



Canada-Newfoundland and Labrador Benefits

Annual Report 2018

Husky Energy Ref. No.: WR-ADM-RP-0058



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1.0 Introduction – 2018 Highlights

Husky completed its 13th full year of operations on the White Rose field, safely producing approximately 9.06 million barrels of oil. To the end of 2018, the White Rose field and satellites have produced over 294 million barrels of oil. Husky recognizes the impact of the White Rose and satellite projects on the provincial economy and on local communities, and works proactively to ensure that Newfoundland and Labrador residents and members of the local supply community are full participants in the projects.

In 2018, the North Amethyst field completed its ninth year of production, producing approximately 1.8 million barrels of oil and West White Rose completed its seventh full year of production, producing approximately 395 thousand barrels of oil. Also in 2018, South White Rose Extension (SWRX) completed its third year of oil production, producing approximately 3.6 million barrels of oil.

In May, 2017, Husky announced sanction of the West White Rose Project. This project involves construction of a stationary drilling platform. Construction of various components for the West White Rose Platform is underway at sites in NL, and in Ingleside, Texas, where the facility's topsides is being fabricated. The accommodations module is progressing well in Marystown, NL and construction of the platform's Concrete Gravity Structure ("CGS") advanced in a purpose-built graving dock in Argentia, NL. The CGS was poured to a height of 46 metres during the 2018 construction season. Concrete works will continue in 2019, with mechanical completion of the CGS scheduled for 2021.

Husky presently holds working interests ranging from 5.8 percent to 100 percent in 22 significant discovery areas in the Jeanne d'Arc Basin and Flemish Pass Basin, offshore NL and Baffin Island.

In May 2018, Husky announced a near-field oil discovery at the White Rose A-24 exploration well, located approximately 10 kilometres north of the *SeaRose FPSO*. The well encountered more than 85 metres of oil-bearing sandstone. Additional delineation in the region is planned. Husky has a 68.875 percent ownership interest, with partners Suncor Energy and Nalcor Energy Oil and Gas holding 26.125 percent and five percent, respectively.

Husky continues to evaluate the results of a 2017 discovery at Northwest White Rose. The White Rose A-78 well was drilled approximately 11 kilometres northwest of the *SeaRose FPSO* in the first quarter of 2017 and delineated a light oil column of more than 100 metres. Husky has a 93.232 percent ownership interest.

Husky and its partner continue assess potential development of Bay du Nord and other discoveries in the Flemish Pass Basin. A benefits framework agreement was reached with the Government of Newfoundland and Labrador in July 2018, based on an FPSO-based development concept to produce resources at Bay du Nord and Bay de Verde.

Technological and commercial evaluations continue. Husky holds a 35 percent non-operated working interest in the Bay du Nord, Bay de Verde, Baccalieu, Harpoon and Mizzen discoveries.

Husky is a non-operating partner in two exploration licences awarded in the November 2018 C-NLOPB land sale. The licences are adjacent to Terra Nova and White Rose in the Jeanne d'Arc Basin and will bring Husky's total licence holdings in the region to nine.

In 2018, Husky had 120 co-op student placements in various disciplines throughout the company (52 males and 68 females).

Quarterly updates, procurement and business opportunities are posted on the Husky website. Husky also has a West White Rose Project-specific website where Husky procurement opportunities are identified and links to contractor procurement websites are available. Husky continues to interact with local stakeholders in the White Rose and satellite projects, including maintenance of a close working relationship with the Newfoundland Ocean Industries Association (Noia). Husky regularly posts procurement opportunities with Noia through the Noia Daily Barrel. Again this year, Husky participated in the annual Noia conference providing an update on current and future operations.

2.0 Summary of 2018 Activities

2018 marked the 13th full year of production from the White Rose field. A total of 9.06 million barrels of oil was produced. 2018 also marked the ninth year of production from the North Amethyst field with a total of 1.8 million barrels of oil produced and the seventh full year of production from West White Rose with 395 thousand barrels of oil produced. 2018 was the third full year of oil production from SWRX with 3.6 million barrels of oil produced.

In 2018, *Heather Knutsen*, *Navion Hispania*, *Beothuk Spirit*, *Norse Spirit* and *Dorset Spirit* transported White Rose crude. A total of 15 White Rose cargoes were completed in 2018 of which all (100% or approximately 9.5 million bbls) was delivered to the NTL terminal at Whiffen Head, Placentia Bay, NL

In 2018, Husky invested over \$8.98 million in Research and Development and Education and Training on a number of initiatives, including \$50,000 to Thrive for educational programs, \$15,000 in support of the Eastern NL Science Fairs Council (ENSFC) and \$30,000 in continued support of the WRDC Techsploration Program.

As of December 31, 2018, a total of 1,088 people were reported employed on Husky's White Rose Operations of which 493 were located offshore. This includes people employed with Husky and its contractors and includes North Amethyst, West White Rose and South White Rose Extension (SWRX). Of this total, 925 or 85 percent were residents of Newfoundland and Labrador when hired, while another 102 or 9 percent were residents of other regions of Canada at the time of hire. The number of females employed on White Rose operations was 181 or approximately 17 percent of the total workforce.

As of December 31, 2018, 2,656 people were reported employed on Husky's West White Rose Project, representing approximately 1,624,420 person hours. The number of females employed on the project was 382 or approximately 14 percent of the total workforce.

Total Newfoundland and Canadian content for expenditures on the White Rose project for the period January 1 to December 31, 2018 stands at 73.12 percent (52.25 percent NL; 20.87 percent Other Canadian).

3.0 Employment Summary

3.1 White Rose Project

As of December 31, 2018, a total of 1,088 people were reported employed on Husky's White Rose Operations of which 493 were located offshore. This includes people employed with Husky and its contractors and includes North Amethyst, West White Rose and South White Rose Extension (SWRX).

Of the total personnel, 925 or 85 percent were residents of Newfoundland and Labrador when hired, while another 102 or 9 percent were residents of other regions of Canada at the time of hire. The number of females employed on White Rose operations was 181 or approximately 17 percent of the total workforce (Table 3.1).

Table 3.1 White Rose Employment Summary by Location, as of December 31, 2018



Atlantic Region Contractor Stats

Head Count By Location
 White Rose - Q4 2018

Location	NL Male	NL Female	NL Subtotal	Other Canadian Male	Other Canadian Female	Other Canadian Subtotal	Foreign Male	Foreign Female	Foreign Subtotal	Male Subtotal	Female Subtotal	Total
Foreign	0	0	0	0	0	0	14	3	17	14	3	17
Newfoundland - Offshore	432	15	447	38	0	38	6	2	8	476	17	493
Newfoundland - Onshore	337	138	475	48	15	63	23	6	29	408	159	567
Other Canadian	2	1	3	1	0	1	6	1	7	9	2	11
Total	771	154	925	87	15	102	49	12	61	907	181	1,088

Table 3.2 Employment Summary - Husky & Major Contractors as of Dec 31, 2018

Atlantic Region Contractor Stats

 Head Count By Contractor
 White Rose - Q4 2018

Contractor	NL Male	NL Female	NL Subtotal	Other Canadian Male	Other Canadian Female	Other Canadian Subtotal	Foreign Male	Foreign Female	Foreign Subtotal	Male Subtotal	Female Subtotal	Total
A Harvey	9	2	11	0	0	0	0	0	0	9	2	11
Aker Solutions	33	11	44	0	0	0	3	1	4	36	12	48
ASCO Canada Limited	6	0	6	0	0	0	0	0	0	6	0	6
Atlantic Offshore Medical Services	9	4	13	0	0	0	0	0	0	9	4	13
Atlantic Towing	24	6	30	20	6	26	1	0	1	45	12	57
Atlantic XL	1	1	2	0	0	0	0	0	0	1	1	2
Baker Hughes	2	0	2	0	0	0	0	0	0	2	0	2
Cormorant Ltd.	1	1	2	0	0	0	0	0	0	1	1	2
Cougar	32	9	41	10	1	11	0	0	0	42	10	52
Crosbie Salamis	40	3	43	3	0	3	0	0	0	43	3	46
DBC Marine Services	2	2	4	0	0	0	0	0	0	2	2	4
DOF Subsea	68	4	72	6	0	6	2	0	2	76	4	80
East Coast Catering	15	5	20	0	0	0	0	0	0	15	5	20
East Coast Tubulars	18	2	20	1	0	1	2	0	2	21	2	23
Enhanced Drilling	1	0	1	0	0	0	0	0	0	1	0	1
Expro Group Canada	5	2	7	0	0	0	2	0	2	7	2	9
FI Oilfield Services Canada ULC	8	0	8	0	0	0	0	0	0	8	0	8
Fugro Jacques GeoSurveys Inc	5	1	6	0	0	0	0	0	0	5	1	6
Halliburton	6	0	6	0	0	0	0	0	0	6	0	6
Husky	223	84	307	31	8	39	20	8	28	274	100	374
Import Tool	2	0	2	0	0	0	0	0	0	2	0	2
Maersk Seabase	31	1	32	2	0	2	0	0	0	33	1	34
Oceaneering International Ltd.	0	0	0	0	0	0	5	1	6	5	1	6
Oceans Ltd	4	0	4	0	0	0	0	0	0	4	0	4
OneSubsea	31	3	34	0	0	0	10	2	12	41	5	46
Pennecon	1	0	1	0	0	0	0	0	0	1	0	1
Provincial Airlines	0	0	0	0	0	0	0	0	0	0	0	0
Schlumberger Services	23	3	26	3	0	3	1	0	1	27	3	30
Score	5	3	8	0	0	0	2	0	2	7	3	10
SGS Canada Inc.	0	0	0	0	0	0	0	0	0	0	0	0
Siemens	9	1	10	0	0	0	0	0	0	9	1	10
SNC Lavalin	2	0	2	1	0	1	0	0	0	3	0	3
Stantec	0	0	0	0	0	0	0	0	0	0	0	0
TechnipFMC	7	1	8	0	0	0	0	0	0	7	1	8
Teekay	34	0	34	0	0	0	0	0	0	34	0	34
Terrapure Environmental	2	0	2	0	0	0	0	0	0	2	0	2
Trans Ocean	111	5	116	10	0	10	1	0	1	122	5	127
Weatherford	0	0	0	0	0	0	0	0	0	0	0	0
Workstrings Canada	1	0	1	0	0	0	0	0	0	1	0	1
Total	771	154	925	87	15	102	49	12	61	907	181	1,088

Table 3.3 Employment Summary of Husky and Major Contractors – By Discipline and Gender as of December 31, 2018



Atlantic Region Contractor Stats

Head Count By Occupation

White Rose - Q4 2018

Occupation	NL Male	NL Female	NL Subtotal	Other Canadian Male	Other Canadian Female	Other Canadian Subtotal	Foreign Male	Foreign Female	Foreign Subtotal	Male Subtotal	Female Subtotal	Total
Administration & Clerical	7	33	40	0	2	2	0	1	1	7	36	43
Engineers	86	30	116	13	4	17	17	2	19	116	36	152
Management	38	4	42	7	1	8	8	2	10	53	7	60
Marine Crew	156	8	164	9	0	9	0	0	0	165	8	173
Other Field Services	98	6	104	9	1	10	0	0	0	107	7	114
Professionals	128	57	185	29	7	36	11	6	17	168	70	238
Skilled Trades	113	2	115	11	0	11	2	0	2	126	2	128
Technicians & Technologists	145	14	159	9	0	9	11	1	12	165	15	180
Total	771	154	925	87	15	102	49	12	61	907	181	1,088

Note: In Q4 2018, Husky employed 33 co-op students (19 female) on the White Rose project. The students are not included in the head count above because they started and ended their term outside of the reporting system period.

3.2 West White Rose Project

As of December 31, 2018, 2,656 people were reported employed on Husky's West White Rose Project. During the fourth quarter of 2018 approximately 1,624,500 hours were expended on the project and the total for 2018 was approximately 3,567,500 person hours.

The majority of person hours expended on the project during the last quarter of 2018 were by SDP; these hours are related to slipforming activities. Hours reported by Husky Energy are related to project management. Arup Canada Inc. hours were for continued CGS engineering design work. The hours reported by Kiewit reflect the construction of living quarters in Marystown. Kvaerner hours were for engineering, analysis and planning related to marine operations. TechnipFMC hours relate to engineering of the subsea tie-back system.

Eighty-two percent of the person hours related to detailed engineering of the CGS took place in Newfoundland and Labrador in the fourth quarter of 2018 (see Arup in Table 3.4) and, overall, 93 percent of person hours expended on the project occurred in Newfoundland and Labrador.

Table 3.4 Person Hours by Contractor – West White Rose Project Employment

Atlantic Region Contractor Stats

 Hours By Contractor
 West White Rose Project - Q4 2018

Contractor	Onshore	Offshore	Subtotal	Other Canadian	Foreign	Total
Arup Canada Inc.	37,177	0	37,177	100	7,790	45,067
Husky	26,155	0	26,155	2,348	534	29,037
Kiewit	82,915	0	82,915	0	0	82,915
Kvaerner	4,963	0	4,963	0	1,441	6,404
SDP	1,317,454	0	1,317,454	0	2,220	1,319,674
TechnipFMC	6,441	0	6,441	0	0	6,441
Wood	33,763	0	33,763	0	101,119	134,882
Total	1,508,868	0	1,508,868	2,448	113,104	1,624,420

Residents of NL comprised of 88 percent of the West White Rose Project work force, and residents of Canada comprised two percent of the work force. Women comprised approximately 14 percent of the workforce (Table 3.5).

Table 3.5 Head Count by Contractor – West White Rose Project

Atlantic Region Contractor Stats

 Head Count By Contractor
 West White Rose Project - Q4 2018

Contractor	NL Male	NL Female	NL Subtotal	Other Canadian Male	Other Canadian Female	Other Canadian Subtotal	Foreign Male	Foreign Female	Foreign Subtotal	Male Subtotal	Female Subtotal	Total
Arup Canada Inc.	28	19	47	4	0	4	30	6	36	62	25	87
Husky	62	21	83	6	2	8	2	1	3	70	24	94
Kiewit	189	22	211	0	0	0	2	0	2	191	22	213
Kvaerner	9	2	11	0	0	0	2	0	2	11	2	13
SDP	1,651	244	1,895	40	13	53	29	2	31	1,720	259	1,979
TechnipFMC	9	3	12	0	0	0	1	0	1	10	3	13
Wood	56	9	65	0	0	0	154	38	192	210	47	257
Total	2,004	320	2,324	50	15	65	220	47	267	2,274	382	2,656

The majority of positions in Q4 2018 were associated with other field services, supported by skilled trades, engineers, and technicians/technologists (Table 3.6).

Table 3.6 Summary by Occupation – West White Rose Project

Atlantic Region Contractor Stats
Head Count By Occupation

West White Rose Project - Q4 2018

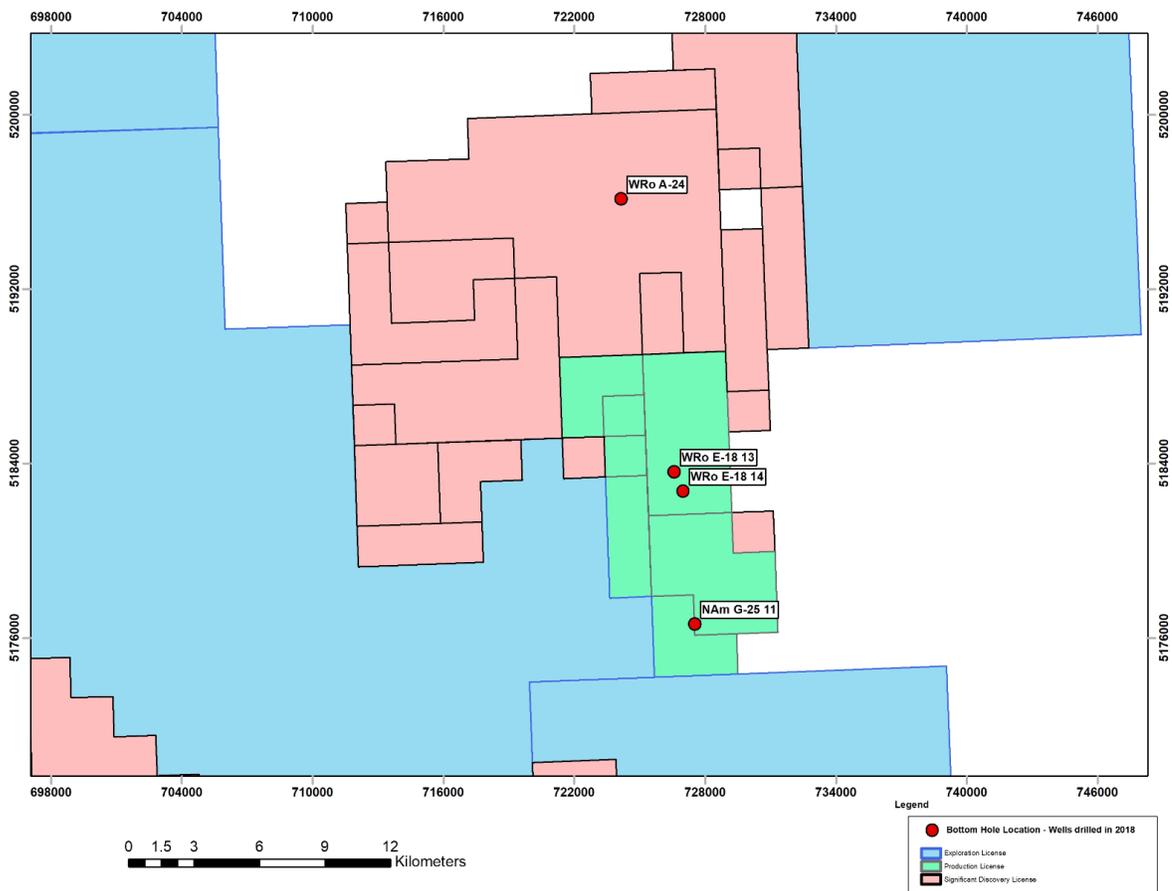
Occupation	NL Male	NL Female	NL Subtotal	Other Canadian Male	Other Canadian Female	Other Canadian Subtotal	Foreign Male	Foreign Female	Foreign Subtotal	Male Subtotal	Female Subtotal	Total
Administration & Clerical	9	29	38	0	1	1	0	5	5	9	35	44
Engineers	100	23	123	37	9	46	106	11	117	243	43	286
Management	116	18	134	7	0	7	12	0	12	135	18	153
Other Field Services	918	105	1,023	0	0	0	8	0	8	926	105	1,031
Professionals	77	42	119	3	5	8	11	7	18	91	54	145
Skilled Trades	683	73	756	0	0	0	1	0	1	684	73	757
Technicians & Technologists	101	30	131	3	0	3	82	24	106	186	54	240
Total	2,004	320	2,324	50	15	65	220	47	267	2,274	382	2,656

Note: In Q4 2018, Husky employed 6 co-op students (3 female) on the West White Rose Project.

4.0 White Rose Drilling Program

During 2018, Husky completed one production well (North Amethyst G-25 11) and carried out well intervention work on two existing wells in the main field. Two additional infill production wells were spud in the Central Drill Centre (E-18-13 and E-18 14) and will be completed in 2019. The White Rose A-24 exploration well was drilled north of the White Rose field.

Figure 4-1 Map of Husky Wells Drilled in 2018



5.0 Procurement

During 2018 a total of 31 new contracts and 37 contract extensions valued at over \$250,000 were awarded. Table 5.1 provides a summary of these contracts.

Table 5.1 Procurement Summary for 2018

Husky East Coast Operations Procurement Summary		2018						
Description	Vendor Name	Vendor Location	Range	NF	CDN	FOR	Total	
New Contracts								
Offshore Supply Vessel (Adhoc) - Atlantic Osprey	Atlantic Towing Limited	St. John's, NL	C	62%	31%	7%	100%	
Offshore Supply Vessel (Adhoc) - Maersk Detector	Maersk Supply Service Canada	St. John's, NL	C	90%	5%	5%	100%	
Printed Circuit Heat Exchangers	Heatric UK	Poole, UK	C	0%	0%	100%	100%	
Quick Disconnect Connector Replacement	MIB Italiana	Casalserego, Italy	E	0%	0%	100%	100%	
Environmental Effects Monitoring	Stantec Environmental	St. John's, NL	C	75%	20%	5%	100%	
Offshore Laboratory Services	Avalon Laboratories	St. John's, NL	B	95%	5%	0%	100%	
WWRP Solids Control	Schlumberger Canada Limited	St. John's, NL	K	45%	17%	38%	100%	
Laboratory Services	Avalon Laboratories	St. John's, NL	B	95%	5%	0%	100%	
BOP Tethering System	Kongsberg Maritime	Houston, Texas	H	35%	0%	65%	100%	
Laboratory Commodities	Mikan Scientific	St. John's, NL	A	100%	0%	0%	100%	
Laboratory Commodities	Enviromed Analytical	St. John's, NL	A	100%	0%	0%	100%	
3rd Party Cold Eyes Review	Pilko & Associates	Houston, Texas	B	0%	0%	100%	100%	
EA Services	Stantec Environmental	St. John's, NL	B	70%	30%	0%	100%	
Offshore Cooler Equipment	Maynard Reece	Dartmouth, Nova Scotia	C	0%	0%	100%	100%	
Motor Repair and Preservation	Northpoint Technical Services ULC	St. John's, NL	B	100%	0%	0%	100%	
Architectural Study of SeaRose FPSO Accommodation Complex	LAT49 Architecture Inc.	St. John's, NL	B	81%	19%	0%	100%	
Installation, Commissioning and Maintenance of PD Couplers	Iris PowerLP	Mississauga, ON	B	0%	100%	0%	100%	
2D Seismic Data	Key Sismic	Calgary, AB	A	0%	100%	0%	100%	
Subsea Flowline Inspection	Halfwave AS	Ervik, Norway	A	0%	0%	100%	100%	
Harbour Deep 3D Data	TGS	Calgary, AB	F	40%	18%	43%	100%	
WWRP Electrical Submersible Pump (ESP) Equipment and Services	Schlumberger Canada Ltd.	Mount Pearl, NL	K	45%	17%	38%	100%	
Fire Safety Equipment Maintenance - WWRP and SeaRose	K&D Pratt	St. John's, NL	F	95%	2%	3%	100%	
Provision of Drill Bits	Schlumberger Canada Limited	St. John's, NL	F	20%	0%	80%	100%	
Flexible Riser Life Extension Engineering Support	2H Offshore Engineering Limited	Aberdeen, UK	B	0%	0%	100%	100%	
Slop Water Treatment Materials	Cetco Energy Services Company, LLC	Houston, Texas	B	0%	0%	100%	100%	
Offshore Crane Maintenance	Liebherr Canada Ltd.	St. John's, NL	H	22%	78%	0%	100%	
Aviation Consulting Services	Contrail Aviation Safety Ltd.	Calgary, AB	B	0%	100%	0%	100%	
Offshore Supply Vessel (Adhoc) - Maersk Detector	Maersk Supply Service Canada	St. John's, NL	B	90%	5%	5%	100%	
Offshore Supply Vessel (Adhoc) - Skandi Chieftain	DOF Subsea	St. John's, NL	B	79%	0%	21%	100%	
Offshore Hose Management	Atlantic Hose and Fittings Ltd.	St. John's, NL	A	10%	8%	82%	100%	
Provision of Drill Bits	Dreco Energy Services ULC	St. John's, NL	F	24%	5%	71%	100%	
Contract Extensions								
Offshore Engineering Services	Aker Solutions	St. John's, NL	N	95%	5%	1%	100%	
MODU Henry Goodrich	Transocean Canada Drilling Services	St. John's, NL	M	50%	10%	40%	100%	
MODU Drilling Fluids	Schlumberger (MI Swaco)	St. John's, NL	I	9%	47%	44%	100%	
MODU ROV Equipment and Services	DOF Subsea	St. John's, NL	G	79%	0%	21%	100%	
MODU Lower String Completions	Halliburton Energy Services	St. John's, NL	H	27%	38%	35%	100%	
MODU Lower String Completions	Schlumberger Canada Limited	St. John's, NL	B	10%	10%	80%	100%	
MODU Cementing Services	Schlumberger Canada Limited	St. John's, NL	I	9%	19%	72%	100%	
MODU Well Tractor Equipment	Welltec	St. John's, NL	D	8%	79%	13%	100%	
MODU Tubular Running Services	FI Canada	St. John's, NL	F	68%	2%	30%	100%	
MODU Cuttings Conveyance Services	Enhanced Drilling	St. John's, NL	F	80%	0%	20%	100%	
MODU Swell Packers	TAM International	St. John's, NL	B	30%	45%	25%	100%	
MODU Tubing Conveyed Perforating	Schlumberger Canada Limited	St. John's, NL	F	21%	9%	70%	100%	
MODU Mud Logging Services	Schlumberger Canada Limited	St. John's, NL	C	67%	7%	26%	100%	
MODU Well Bore Cleanout Services	Halliburton Energy Services	St. John's, NL	C	33%	28%	39%	100%	
MODU Landing String Services	Expro Group Canada	St. John's, NL	F	47%	0%	53%	100%	
MODU Well Test Services	Expro Group Canada	St. John's, NL	E	40%	0%	60%	100%	
MODU Solids Control	Schlumberger (MI Swaco)	St. John's, NL	F	29%	9%	62%	100%	
MODU Slickline Services	Halliburton Energy Services	St. John's, NL	E	31%	49%	20%	100%	
MODU Inflow Control Device/Stand Alone Screens	Schlumberger	St. John's, NL	B	44%	20%	36%	100%	

Table 5.1 Procurement Summary for 2018 (cont'd)

Certifying Authority	DNV Canada Limited	St. John's, NL	F	70%	0%	30%	100%
Inspection Services	SNC Atlantic Inspection Services	St. John's, NL	E	89%	9%	2%	100%
Subsea Equipment Storage and Maintenance	OneSubsea	St. John's, NL	M	73%	2%	25%	100%
Valve Supply and Management	Score Valves	St. John's, NL	H	94%	2%	4%	100%
360 Photogrammetric Survey SeaRose FPSO - Labour	UTEC Survey Canada Ltd.	St. John's, NL	B	100%	0%	0%	100%
360 Photogrammetric Survey SeaRose FPSO - Equipment	UTEC Survey Canada Ltd.	St. John's, NL	B	0%	0%	100%	100%
Supply of Lubricants	Blue Water	St. John's, NL	B	76%	14%	10%	100%
Tracer Marking Systems	Resman	Trondheim, Norway	A	0%	0%	100%	100%
MODU Henry Goodrich	Transocean Canada Drilling Services	St. John's, NL	O	50%	10%	40%	100%
Third Party Quality Control and Inspection	Bureau Veritas North America	Houston, Texas	A	0%	0%	100%	100%
SeaRose FPSO Structural Integrity Manuals Management	Marine Technical Limited Ltd.	Aberdeen, UK	F	0%	0%	100%	100%
Offshore Survey Support	EPCO Services Inc.	St. John's, NL	C	100%	0%	0%	100%
Offshore Pipe Inspection and Cleaning	Afonso Group Limited	St. John's, NL	E	100%	0%	0%	100%
Technical and Engineering Support Services	Madera Engineering Inc.	St. John's, NL	B	100%	0%	0%	100%
Subsea Engineering Services	Technip Canada Limited	St. John's, NL	D	79%	1%	20%	100%
Intervention Support Services	Technip Canada Limited	St. John's, NL	D	79%	1%	20%	100%
Casing and Liner Equipment	Import Tool	St. John's, NL	F	35%	56%	9%	100%
Offshore Satellite Services	Rignet Inc.	Houston, Texas	A	17%	0%	83%	100%
Cost Range Code Legend							
A = 250,001 - 500,000 \$	E = 2,000,001 - 3,000,000 \$	I = 10,000,001 - 15,000,000 \$	M = 50,000,001 - 75,000,000 \$				
B = 500,001 - 1,000,000 \$	F = 3,000,001 - 5,000,000 \$	J = 15,000,001 - 20,000,000 \$	N = 75,000,001 - 100,000,000 \$				
C = 1,000,001 - 1,500,000 \$	G = 5,000,001 - 7,500,000 \$	K = 20,000,001 - 30,000,000 \$	O = Over 100,000,001 \$				
D = 1,500,001 - 2,000,000 \$	H = 7,500,001 - 10,000,000 \$	L = 30,000,001 - 50,000,000 \$					

6.0 Research and Development

Husky's investment in Newfoundland and Labrador executed R&D was over \$4.1 million in 2018. R&D expenditures include engagement with a wide spectrum of local companies and academic institutions.

7.1 Ongoing R&D Projects

A number of Husky directed or sponsored R&D initiatives noted in the 2017 Annual Report continued into 2018, including:

Memorial University

- NSERC/Husky industry chair for safety at sea recognizing present capacity and to promote the development of simulation technologies to improve operational safety leading to a more robust, inherent safe design, of offshore facilities.
- Corrosion under Insulation – Dr. Faisal Khan with NL R&D Corporation.

Petroleum Research (PRNL)

- Dynamic Positioning Operations in Ice Environments
- Bioindicators – Diagnostic Tools for Effects Assessment
- Effects of Seismic Activity on Shrimp Behavior – Phase II pilot survey
- Effectiveness of Virtual Environments to Improve Onboard Drills & Exercises
- Offshore Personnel Transfer Phase 2
- Enhanced Oil Recovery - Complex Reservoirs
- Performance of Personal Locator Beacons (PLBs) in Realistic Seas
- Development of research themes in relation to:
 - Greenhouse Gas emissions scoping study
- Seeding activity associated with integrity management:
 - Microbial Corrosion
 - Remotely Operated Mooring Inspection Tool
 - Liquid Repellent Surfaces for Asset Integrity
 - Integrity Assessment Thru 3D Reconstruction and Simulation
- Seeding activity associated with digitalization & integrated operations
 - Cloud Based Integration of Next-Gen Sensor Data
 - Robotic Process Automation Assessment & Proof-of-Concept
 - Maintenance Advisor Implementation Demonstration
 - Digital Oilfield Education
- Ocean Supercluster (OSC)

- The OSC interim organization was established and worked diligently with the federal government, other superclusters, and the OSC investments partners to develop core strategies. Specifically, the OSC moved towards completing a Contribution Agreement with Industry, Science and Economic Development (ISED) and three additional strategies that are required for project funding to be advanced by ISED; the Project Selection Guidance Document, IP Strategy and Data Strategy. Negotiation of the OSC Members Agreement and By-Laws were also a key priority.

C-CORE

- Enhanced satellite radar based iceberg detection and sea ice monitoring.
- *Henry Goodrich* MODU operations in sea ice.
- Development of an iceberg profiling road map using AUV technology.

VMT

- Improving the fidelity of Virtual Marine's Ice Management Simulator and using the simulator to evaluate ice management procedures.

Radiant360

- Development of mobile computing technology to develop integrated operations applications for the piping system, process safety metrics:
 - Development of piping and pressure vessel integrity management and risk model.
 - Extension of the *SeaRose FPSO* integrity system for subsea assets.
 - Development of SIL equipment applicaion.

Equinor Led R&D

- Husky and Equinor continue to cooperate on a number of R&D initiatives for offshore development.

Husky Led R&D

- Collaboration with Avara, Hatch, Halliburton and Atkins to mature the proof of concept associated with the stand-alone XMT. Work included FEA analysis of the completion string and reliability analysis of the completion system.
- Collaborative research with the Marine Institute and Notus to develop an ice net for use in high sea states.
- Collaborative research with TechnipFMC and C-CORE to develop an engineering alternative to a weak link system for flowlines.

- Collaborative research with C-CORE, Arup and others to mature the WWRP design basis.

7.2 New R&D Projects

Husky's R&D program continued to grow with initiation of a number of new R&D projects during 2018. Notable new projects include:

Petroleum Research (PRNL)

- Digitizing Extractive Industries
- R&D program activity related to enabling subsea marginal field tieback developments:
 - Flowline Protection for Extended Tiebacks
 - Technology Advancement for Subsea Excavations - Grand Banks
 - Hydrate Management for Marginal Fields
 - Evaluation of Use of Weak Links for Iceberg Mitigation
- RPM Aerial UAV Iceberg Tracking
- 2018 Call for Projects (Environment)
- MUN (Dr. Lesley James) - Digital Oilfield Education

C-CORE

Enhancements of Ice Management program including the following;

- Automation of Water Cannon Target Tracking for Ice Management
- Evaluation and Optimization of an Iceberg Drift Forecast Model for the Smart Iceberg Management System (SIMS)

Husky R&D (led or support)

- Ice Loads on Floating Structures JIP with industry operators and engineering service providers
- Laser Inspection of the SeaRose FPSO Mooring Chain Using Kraken SeaVision Technology
- Advancements in Well Completion Annular Barriers for horizontal production wells

7.3 Future Initiatives in R&D

Husky's investment in collaborative R&D in Newfoundland and Labrador continues to contribute to the growth of local R&D capacity and capability.

Husky supports initiatives which motivate innovation in safety practices, efficiency, and reliability of offshore exploration and production operations, while continuing to advance the technological feasibility of future offshore developments. A combination of direct investments in R&D, addressing strategic challenges unique to its business needs and opportunities, participation on collaborative R&D, and targeting more generic industry and regional operation challenges, helps maintain Husky's diverse R&D portfolio.

Husky remains committed to its role as a strategic industry partner to enable Newfoundland and Labrador innovators to successfully leverage additional funding from agencies such as ACOA Atlantic Innovation Fund, toward advanced technology demonstration and commercialization of projects. Husky's contribution incorporates a blend of direct financial investment and participation through mentoring, which includes access to subject matter experts and operational resources.

7.0 Education and Training

Education and training remains a key area for Husky and continues to provide an opportunity to contribute to the development of the local offshore industry.

Husky will continue to invest in education and training to assist personnel in developing key skills and knowledge for professional and personal development. Husky's regard for the health, safety and wellbeing of the people who support Husky's operations remains paramount, and will be reflected in training associated with implementation of elements of Husky's Operational Integrity Management System, including a behavioral based safety management system

Below is a description of the major initiatives in education and training undertaken in relation to the White Rose project in 2018.

8.1 Husky Energy

Husky continued its strong commitment to the Memorial University of Newfoundland and College of the North Atlantic co-operative education programs in 2018. Husky continued to be an important employer of co-operative education students working in various disciplines, hiring 120 students in 2018. Total expenditure on co-operative education for 2018 by Husky was over \$3.1 million. Husky views this program as an important tool for building local capabilities in the offshore oil and gas sector and will continue to support this program in the future.

Husky renewed its commitment to influencing education and career choices of young adults in Newfoundland and Labrador through a \$30,000 contribution to Techsploration in 2018, the 16th year that Husky has provided funding. The Techsploration program is delivered by the Women in Resource Development Corporation (WRDC) in St. John's.

The program introduces career opportunities in the trades and technologies to female Grade 9 students in an effort to interest them in the sciences before selecting courses for their secondary program. In addition to funding, Husky supports the efforts of several female employees who volunteer their time to be mentors for this program. This included a school visit (including presentation and speed networking activity), a site tour (WWRP construction site in Argentina), facility tour (Cougar Helicopters) and an afternoon at the Husky's offices where participants were provided an overview of career options in the oil and gas industry.

Husky also continued to work closely with Women in Science and Engineering (WISE) in 2018 through provision of \$25,000 for summer student positions. As part of this program, female Husky employees also hosted a Husky Day on August 15 for the SSEP students which provided an opportunity for participants to meet with other females in non-traditional jobs as well as taking a tour of OneSubsea and Cougar Helicopters.

In 2018 Husky also provided over \$11,000 in scholarships to Memorial University, College of the North Atlantic and the Coalition of Persons with Disabilities, \$1,000 to the Company of Master Mariners' Nautical Skills Competition and \$1,000 to the Marine Institute's Mate ROV Competition.

8.2 Husky Personnel Training

During 2018, Husky personnel received locally-based training from various educational facilities including a Nucleonic Equipment technicians training course at a cost of \$44,000, Standard Usability Mapping Workshop at a cost of over \$28,500, a three-day Train the Trainer course at a cost of over \$23,000, and Radiation Safety Officer training at a cost of over \$20,700.

8.3 Other Training Initiatives

- Teekay spent over \$55,000 on work term students studying Marine Navigation and Marine Engineering at the Marine Institute.
- Atlantic Towing spent over \$95,000 on work term students from the Marine Institute and College of the North Atlantic.
- Atlantic XL spent over \$18,000 on work terms students from Memorial University and the College of the North Atlantic.
- Aker Solutions spent over \$25,000 on Engineering work term students from Memorial University.

8.0 Technology Transfer and Supplier Development

Husky considers investments to develop Newfoundland and Labrador's technological, industrial and economic capacity to be strategic to the sustainable growth of Husky's Atlantic Region. Developing the technologies that can support improvements in safety, performance, and productivity for the Grand Banks environment is key to supporting future activity in the region.

Husky acknowledges that the emergence of new digital technologies, their adoption and the intelligent exploitation of data can make our industry more competitive and safer.

Ice Design R&D Program

Husky continues to be a key collaborator in PRNL's Ice Management Joint Industry Program along with Rutter, TechnipFMC, C-CORE and the Marine Institute. Projects within this program are advancing technologies and positioning Newfoundland and Labrador companies, such as Rutter and C-CORE, as world leaders in ice intelligence and management technology. These initiatives serve to advance Newfoundland and Labrador's international reputation as a "gateway to the Arctic". These initiatives also recognize the need for our technology providers to be internationally competitive.

Tools which are gaining maturity and have received Husky support include:

- Development of AUV technology for iceberg monitoring
- Automation of Water Cannon Target Tracking for Ice Management
- Evaluation and Optimization of an Iceberg Drift Forecast Model for the Smart Iceberg Management System (SIMS)
- Continuation of Dynamic Positioning in Sea Ice 5-year JIP with our operating partners.
- Continuation of development of a harsh environment ice net instrumented to enhance safe ice management capability in high sea states.
- The PRNL lead Subsea Marginal Fields Development has a number of studies involving research on icebergs loads on flowlines and subsea equipment
- Further review of the weak link design basis and development of an alternative engineered restraining solution for use in future flowlines.

Implementation of a Common Operations platform for ice management overlaying multiple datasets, drift models and met ocean data to improve operation awareness and decision making.

Engagement with Research Institutes

Husky continued to participate as an advisor on a number of steering committees to provide industry perspective and guidance in a number of areas including:

- Research Advisory Committee for Husky Energy Chair in Oil and Gas Research at Memorial University of Newfoundland.
- Membership in the Canadian Standards Association group engaged in standards review and the harmonization of ISO standards to Canadian requirements.

9.0 Community Investment

In the Atlantic Region, Husky focused its efforts on preserving relationships with key community partners and supporting initiatives that will build stronger communities by supporting diversity, inclusion, and education. Many of our contributions were payments under existing agreements that were previously announced. However, in 2018 Husky supported new commitments such as:

- \$50,000 to the St. John's Farmer's Market to provide support for youth training programs so build basic furnishings for the new market
- \$50,000 to the Salvation Army to support construction and outfitting for their Center of Hope
- \$10,000 to the Canadian Hard of Hearing association to support their Noise Awareness program
- \$10,000 to the Shorefast Foundation to support their Geology at the Edge internship program

In addition to these major gifts, Husky also supported other local community organizations including \$15,000 to the Jimmy Pratt Memorial Outreach Centre, \$5,000 to the Newfoundland Symphony Orchestra and our internal Husky Has Heart fundraising campaign which raised over \$46,800 for the Canadian Mental Health Association (NL Chapter), Kids Eat Smart NL, and Single Parent Association (SPAN).

10.0 Diversity

Husky continued to work closely with its sub-contractors to advance the various initiatives identified within the Diversity Plan. More than 90 people (employees, contractors and representatives from community partners) attended Husky's Diversity Forum in February 2018. This year's forum included a Husky Energy update, a keynote speaker (Mr. Alexander MacDonald, Newfoundland and Labrador Supreme Court Justice), and guest panelist discussed the theme of the day, What is True Inclusion in the Workplace. Roundtable discussions for this event focused on initiatives that would involve community groups collaborating with contractors, operators and/or government to address diversity issues in the workplace. A report on diversity-related activities in 2018 will be submitted under separate cover.

11.0 Photographs



Husky employees volunteer with Junior Achievement at St. Kevin's High School – January 2018



Husky donates \$15,000 to the Jimmy Pratt outreach centre breakfast program – February 2018



Husky employees raised \$25,500 for the Husky Has Heart campaign – the funds were split amongst the Canadian Mental Health Association of NL, Kids Eat Smart, and the Single Parent Association of NL– February 2018



Attendees at Husky’s annual Diversity Forum wear pink in support of Anti-Bullying Day – February 2018



Husky employees attend Oil and Gas week – March 2018



**Husky's Women's Leadership Network hosts a mentorship program
for work term students – March 2018**



**Husky sponsors the Eastern NL Science and Technology Fair
– April 2018**



**Husky representatives travel to Laval High School in Placentia, NL,
for the WRDC Techsploration program
– April 2018**



Husky was a proud event sponsor of the Newfoundland and Labrador Regional MATE 2018 Remotely Operated Vehicle (ROV) Competition– May 2018



Husky sponsors a visit to MacDonald Drive Junior High from Earth Rangers to inspire children about the importance of biodiversity and conservation – June 2018



**Husky donates \$50,000 to the community building project for the
St. John's Farmer's Market
- July 2018**



**Husky coordinates Cougar tour for ThriveNL students, ages 10-17, -
July 2018**



Husky sponsors the St. John’s Ambulance Therapy Dog program to support mental health in the workplace – August 2018



Husky contributes funds to help support the Eating Disorder Foundation of NL EFFT program – August 2018



**Husky employees collect and donate sports gear to the Single Parents Association
- October 2018**



**ThriveNL use Husky rental space for its Boat Building Project, an initiative where youth connected with the Thrive GED program construct a 17ft dory.
- November 2018**



**Husky employees take the life bus to the Canadian Blood Services clinic to donate blood.
– November 2018**



**Employees at the West White Rose Project site in Argentia collect and donate funds to the Zone 6 Region D Lion's Club.
– December 2018**