

DELONG MOUNTAIN TRANSPORTATION SYSTEM

Asset Management Review Executive Summary



December 2017



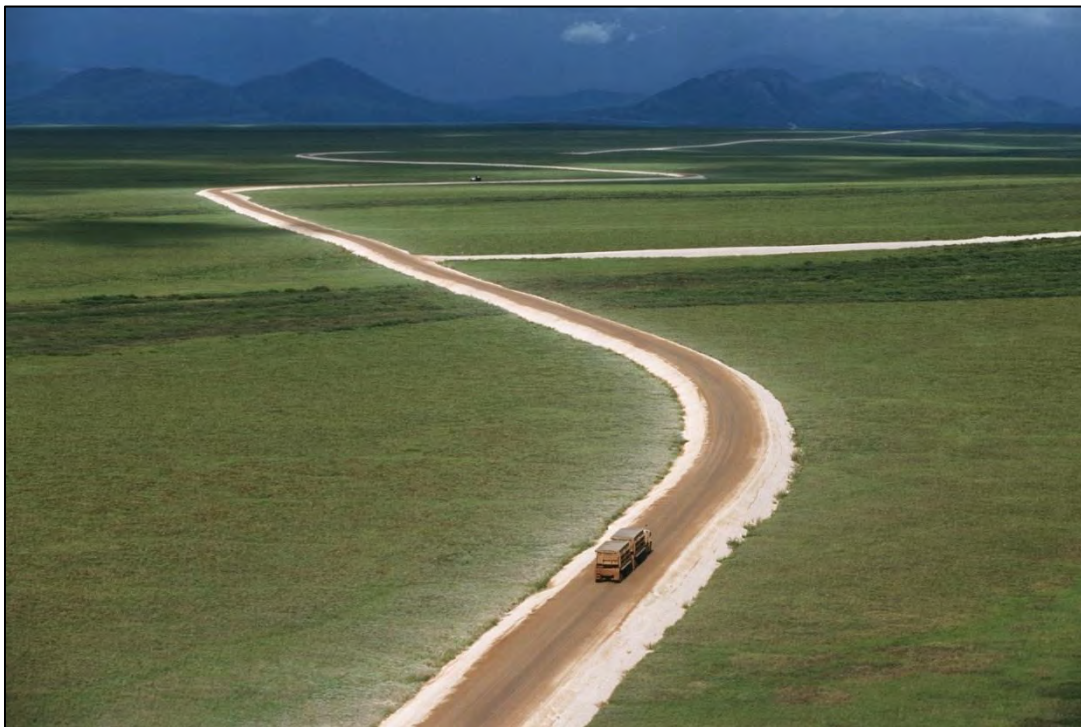
EXECUTIVE SUMMARY

INTRODUCTION AND PURPOSE

Alaska Industrial Development and Export Authority's (AIDEA) involvement in the Red Dog Mine and the DeLong Mountain Transportation System (DMTS) began over 30 years ago. The intent of this report is to:

- Summarize the DMTS project history, project agreements, key milestones, and key stakeholders
- Identify key takeaways/project elements to be applied to this and other AIDEA projects
- Understand and articulate potential project related expansion or other associated economic development opportunities
- Understand the project risks and opportunities in a changing external environment
- Identify areas in the existing project agreements that may require modification or adjustment to reflect current operational and/or management practices
- Outline key risks and potential action scenarios related to the on-going operation and future for the DMTS

This report is not intended to recommend any particular course of future action, but rather to identify future risks and management scenarios that may apply to the DMTS and AIDEA's continued ownership of this asset. The summarized key factors of success for the DMTS may also be considered for any future AIDEA projects.



BACKGROUND AND HISTORY

Incidental discovery of the original Red Dog zinc deposit occurred in the mid 1950s with the official discovery announced in 1975 after the US Bureau of Mines (USBM) completed exploration activities in the area. The passage of Alaska Native Claims Settlement Act (ANCSA) in 1971 created a rush by the newly established regional native corporations to select lands with potential future economic value. However, the area around Red Dog was designated as a potential set aside for a national park or wilderness area, pending the outcome of the USBM exploration activities. NANA,



the regional Alaska Native Corporation (ANC) for northwest Alaska, selected the lands around the future mine as part of its settlement lands. Due to disputes with existing mining claims, land transfer for the Red Dog area (to NANA) was officially settled through the passage of Alaska National Interest Lands Conservation Act (ANILCA) in 1981. Anticipating the transfer, NANA began soliciting offers from several mining companies for the potential development of the mine.

NANA reached an agreement with Cominco (now Teck) for the construction and operations of the Red Dog Mine in 1982. Seeking administrative and financial support for the project, NANA and Cominco reached out to Governor Sheffield's administration and the Alaska Legislature for potential economic assistance, including the state's ownership of the project's road and port facilities, in a similar manner as other state-owned transportation infrastructure. Recognizing the unique nature of the project's remote and semi-dedicated transportation system, the Alaska Legislature passed legislation to ultimately provide significant new tools to AIDEA to enable its financial support of the project. The DMTS project also fit AIDEA's mission of promoting economic development and job creation in Alaska. AIDEA's participation was facilitated through bills passed by the 13th and 14th Alaska Legislatures to create AIDEA's economic development account, seed the account, provide AIDEA bonding capability, and provide distinct procurement capabilities to match the project requirements.

AIDEA signed the project financing and operations agreement with Cominco (now Teck) in 1986 and sold \$103M of bonds in 1987 to support the project's construction. The AIDEA-Cominco Agreement provided for the financing of the DMTS via a 50-year lease arrangement (1990-2040) with an interest rate essentially equivalent to the market rate at the time of the financing (6.5%). Importantly, the projected mine life at the time of the project financing only extended to 2020, or twenty years short of the agreement/financing term. As a partial compensation for this risk, the Agreement included reasonable payments for AIDEA based on high road/port throughputs (the contingent tonnage fee "CTF") and/or elevated zinc prices (the contingent escalator for zinc price increases fee, "CEZ"). Following standard accounting practices, these additional upside payments are internally booked by AIDEA as additional payments on the lease, shortening the payback period on AIDEA's project financing. While Teck will continue making the agreement required payments through 2040, current estimates indicate that AIDEA will begin recognizing these upside payments as net income in 2023-2024.

AIDEA invested approximately \$160 million in the original project, spending about \$90 million for the road construction and \$70 million for port infrastructure. This included spending for the initial development of the financing and its administrative costs (bond insurance, capitalized interest, etc.). The complete infrastructure of the DMTS at that time included:

- A 52-mile double-lane gravel road to connect the port and mine
- A concentrate storage building (CSB) with capacity for approximately 535,000 tons of stored concentrate, including appropriate receipt and loadout conveyors and shiploader
- A dock facility to include a shallow-water barge dock
- A bulk fuel storage facility with approximately 10 million gallons of fuel storage capacity
- A 40-bed mancamp including all necessary utilities and other supporting infrastructure to support continuous concentrate storage and port operations



Project Location Map

Recognizing the extension of the DMTS road from the port to the mine site would require crossing through the newly established Cape Krusenstern National Monument, NANA and Cominco both began working with the National Park Service (NPS) to obtain an easement for the road right-of-way (ROW) through the monument according to provisions contained within ANILCA. However, to expedite (and ultimately avoid) this process, both companies also worked with the Alaska Congressional delegation to introduce and encourage the passage of legislation in 1985 authorizing a land exchange between the NPS and NANA for the ROW. Subsequently, in 1986 AIDEA signed a 99-year lease with NANA enabling the construction of the DMTS road and port on the NANA and NPS ROW lands.

The mine began initial operations in 1989 and the first loads of ore concentrate were shipped from the DMTS port in 1990. Unfortunately, commodity prices began a multi-year decline in 1990, challenging the economics of the project. Despite increasing mine production, the low zinc and lead prices necessitated the evaluation of options to increase the project's economic resiliency and ensure its on-going profitability. An expansion of mine throughputs by roughly 75% proved to be the most viable option. Although there were significant risks from uncertainty in the commodity price and on the extent of available future ore reserves, AIDEA moved forward with the execution of a new/restated agreement with Cominco to provide \$85M of additional financing for port expansion and modifications. Major elements of the expansion included a new/additional CSB, a modified truck unloading building (TUB), a new/replacement personnel accommodations complex (PAC) mancamp (96-bed), additional fuel storage, improvements to the conveyor systems, and additional/new utilities.

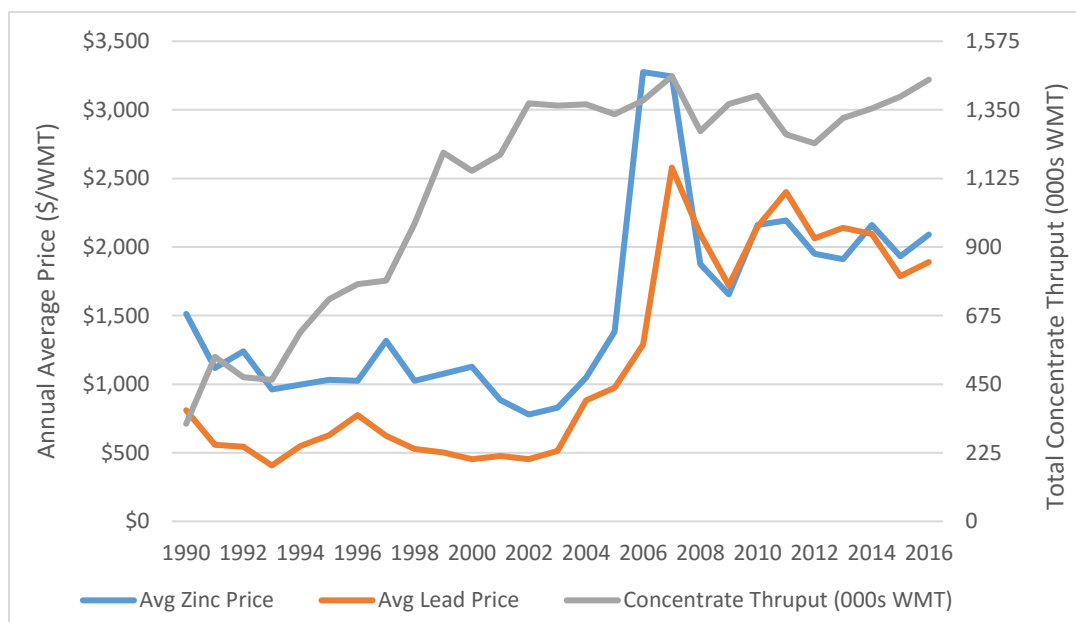


Figure ES-1. Graph of historical lead and zinc prices and Red Dog concentrate production

Following the mill and port expansion, concentrate production continued to increase. Since 2001, production has consistently exceeded 1.1 million tons per year. Recognizing additional ore reserves were required to enable the continuation of mine operations, especially at the now higher mining rates, Teck continued significant exploration and delineation activities in the area around the mill. The Aqqaluk ore body was sufficiently delineated by the mid-2000s to enable the preparation and filing of a Supplemental Environmental Impact Statement (SEIS) in 2007. The SEIS would be used to support potential permit decision-making associated with the opening of the Aqqaluk deposit. The Record of Decision (ROD) for the SEIS was issued in 2010 in conjunction with the renewed mine and mill wastewater discharge permit. These permits enabled Teck to begin mining of the Aqqaluk deposit. The original Red Dog deposit was closed in 2012, after mining over 65 million tons of ore, at an average grade of approximately 20% zinc.

Teck currently projects mining from the Aqqaluk deposit to continue through 2031 and is evaluating several options to potentially extend the overall project's life beyond that date through mining of other nearby ore bodies. Some of these ore bodies are located at depth, requiring underground mining practices which would significantly increase operational costs and decrease potential throughputs. Recent announcements provide significant promise for the development of a new deposit and the continuation of operations at Red Dog.

ECONOMIC IMPACTS

The on-going operations of the Red Dog mine/mill and the DMTS provide significant positive economic impacts for the Northwest Arctic Borough (NWAB) and the State. Table ES-1 provides a summary of these impacts. Teck, through its payment-in-lieu of taxes (PILT) agreement with the NWAB, provides more than 80% of the borough's on-going operation funding. The new PILT agreement, authorized in April 2017, will continue the borough's relationship with Teck and fund community infrastructure projects, through a village infrastructure fund. Teck also provides significant contributions to local charities and other organizations.

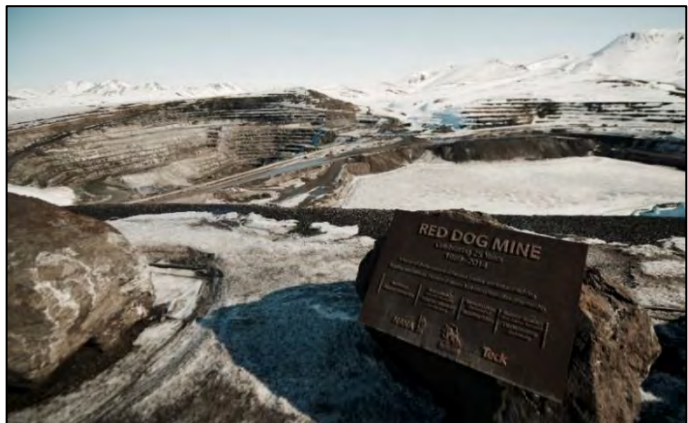
Table ES-1. Summary of Red Dog/DMTS Related Economic Impacts (thru 2016)

Description	Impact
Annual average number of jobs (includes on-site contractors)	550
Average Salary of a Red Dog Mine Employee	\$99,000
Red Dog Wage Impact in NWAB	\$65 Million
Red Dog Annual Payroll Spending	\$75 Million
Spending on goods and services within the State of Alaska (2015)	\$158 Million
NANA Royalty Payments (since inception)	>\$1.3 Billion
NANA 7(i) payments from Red Dog's >\$1.3B royalties	\$860 Million
Community investment and donations in the region (2010-2015)	\$2.8 Million

KEY FACTORS OF SUCCESS

Red Dog Mine is now one of the largest zinc and lead mines in the world. Utilizing the DMTS, the mine consistently exports more than 1 million tons of zinc concentrate annually, representing roughly 4-6% of the world's total annual zinc production. In reaching its current level of success, the project has overcome many challenges over its 30+ year history. Its ability to overcome these challenges can be attributed to several key factors, including:

- 1. *Solid enterprise business case.*** The Red Dog Mine and DMTS infrastructure now represent an enterprise that is economically self-sufficient and capable of achieving positive returns for all involved. Red Dog produces zinc and lead concentrates ultimately used for the manufacture and construction of basic infrastructure and other essential products worldwide. While long-term risks to the continued growth in demand for both metals exists, nearly all projections do not anticipate near-term significant demand changes. Red Dog's expansion in the mid-1990s enabled it to achieve economic resiliency and at current production rates it is one of the lowest cost producers worldwide.
- 2. *Long-term planning and coordination.*** The initial go-ahead for Red Dog required significant early coordination and planning. Early-on, NANA and Teck cooperatively established key relationships with the Alaska Legislature, Governor Sheffield's administration, and federal representatives/stakeholders. These relationships supported the project and helped secure important elements of the project's financing and other authorizations/permits. The Alaska Legislature's creation of AIDEA's financing tools, such as the Economic Development Fund, and its ability to own and bond for project investments is an example of one of the early project elements supported through these relationships. Similarly, NANA's consolidation of the village corporations in its region also facilitated early project approvals by minimizing potential non-supportive factions. Both companies also exhibited patience in these pursuits, exemplified through the AIDEA tool development process, which required several years and two Legislative sessions.
- 3. *Sound agreements.*** The Red Dog project is governed by numerous agreements as described in this report. The agreements between NANA, Teck, and AIDEA have each proven



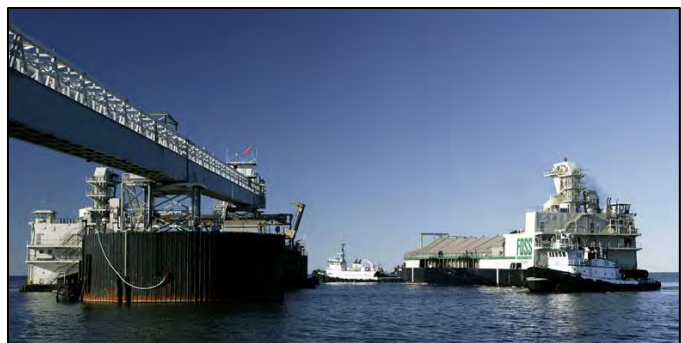
to be fair and yet flexible to enable continued operations without necessitating significant modifications or amendments. The AIDEA-Teck agreement, structured as a lease agreement, provides a consistent paydown (with return) on AIDEA's capital investment for the project, while also providing appropriate upsides based on the project's success and its relative risk sharing.

Similarly, the NANA-Teck agreement facilitated overall project success via its patient approach to providing project returns, only increasing NANA's royalty payments after the mine capital investment was repaid and then on a graduating scale for future years. NANA also benefits through shareholder employment opportunities and subcontracting preference opportunities for NANA subsidiaries. The long-term nature of these agreements also minimizes risks from short-term commodity price cycles.

4. ***Patient and reasonable capital.*** The original AIDEA-Teck Agreement stands as an example of patient financing and risk sharing, with the stated intent to assure the completion and success of the project, while also promoting AIDEA's mission of economic development in an under-developed area of the state. The 50-year term of this agreement exceeded the initial anticipated life of the mine and provided a reasonable financing rate which was equivalent to market conditions at the time of the financing. It included both credit enhancements and reasonable payments intended to offset some of these risks. AIDEA's further investment (\$85 million), in the 1996 expansion, exhibited these same elements of risk sharing and patient capital. At the time of that Agreement (1997), zinc markets were consistently low for several years with an unclear future; the mine had lost money since its opening; and the future life of the mine (via the existing/main deposit) only provided certainty for operations through 2020, which was 20 years short of the agreement's term. Despite these risks, AIDEA moved forward with the additional financing, maintaining the term through 2040. Importantly, the long-term nature of the agreement also provides a stable cash flow to AIDEA, supporting its current bond rating and ability to perform or finance other projects.



5. ***Strong partnerships and willingness to take risks.*** The collaborative working arrangements between AIDEA, Teck, and NANA have contributed to the project's success. Each party understands the long-term nature of the project and is willing to provide support to ensure its overall success. As described above, for



AIDEA, this was most acutely demonstrated through the additional financing provided in the mid-1990s for the port expansion. Given the uncertainty in the future mine reserves at the time and an on-going downturn in commodity prices, the long-term success of the project was not assured. Despite these risks, AIDEA still invested \$85 million in the expansion. AIDEA exhibited patience through the early years of the project, working with Teck through financial, environmental, safety, and other issues that confronted the project through the 1990s and 2000s.

6. ***Stable political and regulatory environment.*** The predictable laws governing the DMTS/Red Dog project provide assurance that helps support Teck's investment into the project. Even though laws and regulations can change, their change process is typically manageable and incremental; this is especially favorable for multi-national corporations like Teck, when compared to operations in less developed and less stable countries.

FUTURE RISKS AND OPPORTUNITIES

The Red Dog Mine and DMTS have operated successfully for 27 years. The continued success of the project requires an understanding of potential risks and opportunities facing the project into the future.

Risks

- ***Potential Closure.*** Currently, Teck anticipates mining to continue through 2031. Extension opportunities primarily revolve around the continued evaluation of other nearby ore bodies/deposits. Current information indicates the most likely reserves are located either at depth or a few miles from the existing mine/mill site.



Underground mining would significantly increase costs and reduce potential output. Surface mining of deposits located a few miles away would potentially require relocation of the mill complex, construction of new tailings facilities, and/or new agreements with NANA and the State (these deposits are primarily located on State lands). Teck is currently performing additional exploration and delineation activities to accompany on-going feasibility studies for the mining of these deposits. Initial planning, permitting, and agreement development/negotiation will be necessary in the upcoming years to ensure continuous mill and DMTS operations post-2031.

- ***Increasing Operational Costs.*** Increasingly stringent environmental requirements, increasing taxes or PILT agreements, and increasing personnel costs all reduce the overall economic resiliency of the project. Managing these costs is crucial to planning the future of the project.
- ***Commodity risks.*** Red Dog produces zinc and lead concentrates which are used for products worldwide. Zinc's primary use is for galvanizing steel to protect it from rust; lead is primarily used in lead-acid batteries. Substitution of these products with new alternatives is a long-term risk to the continued demand growth for both metals. Demand and pricing for zinc and lead generally follows world economic cycles. Teck anticipates future demand support for zinc to be

largely driven by increasing rates of galvanizing in countries such as China. The current high prices for zinc and lead are largely believed to be due to supply constraints from recent mine closures; the potential opening of new mines may impact future prices.

- *Environmental Risks and DR&R.*

Operating a mine and road/port come with inherent environmental risks. The potential future closure of the mine is managed through the state-required mine closure and reclamation plan and its associated dismantlement, removal, and rehabilitation (DR&R) bonding. However, the closure plan and DR&R funding do not include the DMTS port



and road. As a result, the level of potential financial impacts to AIDEA from a potential future closure of the mine (and port) are unknown. Port and road infrastructure will be needed to support post-mine closure environmental activities, however without a user, the full DMTS port infrastructure will not be needed (such as the bulk fuel tanks, mancamp, CSBs, and conveyors/shiploader). The current agreements do not indicate the responsibility for any of the potential DMTS related DR&R. Further, the current agreements do not indicate the status of the Reserve Account at the end of the term or if this account can be used for these purposes. Depending upon the nature of any new future development, the closure plan and DR&R amount will likely be renegotiated.

Opportunities

The DMTS infrastructure can provide support to numerous opportunities into the future. Some of these include:

- *Regional fuel distribution.* The bulk fuel tank farm at the DMTS port could provide fuel for some of the local communities and potentially reduce their current high-cost of fuel for both heating and electrical production.
- *The “Opening of the Arctic”.* The potential for increased shipping traffic for the northwest passage route (US West Coast to Europe or Asia to US East Coast/Europe) may also provide opportunities for DMTS to support these shipping activities.
- *Regional material receipt and staging.* The port provides a potential location for receipt and staging of bulk goods necessary for arctic projects located along the North Slope and/or interior of northwest Alaska.

- *On-going mining activities.* The area around Red Dog and Northwest Alaska is generally unexplored and provides numerous potential opportunities for the development of other mines that could potentially utilize the DMTS road and port. Teck recently approved the VIP2 project, which is anticipated to increase mill throughput at Red Dog by up to 15%; this production rate increase will help aid in maintaining overall concentrate production levels despite anticipated decreases in raw ore grades over the remaining life of the Aqqaluk deposit. Teck is also pursuing an exploratory drilling program at the nearby Aktigiruk deposit to potentially provide a new source of ores once the Aqqaluk deposit is exhausted.

SUMMARY

The DMTS is one of AIDEA's watershed projects and provides a key example of how State support, combined with AIDEA's resources and capabilities, can be deployed for successful economic development activities.

The DMTS provides a significant portion of AIDEA's on-going annual revenues while also supporting the largest economic engine for northwest Alaska and providing much needed jobs for residents of the region. The agreements which structure the full Red Dog project, exemplify a successful public-private partnership. Continued future planning and engagement by all stakeholders, coupled with an understanding of the project's history, will ensure its continued success.

