

# KITTITAS COUNTY COMMUNITY DEVELOPMENT SERVICES

411 N. Ruby St., Suite 2, Ellensburg, WA 98926

CDS@CO.KITTITAS.WA.US

Office (509) 962-7506

Fax (509) 962-7682

"Building Partnerships – Building Communities"

## Exhibit A

### Project Description

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DARRYL PIERCY, DIRECTOR

ALLISON KIMBALL, ASSISTANT DIRECTOR

COMMUNITY PLANNING • BUILDING INSPECTION • PLAN REVIEW • ADMINISTRATION • PERMIT SERVICES • CODE ENFORCEMENT • FIRE INVESTIGATION

## Exhibit A

### VANTAGE WIND PROJECT PROJECT DESCRIPTION

The Vantage Wind Project ("the Project") is a renewable wind energy generation facility located near the town of Vantage, in Kittitas County, Washington. The Project will consist of a maximum of 69 wind turbines located on an approximately 4750-acre Project Area. It will have a capacity of 103.5 megawatts (MW).

#### The Applicant

The applicant for the Vantage Wind Project is Invenergy Wind North America LLC ("IWNA"). IWNA is a Delaware limited liability company formed for the purpose of developing, permitting, financing, constructing, owning and operating wind projects in the United States. IWNA is wholly owned by Invenergy LLC, a Delaware limited liability company that develops, constructs and operates large-scale energy assets in North America and Europe.

IWNA and its affiliates are actively developing wind power projects in more than twenty states in the United States as well as in Canada and Europe. IWNA and its affiliates have financed in whole, or in part, more than \$1 billion worth of wind energy projects in the United States. They are the owner-operators of wind projects in Colorado, Iowa, Idaho, Montana, Oklahoma, Tennessee, and Texas with a total capacity almost 700 MW. IWNA and its affiliates have additional wind projects under construction and many more in various stages of development.

IWNA currently has 400 General Electric 1.5 SLE wind turbines on order for 2007 delivery and an additional 400 turbines on order for delivery in 2008. We anticipate that IWNA will continue to order turbines one to two years in advance to satisfy on-going project development plans.

IWNA's focus is on the development and long-term ownership of utility-scale wind projects ranging in size from 25 to 400 MW. IWNA primarily originates and develops its own wind projects from conception through operation. With this long-term perspective, IWNA takes a proactive approach to building strong relationships with various stakeholders including landowners, host communities and power purchase clients. IWNA affiliates have also completed some late development acquisitions with this same philosophy.

The applicant's contact information is listed below.

Dave Iadarola  
Invenergy Wind North America  
2580 W. Main St., Suite 200  
Littleton, CO 80120

Mike Logsdon  
Invenergy Wind North America  
One South Wacker Dr. Suite 2020  
Chicago, IL 60606

Phone: (720)283-4694  
Email: [diadarola@invenergyllc.com](mailto:diadarola@invenergyllc.com)

### **Project Site**

IWNA proposes to construct and operate the Vantage Wind Project in eastern Kittitas County, on the open ridge tops located between the towns of Kittitas and Vantage. The Project Area is rural, with much of the surrounding land used as rangeland for grazing and very few residences located nearby.

The Project Area is shown in **Figure 1.1**. It consists of approximately 4750 acres located north of Interstate 90 and south of the Old Vantage Highway. The Project Area is approximately seven miles west of the Columbia River and approximately three miles south east of the existing Wild Horse Wind Project.

The Project Area is owned by three private landowners and the Washington Department of Natural Resources. All of the land is currently secured under long term lease.

The Project Area is zoned Commercial Agricultural under the Kittitas County Code. The Project Area is also within the Pre-Identified Areas for Wind Project Siting pursuant to Kittitas County Code section 17.61A.035.

**Figure 1.2** also shows the proposed configuration of turbines. The turbines and associated project facilities will occupy only approximately 325 acres within the larger Project Area.

### **Project Facilities**

The Project consists of several types of facilities, including wind turbines, power collection facilities, a substation and transmission line, access roads, and an operation and maintenance facility.

The approximate location of these facilities is shown in **Figure 1.2**. The exact location may vary as a result of micro-siting at the time of final engineering design and construction to allow for in-field conditions at the time of construction. Minor adjustments to road layout and turbine locations may be necessary due to such factors as geotechnical inconsistency, final on-site meteorological survey may change spacing, and final surveys to accommodate communication microwave paths.

### **Wind Turbines**

The Project will have no more than 69 wind turbines. Each turbine consists of three rotor blades, connected to the rotor hub, a nacelle (the housing for the generator, which is connected via a great box and rotor to the blades), and a tubular tower anchored to a tower foundation. **Figure 1.3** is a diagram of a typical wind turbine.

The Project will use General Electric (GE) 1.5 SLE wind turbines. Each turbine has a rated output of 1.5 MW. The total height of each turbine from ground to tip when the tip blade is pointing straight up will be 389 feet (118.5 meters), with a hub height of 262 feet (80 meters) and a 253-foot (77 meter) rotor diameter. The blades will be 136 feet (41.5 meters) off the ground when pointed straight down.

The GE 1.5 MW wind turbine is among the mostly widely used wind turbines in the industry. There are more than 1,800 of these wind turbines in service. For example, this turbine is installed at the Klondike wind energy project in Oregon and at Invenergy's Wolverine Creek and Judith Gap projects in Idaho and Montana.

Tubular steel towers support the nacelle, rotor and blades. Each tower will have a diameter of approximately 13.6 feet (4.15 meters) at the base, narrowing to approximately 8.0 feet (2.4 meters) at the top. Towers will be painted a neutral color and lighted according to Federal Aviation Administration requirements. A maintenance door is located at the base of each wind turbine tower to provide access to the components inside the nacelle. This door will be locked to prevent entry by unauthorized personnel.

The turbine towers will stand on steel and concrete foundations. A registered engineer will design the foundation for each turbine location based on site-specific geotechnical information. A typical tower foundation is a spread footing design about 48 feet wide and 7 feet deep. At grade, an 18 foot diameter pedestal section will be exposed at the center of the foundation. This center pedestal section extends 1 foot or less above finished grade and extends about 3.5 feet below grade to an octagon shaped spread footing. The spread footing is typically about 5 feet thick at the center and tapers to a thickness of about 2 feet at its outer edge. On slopes between 5% and 15%, the pedestal of the spread footing is buried deeper. On the uphill side, more of the pedestal is below grade, providing adequate foundation ground cover on the downhill side.

The rotors and hub transfer wind energy to the drive train and generator located in the nacelle, which sits atop the tower. The nacelle acts as a cover and protects the components inside, consisting of the gearbox, low and high-speed shafts, generator, yaw system, pitch system, controller and brake. The yaw system components inside the nacelle rotate to turn the blades into the direction of the wind. Each turbine's electrically actuated blade pitch system regulates rotor speed for optimum thrust at varying wind speeds and acts as the main braking control by feathering the blades parallel to the wind, minimizing dependence on large emergency braking systems. Each turbine is also equipped with a mechanical brake.

## Electrical System

The 60 Hertz (Hz) 575 volt electric energy produced by each wind turbine is conducted through cables running down the inside of the wind turbine tower, through an underground conduit, to a pad-mount transformer that sits adjacent to the base of each tower. The pad-mount transformer will be contained in a steel case approximately 5 feet on all sides and mounted on a small concrete pad. It transforms power from the turbine output voltage to 34.5 kV.

Each pad-mount transformer is connected to a system of insulated and shielded underground cables, which connects the output of the wind turbines in circuits each capable of carrying approximately 20 to 25 MW to the Project substation.

The underground collection system is routed to minimize cable length and to minimize impact to existing land uses. In many cases, electrical cables will be routed adjacent to service roads. The electrical collection system will be installed in trenches. The electrical cables will be buried 3 feet to 4 feet below finished grade. Cable trenches will also include a marker ribbon and a fiber optic cable for transmitting operation and control data needed to monitor the wind turbines. The locations of buried cables will be identified by markers placed at edges of fields and property lines.

Approximately 10 miles of 34.5 kV buried cable will be required to connect the turbines to the Project substation.

The collection system lines will be routed to a combined electric substation and 230 kV switchyard planned to be located on approximately 5 acres located on the western portion of the project to easily facilitate interconnection. At the substation, a Project transformer will increase voltage from 34.5 kV to 230 kV.

There will be one 230 kV feeder line for interconnection into Puget Sound Energy's (PSE) 230 kV Wild Horse feeder line, which is located along the southern edge of the Project Area. Power will be fed along the feeder line into the interconnection point at PSE's line.

## Meterological Towers

The Project will include 3 permanent meterological towers. These towers will be approximately 197 feet (60 meters) tall, and will be free-standing steel structures without guy wires.

## Service Roads

Service roads will be constructed to allow for delivery of concrete, equipment, and turbine components needed for wind turbine construction. Following construction, service roads will be maintained to provide long-term access for maintenance of the wind turbines. A typical service road will be 16 feet wide with a compacted base and gravel top layer. Roads will be designed to have a maximum grade of 10% and to allow

delivery of the largest turbine components using trucks with a minimum turning radius of 135 feet.

### Operation and Maintenance Facility

An Operations and Maintenance Building is planned for an area in the middle of the site near the access point. The Operations and Maintenance Building will be approximately 1200 square-foot and will house Project offices, garages, workspace, and storage areas for parts and tools. The building will have a low-reflectivity, neutral finish to minimize contrast with the sky and surrounding backgrounds and to minimize reflections. Landscaping will be used around buildings for partial screening and integration of the buildings into the surroundings. The building will be serviced with sanitary facilities and potable water. The exterior of the building will have parking.

The Operations and Maintenance Building site may also be used as a temporary construction staging area. The maximum total area to be occupied by the construction laydown area, the Operations and Maintenance Building, the substation and switchyard is estimated to be no more than 15 acres.

### Safety and Control System

The Project will have a Supervisory Control and Data Acquisition (SCADA) System to remotely monitor and control the individual turbines. Communication lines will connect each turbine to the SCADA system.

The turbines are designed with two fully independent braking systems: an aerodynamic breaking system and a separate hydraulic disc brake system. Both systems operate independently, and each by itself is capable of stopping the rotor blade. Each turbine is also equipped with a parking break used to "park" the rotor during maintenance and inspections.

Each turbine is also equipped with a lightning protection and grounding system.

### Lighting

The FAA typically requires every structure taller than 200 ft above ground level to be lighted, but in the case of wind power developments, it will allow a strategic lighting plan that provides complete conspicuity to aviators but does not require lighting every turbine. IWNA is developing a lighting plan to be submitted for FAA approval. An estimated 20-25% of the project's turbines will be designated for lighting with medium intensity dual red synchronously flashing night-time lights and either no daytime lights or white strobe daytime lights.

The Operations and Maintenance building and electrical substation will also be equipped with night-time and motion sensor lighting systems to provide for a safe working environment and illumination under emergency conditions.

## Project Area Access, Safety and Security

Landowners do not currently allow public access to the Project Area. Both the Project gates and land owner gates will be secured shut and only people authorized to use the property will be allowed onto to the project site.

The substation and Operations and Maintenance building will be fenced as required for public safety. Turbine towers will be locked. The substation will be fenced and locked to prevent unauthorized entry.

All fires will be extinguished immediately by IWNA personnel, if there is no danger to life or personal safety, and the appropriate landowner and the county sheriff's department will be notified immediately. Some fire-fighting equipment will be located in vehicles and in the Operations and Maintenance building. If the fire cannot be safely extinguished by IWNA personnel, the landowner and sheriff will be so advised. Fire deterrents within the wind project will include access roads, which may serve as fire breaks and regular clearing of vegetation from areas around transformers, riser poles, and the substation.

Safety signing will be posted around all towers (where necessary), transformers, and other high-voltage facilities, and along roads, in conformance with applicable state and Federal regulations.

## Project Construction

The Project will be constructed using standard construction procedures. The following sections summarize the schedule and sequence of construction activities, and the procedures used during construction activities.

### Construction Schedule and Sequence

Proposed project construction could begin July 2008 immediately after all county permitting requirements are obtained and an interconnection agreement is signed. This project should take about six to eight months to construct, with a service life of approximately 25 years. General engineering and construction activities will include:

*Design Engineering:* Detailed site engineering will commence when turbine locations are firmly established following permit issuance.

*Marking of Impact Areas:* 15 days or more prior to the commencement of construction, stakes or other markers will be used to identify boundaries of the area to be impacted by construction.

*Road Construction:* Road construction will include clearing and grading service road routes and placement of road subgrade and surface material.

*Turbine Site Preparation:* Site preparation will include clearing and grubbing of vegetation of an area sufficient to lay down turbine components and to assemble the blades onto the hub.

*Foundation Construction:* Installation of the foundation will include excavation of the foundation pit, construction of the steel frame for the concrete form, pouring of concrete and burial and re-grading of the foundation surface area. Following re-grading, a crane pad will be constructed for the next phase.

*Turbine Installation:* Installation of the turbine will include the use of a helper crane and main crawler crane to assemble the four tower section, nacelle and rotor (hub and blades).

*Turbine Commissioning:* Commissioning will occur once a turbine has been connected to the electrical system connecting the turbine to the SCADA system and substation.

*Electrical System Construction:* Construction of the electrical collection system will occur coincidentally with the foundation construction and will involve trenching and laying the electrical wires and fiber optic control cable from the turbine to the maintenance facility. The substation and switchyard will be constructed concurrently.

*Operations and Maintenance Building:* The construction of the Operations and Maintenance Building will occur concurrently with the construction of the substations and switchyard.

*Restoration:* Site restoration will be completed following completion of the main ground disturbance activities, starting with the completion of the foundation construction.

### Construction Activities

*Clearing and Grading:* As one of the first steps in the construction process, existing trees and shrubs will be cleared from planned construction impact areas. Clearing will be completed around each turbine location to facilitate construction of a crane pad, assembly of the rotor and to allow for staging of the four tower sections and nacelle. Clearing may also be required in some areas to facilitate construction of the electrical system. Clearing will be kept to the minimum necessary for construction purposes.

*Service Road Construction:* Service roads will be constructed using standard construction methods. Following clearing and grubbing, topsoil stripping and stockpiling, the subgrade will be shaped and compacted. Where necessary, drainage swales or ditches will be constructed along the road bed to allow drainage of surface water. After the subgrade is shaped and compacted, a geotextile fabric will be placed and covered with a layer of gravel surfacing to provide an all weather surface for the roads.

*Turbine Foundation Construction:* Geotechnical studies of the Project Area and borings at sample turbine locations indicate that soil conditions are well suited for the typical isolated spread footing foundation design. These studies indicate that foundation



excavation can be performed with standard excavators, and no blasting will be necessary to construct the foundations. Foundation construction will start with excavation of the area. The framework of the foundation will then be constructed of re-bar and anchor bolts. The foundation will be completed with concrete. Each foundation is expected to require approximately 250 cubic yards of concrete. A grounding system will be installed as part of the foundation system. After the foundation is built and poured, the area around the foundation will be backfilled with stockpiled subsoil and topsoil.

*Turbine Assembly:* Construction cranes will be used to assemble the turbines. The main crawler crane will have a lifting capacity of approximately of 400 tons and will be assembled on-site. Once assembled, it will have a track width of approximately 30 feet and will be able to move slowly across relatively level terrain. Upon completion of the foundation, each of the four (4) tower sections will be raised and set in place. The main crawler crane will then place the nacelle atop the tower. With support from a helper crane, the main crawler crane will raise each rotor to the nacelle where ironworkers will bolt the rotor to the nacelle. Upon installation of the rotor, all crane-dependent work will be completed for the turbine, and the main crawler crane will be relocated to complete the assembly of another turbine.

*Electrical System Trenching:* Where possible, electrical collection cables will be installed using direct burial methods such as cable plow, rock saw or trencher.

### Construction Work Force

There will be 100-200 workers on site during the six month construction period. The work force is expected to peak approximately three months into the construction process.

### Sources of Aggregate and Concrete

The Project will require significant quantities of aggregate for construction of foundations and service roads. Existing regional, commercially-available sources aggregate are expected to be able to supply the Project needs, and no new mining operations are planned in the Project area to support Project construction.

A temporary concrete batch plant will be onsite, but the location has not been determined. It will be used for mixing of the turbine pads and foundations. The source of concrete will be determined when the final bid is awarded.

### Construction Material Deliveries and Storage

Major equipment and materials deliveries required for Project construction include:

- Special purpose trucks carrying turbine components:
- Blades
- Tower sections
- Nacelles

- Rotor hubs
- A heavy load truck carrying the main station transformer
- Standard Trucks carrying raw materials and equipment:
- Spools of electric system cables
- Pad-mount transformers
- Re-bar and anchor hardware for turbine foundations
- Pad-mount transformers and substation equipment
- Sand and stone aggregate
- Concrete trucks with concrete for foundations
- Trucks carrying construction vehicles
- Cranes
- Bulldozers and excavators

The contractor will have most deliveries offloaded at the point where they will be used. Turbine components, including nacelles, blades, hubs, and tower sections, will be delivered directly to the turbine sites. Some materials such as cables and foundation hardware will likely be offloaded and temporarily stored in the construction laydown area.

#### Sediment and Erosion Control During Construction

Potential impacts associated with sedimentation and erosion during construction will be minimized by siting the turbines, service roads and electrical collection system in relatively flat locations. Prior to construction, a Storm Water Pollution Prevention Plan (SWPPP) will be prepared for implementation in accordance with Washington Department of Ecology permit requirements and guidance documents. The SWPPP will include best management practices to minimize and control sediment and erosion.

#### Final Grading and Restoration

Disturbed areas within the Project Area will be graded. Areas that have been temporarily disturbed by construction activities will be restored and reseeded with native vegetation.

#### Road and Pad Construction

Service roads will be constructed in accordance with landowner easement agreements. Roads will be located to minimize disturbance and maximize transportation efficiency and to avoid sensitive resources and steep topography.

Roads will be built and maintained to provide safe operating conditions at all times. The minimum full surfaced travel way width will be 16 ft; overall surface disturbance could be up to 35 ft wide. Disturbance width may increase in steeper areas due to cuts and fills necessary to construct and stabilize roads on slopes.

Topsoil removed during new road construction will be stockpiled in elongated piles within road easements. Topsoil will be re-spread on cut-and-fill slopes and these areas will be reclaimed in accordance with easement agreements.

During construction and operation of the wind project, traffic will be restricted to the roads developed for the project. Use of unimproved roads will be restricted to emergency situations. Speed limits will be set to ensure safe and efficient traffic flow. Signs will be placed along the roads, as necessary, to identify speed limits, travel restrictions, and other standard traffic control information.

Turbine pads will be constructed using standard cut-and-fill procedures.

### Trenching and Placement of Underground Electrical and Communications Cables

Underground electrical and communications cables will be placed in approximately 1-ft wide trenches along the length of each turbine string corridor. In some cases, trenches will run from the end of one string to the end of an adjacent string to connect more turbines together via the underground network. Trenches will be excavated to below frostline and electric distribution and communications cables will be placed in the trench using trucks. Electrical cables will be installed first and the trench will be partially backfilled prior to placement of the communications cables. Trenches will be backfilled and the area revegetated concurrently with revegetation of other construction areas. An estimated 87 transformers will be used to step up low voltage power to 34.5 kV and approximately 54 mi of underground power cable will be installed.

### Installation of FAA-required Lights

Federal Aviation Administration (FAA)-required lights will be installed on the nacelle prior to lifting the nacelle onto the turbine tower. Power to the lights will typically be provided by the turbine; when turbines are not generating power, power to the lights will be provided by the existing grid.

## **Project Operation**

IWNA intends to operate and maintain the Project after construction is completed. All turbines, collection and communications lines, substations, and transmission lines will be operated in a safe manner according to standard industry operation procedures. Routine maintenance of the turbines will be necessary to maximize performance and detect potential difficulties. Each turbine will be remotely scanned by computer every day to ensure operations are proceeding efficiently. Any problems will be promptly reported to on-site personnel, who will perform both routine maintenance and most major repairs. Most servicing will be performed up-tower, without using a crane to remove the turbine from the tower. Additionally, all roads, pads, and trenched areas will be regularly inspected and maintained to minimize erosion.

Access roads will be maintained during project operations to prevent off-road detours due to ruts, mud holes, landslides, etc. Roads will be maintained as needed; it is anticipated that maintenance will occur twice per year but more frequent maintenance will be performed, if needed, to maintain roads in an condition acceptable to the county (for county roads) and to the landowner (for private roads). All fuels and/or hazardous materials will be properly stored during transportation and at the job site. Workers will be instructed to keep all job sites in a sanitary and safe condition. Workers will be expected to respect the property rights of private landowners.

### Activities

Long-term operation and maintenance activities will include:

- 24-hour a day monitoring of the safety and control system, the performance of each turbine, and the Project output.
- Controlling turbine operations to meet scheduled power deliveries and outages
- Periodic, routine testing and maintenance of turbines
- Maintenance of service roads
- Repair project equipment
- Security

### Work Force

The Project will employ 6 to 10 full time staff. This staff will include a manager, various maintenance technicians and field staff. They will monitor the facility and its grounds.

### **Reclamation and Abandonment**

Reclamation will be conducted on all disturbed areas to comply with easement agreements. The short-term goal of reclamation will be to stabilize disturbed areas as rapidly as possible, thereby protecting sites and adjacent undisturbed areas from degradation. The long-term goal will be to return the land to approximate pre-disturbance conditions.

After construction is complete, temporary work areas will be graded to the approximate original contour and the area will be revegetated with approved seed mixtures. IWNA will consult with the Natural Resources Conservation Service on appropriate reclamation methods and seed mixtures and will obtain approval from landowners to implement the appropriate practices. Most post-construction work will entail stabilizing slopes; scarifying soils to reduce compaction; and reseeding unused disturbed areas including portions of turbine pads not required for operation and maintenance, road cuts-and-fills, underground power line trenches, and overhead power line routes. Approximately 69% of new disturbance will be reclaimed upon construction completion.

At the end of the project's useful life (estimated at 25 years), IWNA will obtain any necessary authorization from the appropriate regulatory agency or landowner to abandon the wind project. Turbines, towers, and transformers will be removed and recycled or disposed of at approved facilities. Foundations will be abandoned in place to a depth of 3 to 4 ft below grade. All private project roads will revert to landowner control. Underground power and communication lines will be abandoned in place; overhead power lines and poles will be removed. Reclamation procedures will be based on site-specific requirements and techniques commonly employed at the time the area is to be reclaimed and will include regrading, topsoiling, and revegetation of all disturbed areas.

Figure 1.1

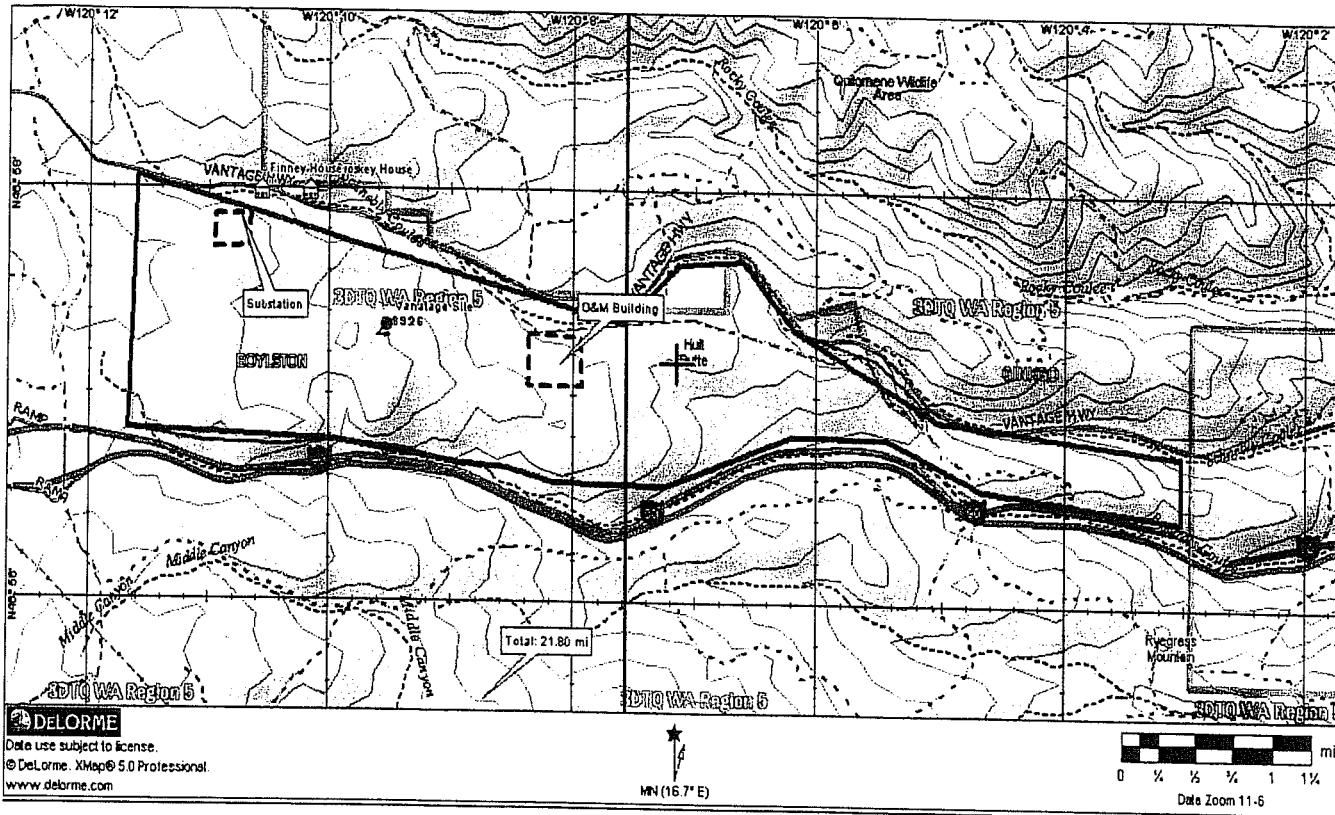


Figure 1.2

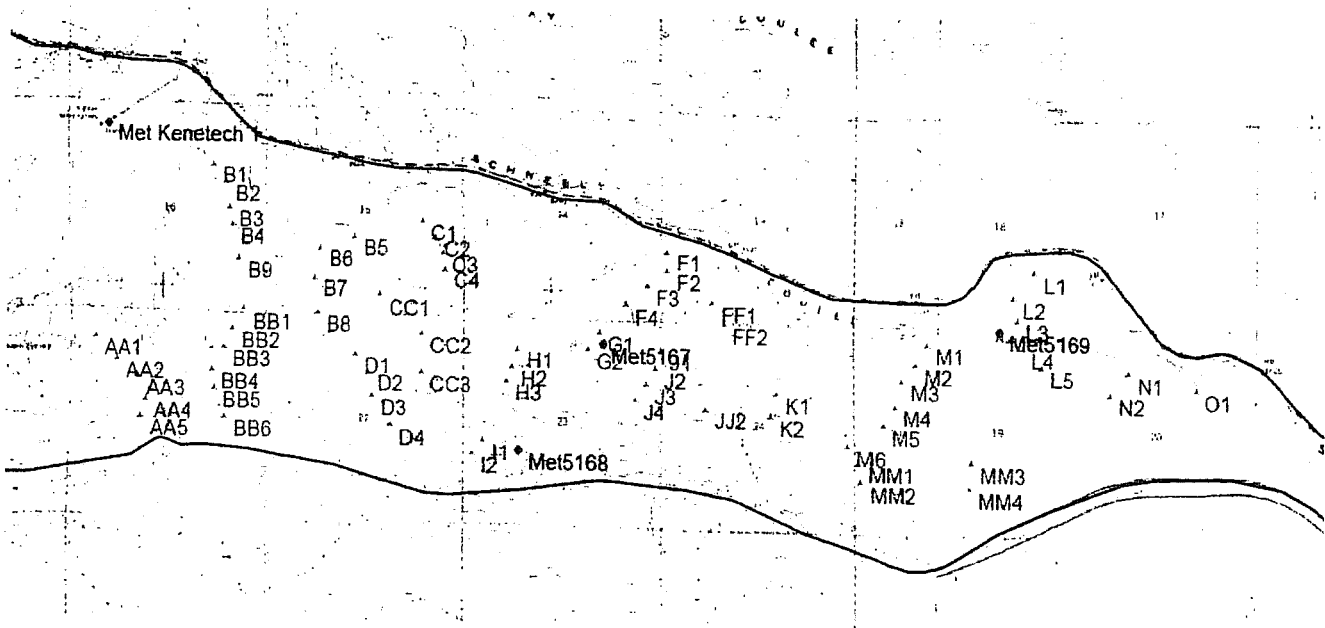


Figure 1.3

