

FINDINGS AND DECISION

of the Director, Division of Oil & Gas

APPROVING THE  
SAKKAN UNIT APPLICATION

Under Delegation of Authority from the  
Commissioner, Department of Natural Resources, State of Alaska

October 30, 2006

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Attachments: 1. SU Exhibit A, Tract Description and Ownership Schedule  
2. SU Exhibit B, Map of the Sakkan Unit  
3. Exhibit G, SU Initial Plan of Exploration  
4. Sakkan Unit Agreement

## INTRODUCTION AND BACKGROUND

The Sakkan Unit (SU) is located in Northwest Alaska adjacent to the Red Dog Lead-Zinc Mine, the world's largest producer of zinc concentrate. The Red Dog Mine is located in the DeLong Mountains of the Brooks Range, approximately 90 miles north of Kotzebue and 55 miles from the Chukchi Sea. It is 100 percent owned and operated by Teck Cominco Alaska Inc. (TCAI) under a development agreement with NANA Regional Corporation, Inc., (NANA). TCAI is a diversified mining, smelting and refining group and a world leader in the production of metallurgical coal and zinc.

TCAI filed the unit application (Application) with the Alaska Department of Natural Resources (DNR), Division of Oil & Gas (Division), on August 18, 2006. Revisions and additional support information were submitted by TCAI, or its representative, on August 21, August 29, September 11, and October 3, 2006. TCAI is the sole working interest owner of the leases proposed for unitization and the designated unit operator.

The Sakkan Unit Agreement (Agreement), which uses the State Only Model Form, dated June 2002, with modifications, proposes to conform and modify four individual State of Alaska shallow gas leases so that unit operations can be conducted on a unit basis instead of on a lease basis. The SU covers approximately 19,200 acres located on all or portions of the following state lands:

T. 32 N., R. 19 W., KRM., Sections 2-5, 8-11, 14-17, 20-23, 26-29, 34-36; and  
T. 31 N., R. 19 W., KRM., Sections 1-3, 11-14.

The SU will be administered by the Division under state regulations, the terms of this Findings and Decision, and the Agreement.

TCAI's leases were originally issued effective November 1, 2000, for a three-year term under the Division's former shallow natural gas leasing program. The leases were issued on form DOG # 200001 subject to mitigation measures for ADLs 389248-389251. On August 30, 2002, the Division offered all shallow natural gas leaseholders the option to convert their existing leases to a revised lease program. TCAI did not accept this offer and retained the lease terms of the original lease form. On September 16, 2003, TCAI filed an application to extend the terms of shallow gas leases for three years. On November 6, 2003, the Division approved TCAI's application and extended the leases until October 31, 2006. The Division based its approval on the exploration activity already conducted in adjacent areas and the likely prospect of further exploration activities and possible development and production.

The leases and their corresponding lease numbers, acreages, state royalty interests, lease issue dates, and current lease expiration dates are shown below in Table 1. The leases retain a 6.25 percent royalty to the state. TCAI intends to use any gas produced from the SU in its Red Dog Mine operations.

Table 1 – SU Lease Information

<u>ADL</u>	<u>Acres</u>	<u>State Royalty Interest %</u>	<u>Lease Effective Date</u>	<u>Lease Expiration Date</u>
389248	5760	6.25	11/1/2000	10-31-2006
389250	5760	6.25	11/1/2000	10-31-2006
389249	2560	6.25	11/1/2000	10-31-2006
389251	5120	6.25	11/1/2000	10-31-2006

## APPLICATION FOR THE FORMATION OF THE SAKKAN UNIT

TCAI submitted the Application to form the SU and paid the \$5,000 unit application filing fee on August 18, 2006. The Application included: the SU Agreement; Exhibit A to the Agreement, legally describing the SU, its leases, and ownership interests; Exhibit B to the Agreement, a map of the SU; and Exhibit G to the Agreement, the proposed plan of exploration (initial POE). All proper parties executed the Agreement.

The Division published an Application notice in the Anchorage Daily News and in The Arctic Sounder. The Division also posted notices on the state's online public notice Web page, DNR's public notices page, and the Division's Web page. The Division provided copies of the public notice to the Northwest Arctic Borough and mayor, NANA, Kikiktagruk Inupiat Corporation, the cities of Kotzebue, Noatak and Kivalina, the Kotzebue IRA Council, the Native Village of Noatak, the NW Arctic Economic Development Corporation, and other interested parties in compliance with 11 AAC 83.311. The Division also provided public notices to the Alaska Department of Environmental Conservation, the Alaska Department of Fish and Game, Department of Natural Resources, Northern Regional Office of the Division of Mining, Land and Water, the Department of Natural Resources, Office of Habitat Management and Permitting Fairbanks Area Office, the Alaska Oil and Gas Conservation Commission, the US Department of the Interior, Bureau of Land Management, Arctic Management Unit, and the Division of Minerals, Anchorage District Office, and to post offices, libraries, print media, public television, and radio stations in the area. The notice invited interested parties and members of the public to submit comments by October 16, 2006. No public comments were received.

## DISCUSSION OF DECISION CRITERIA

AS 38.05.180(p) gives DNR the authority to approve a unit when necessary or advisable in the public interest to conserve the natural resources of all or a part of an oil or gas pool, field, or like area. The DNR commissioner (Commissioner) reviews unit applications under 11 AAC 83.301 – 11 AAC 83.395. By memorandum dated September 30, 1999, the Commissioner approved a revision of Department Order 003, and delegated this authority to the Division Director (Director).

The Director will approve a unit application upon finding that it will: 1) promote the conservation of all natural resources; 2) promote the prevention of economic and physical waste; and 3) provide for the protection of all parties of interest, including the state in accordance with 11 AAC 83.303(a). 11 AAC 83.303(b) sets out six factors that the Director will consider in evaluating a unit application. A discussion of the subsection .303(b) criteria, as they apply to the Application, is set out below, followed by the Director's findings under subsection .303(a), and the Director's conditional approval of the Application.

## **1. The Environmental Costs and Benefits of Unitization**

The administrative approval of the SU has no environmental impact itself because it does not authorize the unit operator to conduct operations within the unit. Unitization does not waive or reduce the effectiveness of the mitigation measures that condition the lessee's right to conduct operations on these leases. The Division's approval of the SU and initial POE is only one step in the process of obtaining permission to drill wells and develop the known reservoirs within the unit area. The unit operator shall still obtain approval of a unit plan of operations and obtain various permits from state agencies before initiating activities. Plans of operations must describe the operating procedures designed to prevent or minimize adverse effects on natural resources. The plan of operations application undergoes a multi-agency review that includes a public notice and 30-day comment period. When the operator proposes to further explore and develop the unit area with any increase in the approved footprint, it must submit a new unit plan of operations, and the Division will ensure that it complies with any lease stipulations and lessee advisories.

The environmental impact of unit operations will depend on the level of development activity, the effectiveness of mitigation measures, and the availability of alternative habitat and subsistence resources. The anticipated activity under the SU will impact the environment, habitat, and subsistence activity less than if the lessees developed the resources on an individual lease basis.

The leases were issued on form DOG 200001 subject to mitigation measures for ADLs 389248-389251. These specific mitigation measures, established at the time of leasing, will continue to apply and provide additional environmental safeguards and protection. Other lease stipulations will also continue to apply.

There are also significant potential environmental benefits associated with this development if it is successful. Replacement of liquid fuel imports with locally produced cleaner burning gas would reduce potential adverse environmental impacts associated with transportation of liquid fuels. Also, by using gas instead of diesel for power generation, a cleaner burning fuel can be used for power generation.

The environmental costs and benefits of unitizing the leases justify approval of the Application under the section .303(b)(1) criteria.

## **2. The Geological and Engineering Characteristics of the Reservoir or Potential Accumulation**

### **Regional Geology**

The Red Dog mining district is located in the western Brooks Range and is comprised primarily of Paleozoic- to Mesozoic-aged sediments and volcanics of continental shelf, slope and oceanic floor affinities. The regional structure is dominated by an east-west trending fold and thrust belt formed by the Early Cretaceous collision of continental Alaska with oceanic terrains to the south.

Eight major allochthonous, north verging thrust packages have been recognized, four of which (Wolverine Creek, Brooks Range, Picnic Creek and Kelly River allochthons) are present in the Red Dog area. Each is comprised of similar stratigraphic sequences that are differentiated by minor facies variations, principally in the Mississippian formations. Shale gas exploration is currently focused on the Brooks Range allochthon. It is subdivided into the upper Key Creek plate and underlying Red Dog plate, which hosts the district's zinc deposits. The Wolverine Creek allochthon lies immediately below and is in structural contact with the Brooks Range allochthon.

### **Stratigraphy**

The stratigraphy of the Brooks Range allochthon consists of Devonian to Jurassic continental margin sediments overlain by Cretaceous flysch. The Endicott Group is the oldest unit and consists of fluvial-deltaic shales, siltstones, sandstones and conglomerates. Coarser clastics dominate the base of the Endicott, while finer-grained, deeper water black shales (Kayak shale) occur in the upper portion. The Endicott Group is conformably overlain by deeper water sediments of the Mississippian Kuna Formation. Within the Red Dog Plate, the Kuna Formation is subdivided into two units; the lower Kivalina and upper Ikalukrok shales. The Kivalina shale is composed of rhythmic banded calcareous turbidite and black calcareous shale. The Ikalukrok is a black siliceous shale with minor sandy turbidite, micritic limestone and upper black chert with locally silicified micritic limestone. The Kuna Formation is overlain by the Pennsylvanian Siksikpuk Formation, which is subdivided into three members. The lower unit is composed of gray chert and siliceous shale. Barite beds and nodules and locally significant amounts of pyrite are common. The middle Siksikpuk is generally composed of maroon to green-gray laminated siliceous shales. The upper Siksikpuk is dominantly composed of maroon to green-gray cherts and subordinate gray shales.

The Triassic to Middle Jurassic Otuk Formation overlies the Siksikpuk. It is composed of two members in the Red Dog plate. The lower Otuk is interbedded gray to black shale and chert. The upper unit is predominately gray ribbon chert with lesser black shale. The Ipewik Formation of Jurassic to Early Cretaceous age overlays the Otuk. It is composed of maroon to green-gray mudstone, often containing clasts of volcanic debris or ash beds. The stratigraphic section is capped by the Early Cretaceous Okpikruak Formation which unconformably overlies the older units with both depositional and structural contacts. The Okpikruak consists of gray, fine-

grained graywacke deposits, presumably shed off the advancing thrust wedge. Contacts with the underlying strata suggest the Okpikruak is both pre- and syn-thrusting in age.

## Structural Geology

The Red Dog district is a structurally complex area composed of several allochthons separated by major thrust faults. These faults are characterized by locally extensive zones of intense shearing, sometimes several hundred feet thick. The zones are commonly developed in black shale and impart a phyllitic to mylonitic fabric to the rock, locally referred to as melange. In addition to the major thrust faults, there are numerous internal thrust faults and folds within each plate. Where sufficiently detailed data exist, several orders of sub-plates can be recognized. The structural picture is further complicated by Tertiary high-angle, oblique extensional faults, associated low-angle faults and high-angle strike-slip faults. Lateral off-sets of several miles can be recognized on some of these faults.

Two structural features, informally referred to as basins, are recognized in the Red Dog area. The North Basin is a topographic basin lying along the North Fork of Red Dog Creek. It is underlain by at least two thrust sub-sheets. The upper Cover Plate is composed predominantly of Kivalina calcareous turbidite and shale, which become more shaley and blacker (higher TOC) deeper in the section and to the east. The lower Gull Creek Plate, which hosts the Red Dog zinc deposit, is dominated by the Ikalukrok shales and younger units. Both plates are in structural contact with the lowermost Wolverine Creek allochthon.

The Wulik Basin is also composed of two sub-plates and is possibly a dextral offset of the North Basin along a north trending strike-slip fault. The upper Competition Creek plate is composed primarily of Kivalina shale, but also includes some of the overlying Ikalukrok. The lower Gull Creek plate is dominated by Ikalukrok shales and the overlying Siksikpuk and Otuk formations. It also hosts the zinc mineralization at the Anarraaq deposit and is probably equivalent to the plate hosting Red Dog. As in the North Basin, both plates locally rest on the Wolverine Creek allochthon.

## Shale Gas Geology

Shale gas near Red Dog has been identified in cores from three geologic units; the Ikalukrok and Kivalina shales of the Kuna Formation and thrust-related melange. Both shale units were deposited in deep water, anoxic environments on the continental slope and basin, thereby preserving original organic material. Methane produced since burial is adsorbed onto organic material or migrates into open pore spaces and fractures. Gas that migrated along faults into the overlying Siksikpuk shale locally reduced hematite to ankerite or siderite. Some of the faults cutting the Siksikpuk also contain solid bitumen that probably originated as oil from the underlying Ikalukrok shale.

The Ikalukrok shale, which is the better gas source, contains 1 to 5% TOC with occasional values ranging up to 15%. Freshly drilled cores from darker (higher TOC) intervals have gas contents averaging 17.6 scf/ton. The Ikalukrok ranges in thickness from 90 feet in the vicinity of

Ferric Creek up to 800 feet near Anarraaq. Most of this variability is due to structural thinning or thrust duplication, although some may be related to primary depositional parameters.

The Kivalina shale, which is depositionally similar to the Ikalukrok, contains a higher proportion of carbonate sand and silt but has a lower TOC content (1-3%). Despite leaner organic matter, the average gas content in Kivalina cores (16.4 scf/ton) is similar to that from the Ikalukrok (17.6 scf/ton). Average thickness is 600 feet but sections greater than 2,500 feet have been encountered in the Cover plate from the Wulik and North basins. In thicker sections the lower portions are sometimes interbedded with black, very organic shale facies of the Mississippian Kayak Shale that have very high TOC values (>7%) and gas contents (up to 65 scf/ton).

Melange formed where Ikalukrok and Kivalina shales are incorporated in shear zones of thrust faults can contain as much gas as the original shales. However, melange developed in other stratigraphic units, such as the Okpikruak shale, is not a significant gas source. Permeability varies from low values in healed, very tight mylonitic zones to high values where larger clasts of resistant formations are incorporated in the shear zones.

Gas shales in the Red Dog area are normally pressured. Methane is held in the shales by weak electrostatic attractions between molecules and organic matter, aided by hydrostatic pressure from the overlying groundwater column. The gas content of shallow rocks is therefore quite low and will probably not produce sufficient gas to be economic. Only reservoirs buried deeper than 1,000 feet will likely yield economic quantities of methane.

### **3. Prior Exploration Activities in the Unit Area**

The shale gas potential of the greater Red Dog area was first identified in the mid 1990s when gas bubbles were observed in various mineral exploration bore holes within the proposed S U area. Subsequent investigations were carried out to further evaluate this potential resource using the ongoing mineral exploration program as a vehicle to recover samples for analysis, as well as for geophysical studies. Data collected over several field seasons includes analyses of TOC, bulk density, rock gas content, permeability and formation water quality. In addition petrophysical measurements were collected from nine core holes. This preliminary work was distributed throughout the proposed area, and culminated in the drilling of two shale gas wells (NB-01 and NB-02) in 2005 on NANA lands outside the unit area. Access roads and drill pads were constructed early in 2006. Other pertinent information on year 2005 and 2006 work is shown below.

Well No.	Location	Total Depth, MD/TVD	Planned Completion
NB-01 – drilled 2005	35ft WEL 1110ft NSL Sec 18, T.31 N., R.18 W., KRM (NANA lands)	2745 ft.	Hydraulically fractured in three additional zones. Hole to be completed, tied into the water return line and put on long-term test.
NB-02 – drilled 2005	1070ft WEL 3730ft NSL Sec. 18, T.31 N., R. 18 W.,	3110 ft.	Hydraulically fractured in three additional zones. Hole to be completed, tied into the water return line and put on long-term test.



	KRM (NANA lands)		
NB-03 – drilled 2006	1655ft EWL 1855ft NSL Sec 17, T.31 N., R. 18 W., KRM (NANA lands)	3502 ft.	Drilled to 3502’ and geophysical logs run. Bit stuck and cemented back to 1913.’ Hole placed in a SI condition for drilling n 2007.
NB-04 – drilled 2006	1100ft EWL 3770ft NSL Sec 17, T.31 N., R. 18 W., KRM (NANA lands)	2409 ft.	Drilled to 2409’, bit and drill string lost. Hole plugged and abandoned.

#### **4. Plans for Exploration or Development of the Proposed Unit Area**

The operator shall provide plans for exploration or development that justify including the proposed acreage in the unit area. Following preliminary discussions, TCAI submitted the initial POE on August 18, 2006, and provided revised submittals on August 29, 2006 and on October 3, 2006. Division edits were incorporated into the final Exhibit G, shown as Attachment 3.

The initial POE requires data and studies resulting from TCAI’s development activities be provided to the state. The following “general plans” have been proposed by TCAI to acquire the necessary information required under the initial plan of exploration:

##### **a. General Work Plans - Overall**

TCAI will conduct drilling during the barge season window of July to September.

TCAI will drill all wells as straight holes.

##### **b. General Work Plans - Year 2006**

Surface production equipment will be installed at each well location in 2006, and a gathering system constructed for sending produced water to a central pumping facility. An all-season produced water pipeline will be constructed to the Red Dog mine tailing pond so that well de-watering and production testing can continue through the winter months. It is expected that de-watering of the wells could require nine months or more before gas production potential can be adequately assessed.

##### **c. General Work Plans - Year 2007**

Up to four additional exploration wells may be drilled in 2007 somewhere on NANA lands to complete the initial 5-spot pattern (5 producers on equidistant well spacing). The fourth well in the program (NB-06) is a possible re-drill of NB-01, depending on the success of the re-work and frac jobs in the 2006 program. Each hole will be hydraulically fractured in four or five stages and then dewatered. An injection test is planned in one of the holes for possible produced water disposal.

Because stabilized gas production cannot be expected before late spring 2007, the remainder of the year will be required to definitively evaluate the true production potential of the wells. Much of 2007 will be dedicated to production testing and data analysis.

**d. General Work Plans - Year 2008**

Assuming positive results from production testing are achieved, exploration will be initiated on state acreage within the SU with the drilling of up to six stratigraphic core holes. The precise locations have not been determined at this time. These holes will be geophysically logged, and the core samples analyzed for TOC, bulk density, rock gas content and permeability.

Production testing will be continued at the original 5-spot location in order to assess decline rate.

A first stage feasibility study will be started during this period to determine development costs, number of wells required for commercial production, schedule for development tasks, and permitting.

**e. General Work Plans - Year 2009**

A second 5-spot production test is planned for this year, the location of which may be determined after the year 2008 stratigraphic program. The target is a project go/no-go decision by early 2011. The feasibility study initiated in 2008 will be completed this year. It is expected that a full development will require 24 to 36 months for permitting and engineering.

**f. General Work Plans - Year 2010**

Project engineering is expected to be completed during this period with permitting continuing. Extended production testing will be continued at the second 5-spot location.

**g. General Work Plans - Year 2011**

This year is expected to have permitting complete and at this point, a “go/no go” decision could be made about future development. The construction of roads and drill pads are scheduled for the spring and summer months. Development drilling is expected to start during the year, the location of which is uncertain at this time.

TCAI intends to employ a “learn as you go” approach due to the uncertainty and challenges associated with developing this resource. This resource in Alaska has not been proven commercial and challenges include the uniqueness of the resource, the remoteness of the location, the lack of infrastructure for gas development, the lack of support services in the region (North Slope services cannot access this region and service equipment must be barged in from outside Alaska), and the narrow summer barge window. The commerciality of the resource is very much uncertain.

With this uncertainty, general work plans, that are not work requirements under the initial POE, are planned so that each successive year’s work plan can be developed based on the prior year’s results. Data gathering is a key objective of the initial plan of exploration for the SU. The initial POE, in this case, requires data and studies be provided to the state documenting the results of the “general work plans” so that data gathering to make a “go” or “no go” decision about further

commercialization of the resource, can be done in a rational way and so that the primary objective of the initial plan of exploration can be achieved.

The initial POE provides TCAI flexibility and five-years to complete work and studies so that a decision point regarding commercialization can be reached. This five-year term and flexibility are needed in the initial POE because of the challenges as described, the uniqueness of the resource (first of its kind for the State of Alaska), and the “learn as you go” approach planned by TCAI. During the five-year term of the initial POE, TCAI plans to conduct exploration drilling, core analysis, testing, permitting, engineering, and feasibility studies to evaluate the resource potential. TCAI is making a considerable investment to attempt to realize the potential benefits associated with developing this challenging and unique resource. TCAI’s position as operator of the adjacent Red Dog mine and the cost of power at the mine justifies TCAI’s investment in this potential resource.

The initial POE includes the requirement that if four consecutive barge seasons, beginning in 2007, pass without TAIC drilling any additional wells or stratigraphic holes to at least 2000 feet on the SU area or on adjacent NANA land, the unit will automatically terminate on October 31, 2010.

Drilling and testing under the initial POE will initially be conducted on NANA lands adjacent to the unit boundary, which are closer to the existing infrastructure than state lands in the SU. Assuming positive results from production testing are achieved, exploration will be initiated within the SU with the drilling of up to six stratigraphic core holes in 2008.

The initial POE will satisfy the performance standards and diligence requirements of the state and provides significant benefit to the state that justifies approval of the Application under the section .303(b)(4) criteria. A positive outcome will facilitate commercial development and production from unit lands.

## **5. The Economic Costs and Benefits to the State**

The general work plan and assessment of the gas potential of these resources offers many economic benefits to the state if completed as contemplated and if gas production is ultimately proven commercial, including:

- jobs and economic activity associated with fulfilling the work plan in the short term and, if successful, in the long-term;
- potential to lower the cost of power at the Red Dog Mine, improving the competitiveness of the mine, which is an important source of jobs and income in the NANA region;
- supports the state’s investment in the DeLong Mountain Transportation System and terminal;

- develops a new resource in Alaska. Currently, there are no shale gas developments in Alaska. If this development is successful, it may serve as a case study for similar opportunities statewide, particularly in remote regions that rely almost exclusively on costly imported fuels for power generation and transportation. Shale gas and other unconventional gas plays are currently a significant and rapidly growing segment of the North American gas market with more than 30,000 producing wells and more than 5 bcf/day of production in 2003 according to the unit applicant; and
- the state will receive royalty and tax revenues.

If the initial POE is not completed, there would be no lost bonus payments during the term of the unit, because there is currently no state-wide shallow gas leasing program. As a result, the initial POE does not include any lease extension charges to compensate the state for lost bonus payments associated with a lease sale that might result from unit termination and release of the leases back to the state.

The primary terms of the leases are due to expire on October 31, 2006, but it is in the economic interest of the state to form the SU to facilitate exploration activity to stimulate economic development and create greater revenue opportunities. Any additional administrative burdens and other risks and concerns associated with the formation of the SU are outweighed by the potential for additional economic benefits derived from any production that may occur if the initial POE is completed and successful. Under the initial POE, it is expected that the leases will be explored quicker than if the leases are returned to the state and re-leased, especially considering that there is currently no shallow gas leasing program.

The economic costs and benefits to the state of the SU justify approval of the Application under the section .303(b)(5) criteria.

## **FINDINGS**

The Application meets the criteria in 11 AAC 83.303(a) as discussed below.

### **1. Promote the Conservation of All Natural Resources and Prevention of Economic and Physical Waste**

Unitization provides benefits by allowing exploration to be conducted more efficiently across an entire unit area rather than on a lease basis. Infrastructure, such as production, gathering, and processing facilities can be shared rather than constructing standalone facilities on a lease-by-lease basis. This results in the use of fewer materials, less equipment, and minimizes surface impacts, environmental risk, and waste.

The formation of the SU will allow state lands to be comprehensively and efficiently explored and developed. The unit and unit operating agreement and completion of the initial POE and subsequent plans of exploration or development governing that production will help avoid unnecessary duplication of development efforts. Infrastructure can be shared to require fewer materials, less equipment and to minimize surface impacts, environmental risk, and waste, and to promote the conservation of resources and prevention of waste through unitized exploration and development on state lands. It is anticipated that over the long term the state and adjacent NANA lands could be formed into a single unit and managed jointly. Formation of a co-managed state-NANA unit, however, has been deferred until work that better defines the commercial potential of the reservoir can be completed and terms for a co-managed unit can be developed. In consideration of this potential, no duplicative developments are planned on state and NANA lands.

If the initial POE results in commercial development of the SU, significant volumes of liquid fuel used at the Red Dog Mine would be replaced with a cleaner burning, more efficient, and locally produced natural gas. This would eliminate economic and physical waste associated with transporting, storing, and combusting large quantities of liquid fuels, which are expected to be more expensive, have a higher degree of environmental risk, and burn less cleanly when combusted for power generation.

An additional benefit is that unit formation allows marginally economic reserves, which otherwise may not be economic on a lease-by-lease basis, to be produced in combination with more productive leases in a unit. Providing access to marginal reserves may prevent the physical and economic waste of not producing marginal reserves. Shale gas production from the SU is anticipated to be low-rate and marginally economic. The SU combines state leases allowing less productive areas to be developed along with the most productive areas. Providing access to marginal reserves within the SU prevents the physical and economic waste of those reserves.

An additional benefit of unit formation is that the Agreement and the unit operating agreement ensure an equitable allocation of costs and revenues commensurate with the value of the leases. Unitization divides costs and production equitably amongst competing landowners. Without an equitable cost-sharing formula, competing landowners or individual leasehold interests could produce reserves without regard to the impacts on recovery of other reserves owned by other leasehold interests. TCAI, the sole working interest owner of the SU, has signed the Agreement and a unit operating agreement. The Agreement allocates cost and production, according to Exhibit A, across the unit on a surface acre basis.

Future exploration and development of the state leases under the initial POE will reduce the incremental environmental impact of production and will conserve natural resources and prevent economic and physical waste. Therefore, the Division's evaluation of the section .303(a)(1)(2) criteria supports approval of the Application.

## **2. Provide for the Protection of All Parties, Including the State**

The Agreement should protect the economic interests of the working interest owner in the SU, as well as the royalty owner. Although there is currently only one working interest owner in the SU,

the ownership structure is subject to change. TCAI submitted the Agreement based on the State Only Model Form, dated June 2002, including modifications required by the Division. A copy of the Model Form with the modifications is included as Attachment #4.

The state's economic interest is protected because gas recovery from the unitized area is more likely maximized than it would be on a lease-by-lease basis. Diligent development and exploration under a single approved unit plan promotes efficient and more economic evaluation and development of the state's resources, while at the same time minimizing impacts to the area's cultural, biological, and environmental resources.

Also, as previously noted, the working interest owner's interest is protected in a unit by ensuring an equitable allocation of costs and revenues commensurate with the value of the leases in the Agreement and unit operating agreement. Unitization divides costs and production equitably among competing working interest owners, should additional working interest owners come into the unit.

Drilling and testing under the initial POE will be conducted on NANA lands adjacent to the unit boundary, which are closer to the existing infrastructure than state lands in the SU. Assuming positive results are achieved, exploration will be initiated on state acreage within the SU with the drilling of up to six stratigraphic core holes in 2008. It is anticipated that over the long term the state and adjacent NANA lands could be formed into a single unit and managed jointly. Formation of a co-managed state-NANA unit, however, has been deferred until work that better defines the economic potential of the reservoir and its drainage characteristics can be completed and terms for a co-managed unit can be developed. Information acquired from work completed on NANA lands will be shared with the state to contribute towards development of state lands and development of a co-managed unit in the future.

Until a co-managed unit can be formed, and while production and testing initially occurs on NANA lands, the state's interests are protected against any drainage of the state's royalty gas from wells drilled on NANA lands through the offset well provision in Article 10 of the Agreement, NANA's obligation to seek approval of a participating area under Article 9 before sustained production begins from a reservoir, and its obligation to submit an allocation of production plan under Article 11.

When the drainage characteristics of the reservoir are better defined, it is anticipated that wells could be drilled on spacings of less than 160-acres without draining across the NANA-state property line. With this expectation in mind and out of concern to not unreasonably burden the operator with having to drill offset wells on state lands when drainage is unlikely to occur, the Division acknowledges that TCAI may submit an application to amend the unit agreement under 11 AAC 83.303 ( c )(2) proposing to allow for an offset well spacing provision of less than 1320 feet. Upon receipt of that application, after additional testing and production, and when the drainage radius of wells producing from the unit are adequately defined by TCAI and as determined by the Division, the Division will review the merits of application and consider whether amending Article 10 of the agreement is justifiable to allow for an offset well spacing provision of less than 1320 feet.

Future drilling, testing, and exploration will define the potential presence and lateral extent of paying quantities within the SU, and provide for the protection of all parties in interest. As a part of this decision, the annual report submitted to the Division by TCAI will incorporate new well test, drilling, or other data acquired as a result of work completed under the initial POE into an analysis that more fully defines the extent of the unit area. The annual report will describe the operations conducted under the initial POE during the preceding year. All production test results and data analysis must be provided to the Division as a part of the initial POE annual report. This will include well test rate and results, water and hydrocarbon volumes, pressure data, geophysical logs, core analysis including TOC, bulk density, rock gas content, permeability if acquired, and eventually the completed feasibility study.

Also, the lease form and the conditions of this decision provide in part that the state's royalty share will be free and clear of all lease expenses. Operating under the terms and conditions of the lease and unit agreement provides for accurate reporting and record keeping, royalty settlement, in-kind taking, and emergency storage of oil, all of which will further protect the state's interest.

The Division's evaluation of the section .303(a)(3) criteria and the modifications to the standard unit agreement supports approval of the Application.

## DECISION

- 1) For the reasons discussed above, I hereby approve the Application, subject to the conditions specified herein, including terms and conditions in Attachments 1, 2, 3, and 4 to this document. The Agreement and the initial POE become effective as of 12:01 a.m. on the day following approval by the Director.
- 2) The initial POE, Exhibit G, requires that TCAI shall provide the Division with the final feasibility study and supporting data which forms the basis of a “go/no-go” decision regarding commercial development of this resource, excluding proprietary commodity pricing data. TCAI shall have a continuing and ongoing obligation to provide the Division with this study as soon as it is completed, if it is completed, even if it is completed after unit termination.
- 3) The unitized development and operation of the leases will reduce the amount of land and fish and wildlife habitat that would otherwise be developed on individual leases. Reducing environmental impacts and minimizing interference with subsistence activity is in the public interest.
- 4) Under regulations governing formation and operation of gas units (11 AAC 83.301 – 11 AAC 83.395) and the terms and conditions under which these lands were leased from the state, the leases listed in Attachment 1 and shown on Attachment 2 are included in the SU.
- 5) The operator shall submit updated Exhibits A and B to the Agreement within 30 days following approval by the Commissioner of any expansion or contraction of the unit area under Article 13 or any change of the working interest or royalty interest in any unit tract.
- 6) In accordance with the Agreement, 11 AAC 83.341, and the initial plan of exploration an annual report is due that describes the status of projects undertaken and the work completed during each year of the initial POE, as well as any proposed changes to the plan. The annual report must describe the applicant’s proposed exploration activities, including the bottom-hole locations and depths of proposed wells, and the estimated date drilling will commence. The annual report must also describe the operations conducted under the initial POE during the preceding year. All production test results and data analysis must be provided to the Division as a part of the annual report. This must include well test rate and results, water and hydrocarbon volumes, pressure data, geophysical logs, core analysis including TOC, bulk density, rock gas content, and permeability if acquired. In addition, TCAI shall inform the Division about project progress and future development decisions through periodic meetings with agency representatives. TCAI may, as allowed under 11 AAC 83.153 or other applicable statutes and regulations, request that reports or information be kept confidential.
- 7) The unit operator shall submit a second POE to the commissioner at least 60 days before the initial POE expires. Alternatively, the unit operator shall request approval of the first plan of development, if appropriate, at least 90 days before the initial POE expires. 11 AAC 83.341(b) and .343(c).
- 8) TCAI is designated unit operator.
- 9) An approved unit plan of operations must be obtained before commencing any operations in the unit area. Neither this decision, nor the initial POE, authorizes operations, or well testing



for royalty accounting purposes, or otherwise. A separate approval must be obtained from the Division for all unit operations.

An eligible person affected by this decision may file an appeal, which must be made in accordance with 11 AAC 02 before any appeal can be filed in the Superior Court. Any appeal received by the commissioner's office must be received within 20 calendar days after the date of "issuance" of this decision, as defined in 11 AAC 02.040 (c) and (d), and may be mailed or delivered to Michael L. Menge, Commissioner, Department of Natural Resources, 550 W. 7th Avenue, Suite 1400, Anchorage, Alaska 99501; faxed to 1-907-269-8918; or sent by e-mail to [dnr\\_appeals@dnr.state.ak.us](mailto:dnr_appeals@dnr.state.ak.us). A copy of 11 AAC 02 may be obtained from any regional information office of the Department of Natural Resources.

*William Van Dyke*

October 30, 2006

\_\_\_\_\_  
William Van Dyke, Acting Director  
Division of Gas

\_\_\_\_\_  
Date

Attachments: 1. SU Exhibit A, Tract Description and Ownership Schedule  
2. SU Exhibit B, Map of the Sakkan Unit  
3. Exhibit G, Plan of Exploration  
4. Sakkan Unit Agreement

# Attachment #1

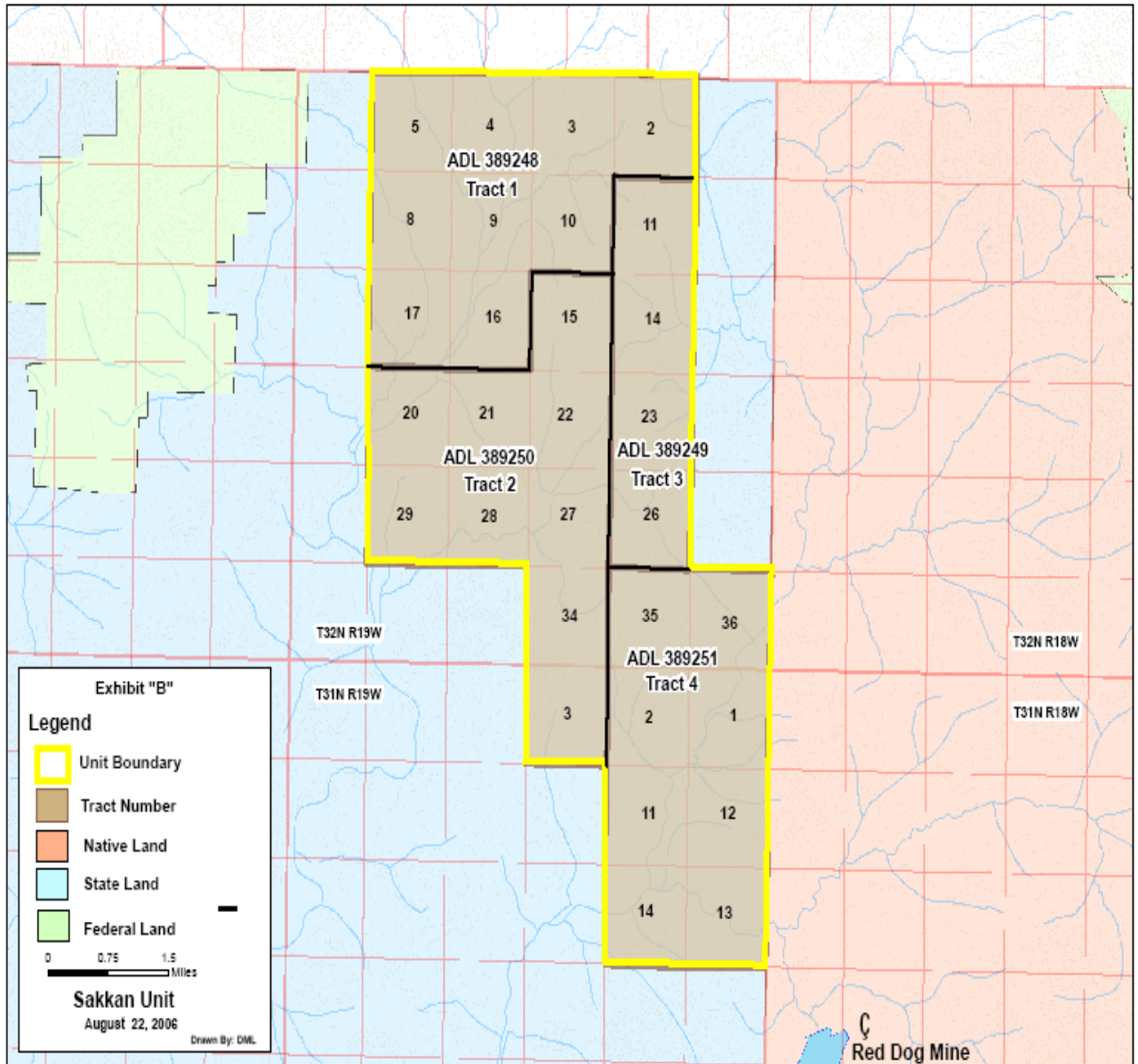
## EXHIBIT "A"

### Sakkan Unit Agreement

#### Existing Acreage and Oil and Gas Interest within the Sakkan Unit Area, Alaska

<b>Tract No.</b>	<b>Legal Description</b> KRM –Kateel River Meridian	<b>Effective Date</b>	<b>No. of Acres</b>	<b>ADL No.</b>	<b>State Royalty</b>	<b>Working Interest Ownership</b>	
1	T32N, R19W KRM	11/1/2000	5760	389248	6.25%	TCAIK	100%
	Section 2		640		6.25%	TCAIK	100%
	Section 3		640		6.25%	TCAIK	100%
	Section 4		640		6.25%	TCAIK	100%
	Section 5		640		6.25%	TCAIK	100%
	Section 8		640		6.25%	TCAIK	100%
	Section 9		640		6.25%	TCAIK	100%
	Section 10		640		6.25%	TCAIK	100%
	Section 16		640		6.25%	TCAIK	100%
	Section 17		640		6.25%	TCAIK	100%
2	T31N, R19W KRM	11/1/2000	5760	389250			
	Section 3		640		6.25%	TCAIK	100%
	T32N, R19W KRM				6.25%	TCAIK	100%
	Section 15		640		6.25%	TCAIK	100%
	Section 20		640		6.25%	TCAIK	100%
	Section 21		640		6.25%	TCAIK	100%
	Section 22		640		6.25%	TCAIK	100%
	Section 27		640		6.25%	TCAIK	100%
	Section 28		640		6.25%	TCAIK	100%
	Section 29		640		6.25%	TCAIK	100%
	Section 34		640		6.25%	TCAIK	100%
3	T32N, R19W KRM	11/1/2000	2560	389249			
	Section 11		640		6.25%	TCAIK	100%
	Section 14		640		6.25%	TCAIK	100%
	Section 23		640		6.25%	TCAIK	100%
	Section 26		640		6.25%	TCAIK	100%
4	T31N, R19 W KRM	11/1/2000	5,120	389251			
	Section 1		640		6.25%	TCAIK	100%
	Section 2		640		6.25%	TCAIK	100%
	Section 11		640		6.25%	TCAIK	100%
	Section 12		640		6.25%	TCAIK	100%
	Section 13		640		6.25%	TCAIK	100%
	Section 14		640		6.25%	TCAIK	100%
	T32N, R19W KRM						
	Section 35		640		6.25%	TCAIK	100%
	Section 36		640		6.25%	TCAIK	100%

## Attachment #2



**Attachment #3**  
**Exhibit G – SU Initial Plan of Exploration**

1. The initial POE becomes effective as of 12:01 a.m. on the day following approval by the Director, and expires on October 31, 2011, unless terminated earlier.
2. TAIC shall complete the following specific requirements in order for the SU to remain in effect and failure to complete them will result in immediate termination of the SU:
  - a. TAIC shall diligently explore the resource. If four consecutive barge seasons, beginning in 2007, pass without any wells or stratigraphic core holes being drilled to a minimum depth of 2000' true vertical depth within the SU area or on adjacent NANA lands, then the SU will immediately terminate on October 31, 2010.
  - b. TCAI shall submit annual reports to the Division during the term of the initial POE. The annual reports must describe the status of projects undertaken and the work completed during each year of the initial POE, as well as any proposed changes to the plan. The annual report must describe the applicant's proposed exploration activities, including the bottom-hole locations and depths of proposed wells, and the estimated date drilling will commence. The annual report must also describe the operations conducted under the initial POE during the preceding year. All production test results and data analysis must be provided to the Division as a part of the annual report. This must include well test rate and results, water and hydrocarbon volumes, pressure data, geophysical logs, core analysis including TOC, bulk density, rock gas content, and permeability if acquired. In addition, TCAI shall inform the Division about project progress and future development decisions through periodic meetings with agency representatives. TCAI may, as allowed under 11 AAC 83.153 or other applicable statutes and regulations, request that reports or information be kept confidential.
  - c. Immediately upon its completion, TCAI shall provide the Division with the final feasibility study and supporting data which forms the basis of a "go/no-go" decision regarding commercial development of this resource, excluding proprietary commodity pricing data. If a final feasibility is not completed, TCAI has no obligation to provide the Division with the feasibility study.

**Attachment #4**

**Sakkan Unit Agreement**

## SAKKAN UNIT AGREEMENT

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## RECITALS

All record owners of any right, title, or interest in the natural gas reservoirs or potential hydrocarbon accumulations to be included in this Unit have been invited to join this Agreement.

The Commissioner of the Department of Natural Resources, State of Alaska, is authorized by Alaska Statute 38.05.180(p) and (q) and applicable regulations to consent to and approve oil and gas unit agreements to explore, develop and produce state oil and gas resources.

## AGREEMENT

In consideration of the mutual promises in this Agreement, the parties commit their respective interests in the Unit Area defined in Exhibit A and depicted in Exhibit B to this Agreement, and agree as follows:

## ARTICLE 1: DEFINITIONS

1.1 **Alaska Oil and Gas Conservation Commission (AOGCC)** means the independent quasi-judicial agency of the State of Alaska established by the Alaska Oil and Gas Conservation Act, AS 31.05.

1.2 **Approved Unit Plan** means a Unit Plan that has been approved by the Commissioner.

1.3 **Commissioner** means the Commissioner of the Department of Natural Resources, State of Alaska, or the Commissioner's authorized representative.

1.4 **Effective Date** means the time and date this Agreement becomes effective.

1.5 **Lease or Leases** means one or more natural gas lease subject to this Agreement.

1.6 **Natural Gas Rights** means the rights to explore, develop, and produce Unitized Substances.

1.7 **Outside Substances** means oil, gas, and other hydrocarbons and non-hydrocarbon substances obtained from outside the Unit Area and injected into a Reservoir in the Unit Area with the approval of the Commissioner.

1.8 **Outside PA Substances** means oil, gas, and other hydrocarbons and non-hydrocarbon substances obtained from one Participating Area in the Unit Area and injected into a Reservoir in a different Participating Area in the Unit Area with the Commissioner's approval.

1.9 **Participating Area** means all Unit Tracts and parts of Unit Tracts designated as a Participating Area under Article 9 to allocate Unitized Substances produced from a Reservoir.

1.10 **Participating Area Expense** means all costs, expenses or indebtedness, which are incurred by the Unit Operator for production from or operations in a Participating Area and allocated to the Unit Tracts in that Participating Area.

1.11 **Paying Quantities** means a quantity of Unitized Substances sufficient to yield a return in excess of operating costs, even if drilling and equipment costs will never be repaid and the undertaking considered as a whole will ultimately result in a loss. The quantity is insufficient to yield a return in excess of operating costs unless it will produce sufficient revenue, not considering transportation and marketing, to induce a prudent operator to produce it.

1.12 **Reservoir** means that part of the Unit Area containing an accumulation of Unitized Substances which has been discovered by drilling and evaluated by testing a well or wells, and which is geologically separate from and not in hydrocarbon communication with any other oil and gas accumulation.

1.13 **Royalty Interest** means an ownership right to or interest in the amount or value of Unitized Substances other than a Working Interest.

1.14 **State** means the State of Alaska acting in this Agreement through the Commissioner.

1.15 **Sustained Unit Production** means continuing production of Unitized Substances from a well in the Unit Area into production facilities and transportation to market, but does not include testing, evaluation or pilot production.

1.16 **Unit Area** means the lands subject to this Agreement, described in Exhibit A and depicted in Exhibit B to this Agreement, submerged or not.

1.17 **Unit Equipment** means all personal property, Lease and well equipment, plants, platforms and other facilities and equipment used, taken over or otherwise acquired for use in Unit Operations.

1.18 **Unit Expense** means all costs, expenses or indebtedness incurred by the Unit Operator for Unit Operations, except for Participating Area Expense.

1.19 **Unit Operating Agreement** means the agreement(s) entered into by the Unit Operator and the Working Interest Owners, as described in Article 7.

1.20 **Unit Operations** means all operations conducted in accordance with an Approved Unit Plan or Approved Unit Plans.

1.21 **Unit Operator** means the party designated by the Working Interest Owners and approved by the Commissioner to conduct Unit Operations.

1.22 **Unit Plan** means a unit plan of exploration or development as described in Article 8.

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1.23 **Unit Tract** means each separate parcel that is described in Exhibit A and given a Unit Tract number.

1.24 **Unit Tract Participation** means the percentage allocation credited to a Unit Tract in a Participating Area to allocate Unitized Substances.

1.25 **Unitized Substances** means all natural gas and associated substances, as those terms are defined in the Leases, produced from the Leases within the Unit Area.

1.26 **Working Interest** means the interest held in lands by virtue of a lease, operating agreement, fee title or otherwise, under which the owner of the interest is vested with the right to explore for, develop and produce minerals; the right delegated to a unit operator by a unit agreement is not a working interest.

1.27 **Working Interest Owner** means a party who owns a Working Interest.

## **ARTICLE 2: EXHIBITS**

2.1 The following Exhibits are to be attached to and made a part of this Agreement. When this Agreement is approved, only Exhibits A, B, and G are required. Exhibit F is also required when this Agreement is approved, if the Unit Area includes Net Profit Share Leases. The Unit Operator shall supply all Exhibits.

2.2 Exhibit A is a table that identifies and describes each Unit Tract, and displays: the Unit Tract number, the Lease number, the Working Interest ownership, the Royalty Interest ownership, and the applicable royalty and net profit share rates applicable to each Unit Tract. Within thirty days after approval by the Commissioner of any expansion or contraction of the Unit Area under Article 13 or any change of the Working Interest or Royalty Interest in any Unit Tract, the Unit Operator shall submit a revised Exhibit A to the Commissioner.

2.3 Exhibit B is a map that shows the boundary lines of the Unit Area and of each Unit Tract, identified by Unit Tract number and Lease number. Within thirty days after the Commissioner approves any expansion or contraction of the Unit Area under Article 13 or any change of the Working Interest or Royalty Interest in any Unit Tract, the Unit Operator shall submit a revised Exhibit B to the Commissioner.

2.4 Exhibit C is comprised of a table for each Participating Area established under this Agreement. The Exhibit C table for each Participating Area must display the Unit Tract numbers, legal descriptions, Lease numbers, Working Interest ownership, Royalty Interest ownership, and Unit Tract Participation for that Participating Area. Exhibits must be prepared for each Participating Area established in the Unit Area. The Unit Operator shall submit an initial or revised Exhibit C to the Commissioner within thirty days of: 1) the effective date of any Participating Area, 2) any expansion or contraction of a Participating Area, 3) any division of interest or allocation formula establishing or revising the Unit Tract Participation of any Unit Tract or Unit Tracts in a Participating Area, or 4) any change of the Working Interest or Royalty Interest in any Unit Tract.

2.5 Exhibit D is comprised of a map for each Participating Area. Each Exhibit D map must show the boundary lines of the Unit Area, a Participating Area and the Unit Tracts in that Participating Area identified by Unit Tract number and Lease number. Within thirty days after approval by the Commissioner of a Participating Area or any expansion or contraction of a Participating Area under Article 9 or any change of the Working Interest or Royalty Interest in any Unit Tract in a Participating Area, the Unit Operator shall submit a revised Exhibit D to the Commissioner.

2.6 Exhibit E is comprised of a table for each Participating Area that displays the allocation of Participating Area Expense to each Unit Tract in the Participating Area, identified by Unit Tract number and Lease number. Exhibits must be prepared for each Participating Area established in the Unit Area. The Unit Operator shall submit an initial or revised Exhibit E to the Commissioner whenever an initial or revised Exhibit C is required.

2.7 Exhibit F is a table that displays the allocation of Unit Expense to each Unit Tract in the Unit Area, identified by Unit Tract number and Lease number. The Unit Operator shall submit an initial or revised Exhibit F to the Commissioner whenever an initial or revised Exhibit A is required if the Unit Area includes Net Profit Share Leases. The Unit Operator may submit a revised Exhibit F anytime, but any revisions to Exhibit F are not effective until approved by the Commissioner.

2.8 Exhibit G is the unit plan of exploration or unit plan of development required by the regulations, and Article 8 of this Agreement.

### **ARTICLE 3: CREATION AND EFFECT OF UNIT**

3.1 All Natural Gas Rights in and to the lands described in Exhibit A and shown in Exhibit B are subject to this Agreement so that Unit Operations will be conducted as if the Unit Area was a single Lease.

3.2 So long as this unit remains in effect, each Lease in the Unit Area shall continue in effect.

3.3 Except as otherwise provided in this Agreement, where only a portion of a lease is committed to this Agreement, that commitment constitutes a severance of the lease into unitized and non-unitized portions. The portion of the leased area not committed to this Agreement will be treated as a separate and distinct lease and may be maintained only in accordance with the terms and conditions of the lease, statutes, and regulations. Any portion of the leased area not committed to this Agreement will not be affected by the unitization, by operations in the Unit Area, or by a suspension approved or ordered by the Commissioner. If a lease has a well certified as capable of production in paying quantities on it before commitment to this Agreement, the lease will not be severed by unitization. If any portion of the Lease is included in a Participating Area formed under this Agreement, the entire Lease will remain committed to this Agreement and the Lease will not be severed.

3.4 Production of Unitized Substances in Paying Quantities from any part of a Participating Area shall be considered production from each Unit Tract in the Participating Area. It shall cause the portion of each Lease that is wholly or partially

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within the Participating Area to continue in effect as if a well were producing from each Unit Tract in the Participating Area.

3.5 The provisions of the various Leases and agreements pertaining to the respective Leases or production from those Leases are amended only to the extent necessary to make them conform to the written provisions of this Agreement. Otherwise, the provisions of those Leases and agreements shall remain in full force and effect.

3.6 This Agreement shall not be construed to transfer title to Natural Gas Rights by any party to any other party or to the Unit Operator.

3.7 All data and information determined by the Commissioner to be necessary for the administration of this Agreement or for the performance of statutory responsibilities shall be provided by the Unit Operator, or Working Interest Owners, or both, upon written request. All data and information provided to the Commissioner shall be protected from disclosure under the Lease, governing law, and regulations.

#### **ARTICLE 4: DESIGNATION OF UNIT OPERATOR**

4.1 Teck Cominco Alaska Incorporated is designated as the Unit Operator. Teck Cominco Alaska Incorporated agrees to accept the rights and obligations of the Unit Operator to conduct Unit Operations and to explore for, develop and produce Unitized Substances as provided in this Agreement.

4.2 Except as otherwise provided in this Agreement and subject to the terms and conditions of Approved Unit Plans, the exclusive rights and obligations of the Working Interest Owners to conduct operations to explore for, develop and produce Unitized Substances in the Unit Area are delegated to and shall be exercised by the Unit Operator. This delegation does not relieve a lessee of the obligation to comply with all Lease terms. The Unit Operator shall notify the other Working Interest Owners and the Commissioner of actions taken by the Unit Operator under this Agreement. The Unit Operator shall minimize and consolidate surface facilities to minimize surface impacts.

#### **ARTICLE 5: RESIGNATION OR REMOVAL OF UNIT OPERATOR**

5.1 The Unit Operator shall have the right to resign at any time. The Unit Operator's resignation shall not become effective until: 1) sixty days have passed since the Unit Operator delivers a written notice of an intention to resign to the Working Interest Owners and the Commissioner; and 2) all artificial islands, installations and other devices, including wells, used for operations in the Unit Area are in a condition satisfactory to the Commissioner for suspension or abandonment of operations. However, if a successor Unit Operator is designated and approved under Article 6, the resignation is effective when approved by the Commissioner.

5.2 The Unit Operator may be removed as provided in the Unit Operating Agreement. This removal shall not be effective until: 1) the Working Interest Owners notify the Commissioner and the Unit Operator; and 2) the Commissioner approves a successor Unit Operator.

5.3 The resignation or removal of the Unit Operator shall not release it from liability for any failure to meet obligations that accrued before the effective date of the resignation or removal.

5.4 The resignation or removal of the Unit Operator does not terminate its rights, title or interest or obligations as a Working Interest Owner or other interest in the Unit Area. A termination of the Unit Operator's rights, title or interest may occur independently under the terms of the Leases and governing law. When the resignation or removal of the Unit Operator becomes effective, the Unit Operator shall relinquish possession of all Unit Equipment, artificial islands, wells, installations, devices, records, and any other assets used for conducting Unit Operations, whether or not located in the Unit Area, to the successor Unit Operator.

#### **ARTICLE 6: SUCCESSOR UNIT OPERATOR**

6.1 Whenever the Unit Operator tenders its resignation as Unit Operator or is removed as provided in Article 5, a successor Unit Operator may be designated as provided in the Unit Operating Agreement. The successor Unit Operator must accept the rights and obligations of a Unit Operator in writing. The successor Unit Operator shall file an executed copy of the designation of successor with the Commissioner. The designation of successor Unit Operator will not become effective until approved by the Commissioner.

6.2 If no successor Unit Operator is designated within sixty days after notice to the Commissioner of the resignation or removal of a Unit Operator, the Commissioner will, in his or her discretion, designate another Working Interest Owner as successor Unit Operator, or declare this Agreement terminated.

#### **ARTICLE 7: UNIT OPERATING AGREEMENT**

7.1 The Working Interest Owners and the Unit Operator shall enter into a Unit Operating Agreement. It will apportion all costs and liabilities incurred in maintaining or conducting Unit Operations among the Working Interest Owners. The Unit Operating Agreement will also apportion the benefits, which will accrue from Unit Operations among the Working Interest Owners.

7.2 Any allocation described in the Unit Operating Agreement will not bind the State in determining or settling royalties and net profit share payments. Allocations of Unit Expense, Participating Area Expense, or Unitized Substances for determining, settling and paying royalties and net profit share payments will be based on Exhibits C, E and F of this Agreement, and must be approved by the Commissioner in writing before taking effect. An original or revised conforming Exhibit C and F shall be submitted to the Commissioner within thirty days of: any change in the division of interest or allocation formula establishing or revising the Unit Tract Participation of any Unit Tract or Unit Tracts in a Participating Area.

7.3 The Working Interest Owners and the Unit Operator may establish, through one or more Unit Operating Agreements and amendments, other rights and obligations between the Unit Operator and the Working Interest Owners. The Unit Operating Agreement will not modify any term or obligation of this Agreement. If the

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terms of this Agreement and the Unit Operating Agreement conflict, this Agreement will prevail.

7.4 Any Working Interest Owner is entitled to drill a well on the unitized portion of its Lease when the Unit Operator declines to drill that well. A Working Interest Owner must have an approved permit to drill and the well must be part of an Approved Unit Plan. If the Commissioner determines any such well to be capable of producing Unitized Substances in Paying Quantities, the land upon which that well is situated will be included in a Participating Area. The Participating Area will be formed or an existing Participating Area enlarged as provided in this Agreement. The Unit Operator will thereafter operate the well in accordance with this Agreement and the Unit Operating Agreement.

7.5 The Unit Operator shall file a copy of the Unit Operating Agreement with the Commissioner when this Agreement is filed for approval. The copy of the Unit Operating Agreement is for informational purposes only. Approval of the Unit Agreement is not approval of the Unit Operating Agreement. Complete copies of all other Unit Operating Agreements and any amendments to them will also be filed with the Commissioner within thirty days of execution and at least thirty days before their effective dates.

#### **ARTICLE 8: PLANS OF EXPLORATION, DEVELOPMENT AND OPERATIONS**

8.1. Any Unit Plan and any amendment to a Unit Plan will not be effective until the Commissioner approves it. Approved Unit Plans are incorporated into this Agreement and become effective on the date of their approval.

8.1.1. A unit plan of exploration ("Plan of Exploration") shall describe the proposed exploration and delineation activities for any land in the Unit Area that is not in a Participating Area. Plans of Exploration shall comply with 11 AAC 83.341 and any successor regulation. The Unit Operator shall submit updated Plans of Exploration to the Commissioner for approval at least sixty days before the current Plan of Exploration expires.

8.1.2. A unit plan of development ("Plan of Development") shall include a description of the proposed development activities based on data available when the plan is submitted. Plans of Development shall comply with 11 AAC 83.343 and any successor regulation. The Unit Operator shall submit updated Plans of Development to the Commissioner for approval at least ninety days before the current Plan of Development expires.

8.1.3. When this Agreement is submitted to the Commissioner for approval, the Unit Operator shall submit an initial Plan of Development or an initial Plan of Exploration (collectively called the "Initial Unit Plan") for approval by the Commissioner.

8.2. The Unit Operator shall not explore, develop or produce on the Unit Area except in accordance with an Approved Unit Plan. The Unit Operator shall obtain a plan of operations approval, and any other permits and approvals required before operations begin. A plan of operations approval must be consistent with the mitigation measures and lessee advisories developed for the most recent State areawide lease sale in the region that includes the unit as deemed necessary by the Commissioner to protect the resources

of the State. The Unit Operator shall submit a complete copy of all such applications to the Commissioner. The Unit Operator shall give the Commissioner written notice before beginning testing, evaluation, or pilot production from a well in the Unit Area.

8.3. After Sustained Unit Production in Paying Quantities begins, Unit Operations shall be maintained, with lapses of no more than ninety days per lapse between operations. The lapse may be longer if suspension of operations or production has been ordered or approved by the Commissioner. Approved Unit Plans may call for a suspension of Unit Operations.

8.4. After giving written notice to the Unit Operator and an opportunity to be heard, the Commissioner may require the Unit Operator to modify from time to time the rate of prospecting and development and the quantity and rate of production.

8.5. If a well has been drilled in the Unit Area prior to the Effective Date of this Unit Agreement or is being drilled within the Unit Area on the Effective Date, that well will be considered a Unit Well as of the Effective Date of this Agreement.

8.6. The Commissioner will, in the agency's discretion, approve any injection of Outside Substances or Outside PA Substances within the Unit Area. Any injection of Outside Substances or Outside PA Substances within the Unit Area must be part of an Approved Unit Plan.

#### **ARTICLE 9: PARTICIPATING AREAS**

9.1. The Unit Operator shall submit a request for approval of the proposed initial Participating Area to the Commissioner at least six months before Sustained Unit Production from a Reservoir in the Unit Area. A Participating Area shall include only land that is reasonably known to be underlain by Unitized Substances and known or reasonably estimated through the use of geological, geophysical and engineering data to be capable of producing or contributing to production of Unitized Substances in Paying Quantities. The Unit Operator must receive approval from the Commissioner of a Participating Area before commencement of Sustained Unit Production. The Unit Operator shall notify the Commissioner before the commencement of Sustained Unit Production from each Participating Area.

9.2. Each application for approval of a Participating Area shall include Exhibits C, D, E, and G. Exhibit F is also required if the Unit Area includes Net Profit Share Leases. If approved by the Commissioner, the area described in Exhibit C and depicted in Exhibit D shall be a Participating Area, and the allocation of Participating Area Expenses and Unit Expenses described in Exhibits E and F shall be effective on the effective date of the Participating Area.

9.3. A separate Participating Area shall be established for each Reservoir in the Unit Area. If one Reservoir underlies another Reservoir in whole or in part, separate Participating Areas may be created for each Reservoir. Any two or more Reservoirs or Participating Areas may be combined into one Participating Area if approved by the Commissioner.

9.4. At the Unit Operator's election or if so directed by the Commissioner, the Unit Operator shall apply to expand or contract the Participating Area if expansion or contraction is warranted by geological, geophysical, or engineering data. Each application for expansion or contraction shall include Exhibits C, D, E, and G. Exhibit F is also required if the Unit Area includes Net Profit Share Leases. The application must be submitted to the Commissioner for approval. Before any directed expansion or contraction of the Participating Area, the Commissioner will give the Unit Operator reasonable notice and an opportunity to be heard.

9.5. The Commissioner will establish the effective date of the initial Participating Area. That effective date shall be no later than the date of the first Sustained Unit Production. The Commissioner will establish the effective date of each later Participating Area.

9.6. Land in a Participating Area shall remain in that Participating Area even if its Unitized Substances are depleted.

9.7. If the Working Interest Owners cannot agree on the fair, reasonable and equitable allocation of production or costs, the Commissioner shall prescribe an allocation.

9.8. A Unitized Substance produced from one Participating Area ("Originating Participating Area") may be used as an Outside PA Substance ("Injected Substance") for repressuring, recycling, storage or enhanced recovery purposes in another Participating Area ("Receiving Participating Area") only if the State is paid royalty as if the Unitized Substance was saved, removed, or sold by the Working Interest Owners, except as follows:

9.8.1. If the Commissioner consents to the transfer of Unitized Substances between Participating Areas without immediate payment of royalties, the Unit Operator shall provide monthly reports to the State of the transferred Unitized Substance volumes in both the originating and receiving Participating Areas as specified in 11 AAC 04. These monthly reports shall reflect the volumes of any Unitized Substance transferred and the British thermal units ("Btus") in any natural gas Unitized Substance transferred as an Outside PA Substance during the preceding month.

9.8.2. If the Commissioner consents to the transfer of Unitized Substances between Participating Areas without immediate payment of royalties, the royalties shall be paid when the Injected Substances are produced and sold from the Receiving Participating Area. The first natural gas Unitized Substances produced and sold from the Receiving Participating Area shall be considered to be the Injected Substances until a volume of natural gas containing Btus equal to the Btus contained in the Injected Substances is produced and sold from the Receiving Participating Area. All the Unitized Substances produced and sold from a Receiving Participating Area that are considered to be the Injected Substance shall be allocated to the Originating Participating Area. The Working Interest Owners shall pay the State royalties on Injected Substances produced and sold from a Receiving Participating Area as if those Injected Substances were produced and sold from the Originating Participating Area when they were produced from the Receiving Participating Area.

9.9. All liquid hydrocarbons removed in any equipment or facility in Alaska from produced Injected Substances and not used for fuel shall be allocated to the Receiving Participating Area. If liquid hydrocarbons are removed from the natural gas, the Btu content of the natural gas shall be measured after liquid hydrocarbons are removed.

9.10. The Commissioner must approve the deemed recovery rate and commencement date for recovery before any Outside Substance is injected within the Unit Area.

9.11. After giving written notice to the Unit Operator and an opportunity to be heard, the Commissioner will, in his or her discretion, require the Unit Operator to modify from time to time the rate of prospecting and development and the quantity and rate of production from a Participating Area.

9.12. Underground storage shall be covered by separate agreement with the Commissioner.

#### **ARTICLE 10: OFFSET WELLS**

10.1. The Unit Operator shall drill such wells as a reasonable and prudent operator would drill to protect the State from loss by reason of drainage resulting from production on other land. Without limiting the generality of the foregoing sentence, if natural gas is produced in a well on other land not owned by the State or on which the State receives a lower rate of royalty than under any Lease in the Unit Area, and that well is within 1320 feet in the case of a natural gas well of lands then subject to this Agreement, and that well produces natural gas for a period of 30 consecutive days in quantities that would appear to a reasonable and prudent operator to be sufficient to recover ordinary costs of drilling, completing, and producing an additional well in the same geological structure at an offset location with a reasonable profit to the operator, and if, after notice to the Unit Operator and an opportunity to be heard, the Commissioner finds that production from that well is draining lands then subject to this Agreement, the Unit Operator shall within 30 days after written demand by the Commissioner begin in good faith and diligently prosecute drilling operations for an offset well on the Unit Area. In lieu of drilling any well required by this paragraph, the Working Interest Owners must compensate the State in full each month for the estimated loss of royalty through drainage in the amount determined by the Commissioner.

#### **ARTICLE 11: ALLOCATION OF PRODUCTION**

11.1 Production and costs will be allocated according to 11 AAC 83.371 and any successor regulation. The Unit Operator shall submit a proposed allocation plan, with supporting data, to the Commissioner for approval. The Commissioner will, in his or her discretion, revise the proposed allocation plan if it does not equitably allocate production and costs from the Reservoir. The Commissioner will give the Unit Operator and Working Interest Owners reasonable notice and an opportunity to be heard before revising the Unit Operator's proposal. The allocation plan must be revised whenever a Participating Area is expanded or contracted. Within thirty days after approval by the Commissioner of any division of interest or allocation formula establishing or revising

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the Unit Tract Participation of any Unit Tract or Unit Tracts in a Participating Area, the Unit Operator shall submit revised Exhibits C and F to the Commissioner. The Unit Operator may submit a revised Exhibit F anytime, but any revisions to Exhibit F are not effective until approved by the Commissioner.

11.2 The Working Interest Owners shall pay royalties for each Unit Tract in proportion to each Working Interest Owner's ownership in that Unit Tract. The amount of Unitized Substances allocated to each Unit Tract shall be deemed to have been produced from that Unit Tract.

11.3 The Working Interest Owners may allocate Unitized Substances, Participating Area Expense, and Unit Expense differently than described in Exhibits C, E and F. However, that allocation shall not be effective for determining royalty or net profit share payments. The Unit Operator shall submit any allocation which is different than the allocations required in Exhibit C, E or F to the Commissioner under 11 AAC 83.371(b) for the State's information within ten days of its effective date with a statement explaining the reason for the different allocation.

11.4 Royalties shall not be due or payable to the State for the portion of Unitized Substances unavoidably lost or used in the Unit Area for development and production in accordance with prudent industry practices. Gas that is flared for any reason other than safety purposes as allowed by the AOGCC shall not be deemed to be unavoidably lost, and the Working Interest Owners shall pay royalties for such flared gas as if it had been produced. This exemption does not apply to Unitized Substances that are sold, traded or assigned, including sales, transactions, or assignments among the Working Interest Owners.

11.5 If a State Lease committed to this Agreement provides for a discovery royalty rate reduction for the first discovery of oil or gas, that Lease provision shall not apply to a well spudded after the Effective Date.

## **ARTICLE 12: LEASES, RENTALS AND ROYALTY PAYMENTS**

12.1. The Working Interest Owners shall pay rentals and royalty payments due under the Leases. Payments to the State must be made in accordance with the applicable State regulations, 11 AAC 04 and 11 AAC 83.110.

12.2. Each month, the Unit Operator shall furnish a schedule to the Commissioner. That schedule shall specify, for the previous month: 1) the total amount of Unitized Substances produced; 2) the amount of Unitized Substances used for development and production or unavoidably lost; 3) the total amount of Unitized Substances allocated to each Unit Tract; 4) the amount of Unitized Substances allocated to each Unit Tract and delivered in kind as royalty to the State; and 5) the amount of Unitized Substances allocated to each Unit Tract for which royalty is to be or has been paid to the State.

12.3. Each Working Interest Owner shall pay its share of royalties to the State on Unitized Substances as provided in the Lease, except "leased area" shall mean Unit Area.

12.4. Notwithstanding any contrary Lease term, royalties and the share of Unitized Substances attributable to royalties and any payment due must be paid free and clear of all Lease expenses, Unit Expenses and Participating Area Expenses. These excluded expenses include, but are not limited to, separating, cleaning, dehydration, saltwater removal, processing, compression, pumping, and manufacturing costs. These excluded expenses also include the costs of gathering and preparing the Unitized Substances for transportation off the Unit Area and gathering and transportation costs incurred within the Unit Area. No lien for any expenses shall attach to royalty Unitized Substances. The royalty share shall bear a proportionate part of any gas shrinkage that occurs during gas processing and blending.

12.5. Notwithstanding any contrary Lease term or provision in 11 AAC 83.228—11 AAC 83.229, all royalty deductions for transportation, including marine, truck, and pipeline transportation, from the Unit Area to the point of sale are limited to the actual and reasonable costs incurred by the Working Interest Owners. These transportation costs must be determined by taking into account all tax benefits applicable to the transportation.

12.6. The Unit Operator shall give the Commissioner notice of the anticipated date for commencement of production at least six months before the commencement of Sustained Unit Production from a Participating Area. The Commissioner may take Unitized Substances in-kind in accordance with the following: The Commissioner will give the Working Interest Owners Unit Operator 90 days written notice of the State's initial elections to take Unitized Substances in-kind. After taking has actually commenced, the Commissioner may increase or decrease the amount of Unitized Substances taken in-kind by not more than 10 percent, upon 30 days written notice to the Unit Operator; and greater than 10 percent, upon 90 days written notice to the Unit Operator.

12.6.1. The Commissioner will, in his or her discretion, elect to specify the Unit Tracts from which royalty Unitized Substances taken in kind are to be allocated.

12.6.2. The Unit Operator shall deliver the State's royalty Unitized Substances at the custody transfer meter at a common carrier pipeline capable of carrying those substances, or at any other place mutually agreeable place. The State will, in its discretion, designate any individual, firm or corporation to accept delivery.

12.6.3. Royalty Interest Unitized Substances delivered in kind shall be delivered in good and merchantable condition and be of pipeline quality. Those substances shall be free and clear of all lease expenses, Unit Expenses, and Participating Area Expenses, and free of any lien for these excluded Expenses. These excluded expenses include, but are not limited to, expenses for separating, cleaning, dehydration, saltwater removal, processing, compression, pumping, manufacturing, and the costs of gathering and preparing the Unitized Substances for transportation off the Unit Area and transportation costs within the Unit Area. If a Working Interest Owner processes the Unitized Substances to separate, extract or remove liquids from a Working Interest Owner's share of natural gas Unitized Substances, the State may require that a Working Interest Owner also process the State's share of natural gas Unitized Substances being taken in kind in the same manner without cost to the State. Under these circumstances, the State, or its buyer,

shall only pay any tariffed transportation costs and shrinkage of the volume of gas resulting from processing.

12.6.4. Each Working Interest Owner shall furnish storage in or near the Unit Area for the State's share of Unitized Substances to the same extent that the Working Interest Owner provides storage for its own share of Unitized Substances.

12.7. If a purchaser of the State's royalty Unitized Substances does not take delivery of Unitized Substances, the State will, in its discretion elect, without penalty, to underlift for up to six months. The State will, in its discretion, underlift all or a portion of those substances. The State's right to underlift is limited to the portion of those substances that the purchaser did not take delivery of or what is necessary to meet an emergency condition. The State shall give the Unit Operator written notice thirty days before the first day of the month in which the underlifted royalty Unitized Substances are to be recovered. The State will, in its discretion, recover at a daily rate not exceeding 25 percent (25%) of its share of daily production, unless otherwise agreed.

12.8. The Unit Operator shall maintain records, and shall keep and have in its possession books and records including expense records, of all exploration, development, production and disposition of all Unitized Substances and Outside Substances. Each Working Interest Owner shall maintain records of the disposition of its portion of the Unitized Substances and Outside Substances including sales prices, volumes, and purchasers. The Unit Operator and the Working Interest Owners shall permit the Commissioner to examine these books and records at all reasonable times. Upon request by the Commissioner, the Unit Operator and Working Interest Owners shall make the books and records available to the Commissioner at the Commissioner's office designated by the Commissioner. They may provide these books and records in a mutually agreeable electronic format. These books and records of exploration, development, production, and disposition must employ methods and techniques that will ensure the most accurate figures reasonably available. The Unit Operator and the Working Interest Owners shall use and consistently apply generally accepted accounting procedures.

12.9. If a Lease committed to this Agreement specifies the amount of rent due, that Lease is amended to require that rentals due be calculated under A.S. 38.05.180(n), as amended. If a Lease committed to this Agreement requires payment of minimum royalty, that Lease is amended to delete that minimum royalty obligation. The rental due under State law, as amended, must be paid in lieu of minimum royalty.

12.10. All rights and obligations relating to the State's net profit share will be determined in accordance with 11 AAC 83.201 - 11 AAC 83.295, as amended, notwithstanding any contrary Lease term. The State may audit the net profit share reports or payments due for any Lease within ten years of the year of production of Unitized Substances in Paying Quantities. The period of limitations for the State to file a lawsuit relating to an audit of a net profit share report or payment shall be three years longer than the audit period. The Working Interest Owners holding interests in net profit share Leases shall maintain the records relevant to determination of net profit share until the audit period has expired.

#### **ARTICLE 13: UNIT EXPANSION AND CONTRACTION**

13.1. The Unit Operator, at its own election may, or at the direction of the Commissioner shall, apply to expand the Unit Area to include any additional lands determined to overlie a Reservoir that is at least partially within the Unit Area, or to include any additional lands that facilitate production or planned production. The Commissioner will give the Unit Operator reasonable notice and an opportunity to be heard before any directed expansion of the Unit Area. The Unit Operator shall notify the Working Interest Owners of any expansion proposed by the Unit Operator or any third party, or proposed or directed by the Commissioner. Any unit expansion shall not be effective until approved by the Commissioner.

13.2. Ten years after Sustained Unit Production begins, the Unit Area must be contracted to include only those lands then included in an approved Participating Area, lands included in an Approved Unit Plan of Exploration or Development, and lands that facilitate production or planned production including the immediately adjacent lands necessary for secondary or tertiary recovery, pressure maintenance, reinjection, or cycling operations. The Commissioner may, after considering the provisions of 11 AAC 83.303, delay contraction of the Unit Area if the circumstances of a particular unit warrant. If a portion of a Lease contracts out of the unit, that portion will be severed and treated as a separate and distinct lease, which may be maintained thereafter only in accordance with the terms and conditions of the original lease. The Working Interest Owners waive the provisions of 11 AAC 83.356(b), which protect the Lease from severance when a portion of a lease is contracted out of the Unit Area.

13.3. Not sooner than 10 years after the effective date of this Agreement, the Commissioner may contract the Unit Area to include only that land covered by an Approved Unit Plan, or that area underlain by one or more oil or gas reservoirs or one or more potential hydrocarbon accumulations and lands that facilitate production. If a portion of a Lease contracts out of the Unit Area, that portion will be severed and treated as a separate and distinct lease, which may be maintained thereafter only in accordance with the terms and conditions of the original lease. The Working Interest Owners waive the provisions of 11 AAC 83.356(c), which protect the Lease is contracted out of the Unit Area. Before any contraction of the Unit Area under this Article 13.3, the Commissioner will give the Unit Operator, the Working Interest Owners, and the Royalty Interest Owners of the Leases or portions of Leases being excluded reasonable notice and an opportunity to be heard.

13.4. The Commissioner will give the Unit Operator reasonable notice and an opportunity to be heard before any directed contraction of the Unit Area. The Unit Operator shall notify the Working Interest Owners of any proposed, directed, or approved contraction of the Unit Area. Any unit contraction shall not be effective until approved by the Commissioner.

13.5. The Unit Area may be contracted with the Commissioner's approval and an affirmative vote of the Working Interest Owners.

13.6. Within thirty days after approval by the Commissioner of any expansion or contraction of the Unit Area, the Unit Operator shall submit revised Exhibits A and B to the Commissioner.

**ARTICLE 14: UNIT EFFECTIVE DATE, TERM AND TERMINATION**  
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14.1. This Agreement is effective as of 12:01 a.m. on the day after the Commissioner approves it. At least one copy of this Agreement shall be filed with the Department of Natural Resources, Anchorage, Alaska and one copy shall be filed with the AOGCC. This Agreement is binding upon each party who signs any counterpart.

14.2. Subject to the terms and conditions of the Approved Unit Plan, this Agreement terminates five years from the Effective Date unless:

14.2.1. A unit well in the Unit Area has been certified as capable of producing Unitized Substances in Paying Quantities; or

14.2.2. The unit term is extended with the approval of the Commissioner. An extension shall not exceed five years.

14.3. If the Commissioner orders or approves a suspension of production or other Unit Operations, this Agreement shall continue in force during the authorized suspension.

14.4. Nothing in this Article holds in abeyance the obligations to pay rentals, royalties, or other production or profit-based payments to the State from operations or production in any part of the Unit Area. Any seasonal restriction on operations or production or other condition required in the Lease is not a suspension of operations or production required by law or force majeure.

14.5. This Agreement may be terminated by an affirmative vote of the Working Interest Owners and the Commissioner's approval.

## **ARTICLE 15: EFFECT OF CONTRACTION AND TERMINATION**

15.1. If a Lease or portion of a Lease is contracted out of the Unit Area under this Agreement, then it will be maintained only in accordance with State law and the Lease.

15.2. Each Lease committed to this Agreement on the day that this Agreement terminates shall remain in force for an extension period of ninety days, or any longer period which may be approved by the Commissioner. After the extension period expires, the Lease will be maintained only in accordance with State law and the Lease.

15.3. Upon the expiration or earlier termination of the unit, the Unit Operator will be directed in writing by the Commissioner and will have the right at any time within a period of one year after the termination, or any extension of that period as may be granted by the Commissioner, to remove from the Unit Area all machinery, equipment, tools, and materials. Upon the expiration of that period or extension of that period and at the option of the Commissioner, any machinery, equipment, tools, and materials that the Unit Operator has not removed from the Unit Area become the property of the State or may be removed by the State at the Working Interest Owners' expense. At the option of the State, all improvements such as roads, pads, and wells must either be abandoned and the sites rehabilitated by the Unit Operator to the satisfaction of the State, or be left intact and the Unit Operator absolved of all further responsibility as to their maintenance, repair, and eventual abandonment and rehabilitation. Subject to the above conditions, the Unit Operator shall deliver up the Unit Area in good condition.

## **ARTICLE 16: COUNTERPARTS**

16.1. The signing of counterparts of this Agreement shall have the same effect as if all parties had signed a single original of this Agreement. Within thirty days after approval by the Commissioner of any change of the Working Interest ownership of Natural Gas Rights in any Unit Tract, the Unit Operator shall submit a revised Exhibits A and C to the Commissioner.

## **ARTICLE 17: LAWS AND REGULATIONS**

17.1. This Agreement is subject to all applicable State and federal statutes and regulations in effect of the Effective Date of this Agreement, and insofar as is constitutionally permissible, to all statutes and regulations placed in effect after the Effective Date of this Agreement. A reference to a statute or regulation in this Agreement includes any change in that statute or regulation whether by amendment, repeal and replacement, or other means. This Agreement does not limit the power of the State of Alaska or the United States of America to enact and enforce legislation or to promulgate and enforce regulations affecting, directly or indirectly, the activities of the parties to this Agreement or the value of interests held under this Agreement. In case of conflicting provisions, statutes and regulations take precedence over this Agreement.

## ARTICLE 18: APPEARANCES AND NOTICES

18.1. If the State gives the Unit Operator a notice or order relating to this Agreement it shall be deemed given to all Working Interest Owners and all persons whose interest in the Unit Area derived from a Working Interest. All notices required by this Agreement shall be given in writing and delivered personally, or by United States mail or by facsimile machine to the Unit Operator at the address or facsimile number listed below. All notices actually received will also be deemed properly given. The Unit Operator will change its notice address by giving thirty days written notice to the State and the other Working Interest Owners. The State will change its notice address by giving thirty days written notice to the Unit Operator.

### Address of the Unit Operator:

Teck Cominco Alaska Incorporated  
3105 Lakeshore Drive, Building A, Suite 101  
Anchorage, AK 99517  
Attention: General Manager, Red Dog Operations  
Telephone No.: (907) 426-2170  
Fax: (907) 426-2177

### Address of the State:

Department of Natural Resources  
550 West Seventh Avenue, Suite 1400  
Anchorage, AK 99501-3554  
Fax: (907) 269-8918

with a copy to:  
Director, Division of Oil and Gas  
550 West Seventh Avenue, Suite 800  
Anchorage, AK 99501-3560  
Fax: (907) 269-8938

## ARTICLE 19: JOINDER

19.1. The Commissioner will, in his or her discretion, order or, upon request, approve a joinder to this Agreement under the expansion provisions of Article 13. The Unit Operator shall submit a request for joinder with a signed counterpart of this Agreement and a notice of proposed expansion under Article 13. A joinder is subject to the requirements of the Unit Operating Agreement. However, the Commissioner will, in his or her discretion, modify any provision in a Unit Operating Agreement, which the Commissioner finds discriminates against parties who request joinder. The Commissioner shall give notice and an opportunity to be heard to the Unit Operator before modifying the Unit Operating Agreement.

## ARTICLE 20: DEFAULT

20.1 The Commissioner will, in his or her discretion, determine that failure of the Unit Operator or the Working Interest Owners to comply with any of the terms of this Agreement, including any Approved Unit Plan, is a default under this Agreement. The failure to comply because of force majeure is not a default.

20.2 The Commissioner will give notice to the Unit Operator and the Working Interest Owners of the default. The notice will describe the default, and include a demand to cure the default by a certain date. The cure period shall be at least thirty days for a failure to pay rentals or royalties and ninety days for any other default.

20.3 If there is no well certified as capable of producing Unitized Substances in Paying Quantities and a default is not cured by the date indicated in the demand, the Commissioner will, in his or her discretion, terminate this Agreement after giving the Unit Operator notice and an opportunity to be heard. The Commissioner will give notice, by mail, of the termination, which is effective upon mailing the notice.

20.4 If there is a well capable of producing Unitized Substances in Paying Quantities and the operations to cure the default are not completed by the date indicated in the demand, the Commissioner will terminate this Agreement by judicial proceedings.

20.5 This Article's remedies are in addition to any other administrative or judicial remedy provided for by Lease, this Agreement, or federal or State law.

IN WITNESS OF THE FOREGOING, the parties have executed this Unit Agreement on the dates opposite their respective signatures.

### WORKING INTEREST OWNERS

TECK COMMERCE FINANCIAL INC  
By: [Signature] Date: August 16/06  
JOHN B. KNAPP  
GENERAL MANAGER  
(Company Name, signatory's printed name and title)

STATE OF ALASKA )  
Second ) ss.  
~~THIRD~~ JUDICIAL DISTRICT )

This certifies that on August 16, 2006, before me, a notary public in and for the State of Alaska, duly commissioned and sworn, personally appeared John B. Knapp, known to me to be the person described in, and who executed the foregoing agreement, who then after being duly sworn according to law, acknowledged to me under oath that he executed same freely and voluntarily for the uses and purposes therein mentioned.

WITNESS my hand and official seal the day and year in this certificate first above written.

[Signature]  
NOTARY PUBLIC in and for Alaska  
My Commission Expires: July 4, 2009



By: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_  
(Company Name, signatory's printed name and title)

STATE OF ALASKA                    )  
  )ss.  
THIRD JUDICIAL DISTRICT        )

This certifies that on \_\_\_\_\_, 2006, before me, a notary public in and for the State of Alaska, duly commissioned and sworn, personally appeared \_\_\_\_\_, known to me to be the person described in, and who executed the foregoing agreement, who then after being duly sworn according to law, acknowledged to me under oath that he executed same freely and voluntarily for the uses and purposes therein mentioned.

WITNESS my hand and official seal the day and year in this certificate first above written.

\_\_\_\_\_  
NOTARY PUBLIC in and for Alaska  
My Commission Expires: \_\_\_\_\_

**OVERRIDING ROYALTY INTEREST OWNERS**

By: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_  
(Company Name, signatory's printed name and title)

STATE OF ALASKA                    )  
  )ss.  
THIRD JUDICIAL DISTRICT        )

This certifies that on \_\_\_\_\_, 2006, before me, a notary public in and for the State of Alaska, duly commissioned and sworn, personally appeared \_\_\_\_\_, known to me to be the person described in, and who executed the foregoing agreement, who then after being duly sworn according to law, acknowledged to me under oath that he executed same freely and voluntarily for the uses and purposes therein mentioned.

WITNESS my hand and official seal the day and year in this certificate first above written.

\_\_\_\_\_  
NOTARY PUBLIC in and for Alaska  
My Commission Expires: \_\_\_\_\_

By: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_  
(Company Name, signatory's printed name and title)

STATE OF ALASKA                    )  
  )ss.  
THIRD JUDICIAL DISTRICT        )

This certifies that on \_\_\_\_\_, 2006, before me, a notary public in and for the State of Alaska, duly commissioned and sworn, personally appeared \_\_\_\_\_, known to me to be the person described in, and who executed the foregoing agreement, who then after being duly sworn according to law, acknowledged to me under oath that he executed same freely and voluntarily for the uses and purposes therein mentioned.

WITNESS my hand and official seal the day and year in this certificate first above written.

\_\_\_\_\_  
NOTARY PUBLIC in and for Alaska  
My Commission Expires \_\_\_\_\_

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