
Falkland Islands Government

Department of Mineral Resources



Petroleum Operations Notice 1

Record and Sample requirements for surveys and wells

Revised April 2016

Contents

1. Introduction

- 1.1. Statutory provisions pertaining to record and sample requirements
- 1.2. Other related Continental Shelf Operations Notices

2. All remote sensing surveys

- 2.1. Information to be supplied before remote sensing surveying commences
- 2.2. Multi-channel seismic data to be supplied
- 2.3. Magnetic and Gravity data to be supplied
- 2.4. Other data such as obtained from geochemical sniffers and airborne laser and passive fluoresensing surveys and Controlled Source Electromagnetic surveys to be supplied
- 2.5. Shallow seismic and other site survey data to be supplied

3. Seabed, grab, vibrocore and shallow drilling samples and records

- 3.1. Data to be supplied before permission is given to collect samples and records
- 3.2. Samples to be supplied
- 3.3. Records to be supplied

4. Well data and records

- 4.1. Data to be supplied before permission is given to drill a well
- 4.2. Data to be supplied during drilling of a well
- 4.3. Data to be supplied on completion of a well
 - 4.3.1. Core and sample materials to be supplied
 - 4.3.2. Well completion report to be supplied

5. Other records to be supplied

6. Destination of records and samples

- 6.1. Destination of all notifications before conducting all remote sensing surveys
- 6.2. Destination of all requests for permission to acquire samples or drill wells
- 6.2. Destination of all data and records
- 6.2. Destination of all samples

1. Introduction

1.1. Statutory provisions pertaining to record and sample requirements

Attention is drawn to the following provisions concerning submission of records and samples from surveys or drilled wells:

The Petroleum Survey Licences (Model Clauses) Regulations 1992;

The Offshore Petroleum (Licensing) Regulations 1995;

The Offshore Petroleum (Licensing) Regulations 2000.

The Governor requires the following records under the above Regulations to be supplied and delivered as he directs.

In addition, the Governor may at any time, under such conditions as may be considered necessary to protect the commercial confidentiality of the data, require the Licensee to forward additional duplicates of any of the specified data to -

The Natural Environment Research Council

This notice lists only the requirements for scientific and technical data and samples which comprise the records obtained from surveys, by drilling wells and from consequent investigations. Sections 2 through 5 of this notice set out guidelines which indicate the type of records and samples which are required and the format in which they should be presented. Section 6 indicates where the records and samples should be sent.

1.2. Other related Continental Shelf Operations Notices

Other information required to control operations in offshore areas or wells before, during and at the end of drilling are the subject of separate Continental Shelf Operations Notices.

2. All remote sensing surveys

2.1. Records to be supplied before remote sensing surveying commences

Licensees are required to advise:

the Director of Mineral Resources and

the British Geological Survey

in writing of any proposed surveys **28 days before the survey** is due to commence.

2.2. Multi-channel Seismic data to be supplied

The following data and records are to be supplied **within 1 month** of processing and ideally within three months of the end of acquisition. A complete set of data comprising:

final processed filtered and scaled migration data, as well as all other derived or inversion datasets and velocity data/cubes, on a hard disk drive, in Seg Y format;

a navigation tape or disc in UKOOA format;

digital copy of all the data in its unprocessed form may subsequently be requested by the Government or the British Geological Survey, but should not be submitted unless requested;

digital copies of all maps, reports or interpretations made from the data;

all of the above requirements apply equally to reprocessed data and to subsequent derived inversions of the data.

Where data are in digital form, industry standard specifications should be employed.

2.3. Magnetic and Gravity data to be supplied

The following data and records are to be supplied **within 1 month** of completion of the final reduction and ideally within three months of the end of acquisition. A complete set of data comprising, where made: paper copies of Eotvos correction, Free air gravity, Bouger gravity, Bathymetry, Magnetic anomaly (IGRF subtracted) and Magnetic reference data profiles, and maps on paper in monochrome and on paper with colour infill and colour shaded relief of Free air gravity, Bouger gravity, Bathymetry, Magnetic anomaly (IGRF subtracted) at a scale of 1:250,000;

a processing report and archive data;

a hard disk drive including but not necessarily limited to description of the survey method, processing parameters, map projection and spheroid of data, IGRF and/or IGF, base magnetometer details, speed and heading, instrument drift, observation points and fixes, latitudes and longitudes, X and Y metres, date and time, time zone, elevation or flight height, raw magnetic reading, base magnetometer filtered magnetic, adjusted/smoothed magnetic anomaly, absolute base gravity ties, density for Bouger and terrain corrections, raw gravity, Bouger gravity, adjusted/smoothed Free Air, Bouger gravity and Eotvos correction;

An Arc GIS layer data for Free air gravity, Bouger gravity, Bathymetry, Magnetic anomaly (IGRF subtracted);

a navigation tape or disc in UKOOA format;

track location or flight line maps

digital copies of all maps, sections, profiles reports or interpretations made from the data.

2.4. Other data such as obtained from geochemical sniffers and airborne laser and passive fluoresensing and Controlled Source Electromagnetic surveys surveys to be supplied

The following data and records are to be supplied **within 1 month** of processing and within three months of the end of acquisition. A complete set of data, in digital form on hard disk drive, comprising:

all raw data, maps and projections;

all processed data in digital form;

navigation maps of all tracks and flight lines;

all environmental data;

reports of all processing techniques and interpretations;

digital copies of all maps, reports or interpretations made from data.

2.5. Shallow seismic and other site survey data to be supplied

The following data and records are to be supplied **within 1 month** of processing and within three months of the end of acquisition. A complete set of data comprising:

if recorded digitally, all of the acquired data, such as airgun, sparker, boomer, pinger, sidescan, towed sonar, swath and bathymetry records to be supplied also on a hard disk drive in a format suitable for loading on to a geophysical work-station;

a navigation tape or disk in UKOOA format;

digital copies of all maps, reports or interpretations made from the data.

3. Seabed, grab, vibracore and shallow drilling samples, records and measurements

3.1. Data to be supplied before the collection of samples and records or the making of in situ measurements of physical or chemical properties

Licensees are required to advise:

the Director of Mineral Resources and

the British Geological Survey,

in writing of any proposed surveys **28 days before the survey** is due to commence.

3.2. Samples to be supplied

The following samples are to be supplied **within 3 months** of the end of acquisition. A complete set of data comprising:

one half by wet weight of all seabed and grab samples preserved and packaged in sealed plastic bags in their wet state, and indelibly labelled with well number and depth intervals;

a continuous vertical slice of each vibracore and shallow drilling core that has not been destructively tested, and measuring not less than one half of the diameter of the core, packaged

and sealed in plastic so as to maintain its integrity, and indelibly labelled with well number and depth intervals (excepting intervals where whole core samples are required by the licensee for geotechnical testing);

the residue material from cores following destructive testing, packaged in sealed plastic bags, and indelibly labelled with well number and depth intervals.

3.3. Records to be supplied

The following records are to be supplied **within 3 months** of the end of acquisition. A complete set of data comprising:

digital copies of all logging and sample data;

a digital list of sample site positions;

digital copies of all location maps, interpretations or interpretive maps and reports, including biostratigraphic, geochemical, engineering, fluid, heat-flow reports and other like reports made from the data.

4. **Well data and records**

4.1. Data to be supplied before permission is given to drill a well

The information required in this subsection pertains only to the geophysical data required to define the objectives of a well, and is listed in this sub-section for completeness. Other information (such as safety surveys, seabed obstruction surveys, shallow gas/hazard surveys, etc) must be supplied under the terms of a separate Continental Shelf Operations Notice.

Licensees are required to advise:

the Director of Mineral Resources and

the British Geological Survey;

in writing of any proposed drilling **at least 28 days before** the drilling is due to commence, and such drilling should not be commenced without the approval of the Governor.

An application to drill must be accompanied by the following geophysical data:

at least two seismic sections at 10cm/second scale, preferably orthogonal to each other, through the proposed well location, marked and interpreted to illustrate the main reflectors and target intervals;

two-way-time and if available depth converted structure contour maps of the primary and any secondary target horizons, showing the location of the seismic lines (referred to above) and the proposed well position and planned bottom hole position, at a scale of 1:50,000;

4.2 Data to be supplied during drilling of a well

FIG and BGS should both be granted access to a real-time well information data viewer service such as Weatherford's Well Wizard, Schlumberger's geoNext11, Baker Hughes' WellLink or Halliburton's OpenWire, in order to benefit from the real-time delivery of drilling, hydrocarbons and lithological data during drilling.

Additionally, digital daily reports should be made available to both FIG and BGS, through access to a file sharing system similar to Weatherford's WellHub, Schlumberger's InterACT, Halliburton's Insite, or any other secure upload/download file sharing site – email is not acceptable due to potentially large file transfer sizes - with such reports to include, but not be limited to, the following:

- a) Daily Drilling Reports;
- b) Daily Geological Reports;
- c) Daily Weather Reports
- d) LWD real time digital data and log plots
- e) LWD recorded digital data and well plots
- f) LWD reports
- g) LWD time based memory digital data and log plots
- h) Deviation surveys, daily and final reports
- i) Mud Logging daily reports, digital data, engineering plot files, finals, gas ratio plots, mud log plots, pressure plots
- j) Lithology logs
- k) Wireline log runs in LAS, DLIS, and log plot files as pdf or industry standard viewable file formats such as PDS, and reports
- l) MDT or similar logs, reports and plots and fluid analyses in appropriate formats
- m) Biostrat daily reports if well-based analyses conducted
- n) Photographs of samples, cuttings or cores
- o) CPI interpreted logs of all logging runs, together with tables of parameters and cut-offs used

4.3. Data to be supplied on completion of a well

The following records are to be supplied immediately on completion of any well including abandonment or suspension:

if not supplied during the drilling of a well for whatever reason, final digital copies of all logging surveys, petrophysical logs and pressure or sampling surveys and associated reports in industry standard formats and clearly labelled;

final digital copies of finalised CPI logs, with tables of parameters and cut-offs used;

details of any discoveries made;

details of reservoir unit tops (MD and TVDSS) and thickness (apparent and TVTH);

fluid contacts or limits and lowest known occurrences (MD and TVDSS), including AFA Sample Station logs and associated reports;

net pay thickness (apparent and TVTH) for individual reservoir units and for total reservoir;

reservoir units average porosities and water saturations.

Immediately on becoming available, the following should also be supplied:

results of any significant chemical and physical analyses of petroleum, including PVT analysis, water or minerals found in the well or injected into the formation;

results of any significant analyses conducted on rock samples or fluids from the well;

results of any significant tests on production, injection and observation wells including downhole formation pressure and temperature surveys carried out, and also including time, pressure and flow listings of drawdown and buildup surveys subsequent to well completion report;

results of any biostratigraphic, geochemical, petrological, petrophysical or other geological analyses conducted for the well;

details of any significant changes to the well.

Within 3 months of the completion of any well including abandonment or suspension after reaching the first potential producing horizon, the following data and records should be supplied:

a composite geological/interpretation log at 1:500 scale and 1:200 scale with natural gamma log, resistivity logs, graphic lithology, biostratigraphy, chronostratigraphy and lithostratigraphy determinations, locations of cores and percentage recovery, location of sidewall cores, location of testing intervals and results, location of casing/liner seats, descriptions of shows in natural and fluorescent light, neutron and density logs, caliper log and sonic log, in industry standard digital form and for which a public viewer is available (such as CGM, TIFF, PDS, PDF, but note that PDF files must be presented as a single file and as a continuous feed without any page breaks);

core description logs made at the well site or subsequently;

core and cuttings samples and derived materials and other samples as detailed in section 4.3.1 below;

a well completion report, the contents and format of which are detailed at section 4.3.2 below;

4.3.1. Core and sample materials to be supplied

Within 3 months of the completion of any well including abandonment or suspension after reaching the first potential producing horizon, the following materials, data and records should be supplied:

cuttings samples - representative, washed and dried samples of at least 100g weight, collected at selected intervals (preferably every 10 meters minimum, and closer in reservoir and/or pay zones) and stored in waxed paper re-sealable envelopes, and indelibly labelled with well number and sample depth;

cuttings samples - representative, unwashed samples of at least 250g weight, collected at selected intervals (preferably every 10 metres minimum, and closer in reservoir and/or pay zones), and

stored in plastic lined cloth bags with twist-stem tops, and indelibly labelled with well number and sample depth;

conventional cores - a longitudinal slab of at least half the core diameter for the full length of the core. Before slabbing, the core should be washed to remove mud and then indelibly marked in such a way that identifies its depth every 1 metre and identifies the orientation the core had prior to being removed from the formation, and also marked with indelible 'way-up' arrows; all markings should be made on the outside, curved surface of the core, and all slabbed surfaces should be unmarked. After slabbing the core should be placed in a container corresponding to the specifications at times laid down by the Manager, Core Store, British Geological Survey, and such that only one slab of core is held per container; the container should be accurately labelled inside to indicate depths and way-up, and externally on an end face to indicate the well number, depth interval of the contained core, and the sequential number of the container in the core-run;

core analysis materials - where preserved samples of a section of core of complete core diameter is required to be retained by the operator for core analysis, the positions and extent of any such samples should be clearly indicated in the core containers supplied to the BGS. Furthermore, all results pertaining to such analysis must be deposited with the BGS;

sidewall cores - all materials remaining after petrographic, reservoir, paleontological, palynological, geochemical or other analyses have been conducted should be submitted to BGS in waxed paper re-sealable envelopes, and indelibly labelled with well number and sample depth. All investigative results and data pertaining to such analyses must also be deposited with the BGS;

well fluid samples - all formation fluids produced on test should be shipped to BGS in inert (not plastic) containers, suitably marked, and of at least four litres capacity. Samples of gas produced on test must be collected and analyzed, but the analytical results only should be submitted to BGS.

Within 6 months of the finish date of any well the following data should be supplied:

all petrographic slides, palynological or paleontological preparations or slides produced from any sidewall core or conventional core.

4.3.2. Well completion report to be supplied

Within 3 months of the completion of any well including abandonment or suspension after reaching the first potential producing horizon, a well completion report should be supplied in digital format only.

The well completion report should contain the following:

- 1) summary outlining the location, nature, purpose and targets of the well, name of the operator, and results including depths of any reservoir intervals tested and flows therefrom.
- 2) General data, including:
 - locality map (single A4 sheet) at 1:100,000 scale of the block, showing the location of the well;
 - FIG well registration number;

well slot number if drilled from a platform;

status of well - ie abandoned, suspended, production, injection;

well chronicle - eg spud and completion dates, rig off location date;

height and nature of drilling reference point - eg KB or RF;

sea bed location in lat and long, with position of bottom of hole;

total depth - measured and TVD;

licence number and round award made;

operator and drilling contractor's full names and addresses;

name, type, registration and year built of drilling unit;

3) Geological data, including:

geological table (single A4 sheet) with formation tops and thicknesses;

summary of confirmation or deviation from prognosed targets;

listing of all log or direct hydrocarbon indications;

record of all cores and sidewalls, with recovery factors;

record of all logs run;

results of all repeat formation tests performed;

results of all drill stem tests and/or production tests, including details of intervals, chokes, rates and/or volumes of fluids obtained, and their gravities, pressure and temperature measured with computed extrapolation to reservoir pressure and reference depth, and all stimulation methods used;

results of chemical and physical analyses of fluids;

results of velocity surveys and vertical seismic profiling;

a geological composite log;

all core descriptions;

all cuttings descriptions;

results of paleontological and palynological analyses, including lists of all species identified, and biostratigraphic zonations derived from analyses.

-
- 4) Engineering data, including;
- drilling history of the well, including mud record and chronological report;
 - details of casings and seat depths, cement volumes, locations of cement tops outside casings;
 - the kick-off point of a sidetracked or deviated hole, with deviation surveys and correction tables for position and elevation;
 - reasons for sidetracked hole;
 - if well is abandoned or suspended, details of packers, subsurface chokes, nipples and safety valves, tubing size grade weight and pipe thread, and well head christmas tree; in the case of subsea completions details of flowline connection are required;
 - a completion diagram showing components of the completion, casing strings, cement tops, perforations and obstructions left in the hole;
 - drilling unit performance including graphical summary of prevailing weather and sea conditions, wave periods, and summary of vessel performance in response to these conditions;
 - summary of difficulties, relays or problems not directly associated with operations, such as delays in drilling due to incompetent foundations, weather, etc.
 - table of hourly activity record.
- 5) Appendices detailing all operator's and contractors reports and analyses on:
- oil, gas and water analyses;
 - all reservoir engineering data on cores and cuttings, porosity, permeability, fluid saturation, density measurements, etc;
 - details of formation and production tests;
 - petrological reports;
 - paleontological and palynological reports;
 - geochemical reports;
 - age determinations (K/Ar, etc);
 - processed combination of well logs;
 - deviation and drift records;

gas detectors log and mud logging records;

completion data such as tubing and stimulation records;

final survey plan.

Where any reports and analyses are not completed by submission of the well completion report they should be delivered to BGS separately **within 1 month** of becoming available.

5. Other records to be supplied

Within 1 month of becoming available the following data and records are required to be supplied:

In digital form, any geological, geophysical, geochemical, paleontological, palynological or engineering report, maps or interpretations or data pertaining to the licence area produced by the licensee or its partners;

In digital form, any geological geophysical, geochemical, paleontological, palynological or engineering report, maps or interpretations or data pertaining to the licence area produced by any contractor employed or hired by the licensee or its partners, or by any other individual or company with access to the data through sale, licensing or other means.

The Governor reserves the right to require the licensee to ensure the prompt delivery to BGS of any other data that may be required periodically as the need arises.

6. Destination of records and samples

This section lists the addresses of the recipients for all the data, records, information and samples.

6.1. Destination of all notifications before conducting all remote sensing surveys and sampling operations

Notifications should be sent to:

Director of Mineral Resources
Department of Mineral Resources
Ross Road
Stanley, Falkland Islands

Fax + 500 27321
E-mail reporting@mineralresources.gov.fk

and to:

British Geological Survey,
Attn. The Falklands Project Manager,
The Lyell Centre, Research Avenue South,
Edinburgh, Scotland EH14 4AP;

E-mail davmcc@bgs.ac.uk

6.2. Destination of all requests for permission to drill wells

Requests for permissions should be sent to:

Director of Mineral Resources
Department of Mineral Resources
Ross Road
Stanley, Falkland Islands

Fax +500 27321
E-mail reporting@mineralresources.gov.fk

6.3. Destination of all data and records

All data records should be sent to:

British Geological Survey,
Attn. The Falklands Project Manager,
The Lyell Centre, Research Avenue South,
Edinburgh, Scotland EH14 4AP;

E-mail davmcc@bgs.ac.uk

6.4. Destination of all samples

All samples should be sent to:

British Geological Survey
Attn: Scott Renshaw
Core Store
Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
E-mail sren@bgs.ac.uk