

# INTERNATIONAL CONSTRUCTION CONSULTING, LLC.

## Recent Project Details

The following narrative provides more detail regarding some of the recent projects with which I have been involved and which may or may not be included on my CV. The projects listed are in chronological order.

### **Obiafu/Obrikom – Oben (OB3) Gas Pipeline Project**

**Client:** Jaihind Project Services Ltd  
**Location:** Nigeria  
**Scope:** Construction Advisor for the Swamp & Major River Crossings for a 48-inch Pipeline Installation Tender  
**Year:** 2009

Review of project documents and development of detailed cost estimates and execution plans for 33 kms of swamp/marsh lands and the Niger River crossing.

Project consists of a 48-inch pipeline system comprising:

- Tie-in station at OB/OB Central Processing Facilities (CPF)
- Ob/Ob Custody Transfer Metering Station.
- Intermediate Pigging Station.
- Oben Gas Treatment Plant.
- CP System Groundbed.
- 127km x 25m width ROW route of the gas pipeline from OB/OB CPF to Oben Node with Intermediate Pigging Station to located at a suitable point to be determined by the engineering design.
- Sub-surface Geological features of all river crossings and the river bed.

### **Angola LNG Project**

**Client:** Angola LNG Ltd (Chevron)  
**Location:** Angola, Democratic Republic of Congo  
**Scope:** Construction Advisor for the Plant Early Site Work  
Nearshore/Onshore Pipeline Construction Manager  
**Year:** 2008 – current

The facility consists of one (1) onshore LNG process train to treat and liquefy natural gas, two (2) LNG storage tanks, marine loading facilities and infrastructure and other support facilities. The Facility will process natural gas from wells offshore of Angola to produce 5.2 Million Tons Per Annum (MTPA) of LNG using the “ConocoPhillips Optimized Cascade Process”, for export by ship. The plant portion of the Project includes the facilities from upstream of the slug catcher(s) to the product loading arms on the marine terminal including: gas separation & treating, condensate stabilization, LPG fractionation, liquefaction, product storage, loading and offsite systems including non-process infrastructure. The LNG will be loaded into LNG Tankers supplied by others, and transported to customers. In addition to producing LNG, the facility will also produce two LPG products (Propane & Butane) and condensate products, also for export by ship.

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Offshore/nearshore/onshore pipelines include 200 kms each of 18", 22", and 24" pipelines for the gathering and transportation of approximately 1,000 MMSCFD of associated gas from Third Party offshore Angolan oilfields north & south of the Congo River, along with non-associated gas from shallow water fields, to the single-train onshore LNG plant. Pipeline scope includes onshore, offshore, and shore approach, Explosive Remnants of War clearance (ERW-performed in accordance with United Nations' International Mine Action Standards (IMAS) and Angolan Nation Standards.), environmentally sensitive (e.g., savannah areas, river crossings, road crossings, and mangrove swamp areas), construction of a temporary jetty, external corrosion coated and internal flow coated pipe, valve stations, design code changes (from the offshore DNV design code, to the ISO onshore design code), ESDV's, leak detection, cathodic protection, fiber optic cable installation, and pressures ranging from 158 bar (2,300 psi) to 295 bar (4,279 psi).

### **Overland Pass Pipeline Project**

**Client:** Willbros Engineers  
**Location:** US  
**Scope:** Constructability Study  
**Year:** 2007

Overland Pass Pipeline is a 760-mile natural gas liquids (NGL) pipeline from Opal, Wyo., in the southwestern part of the state, to the mid- continent natural gas liquids market center in Conway, Kan., one of the nation's primary NGL distribution and storage hubs. The pipeline will be designed to transport 110,000 barrels per day of natural gas liquids. The system includes 5 facilities (pump stations, meter stations). Additional pump facilities would increase the capacity to 150,000 barrels per day.

### **Oneok NGL Pipeline, LP Project**

**Client:** Willbros Engineers  
**Location:** US  
**Scope:** Feasibility Study  
**Year:** 2006

The proposed Oneok NGL Pipeline, LP consists of a 12.75-inch, X-60, 0.219" and 0.330" WT, 135 mile long natural gas liquids (NGL) pipeline operating at 1,480 psig transporting NGL with a throughput of 91,000 BPD. The project begins at the Bushton, Kansas facility (MP 0), and traverses Kansas in an east-southeast direction toward Mitchell, Kansas. From there, the pipeline parallels an existing Oneok pipeline south to the city of Medford, Oklahoma.

### **Escravos Gas Pipeline Project, Phase 3A (EGP3A)**

**Client:** Chevron Nigeria Limited  
**Location:** Nigeria  
**Scope:** Pipeline Project Engineer / Site Manager  
**Year:** 2006 - 2008

EGP3A consists of the fabrication and installation of the below facilities offshore Escravos, Nigeria, West Africa.

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Jacket & piles fabrication & installation for 2 ea topside modules. 2 each Topsides fabrication & installation: 1 new gas gathering and compression platform, capable of receiving up to 70 MMSCFD of low pressure separator gas, receives, compresses and dehydrates the gas to 1200 psig; 1 new well platform, providing nine (9) well slots and capable of handling up to 450 MMSCFD of high pressure gas, 33,000 BPD of condensate and 4,000 BPD of produced water for transport.

Pipeline installation, including FBE & Concrete weight coating for 20 kms of 10"; 6.6 kms of 20", 5km subsea power cable; 15 kms of onshore 245" pipelines; shore approach for dual 24" pipelines; 45 kms of offshore 24" pipelay, including piggable wye, PLEM, and SPM buoy; all related pipeline crossings, burials, riser installations, etc.

All related Brownfield installations (4 related, existing platforms) and all hook up & commissioning and turn over to operations.

### **West Africa Gas Pipeline Project (WAGP)**

**Client:** Willbros Engineers  
**Location:** Nigeria, Ghana, Benin, Togo  
**Scope:** Technical Support – Commissioning Documentation Development  
**Year:** 2005

The WAGP will traverse 620 miles (1,033 kilometers) both on and offshore from Nigeria's Niger Delta region to its final planned terminus in Ghana. The first portion of the pipeline, which will deliver gas to the greater Lagos area (Alagbado), is already in existence. The Escravos-Lagos pipeline (ELP) was commissioned in 1989, supplying natural gas to Nigeria's Egbin power plant and other industrial consumers in Lagos and Ogun States. ELP has a capacity to handle nearly 900 million cubic feet per day (Mmcf/d) of natural gas, but currently the majority of this capacity is not utilized. A 34-mile (57-kilometer) onshore portion of the WAGP will run from Alagbado to Seme beach in Lagos State. The WAGP will continue offshore, with proposed landfall spurs at Cotonou (Benin), Lome (Togo), Tema (Ghana), Takoradi (Ghana) and Effasu (Ghana). The initial capacity of the WAGP will be 200 Mmcf/d, with the capability to expand to 600 Mmcf/d as demand grows.

The \$500-million WAGP will initially transport 120 Mmcf/d of gas to Ghana, Benin and Togo beginning in June 2005. Gas deliveries are expected to increase to 150 Mmcf/d in 2007, to 210 MMcf/d in 7 years and be at 400 Mmcf/d when the pipeline is functioning at its capacity (approximately 15 years after construction). It is estimated that \$600 million will be spent on the development of new and renovated power facilities in the four states to utilize the gas.

### **Overland Pass Pipeline Project**

**Client:** Willbros Engineers  
**Location:** US  
**Scope:** Feasibility Study  
**Year:** 2005

Overland Pass Pipeline is a 760-mile natural gas liquids (NGL) pipeline from Opal, Wyo., in the southwestern part of the state, to the mid-continent natural gas liquids market

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### **Millennium Project**

**Client:** Willbros Engineers  
**Location:** US  
**Scope:** Technical Support – Feasibility Study; Cost Estimate  
**Year:** 2005

The 181.7 miles of The Millennium Pipeline (utilizing more than 90 percent existing easements) will extend from Corning in Steuben County across the southern tier and lower Hudson Valley of New York State to Ramapo in Rockland County.

Interconnections with gas utilities, storage fields, and major interstate pipelines at several points along the Millennium system will significantly enhance the efficiency of the Northeast's natural gas system.

Primary supply will be provided through an interconnection with the Empire State Pipeline at Corning.

Millennium Pipeline will be capable of delivering up to 525,400 million cubic feet of natural gas per day to energy consumers.

### **Acueducto Bajanorte Hydrogeneration Project**

**Client:** Willbros Engineers  
**Location:** Mexico/US  
**Scope:** Technical Support; Feasibility Study; Cost Estimate; Execution Plan  
**Year:** 2005

A \$1.9 billion bi-national water pipeline between the US and Mexico, consisting of a 52" pipeline and associated pumping and pressure reducing stations.

### **Bibiyana Gas Field Development Project**

**Client:** Willbros Engineers/UNOCAL  
**Location:** Bangladesh  
**Scope:** Technical Support; Constructability Study  
**Year:** 2004

The Bibiyana Project is the development of the Bibiyana Gas (and Condensate) Field located in northeast Bangladesh, in Block 12. The field is about 2.5 kilometers wide and 14 kilometers long, and is located 150 kilometers northeast of Dhaka, 50 kilometers miles southwest of the gas producing Jalalabad Plant, and 50 kilometers northwest of the Moulavi Bazar future Gas Plant.

The Bibiyana Field will be developed in 2 phases corresponding to a 2-pad (drilling program) development with the possibility of a third pad north of the Kushiara river if

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extended reach wells from the existing pad cannot be technically or economically justified during detailed engineering.

The field facilities to be installed as part of the Bibiyana Gas Development Project will be developed in two phases, and include the following: Two well pads, North Pad Site and South Pad Site (with the possibility of adding a third depending on the viability of extended reach drilling activities); Four production trains rated at 150-MMSCFD each for a total throughput of 600-MMSCFD; Gas gathering pipeline (20" x 4.5 km) connecting the south pad to the north pad where the as plant will be located; Gas plant, consisting of: loading & transfer pumps; Flare, power generation; Fire and gas system; SCADA; inlet separation, gas dehydration and gas metering; condensate stabilization through staged depressurization, storage, condensate, pipeline pumps, and metering; produced water, degassing, storage and disposal; associated utilities, including flare and blow down system, power generation and distribution, fuel gas, diesel fuel, instrument air, utility air, fire water utility, water systems, open/closed process drain systems; Gas plant, including drilling/production area, process area, flare area, and permanent accommodations area, to be built on a work pad of approximately 12' of thickness made up of dredged, hauled and compacted material.

### **Corporate Constructability Program**

**Client:** Confidential  
**Location:** US  
**Scope:** Technical Support; Constructability  
**Year:** 2004 - 2005

Developed a comprehensive Constructability Program for a major oil & gas engineering firm based in the US. Program consisted of frameworks, plans, checklists, sample agendas, charters, examples, flow charts, etc.

### **Variety of Confidential Feasibility Studies**

**Client:** Confidential  
**Locations:** US  
**Scope:** Technical Support; Feasibility Study  
**Year:** 2004 - 2005

Developed a number of confidential Feasibility Studies for pipeline projects in the US. The Studies consisted of developing conceptual designs, execution plans, schedules, detailed costs estimates, and cash flows. Additionally, risk assessments were performed and a listing of project exposures & vulnerabilities was developed along with recommended mitigations.

### **West Salym Project**

**Client:** Parsons/Shell  
**Locations:** Russia, W. Siberia  
**Scope:** Pipelines & Terminal Construction Manager  
**Year:** 2004

The West Salym Project is located in Khanty-Mansi Autonomous Okrug, 120 kilometres south west of Surgut and 30 kilometres west of Salym village. The Salym oilfields

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include West Salym, Upper Salym and Vadelyp with a license area totaling 2141.4 sq km. The Salym fields recoverable C1+C2 category oil reserves approved by the Russian Federation State Committee on Reserves (GKZ) amount to 152.6 million tonnes.

Project includes major field infrastructure, an all-weather road built in the Communication Corridor (ComCor), linking the three Salym fields. Storage tanks, warehouses, field camps and a helipad were constructed, and a high-voltage power line was routed to the transformer substations to provide electrical power.

Originally, the oil produced from the initial wells in West Salym was shipped to customers by road tankers. To eliminate this, construction of a Central Processing Facility (CPF) in West Salym and the oil-export pipeline to the Yuzhny Balyk Booster Station was undertaken. There, a tie-in funnels the Salym oil into the Transneft main trunk pipeline system. The pipeline will allow crude oil export in larger volumes. Processing (the separation of gas, oil, and water) will take place at the CPF. The plant is designed to collect and process six million tons of crude per year with an option to expand capacity to nine million tons after Upper Salym and Vadelyp fields have been hooked up. From the CPF, the oil will go into the 90- kilometer (56-mile) pipeline, and then into the Transneft system, and from there to the refineries.

### **Sakhalin 1 Project, Phase 1, EGP2**

**Client:** ExxonMobil  
**Location:** Russia, Sakhalin Island  
**Scope:** Early Site Manager; Pipeline Construction Lead  
**Year:** 2002 - 2004

The Sakhalin-1 Project includes three offshore fields: Chayvo, Odoptu, and Arkutun Dagi. Exxon Neftegas Limited (ENL) is the operator for the multinational Sakhalin-1 Consortium (ExxonMobil interest 30%). Co-venturers include affiliates of Rosneft, the Russian state-owned oil company, RN-Astra (8.5%) and Sakhalinmorneftegas-Shelf (11.5%); the Japanese consortium SODECO (30%); and the Indian state-owned oil company ONGC Videsh Ltd. (20%).

Sakhalin-1 potential recoverable resources are 2.3 billion barrels of oil and 17.1 trillion cubic feet of gas (or 307 million tons of oil and 485 billion cubic meters of gas).

Sakhalin-1 is one of the largest single foreign direct investments in Russia and an excellent example of the advanced technological solutions the industry has to apply to meet the challenges of the growing energy demand. Project benefits to Russia include direct revenues to the Russian State estimated at over US\$ 50 billion, major infrastructure improvements, technology transfer and the use of Russian suppliers for contracts and procurement. Commercial development brings with it a contribution of US\$ 100 million to the Sakhalin development fund over a five-year period.

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### West-East China Gas Pipeline Project

**Client:** ExxonMobil  
**Location:** China  
**Scope:** Technical Support; Feasibility Study  
**Year:** 2001

The first phase involved an investment of 140 billion yuan and will be capable of transporting 12 billion cubic meters of gas annually. The 4,000 km pipeline, with a diameter of 1,016 mm ran eastwards from Lunnan gas field in Xinjiang. Its route will take it through Gansu, Ningxia, Shaanxi, Shanxi, Henan, Anhui, and Jiangsu terminating in Baihe Town in Shanghai.

### Core Ventures 1 & 2

**Client:** ExxonMobil  
**Location:** Saudi Arabia  
**Scope:** Technical Support; Independent Project Review  
**Year:** 2001

The integrated program involved exploration and processing of gas plus power stations, water desalination plants and petrochemical schemes. Total investments initially projected between \$ 25-30 billion in the first ten years covering gas field development plus other downstream projects.

The gas initiative has three core ventures. ExxonMobil leads Venture One, known as South Ghawar, tipped as the most prized requiring investments of \$ 10 to \$ 15 billion. ExxonMobil also led Venture Two in the Red Sea area, which requires outlay of \$ 5 to \$ 7 billion, but widely regarded as exceptionally complex in nature.

### Alaska Gas Producers Pipeline Project

**Client:** ExxonMobil  
**Location:** Alaska  
**Scope:** Technical Support; Owner Team Construction Advisor  
**Year:** 2001 - 2002

The feasibility study looked at 2 options (Alaska option or the Mackenzie Valley option) to build a natural gas pipeline and related facilities, which would have a design capacity to transport approximately 4 Bcfd of gas from the Alaska North Slope to markets in Alaska, Canada and the Lower 48 States. The pipeline and related facilities will be designed such that the future capacity could be increased by approximately 1 Bcfd with additional investments.

While specific details of the project design are likely to change as additional engineering studies are conducted and market information is gained through the initial open season, the project is expected to consist of a large diameter, large volume pipeline delivering Alaska gas to North American markets. The major components forming the Alaska Gas Pipeline Project are: gas transmission pipelines from upstream facilities to the Gas Treatment Plant (Gas Transmission Pipelines); a Gas Treatment Plant (GTP); a pipeline in Alaska (Mainline); a pipeline from Alaska to Alberta (Alaska to Alberta Pipeline); potential Natural Gas Liquids (NGLs) extraction facilities, and; a potential pipeline from Alberta to Chicago (Alberta to Lower 48 Pipeline).

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The GTP would be located on the Alaska North Slope and would be designed to remove carbon dioxide (CO<sub>2</sub>), hydrogen sulfide (H<sub>2</sub>S) and other impurities from the natural gas stream to meet the Mainline specifications. These pipeline specifications would also require that the gas be compressed and chilled. The Mainline would be an approximately 730 mile long, large diameter pipeline that extends from the GTP on the Alaska North Slope to the Alaska/Canada border. The Alaska to Alberta Pipeline, which would be a continuation of the Mainline, would be an approximately 1,400 mile long pipeline that extends from the Alaska/Canada border into Alberta.

### **Chad Development Project**

**Client:** 1) Willbros-Spie Capag JV ; 2) ExxonMobil  
**Location:** Chad and Cameroon  
**Scope:** Two-fold: 1) Joint Venture Construction Manager for Planning / Performed Construction Readiness Review for Owner Team  
**Year:** 2000 and 2002

The project was performed under the auspices of World Bank financing and was an EPC consisting of 1,070 km of a 250,000 BPD 30" products pipeline, with terrain ranging from arid plains, tropical rain forests, and mountains, from southern Chad to the west coast of Cameroon, including a CP system, 48 mainline valve settings, 32 major road crossings and 11 major river crossings.

### **Cuiaba Gas Pipeline Project**

**Client:** Parsons/Enron International  
**Location:** Brazil and Bolivia  
**Scope:** Construction Manager, Bolivia  
**Year:** 1999 - 2000

Consisted of the installation of 626 km of a 265 MMSCFD, 18" gas pipeline through extremely remote, environmentally sensitive areas, including 3 major (directionally drilled) and 4 minor (conventional) river crossings, terrain ranged from plains, the wetlands of the Pantanal, mountains, and rainforests. Included in the work scope were metering stations, future compressor station sites, mainline valve settings, launchers/receivers, CP, SCADA, and pipeline pre-commissioning and commissioning.

### **Cerro Negro Upstream Project**

**Client:** Parsons/Mobil  
**Location:** Venezuela  
**Scope:** Dual Role: Construction Manager-Pipelines / Field Engineering Manager-Facilities  
**Year:** 1997 - 1999

Project was an EPC, grass roots 120,000 BPD Central Production Facility (CPF) in a logistically challenged area; 90 kilometers of heavy crude and diluent pipelines, gas sales and receipt pipeline and water injection pipelines, all with intelligent pigging capabilities; required infrastructure (i.e. internal/external roads, water supply, power supply, electrical distribution, etc.); logistics and heavy lift planning; well pads and associated facilities; manifolds and interconnecting piping and flow lines; coordination for

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the permitting of pipeline and power transmission routes and CPF land use; testing and pre-commissioning of pipelines and facilities; alliance agreement and contractual negotiations, integration and implementation with the prime construction sub-contractor for a \$50 MM construction sub-contract; planning, organization, and interface with multi-discipline, multi-cultural engineering and construction staffs; and client interface.

### Gas Recovery Feasibility Study

**Client:** Raytheon  
**Location:** Venezuela  
**Scope:** Project Manager  
**Year:** 1996 - 1997

Project included gas flow measurements, gas analysis, reservoir analysis, future gas production projections, design of a gas recovery and transmission/distribution system, and a gas marketing strategy. The project deliverables included a project financing package and an EPC-type FEED Bid Package. The study covered roughly 6,000 wells producing a total of approximately 300 mmscfd in three separate fields, including one offshore field, with associated facilities.

### Multiple Projects – South America

**Client:** Willbros International  
**Location:** Venezuela  
**Scope:** Operations Manager  
**Year:** 1992 – 1996

Primary responsibilities included: project team organization, management of multiple projects in technically and logistically challenged areas, economic analysis of a wide variety of projects, including swamp, offshore and onshore pipelines and flow lines and related facilities and stations, heavy transportation for drilling rigs, operation and maintenance of oil field installations, marine engineering and heavy civil construction, platform installations, port and harbor facilities, pilings, contract negotiations and risk management.

### Yamal Field Development Project

**Client:** Willbros International/Gazprom  
**Location:** Russia  
**Scope:** Construction Manager  
**Year:** 1992

Feasibility study of the Yamal Field Development Project - Baydartszkaya Bay Crossing. Project consisted of 62 kilometers of five parallel 52" x .831" WT offshore pipelines; beach interface approach; 6 kilometers of eight parallel 48" x .831" WT insulated pipelines on VSM's; and launchers and receivers.

### Yemen LNG Feasibility Study

**Client:** Willbros International/Enron International  
**Location:** Yemen  
**Scope:** Construction Manager  
**Year:** 1992

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Study consisted of analyzing two separate routes, 400 kilometers each of 36"x .656" WT pipe with compressor stations totaling 142,000 HP; gas receipt and tie-in to a CPF at the Mar'ib field; custody transfer; main line valves and launcher/receivers; construction execution plan; testing and commissioning plan with procedures for introduction of process gas.

**Production Facilities Expansion – West Kuwait Project**

**Client:** Willbros International/Kuwait Petroleum Company

**Location:** Russia

**Scope:** Project Manager

**Year:** 1992

Project was for the evaluation and study of the Production Facilities Expansion - West Kuwait Project. The project details consist of detailed engineering, design, and construction of 250 kilometers of 8" to 24" crude oil, gas, condensate and fuel gas pipelines; slug catcher; Central Mixing Manifold (CMM); cathodic protection system; pig traps; and related electrical, civil and ancillary works.