest." Article VIII, Section 1, and "for the maximum benefit of its people." Section 2. Leases of public lands must comply with "safeguards of the public interest." Section 10. The Alaska Supreme Court has consistently found that these provisions place a constitutional duty of care on DNR in making decisions about disposals of state resources. Ensuring the public interest in land disposals precludes blind reliance on future permitting processes, as proposed in the Preliminary Decision. "[Permit conditions may not serve as a substitute for an initial pre-permitting analysis that can be conducted with reasonably obtainable information." *Kachemak Bay Conservation Soc'y*, 6 P. 3d at 277 (quoting *Thane Neighborhood Ass'n v. City and Borough of Juneau*, 922 P.2 901, 906-09 (Alaska 1996)).

Response
The DNR agrees that the Constitution requires careful consideration of decisions to conduct land disposals. AS 38.05.035(e) provides for an analysis based on the information known/foreseeable effects (cite to/quote statute). This Best Interest Finding was implemented pursuant to that statute. Discussion of the regulatory framework is a requirement of the regulation and an important consideration in a best interest finding. DNR has considered reasonably foreseeable effects in this analysis. (See Chapter 4: Statutory and Regulatory Background, and Chapter 9:

Reasonably Foreseeable Effects of Leasing. Also see discussion of AS 38.05.035 (e) and (h) above in this appendix)

Although a considerable body of information is currently available regarding the Canyon Creek area, surface coal mining, and the effects of surface mining, no mine plan or transportation facilities have yet been proposed. It is therefore not possible to know with exactness all of the future impacts of coal mining, or the exact measures that will be taken to avoid, minimize, and/or mitigate those impacts. The statutes and regulations of the ASCMCRA and other regulatory programs administered by the ADEC, USACOE, and other agencies are designed to provide the needed protections as future development requires. If adequate protections cannot be provided, then permits will not be issued. (See Chapters 4 and 10 of this decision)

Comment #175
None of the future permitting processes on which the Preliminary Decision so heavily relies requires a finding that the project be in the State's best interests. Since this is the only place in the process in which the statutes authorize a determination that the lease is in the State's best interests, it is particularly important that DNR conduct a complete evaluation of all phases of the project (leasing, exploration, development, transportation, and reclamation) and not approve a lease absent sufficient information. This necessarily requires obtaining and considering information about baseline conditions, possible mining scenarios under the proposed lease, and their associated direct, indirect, and cumulative impacts.

Response
Under the Susitna Matanuska Area Plan (2011) the Canyon Creek area is open to coal development and mining. During development of the area plan the DNR found that coal mining was one of multiple acceptable uses for the land and its resources. The previous Susitna Area Plan (1985) reached the same conclusion. Indeed, Mobil Oil Corporation held leases in the area from 1977 until 1989, and did considerable exploration work at that time. (See Mining, in Chapter 6)

Under AS 38.05.035 (e)(1) and AS 38.05.035 (h) the DNR is not mandated to conduct extraordinary studies beyond reviewing the facts material to the determination and that are known to the director or knowledge of which is made available to the director during the administrative review. (See comment/response #174, above) Efforts such as baseline studies or detailed wetland delineations are not required. Further, the director may not be required to speculate about possible future effects subject to future permitting that cannot reasonably be determined until the project or proposed use is more specifically defined, such as potential coal transportation routes or modes of transportation, or specific future mining and reclamation scenarios. (See discussion of AS 38.05.035 (e) and (h) above in this appendix)

The above said, sufficient information is available for the DNR to make the decision that having a cola lease sale at Canyon Creek is in the best interest of the State. (See comment/response #173, and Chapters 2, 3, 5, 6, 8, 9 and 10 of the final decision.)

Comment #176
The Preliminary Decision argues that despite the lack of information and the long term encumbrance placed on the State, future permits under the Clean Water Act, the Clean Air Act, and the Alaska Surface Coal Mining Reclamation and Control Act (ASCMCRA) will adequately protect resources. DNR may not assume that future permitting processes will adequately avoid harm to resources and people. A vast body of scientific research shows that even when surface coal mines are fully permitted under the Clean Air Act, the Clean Water Act, the Surface Mining Control and Reclamation Act (SMCRA), and other laws, they have caused and continue to cause significant adverse impacts to public health, state and local government treasuries, water, air, and other resources.

Response
This comment is a general statement supported by Comment/Response #s 26, 28, 29, 31, 88, 89, and 90. See those comments and responses. Also, see comment/response #174 for discussion of statutes and Supreme Court cases regarding DNR's responsibilities.

Comment #177
The preliminary decision states that the Susitna Matanuska Area Plan (SMAP) went through the reconsideration process, and that reconsideration was denied. Consequently, SMAP is currently under litigation in state Superior Court. However, since the plan has been adopted it is the operational area plan and guides the DNR decision making process. The current litigation does not involve the Canyon Creek Area.

This may not be legally defensible. All of SMAP is under appeal in the state Superior Court. This certainly includes the Canyon Creek Area located in SMAP, in the Mt. Susitna Region, subunits M-02, M-05, and M-06. Thus, these statements in the preliminary decision are not correct.

Response
The current Susitna Matanuska Area Plan was signed on August 11, 2011. That plan replaced the 1985 Susitna Area Plan. The plan was not stayed by the superior court case. An April 3, 2013 Superior Court decision upheld the Susitna Matanuska Area Plan. The Susitna Matanuska Area Plan is the operational plan under which this decision has been written. (See Planning and Classification, in Chapter 2 of the Decision.)

The original 1985 Susitna Area Plan generally recognized coal exploration and development as appropriate to the area. "Recognized exploration methods for beatable minerals will be allowed on all state lands unless specifically closed to prospecting and will be subject to the conditions of a land use permit." "Prospecting for coal may be permitted adjacent to anadromous fish streams (other than those protected in specific corridors); however, if a lease is given, the Department reserves the right to restrict surface entry where it determines the surface values are significant enough to warrant such a restriction. Decisions on surface entry for coal adjacent to streams will be made in consultation with the affected agencies." (Page 42)

The current lease area, along with additional ground north of the Skwentna River, was previously leased to Mobil Oil Corporation for coal from 1977 until 1989. Mobil drilled a total of 104 exploratory holes and did extensive field work for coal.

Comment #178
Granting coal leases could ultimately contradict the land classification, adding to DNR's land planning errors.

Response
The State of Alaska manages most state land for multiple uses. None of the land use classifications within the lease area preclude coal mining, and the Susitna Matanuska Area Plan does not restrict coal exploration, development, or mining within the lease area.

Comment #179
The Matanuska-Susitna Borough adopted a borough-wide comprehensive plan in 1970 which was amended in 2005. This plan does not make any specific references to the proposed lease sale or to coal mining. Numerous community comprehensive plans have been adopted; however, none of these plans cover the proposed coal leasing area.

Response
No response necessary. This comment is effectively stated in Chapter 2 of the decision.

Comment #180
Structures must comply with MSB 17.55 - Setbacks. Structures are required to be setback a minimum of 10 feet from side and rear property lines; 25 feet from public rights-of-way; and 75 feet from waterbodies or watercourses.

Response
No response necessary.

Comment #181
MSB 17.02 - Mandatory Land Use Permit, requires that a Mandatory Land Use Permit be obtained for the construction or placement of any structure within 75 feet of any water body or watercourse.

Response
No response necessary. This comment is effectively stated in Chapter 2 of the decision.

Comment #182
MSB Title 28: Natural Resource Utilization, Purpose and Intent, has established the following policy: It is the policy of the borough to promote the utilization of natural resources while protecting the health, safety, and welfare of its residents. This shall be done by utilizing the principals of best management practices that recognize social, environmental, and economic benefits when utilizing natural resources within the borough. None of these benefits is mutually exclusive of the others. The assembly recognizes that the extraction or harvest activities of natural resources vary widely from area to area, and resource to resource, depending on many

natural or manmade factors. Natural resource utilization activities shall be based on the best available professional, scientific or technical standards to assure economic opportunities continue on both private and public land, while protecting the public's health, safety, and welfare." To the extent allowed by law, this title applies to all landowners within the borough, unless otherwise specifically stated in Title 28.

Response
No response necessary. This comment is effectively stated in Chapter 2 of the decision.

References

A1B emissions scenario: IPCC 20011, available at http://www.ipcc.ch/ipccreports/tar/wg2/index.php?idp=154 and http://sres.ciesin.org/final_data.html.

Abudul-Aziz, O. I., Mantua, N. J., Myers, K. W., 2011. Potential climate change impacts on thermal habitats of Pacific salmon (Oncorhynchus spp.) in the North Pacific Ocean and adjacent seas, Canadian Journal of Fisheries and Aquatic Science 68 p 1660-1680.

Achten, Christine, et al., 2008. Impact of Unburnt Hard Coal Particles in River and Marine Sediments: Boon or Bane for Sediment Management? 5th SedNet Conference, 27-29 May, 2008. available at http://www.sednet.org/download/poster%201%20-%20Achten.pdf.

Ahrens, Michael J . & Donald J . Morrisey, 2005. Biological Effects of Unburnt Coal in the Marine Environment, in Oceanography and Marine Biology, An Annual Review 43:69-122 (R. N. Gibson, et al., eds.).

Alaska Climate Impact Assessment Commission, 2008. Final report to the legislature. Representative Ralph Samuels, Chairman, and Representative Reggie Joule, Vice-Chairman. March 17, 2008. http://www.housemajority.org/coms/cli/cli_finalreport_20080301.pdf.

Alaska Climate Impact Assessment Commission, 2009. Mitigation Advisory Group Final Report. Alaska State Legislature's Joint Alaska Climate Impact Assessment Commission. http://www.climatechange.alaska.gov/advgrp.htm.

Alaska Climate Change Strategy's Mitigation Advisory Group, 2009. Final Report: Greenhouse Gas Inventory and Forecast and Policy Recommendations Addressing Greenhouse Gas Reduction in Alaska. Submitted to the Alaska Climate Change Sub-Cabinet august, 2009.

Alaska Department of Fish and Game, Wood Frog, available at http://www.adfg.alaska.gov/static/species/speciesinfo/_aknhp/Wood_Frog.pdf.

Alaska Department of Labor and Workforce Development, 2008. Nonresidents Working in Alaska: Nonresidents make up a big part of the work force, Alaska Economic Trends, available at http://labor.alaska.gov/research/trends/mar08art1.pdf.

Alaska Department of Labor and Workforce Development, 2012. Nonresidents Working in Alaska: 2010, available at http://labor.alaska.gov/research/reshire/nonres.pdf (excerpts).

Alaska Natural Heritage Program (ANHP), BIOTICS Data Portal, wood frog data, available at http://aknhp.uaa.alaska.edu/maps/biotics/.

Alaska Natural Heritage Program (ANHP), Biotics Rare Species Data Portal, Wood Frog Map, available at http://aknhp.uaa.alaska.edu/maps/biotics/.

Bernhardt, Emily S. & Margaret A. Palmer, 2011. The environmental costs of mountaintop mining valley fill operations for aquatic ecosystems of the Central Appalachians, in THE YEAR In Ecology and Conservation Biology, Ann. N.Y. Acad. Sci. 1223:39–57.

Blumer, J.W., 1980, Review of Mobile coal leases – Yentna Region, Alaska, in Rao, P.D., and Wolff, E.N., 1980, Focus on Alaska's coal '80, proceedings of the conference: University of Alaska Mineral Industry Research Laboratory Report No. 50, p. 122-126.

Brown, Donald J., 2012. A Place to Call Home: Amphibian Use of Created and Restored Wetlands, International Journal of Ecology Vol. 2012, 11pp., available at http://www.hindawi.com/journals/ijeco/2012/989872/ .

Centers for Disease Contro, 2008. Behavioral Risk Factor Surveillance System (BRFSS, http://www.cdc.gov/brfss/index.htm).

Centers for Disease Control and Prevention (CDC). 2012. Pneumoconiosis and Advanced Occupational Lung Disease among Surface Coal Miners—16 States, 2010—2011. Morbidity and Mortality Weekly Report . June 15, 2012.)

Centers for Disease Control and Prevention, 2012. Pneumoconiosis and Advanced Occupational Lung Disease Among Surface Coal Miners — 16 States, 2010– 2011, Morbidity and Mortality Weekly Reports (MMWR) 61(23):431-434 (June 15, 2012).

"Clean Air Task Force, June 2001. Cradle to Grave: The Environmental Impacts from Coal, available at http://www.catf.us/resources/publications/files/Cradle_to_Grave.pdf.

Cox, Clara B., 1983. Comparing the Studies of a Coal Slurry Pipeline, Virginia Water Resources Research Center Virginia Polytechnic Institute and State University Blacksburg, Virginia, Special Report No. 17.

de Place, Eric, 2012. Sightline Institute, Northwest Coal Exports: Some common questions about economics, health, and pollution.

Documentation Report, development and Application of an Integrated Hydrologic Model to study the Effects of Climate Change on the Chuitna Watershed, Alaska, 2012. Prepared by the Wilderness Society and Integrated Hydro Systems under a cooperative agreement with the U. S. Fish and Wildlife Service.

Epstein, Paul R., et al., 2011. Full cost accounting for the life cycle of coal, in ECOLOGICAL ECONOMICS REVIEWS, Ann. N.Y. Acad. Sci. 1219:73-98 (Robert Costanza, et al., Eds.

Flores, Romeo M., Stricker, Gary D., and Kinney, Scott A., 2005. Alaska Coal Geology, Resources, and Coalbed Methane Potential, USGS DDS-7.

Haeussler, P. J., T. C. Best and C. F. Waythomas, 2002. Paleoseismology at high latitudes: Seismic disturbance of upper Quaternary deposits along the Castle Mountain fault near Houston, Alaska. Geological Society of America Bulletin 114(10):1296-1310.

Handel, Steven, 2002. Mountain Top Removal Mining/Valley Fill Environmental Impact Statement Technical Study, Project Report for Terrestrial Studies, Terrestrial Plant (spring herbs, woody plants) Populations of Forested and Reclaimed Sites, available at http://www.epa.gov/region3/mtntop/pdf/appendices/e/handelterrestrial/ finalreport.pdf .

Hendryx M, Ahern M. M., 2008. Relations between health indicators and residential proximity to coal mining in West Virginia. American Journal of Public Health; 98:669–671.

Hendryx M., Ahern M. M., Nurkiewicz T. R., 2007. Hospitalization Patterns Associated with Appalachian Coal Mining. Journal of Toxicology and Environmental Health, Part A, 70: 2064–2070.

Hendryx, M., 2008, Mortality rates in Appalachian coal mining counties: 24 years behind the nation. Environ Justice 1:5-11.

Hendryx, Michael & Melissa M. Ahern, 2009. Mortality in Appalachian Coal Mining Regions: The Value of Statistical Life Lost, Public Health Reports, 124:541-550 (July–Aug. 2009).

Hitt, Nathaniel P. & Michael Hendryx, 2010. Ecological Integrity of Streams Related to Human Cancer Mortality Rates, EcoHealth 7:91–104, available at http://www.springerlink.com/content/lu7wgk595v1hhm64/fulltext.pdf .

Hodge, R.P. 1976. Amphibians & reptiles in Alaska, the Yukon, & Northwest Territories. Alaska Northwest Publishing Company, Anchorage, AK. 89 pp. (Quoted in Earthjustice Ex. 8)

Holzman, David C., 2011. Mountaintop Removal Mining, Digging into community health concerns. Environmental Health Perspectives. 19(11): A476-A483.

Konty, Melissa Fry & Jason Bailey, 2009. Mountain Association for Community Economic Development, The Impact of Coal on the Kentucky State Budget. Mountain Association for

Community Economic Development. available at http://www.maced.org/coal/documents/Impact_of_Coal.pdf.

Kuipers, J. R., Maest, A. S., MacHardy, K. A., and Lawson, G., 2006. Comparison of Predicted and Actual Water Quality at Hardrock Mines: The Reliability of Predictions in Environmental Impact Statements. 195 pages.

Kyle, R.E. and T.P. Brabets, 2001. Water Temperature of Streams in the Cook Inlet Basin, Alaska, and Implications of Climate Change. USGS Water-Resources Investigations Report 01-4109. Available: http://or.water.usgs.gov/pubs_dir/WRIR01-4109/wrir014109_4.pdf .

Larsen, P. H., Goldsmith, S., Smith, O., Wilson, M. L., Strzepek, K., Chinowsky, P., Saylor, B., 2008. Estimating future costs for Alaska public infrastructure at risk from climate change, Global Environmental Change 18 p 442-457.

Lockwood, Alan H., Welker-Hood, Kristen, Rauch, Molly, and Gottlieb, Barbara, 2009. Coal's Assault on Human Health. Physicians for Social Responsibility, available at: www.psr.org/assets/pdfs/psr-coal-fullreport.pdf.

MacDonald, S.O. 2003. The amphibians and reptiles of Alaska. A Field Handbook. Unpublished report to U.S. Fish and Wildlife Service, Juneau, AK. (Cited in Earthjustice Ex. 8)

Margaret A. Palmer, 2009. Report on Chuitna Coal Project of PacRim Coal. Commissioned by Trustees for Alaska and Cook Inletkeeper.

McIlmoil, Rory, et al., 2010. Coal and Renewables in Central Appalachia: The Impact of Coal on the Tennessee State Budget. Downstream Strategies, available at http://www.downstreamstrategies.com/projects.html.

McIlmoil, Rory, et al., 2012. The Impact of Coal on the Pennsylvania State Budget. Downstream Strategies, available at http://www.downstreamstrategies.com/projects.html.

Mine Engineers, Inc., 2007. Geology Report: Chuitna Coal Project, Beluga, Alaska, available at http://chuitnaseis.com/documents/projectdocs/Geology-Report-MEI-2007.pdf .

Mohseni, O., Stefan, H.G., and Erickson, T.R., 1998. A nonlinear regression model for weekly stream temperatures: Water Resources Research, v. 34, no. 10, p. 2685–2692. (Cited in Kyle and Brabets 2001)

Morton, John, 2012. U.S. Fish & Wildlife Service, Kenai National Wildlife Refuge, Mystery of the Frog-Killing Fungus, Refuge Notebook 3-30-2012, available at http://www.fws.gov/refuge/Kenai/community/2012_article/03302012.html.

National Institute for Occupational Safety and Health (NIOSH), 2011. Coal Mine Dust Exposures and associated Health Outcomes. Current Intelligence Bulletin 64.

National Marine Fisheries Service, Alaska Region, 2011. Impacts to Essential Fish Habitat from Non-fishing Activities in Alaska, Update to Appendix G of the 2005 Environmental Impact Statement for Essential Fish Habitat Identification and Conservation in Alaska (Nov. 2011), available at http://www.fakr.noaa.gov/habitat/efh/nonfishing/impactstoefh112011.pdf .

National Park Service, Gates of the Arctic National Park & Preserve, Biological Miracle, available at http://www.nps.gov/gaar/naturescience/wood-frog-page-2.htm.

National Research Council (NRC), 2008. Transportation Research Board, Risk of Vessel Accidents and Spills in the Aleutian Islands: Designing a Comprehensive Risk Assessment, Transportation Research Board Special Report 293, available at http://onlinepubs.trb.org/Onlinepubs/sr/sr293.pdf. (excerpts)

Pizarchik, Joseph G., U.S. Department of the Interior, Office of Surface Mining, Reclamation, and Enforcement, Letter to Leonard K. Peters, Secretary, Energy and Environment Cabinet (May 1, 2012).

Power, Thomas M., 2012. The greenhouse Gas Impact of Exporting Coal from the West Coast: An Economic Analysis, available at http://www.sightline.org/wp-content/uploads/downloads/2012/02/Coal-Power-White-Paper.pdf.

Raloff, J. A., 2011. Particulate Threat to Diabetics.. Science News.

Reeves, Mari K., et al., 2008. Road Proximity Increases Risk of Skeletal Abnormalities in Wood Frogs from National Wildlife Refuges in Alaska, Environmental Health Perspectives 116(8):1009-1014.

Szumigala, D.J., Harbo, L.A., and Adleman, J.N., 2011. Alaska's Mineral Industry 2010. Division of Geological and Geophysical Surveys Special Report No. 65.

U.S. Department of Interior, Office of Surface Mining Reclamation and Enforcement, 2008. Black Mesa Project, Final Environmental Impact Statement (excerpts).

U.S. Environmental Protection Agency, 1990. Diamond Chuitna Coal Project, Final Environmental Impact Statement, EPA-10-AK-Chuitna-NPDES-90 (Feb. 1990), available at http://yosemite.epa.gov/r10/water.nsf/NPDES+Permits/Chuitna+Coal/$FILE/0F EIS_DCCPrj_Vol1.pdf. (excerpts)

U.S. Fish and Wildlife Service, Alaska Maritime National Wildlife Refuge, available at http://alaskamaritime.fws.gov/.

U.S. Fish and Wildlife Service, Alaska's Abnormal Frogs, available at http://alaska.fws.gov/fisheries/fieldoffice/anchorage/pdf/factsheet_frog.pdf.

Van Houtven, George, et al., 2010. Rates and Costs of Respiratory Illness in Coal Mining: A Cross-Industry Comparative Analysis, Journal of Occupational & Environmental Medicine

52(6):611-617 (June 2010) (Abstract), available at http://www.ncbi.nlm.nih.gov/pubmed/20523242.

Wipfli, Mark, 2009. Chuitna Coal Mine baseline monitoring and restoration plan review, available at ttp://www.trustees.org/Documents/News- Documents/ChuitnaCoalMinereview-31July09.aspx.

Zemach, Heidi, 2010. DEC Fines Railroad and Coal Facility, mandates dust-control projects, Seward City News (June 5, 2010), available at http://sewardcitynews.com/2010/06/dec-fines-railroad-and-coal-facilitymandates- dust-control-projects/.

Appendix C: Viewshed Analysis of the Canyon Creek Coal Lease Area

Appendix C provides an analysis of the viewshed of the area surrounding the Canyon Creek Coal Lease. The analysis was done using the "Line-of-Sight" tool in All Topo Maps, a computerized topographic map program. The viewshed was analyzed for ten locations around the Canyon Lake/Shell Lake/Skwentna River area. These ten base locations are shown on the Base Station Location Map, below, and described here.

BK0 and BK1 – These two base locations are on Shell Lake. There are numerous lots and cabins on and around Shell Lake.

BK 2 – This base is at the highest point on Shell Hills. Being the highest point in the area, the greatest portion of the Canyon Creek lease area will be visible from this base location. There are no cabins in the area at this elevation.

BK3 – This base is at an intermediate elevation in Shell Hills. There are several cabins around the small lakes in this area.

BK 4, BK 5, and BK6 – These locations are all along the Skwentna River. The river is a corridor for boat and snowmachine traffic, and for recreational use.

BK 7 – This base is on Canyon Lake, which has six cabins and a hunting and fishing lodge.

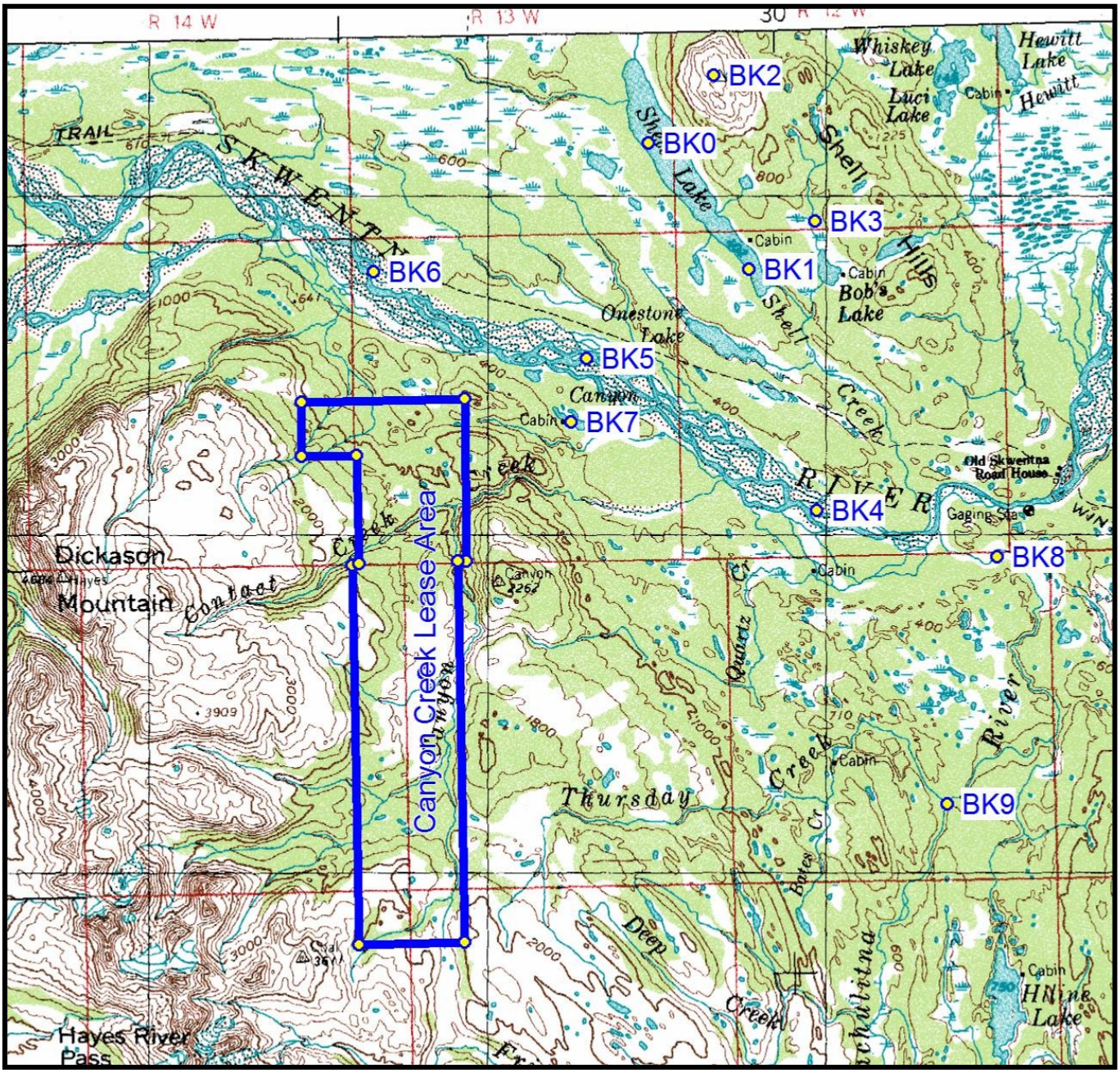
BK8 – This location is a short distance up the Talachulitna River from its confluence with the Skwentna River. There are four or five cabin sites along this stretch of river.

BK9 – This location is at the confluence of the Talachulitna River and Thursday Creek. It was chosen as a base because it is roughly the farthest south point from which much, if any, of the lease area might be visible. The map shows that no points within the lease area are visible from this base location.

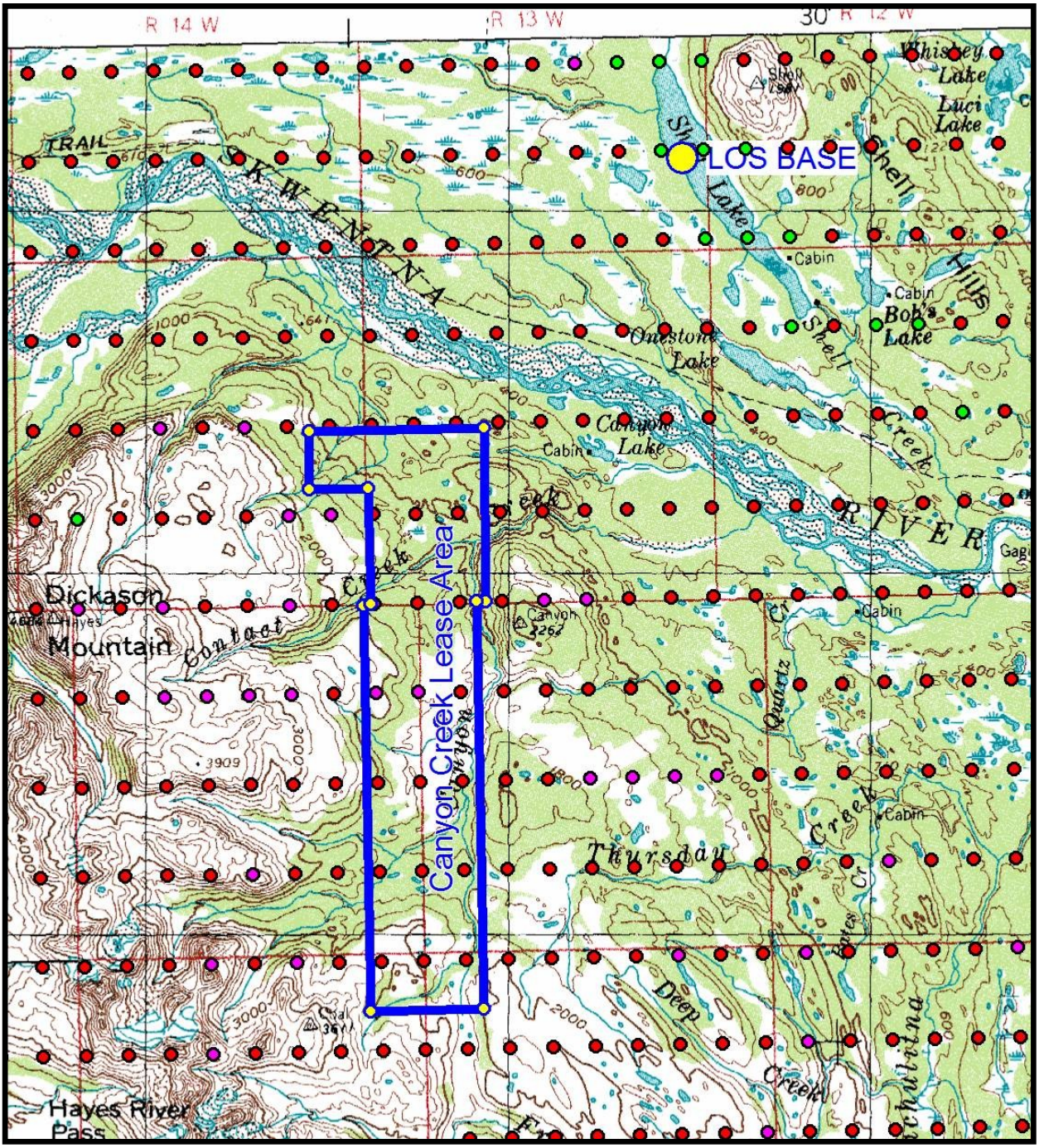
From each base station a grid of points is evaluated for their visibility from two elevations (towers) above the base. Each grid point is color coded as being visible from a point 50 feet above the ground (green dot), 100 feet above ground level (magenta dot) or not visible from either elevation (red dot). In addition to the two elevations at the base station the program assigns a "rover" height above the ground at each grid point. The rover height for this analysis was 50 feet. That is, the program evaluates whether an object 50 feet above the surface would be visible from either of the two tower heights at the base.

Maps of the results for each base location are presented below as Viewshed Analysis BK0 through BK9. On each map the base station is marked by a large yellow dot labeled LOS (Line of Sight) Base.

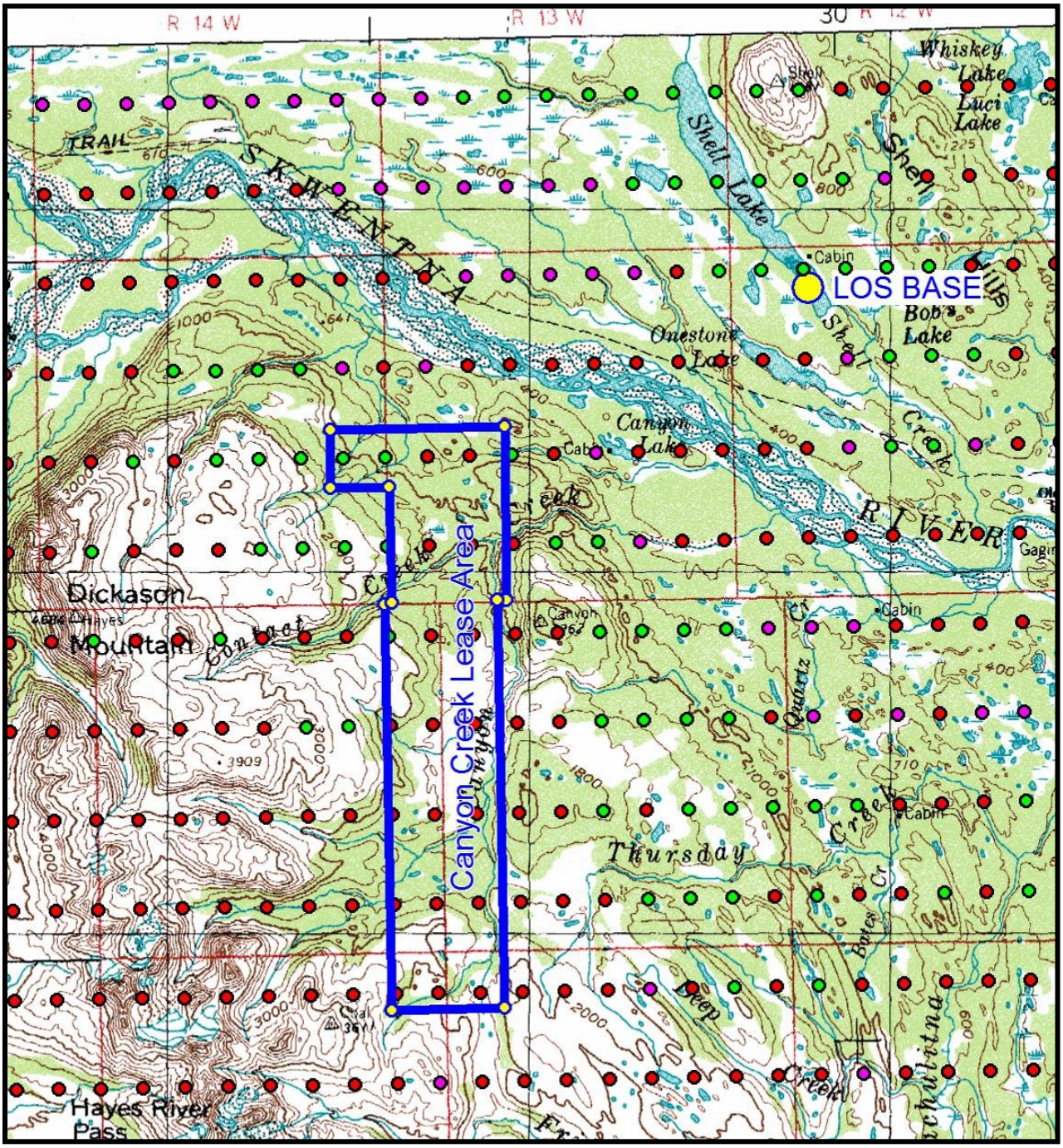
Base Station Location Map



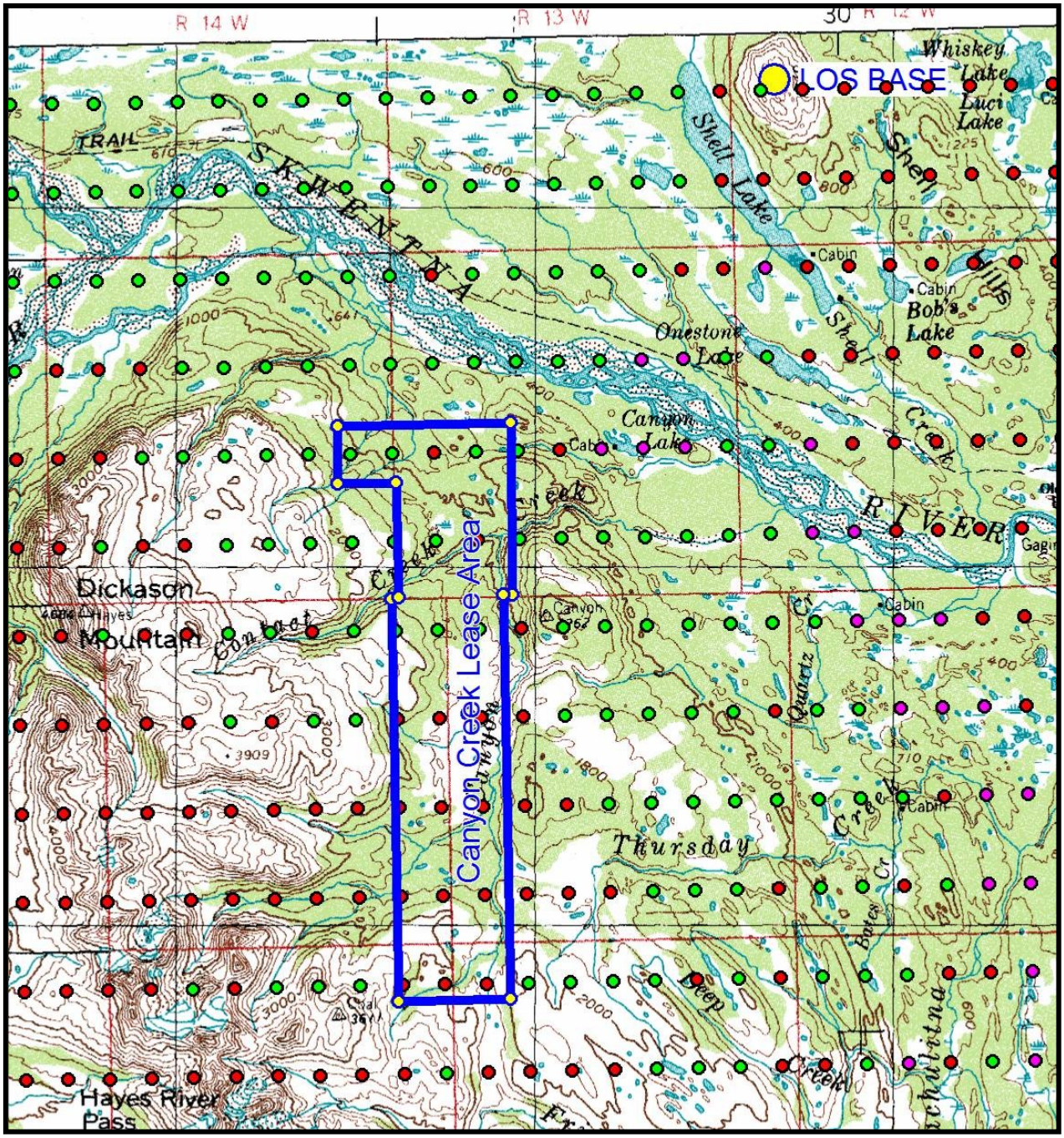
Viewshed Analysis BK0: Green dots are visible from 50 ft. above Base location. Magenta dots are visible from 100 ft. above Base. Red dots are not visible from either height above Base.



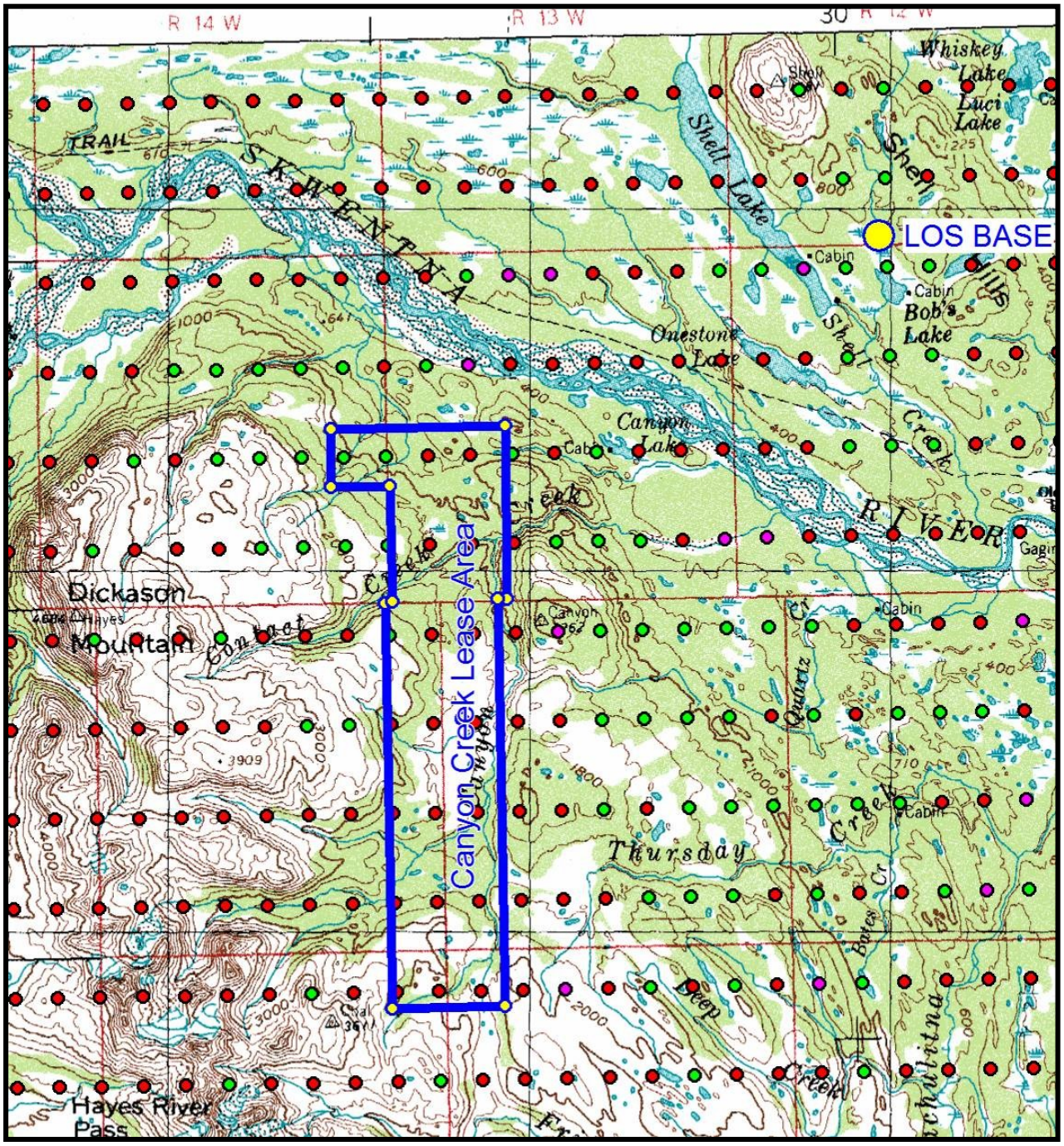
Viewshed Analysis BK1: Green dots are visible from 50 ft. above Base location. Magenta dots are visible from 100 ft. above Base. Red dots are not visible from either height above Base.



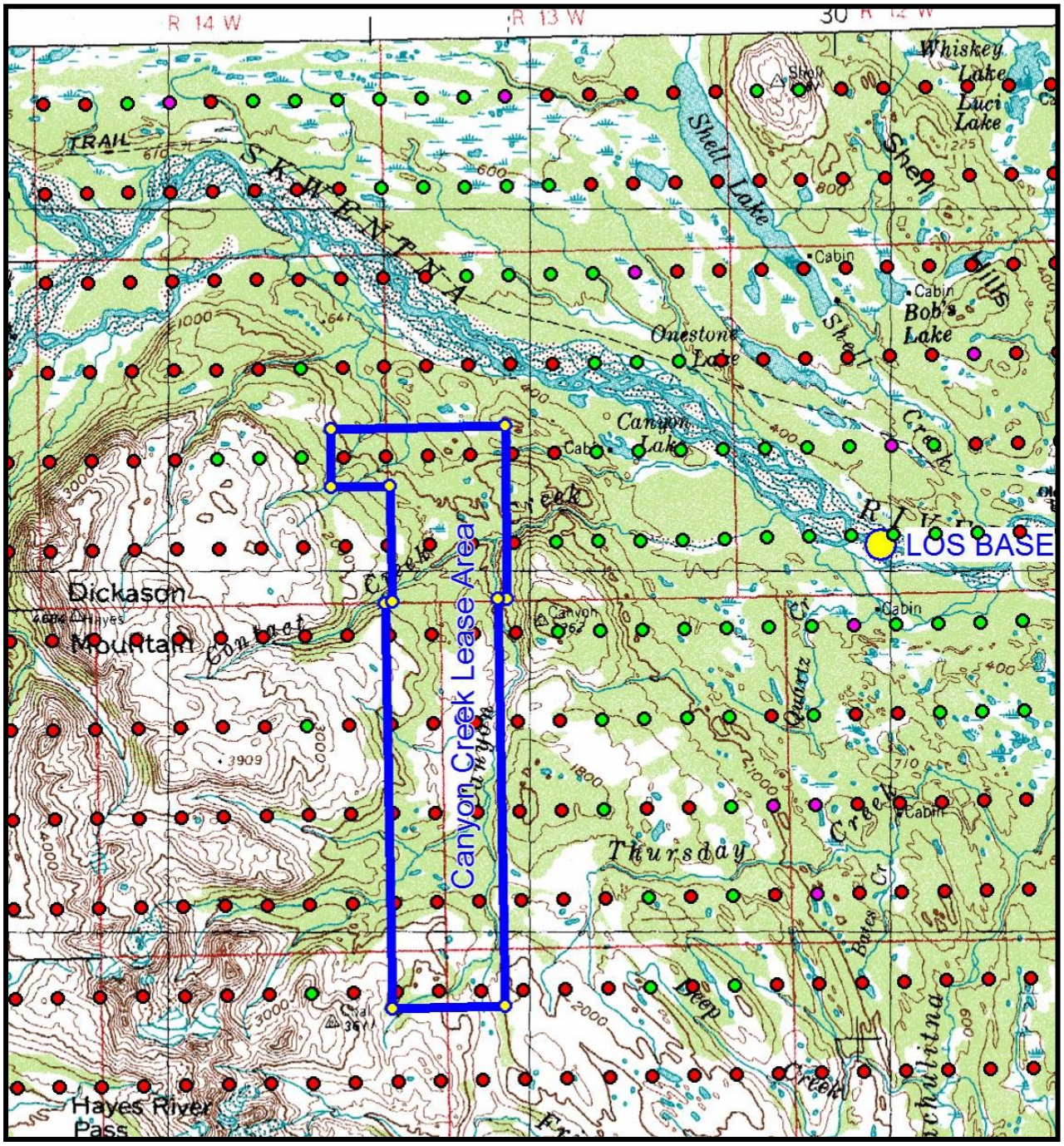
Viewshed Analysis BK2: Green dots are visible from 50 ft. above Base location. Magenta dots are visible from 100 ft. above Base. Red dots are not visible from either height above Base.



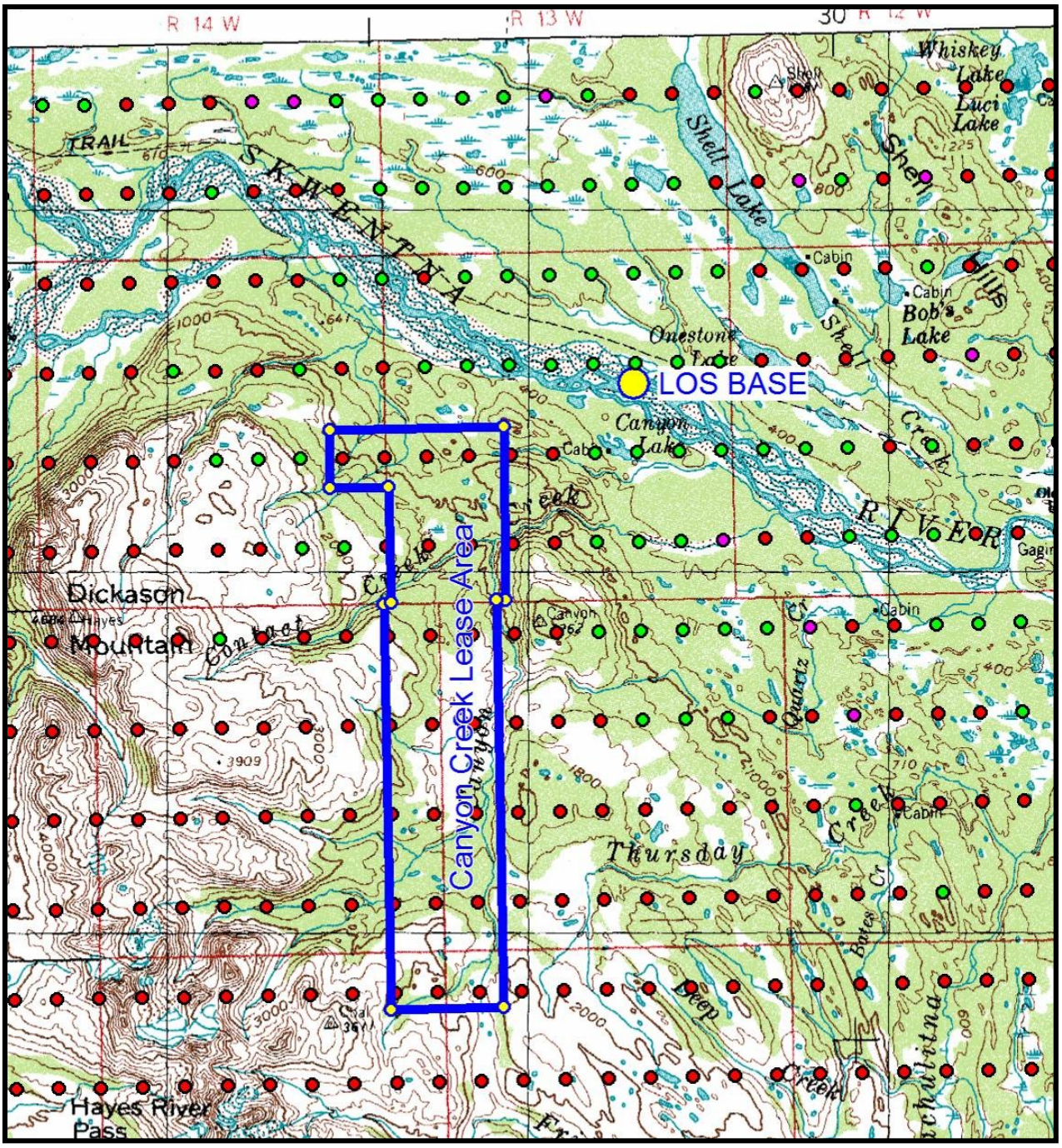
Viewshed Analysis BK3: Green dots are visible from 50 ft. above Base location. Magenta dots are visible from 100 ft. above Base. Red dots are not visible from either height above Base.



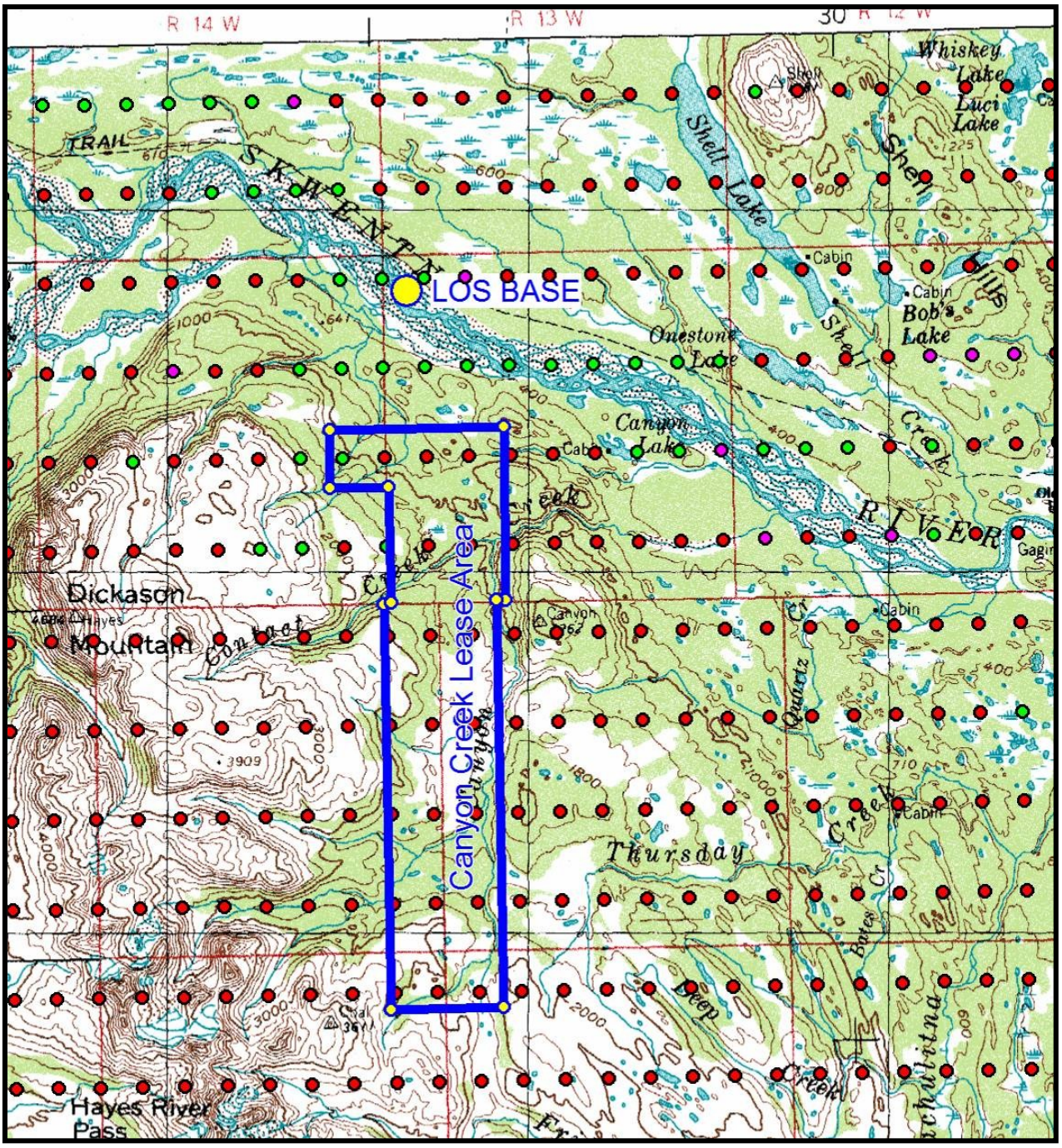
Viewshed Analysis BK4: Green dots are visible from 50 ft. above Base location. Magenta dots are visible from 100 ft. above Base. Red dots are not visible from either height above Base.



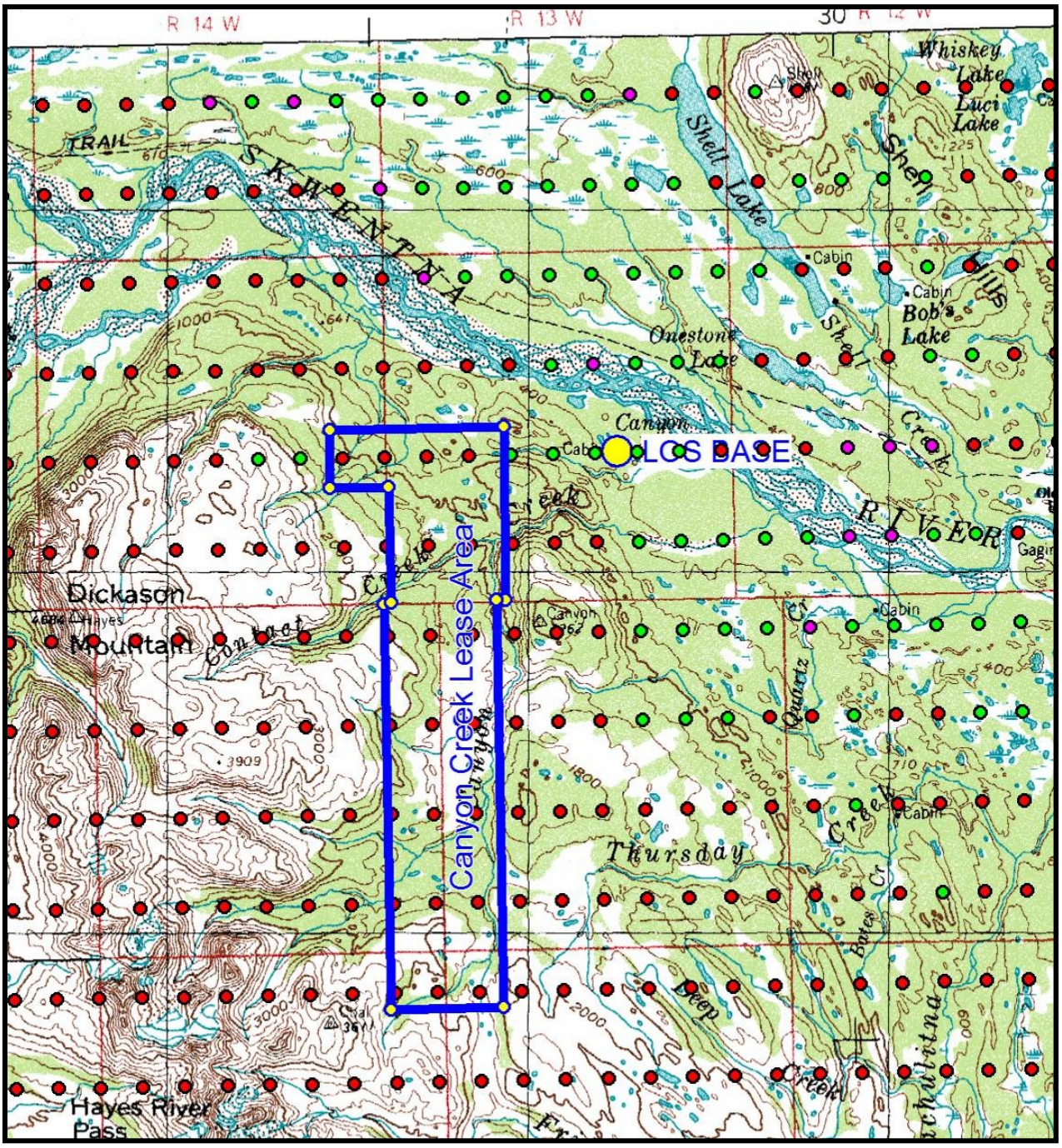
Viewshed Analysis BK5: Green dots are visible from 50 ft. above Base location. Magenta dots are visible from 100 ft. above Base. Red dots are not visible from either height above Base.



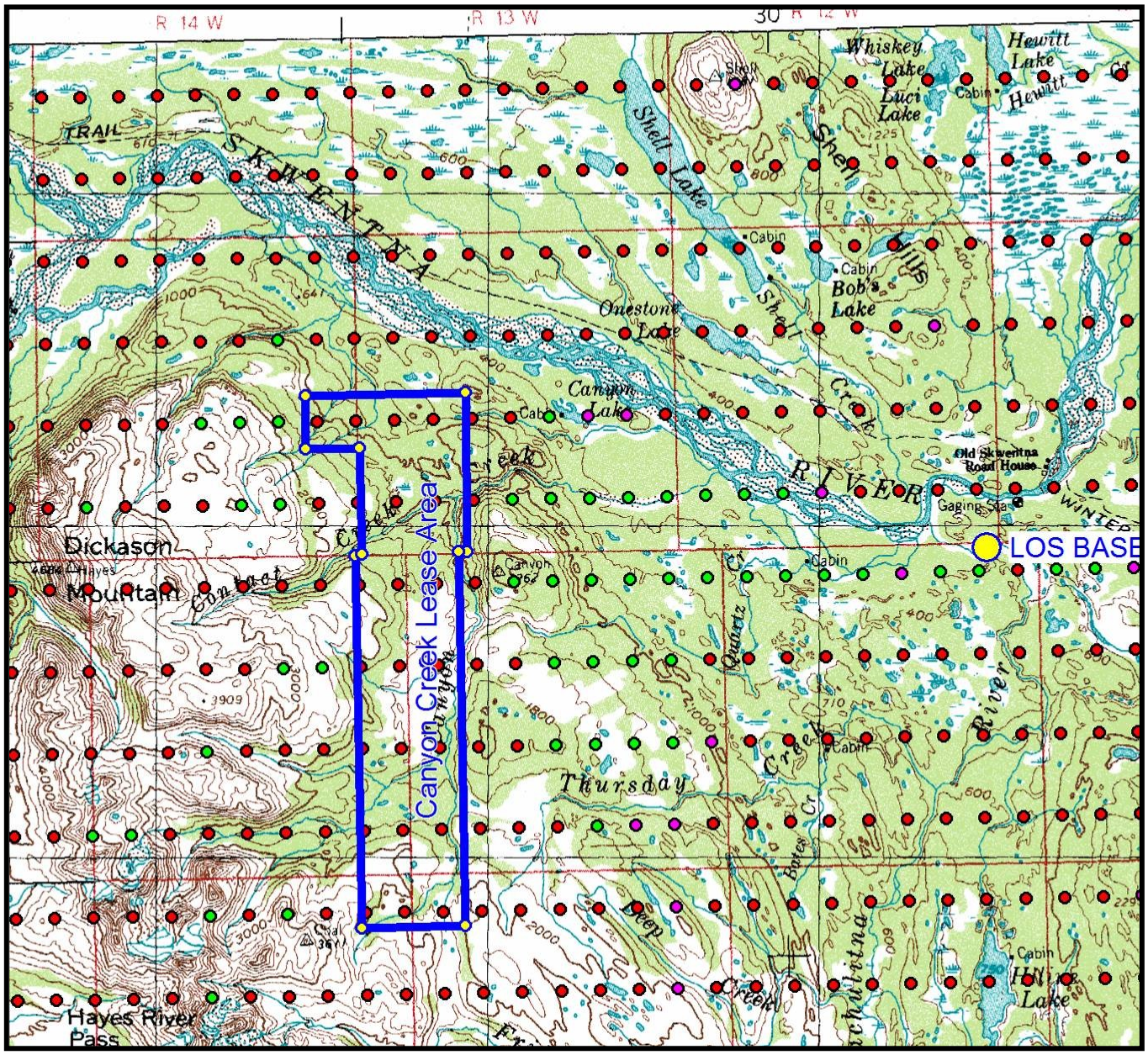
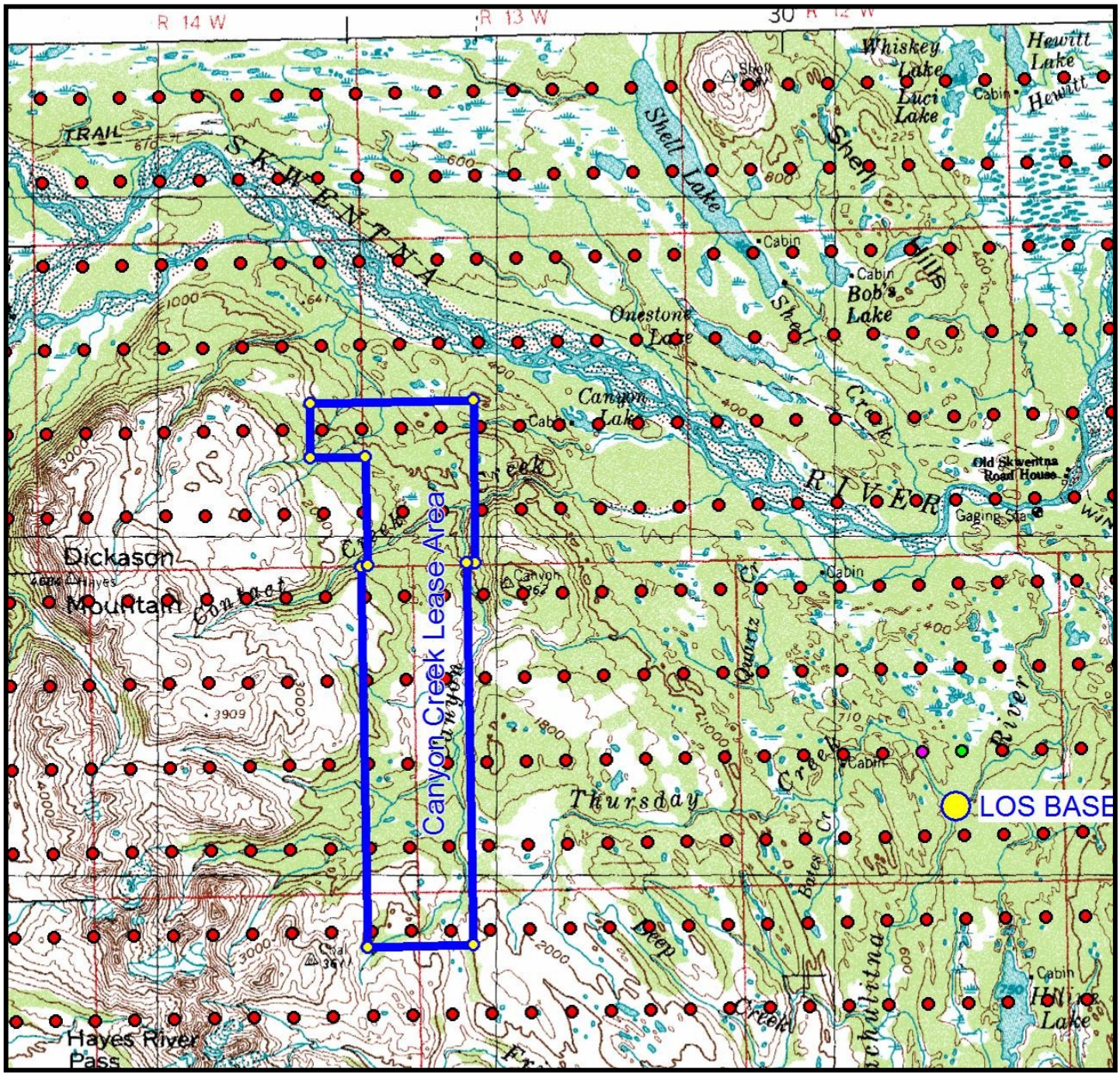
Viewshed Analysis BK6: Green dots are visible from 50 ft. above Base location. Magenta dots are visible from 100 ft. above Base. Red dots are not visible from either height above Base.



Viewshed Analysis BK7: Green dots are visible from 50 ft. above Base location. Magenta dots are visible from 100 ft. above Base. Red dots are not visible from either height above Base.



Viewshed Analysis BK8: Green dots are visible from 50 ft. above Base location. Magenta dots are visible from 100 ft. above Base. Red dots are not visible from either height above Base.



Viewshed Analysis BK9: Green dots are visible from 50 ft. above Base location. Magenta dots are visible from 100 ft. above Base. Red dots are not visible from either height above Base.