

Please review all of the following information, including the gear allocations and field team information, to ensure accuracy. This plan is an agreement between CH2M HILL Polar Services (CPS), formerly VECO Polar Resources, and your group, documenting the logistics support you will receive.

SECTION ONE: PROJECT INFORMATION

Lead Principal Investigator	Richard Hindmarsh
Institute	British Antarctic Survey, Physical Sciences Division
Project Title / Grant #	Measuring and modelling the Raymond Effect to infer low strain-rate ice rheology (NERCRadar)
NSF Program and Manager	GB\Federal\NERC, Ms. Renee Crain
CPS Project Manager	Sandra Starkweather

Logistics Summary

With this NERC-funded project, a research team will conduct radar studies during two field seasons at the site of a former deep core-drilling project called GRIP, in Greenland; and at Dome C in Antarctica. This database carries information on the arctic work only.

During two consecutive field seasons starting in 2008, a field team of two will travel to Summit Station, Greenland, via the NSF logistics chain from Kangerlussuaq. They will base at the station for about two weeks each season and travel via snowmachine to the study site, GRIP, which is about 30 km from Summit. There, they will use a stationary radar to survey a transect about 10 km long. They will take data about every 200m. The work should be finished in about five days (additional time is built in to the schedule for weather delays).

In 2008, in addition to the above radar survey, the team will make a topographic survey of the radar survey area to cover the footprint of a Danish survey over-flight. This will involve traversing parallel tracks into the radar survey area and a small additional survey grid. The four elements of the survey in order of priority are:

- (1) Do the five lines (five days). The most northerly line (5H north of Divide) will be done first.
- (2) Repeat the first line (the most northerly line) as late as possible.
- (3) Do CMP work.
- (4) Do polarimetric measurements.

A team of three will travel to Summit from Europe early in May. The PI will work on the ice cap for about one week; his two team members will remain after his departure for the rest of the month to complete the field work. The researchers will both tent camp and make day trips to their field site. The field plan amounts to about 700 km of snowmachine travel.

For each year of the grant, CPS will provide transport to and from Summit for personnel and cargo, Kangerlussuaq and Summit user days, use of on-site Summit facilities and equipment, including snowmachines a sled, fuel, and a generator. CPS will provide this support on a cost-reimbursable basis. All other support will be arranged by the PI and paid from the grant.

For the complete CPS online project record for this grant, including science objectives, go to: http://www.vecopolar.com/arlss_reports/arlss_projectsdetail.asp?cbPropNum=NERCRadar

For up-to-date information on the project's schedule, please view the online [Greenland calendar](http://www.vecopolar.com/) (<http://www.vecopolar.com/> > Greenland > Calendars/Schedules).

Billable Project

SECTION TWO: SEASON FIELD PLANS

Outstanding Actions and Notes

Issue	Responsibility	Date Completed / Note
Review support plan for accuracy and distribute to all field team members	PI	March 2008
Obtain all necessary permits for fieldwork	PI	Included with station permit
Visit all hyperlinks and review all documents referred to in the support plan	Field Team Members	Outstanding, Gillet needs to do
Contact the GEOSummit Science Coordination Office (SCO) mailto:sco@summitcamp.org regarding your project's plans for the season	PI	January 2008
Medical Clearance completed 6-8 weeks before desired deployment date	Day Gillet Hindmarsh	All PQ's transferred from BAS to NSF
Provide cost estimate for billable support Develop a purchase order with CPS prior to field work Provide bill for actual support Note: Actual costs likely will differ from those reflected in the cost estimate due to exchange rates and other influences.	CPS PI CPS	Rev'd 4.16.08 (See appendix) PI will resubmit PO to Jan with revised estimate
Passports are required for ANG and international travel. It's a good idea to bring two IDs and to pack a copy of your passport in case the original is lost.	Field Team Members	
Complete Critical Success Factors	PI	March 2008
Please alert consignees in Kanger (Ed/Mark) when shipment has been sent, pass along copy of airbill.	Crispin Day	

Allocations and Services

Allocations from Inventory

Quant/Unit	Item
1/ea	Arctic Oven Sleep tent (on-station sleep tents)
2/ea	Sleep pads (in on-station sleep tents)
1/ea	Sleep cots (for off-station overnights)
2	2-stroke Skidoos for work off station (long days and overnight work are a project requirement)
1	Skidoo spare & basic tool kit
1	Siglin sled
1	Nansen sled, standard width, no keel
2	Skidoo helmets, (non-critical – available if new helmets arrive to Summit in time)
500 L	Pre-mix two stroke skidoo fuel (reimbursable support)
8	25 L Fuel Gerry cans empty for skidoo travel (fewer than 8 acceptable if not available)
60 L	Mogas for generator use
5 Gal	Cans of Coleman or equivalent white gas (cook stove)

Billable Project

1	100 amp-hour lead acid car battery
1	Fuel funnel
1	Pyramid Scott Tent, with drying lines
Assorted	Bamboo tent poles for Scott tent
1	2 person Kitchen Box
1-2	Survival Bags (to cover 2-3 persons)
1	VHF handheld radios.
1	Iridium phone.
2	Heavy digging shovels, steel spade
2	Large tarps
1	Honda EU 1000 generator for science equipment, oil & spares. Group may need 2 KW if capacity is insufficient. Summit will keep one on hand just in case.

For more information on satellite phones, radios, manuals and other field communications support, please visit the CPS communications website at <http://vpr.sri.com>.

CPS will provide the following support on a direct-billable basis. Please see Appendix for an estimated cost.

Other Services

Project Allocations	Comments
Freight Kanger><Summit	See cargo list below
Science Support	Miscellaneous services at Summit
User days Summit and KISS	~15 Kangerlussuaq, ~22 Summit Note: This group will work off station for much of their trip. They will provide their own camp meals when off station and unable to meet scheduled meal times.
Air Travel	R/T flights for 3 personnel Kanger><Summit

Location Information

Please visit <http://www.vecopolar.com> and navigate to the Greenland menu for en route and location-specific Greenland information. Prior to deployment, your entire field team should be familiar with the content of the *Greenland Guide* and the *Summit Users' Guide*. Both are available electronically via our Web site's Greenland menu.

Cargo and Customs

All cargo required for your project should arrive in Scotia, NY, **no later than 2 weeks prior** to the desired northbound Air National Guard (ANG) flight, must be entered into our online Cargo Tracking System, and must be properly registered with Customs.

For the most current ANG flight schedule go to <http://www.vecopolar.com> and navigate to Greenland > Calendars/Schedules.

If you are a new user requiring access to the Cargo Tracking System, contact Jason Buenning (jason@polarfield.com).

Customs instructions are available on our website at <http://www.vecopolar.com> (go to Greenland > Customs)

Billable Project

The following is our current understanding of your overall cargo requirements:

Cargo List

Items	Weight/Cube
Lot	700 lbs, 3.5 m3.

Support Schedule

Approx Date	Location	Activity
05/04/2008	Kanger	Field team arrives in Greenland
05/08/2008 – 05/12/2008	Summit Station	Team at Summit, set up for traverse, testing equipment, not overnighing off station.
05/12/2008	Summit / GRIP	Begin Survey and overnights off-station. Work amounts to about 700 km travel
05/13/2008	Summit	PI departs Summit and field team continues research
05/14/2008	Kanger > CPH	PI departs Greenland via Comm Air
05/25/2008- 05/28/2008	Summit Station	Gillet and Day pack, prepare for departure from Summit, etc.
05/29/2008	Summit> Kanger	Gillet and Day depart Summit
06/02/2008	Kanger > CPH	Gillet and Day depart Greenland via Comm Air

For the most up-to-date information on the project's schedule, please view the online [Greenland calendar](http://www.vecopolar.com/) (<http://www.vecopolar.com/> > Greenland > Calendars/Schedules).

Field Team Information

Name	Location	Date In	Date Out	Email
Hindmarsh, Richard	Kangerlussuaq (via CPH)	05/04/2008	05/14/2008	rcah@bas.ac.uk
Hindmarsh, Richard	Summit	05/08/2008	05/13/2008	
Gillet, Fabien	Kangerlussuaq (via CPH)	05/04/2008	06/02/2008	FALL@bas.ac.uk
Gillet, Fabien	Summit	05/08/2008	05/29/2008	
Day, Crispin	Kangerlussuaq (via CPH)	05/04/2008	06/02/2008	cmjd@bas.ac.uk
Day, Crispin	Summit	05/08/2008	05/29/2008	

Project Contact Information

Research Team

Role	Name	Email	Phone / Fax
Principal Investigator	Richard Hindmarsh	rcah@bas.ac.uk	122 322-1495 / 122 322-1226

SECTION THREE: CPS CONTACT INFORMATION

CPS Team Members

Contact for	Name	Email	Primary Phone(s)
Summit operations	Sandy Starkweather	sandy@polarfield.com	Denver: 303.518.8714
Greenland operations (project support)	Jason Buenning	jason@polarfield.com	Denver: 303.638.6669 Greenland: 011.299.524218

Billable Project

Greenland operations (On-island support)	Mark Begnaud	mark@polarfield.com	Denver: 720.320.6160 Greenland: 011.299.524281
Greenland operations (project support)	Robin Abbott	robin@polarfield.com	Denver: 303.748.8507
Sat phones & comms	Roy Stehle	roy.stehle@sri.com	Menlo Park: 650.859.2552
Denver operations	Jill Ferris	jill@polarfield.com	Denver: 720.320.6155
Scotia operations & customs	Earl Vaughn	earl.vaughn@gmail.com vprscotia@hughes.net	Scotia: 518.331.3103
Purchase orders	Jan Zanetell	Janet.Zanetell@ch2m.com	720.286.0415

CPS Offices

Denver	Kangerlussuaq	Scotia
CH2M HILL Polar Services Western Office 8110 Shaffer Parkway Suite 150 Littleton, CO 80127 Tel: 303.984.1450/1439 Fax: 303.984.1445	CH2M HILL Polar Services Attn: Name of Employee/Researcher Postboks 1015 DK-3910 Kangerlussuaq, Greenland Tel: 011.299.841598 Fax: 011.299.841599	Earl Vaughn C/O 109 th Aerial Port Bldg. 20 Stratton Air Base Scotia, NY 12302-9752 Tel: 518.331.3103 Fax: 518.334.2537

Summit Station

Summer
CH2M HILL Polar Services Attn: Name of Employee/Researcher - Summit Station C/O Earl Vaughn 109 th Aerial Port Bldg. 20 Stratton Air Base Scotia, NY 12302-9752 Tel: 518.331.3103 Fax: 518.334.2537

Other

Organization	Internet	Phone
Summit Science Coordination Office	http://www.geosummit.org sco@summitcamp.org	John Burkhart 209.658.7142

SECTION FOUR: SAFETY, ENVIRONMENT, HEALTH and PERMITS

Medical Clearance

The field team has participated in and cleared the BAS medical qualification process, which NSF recognizes as appropriate clearance for work in Greenland as well.

Billable Project

Critical Success Factors

Please list the factors that are most important for the success of your science. We track these factors in order to measure the success of CPS' support. Examples might be the availability of the helicopter or camp gear.

Factors
2 stroke skidoos serviceable and available at Summit for the period through 7th to 29 th May
Transport of science and field equipment by C-130 to Summit for start of project on 7 th May
All requested field camp issue gear and equipment in working order for arrival of science team

Government and Performance Reporting Act of 1993 (GPRA)

NSF/OPP requires your help in complying with the Government Performance and Reporting Act of 1993 (GPRA). One measure of CPS' performance is a "facility-performance metric" which counts the number of productive days your project has in the field while relying on CPS facilities or support. Please keep track of any "lost days" and report these to us at the end of the season.