**MEMORANDUM OF UNDERSTANDING**

between

The German Research Centre for Geosciences (GFZ)

on behalf of the

**International Continental Scientific Drilling Program (ICDP)**

and

The Principal Investigators of the

**XYZ Scientific Drilling Project**

on a

**JOINT RESEARCH VENTURE**





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**PREAMBLE**

Scientific drilling has the capability to make a quantum leap in the scientific understanding of earthquakes, volcanic eruptions, the wise use of resources, climate and environmental changes, the biosphere-lithosphere interaction and the evolution and extinction of species. The International Continental Scientific Drilling Program (ICDP) was established to provide Earth scientists the ability to address this broad spectrum of challenges society will face in the 21st century.

The German Research Centre for Geosciences - GFZ has established Memorandums of Understanding with the U.S. National Science Foundation, the German Research Foundation, the Japan Agency for Marine Sciences and others that define the purpose, organization, and operation of the ICDP. Under said Memorandum of Understanding, the GFZ is the executive agency that provides the administrative leadership and direction of the ICDP.

This document creates an Agreement between the ICDP and PIs and/or the PIs Organization. As parties to this Agreement, the GFZ on behalf of the ICDP and the PIs have agreed to undertake a JOINT RESEARCH VENTURE (JRV) as follows:

**ARTICLE 1 - Project Description**

The scientific goals and methods of the XYZ Scientific Drilling Project are described in detail in the Full Proposal to ICDP by the PIs of this project *(*Proposal No/Year), see Attachment 1.

# ARTICLE 2 - Financial Support and Coordination

The financing of the XYZ drilling operations and logistics will be based on resources provided in a timely fashion by a number of different parties. The major contributions will come from ICDP and the U.S. National Science Foundation.

Costs and billing for the drilling portion of the project will be coordinated by XYZ and the ICDP, with XYZ administering XYZ grant funds to cover expenses associated with drilling, site preparation, and logistics, as described in the XYZ-approved proposal budget and budget justification. The ICDP will be responsible for the balance of costs associated with site preparation and drilling with invoices paid from an account administered by the ICDP (Name: Deutsche Bank Potsdam, Address: Charlottenstr. 40, D-14467 Potsdam, Account No.: 3181344, Account Holder.: German Research Centre for Geosciences - GFZ (ICDP), Address of Holder: Telegrafenberg, D-14473 Potsdam, (IBAN: DE76120700000318134400, Swift Code: DEUTDEBB 160) or by direct billing.

Dr. Uli Harms (ICDP) in consultation with Dr. XYZ and XYZ will provide oversight and approval of all major invoices paid from the ICDP account. The approval will be timely and will not be unreasonably withheld. ICDP will release payments for invoices within 12 days after billing and approval (i.e. the PI’s have 5 days to review the invoices and ICDP has 7 days to release payment). Detailed reports and settlements of accounts are due as defined in Attachment 4.

Of the ICDP contribution, ICDP will retain a minimum of 10% of approved funding if the reports as described in Attachment 4 are not delivered in a timely manner. All payments by ICDP to projects are depending on the timely membership contributions of ICDP member countries. Therefore, all funding duties by ICDP are subject to availability of funds. ICDP will notify all parties through the PIs immediately if funding shortfalls arise.

**ARTICLE 3B - Responsibilities of Driller (if driller to be included in JRV)**

To attain the drilling objectives described in the ICDP Full Proposal, XYZ will be the Drilling Contractor for this project. Drilling operations will take place 24 hours per day, seven days per week, using two shifts working 12 hours each. XYZ’s responsibilities include the following.

1. The overall budget and cost plans are outlined in Attachments 2 and 3. The German Research Foundation is responsible to ICDP and the PIs for controlling costs within this budget. Changes in this budget will require approval of all parties of the JRV.
2. Handling of travel funds provided by ICDP for political and administrative visits to the drillsite before mobilization.
3. Shipment, import, and delivery of all necessary drilling equipment and supplies to the drilling site, offloading and storage of these materials at the site.
4. Planning and construction of a barge/platform, drill rig, and associated tools and equipment capable to core successfully in up to 12 m water depth, to a formation depth of 200m, and to hold position during drilling. It is here noted that the drilling barge is not XYZ signed for operations in all weather conditions. In cases where weather conditions are sufficiently severe to jeopardize either safety or equipment, XYZ’s drilling supervisor is authorized to suspend operations.
5. Identifying and contracting a suitable crane to offload equipment from trucks, assemble and load the drilling platform, and at the end of the project to unload, disassemble, and retrieve the platform and to load trucks for return shipment.
6. Proof that all personnel working on the barge have workers compensation or other insurance that will cover any costs of injury while working on the barge. XYZ to provide Certificates of Insurance to XYZ before any work may begin on site.
7. Management and execution of all drilling operations necessary to successfully carry out the goals of the project as outlined in the ICDP proposal, including supervision and payment of subcontractors, through an experienced onsite drilling manager representing XYZ and a full crew to ensure 24/7 operations. The PIs are authorized to provide direction to the drilling operator on behalf of the scientific team with respect to site selection, and coring depths. Furthermore, the PIs will provide science teams to aid in sample processing at the drill site and the camp. The XYZ onsite drilling manager is authorized to provide direction to all persons at the drill site with respect to technical drilling decisions, safety issues (e.g., storms lightening, and rig stability), environmental issues (e.g., gas, lake water protection), and crew shifts. This manager is also to be held accountable for the condition and maintenance of the technical drilling tools and the choice of tools required to achieve the drilling goals of the PIs.
8. Project Management and budget control including weekly status report (if not included in daily reports) during mobilization, operations and demobilization to the PIs and ICDP concerning the progress or potential problems.
9. Daily drilling (or shift) reports during mobilization, demobilization and drilling operations to PIs and ICDP who will review and provide written approval tothe drilling contractor. This report will list all drilling-related activities and purchases for consumables and services. Upon this approval, the contractor will submit weekly invoices to ICDP to initiate the bank transfer to contractor´s account after PIs approval.
10. Adherence of the anticipated timetable that has been based upon best estimates in the budget (see Attachments 2 and 3). Changes to the timetable will be decided by XYZ and the PIs. At least every 14 days, there will be a management phone conference call involving XYZ and ICDP management as well as PIs and XYZ field personnel.
11. All drilling tools and a reasonable amount of spare parts needed for a successful drilling operation are listed in Attachment 5 as provided by Contractor. If tools or spare parts are missing on site, but listed in the attachment, the costs for drilling delays and express shipping of equipment will be covered by Contractor.
12. Timely supply of all necessary documents to the PIs for research permits applications including CVs, passport information, health documents, and other documents as required.
13. Demobilization, loading/packing and return shipment of all equipment to origin.

Project PIs will be responsible for the cost of repair or replacement of all equipment damaged or lost below the water line unless such loss or damage occurs due to the gross negligence. The cost of repair or replacement is limited to funds available from ICDP for this project.

If it is necessary to shut down operations for repairs, excluding routine rig servicing, XYZ shall be allowed compensation for each period of shutdown time up to a maximum of 12 hours for any one repair job and a total of 24 hours for each thirty 30 day period. Thereafter, XYZ shall not be compensated. Alignment of the rig, waiting on specially ordered scientific experiments or downhole logging, dressing of pumps, shall not be included in computing the number of hours of shutdown time.

**ARTICLE 4 - Responsibilities of ICDP Operational Support Group**

The ICDP Operational Support Group (OSG) was established to provide services and infrastructure to all ICDP projects. As part of the XYZ project, the OSG will provide service and consultation free of charge for personnel costs (OSG personnel) and existing tools and facilities. Nevertheless, travel costs for staff, basic maintenance charges or transportation costs for the downhole measurements, and programming service for data management must be born out of this project.

In addition, the OSG duties for this project include

1) Data and Information Management:

OSG will provide an integrated ICDP Information Infrastructure, which consists of the *On-site Drilling Information System DISGFZ*.

Prior to drilling operations OSG and GFZ Data Center personnel will:

* configure an individual DIS for this project in co-operation with the projects data manager (designated in time by PIs);
* perform a test installation of the individual DIS and provide a training for the projects data manager at GFZ;
* support, usually via phone or email, the data manager of the project on installation and administration of the DIS at the site of this project.
* be available for consultation in cases of emergency

During the project OSG and GFZ Data Center personnel will support the project’s data manager on administration of the DIS.

2) Drilling and Downhole Logging consultation:

* Advice and support through OSG for all logging operational issues.

**ARTICLE 5 - Responsibilities of Principal Investigators**

The PIs of the XYZ Scientific Drilling Project have full responsibility for the direction of the project or activity supported under ICDP and NSF funds and for adherence to the conditions stipulated by the respective funding agency. Although the PIs are encouraged to seek the advice and the opinion of the OSG on special problems that may arise, such advice does not diminish the PIs responsibility for making sound scientific and administrative judgments and does not imply that the responsibility for operating decisions has shifted to the OSG.

The PI’s are responsible for approval of daily reports, prompt approval of invoices from XYZ (within 3 days), accuracy of invoices from the PI Institution(s), and timely participation in the change order decision process (with ICDP, Contractor field manager and Contractor office).

The PIs will use reasonable efforts to fulfill the following responsibilities:

1) Participation of Scientists

The PIs will make the project available through timely announcements, as `hole of opportunity´, for participation of other interested scientists. These scientists are expected to provide their own support, usually after approval through a national funding organization. The proposals from the interested scientists will be reviewed by the PIs and after approval of their intended activity, the interested scientists will be considered as part of the XYZ project.

2) Authorization and Availability of Data and Samples, Rights and Commencement of Disposal

With OSG-support (Article 4) the PIs will enable for all science team members of the project the access to all data, including technical data, engineering plans, samples, cores, well logs and associated surveys, collected during the course of the project. The PIs will therefore archive these data, samples, and other materials through the DIS in co-operation with OSG on a daily basis.

Project data and related information (metadata) shall be made accessible day-by-day to be completed directly after the drilling operations. The first sampling party has to follow within the next six months. PIs will submit an open access Science Report for publication in the journal Scientific Drilling shortly after the completion of the drilling operations, but not later than the first sampling party. This Science Report includes a detailed Operational Report, and the basic data sets as digital DOI-referenced published supplements. The moratorium period for that data should not be longer than two years after the completion of the drilling operations or the first sampling party respectively. Analytical data shall be made publicly available after publication or after a finite period to be defined by the PIs or as required by third-party funding agencies. This time period will reflect both the time needed for the analytical work and the working conditions of the scientists conducting the research.

For this project, the PIs will provide curatorial items and services, including consumables for on-site core handling and temporary storage, freight, and oversight of customs and export/import clearance of the samples generated during field operations. The PIs will in accord with international standards ensure proper scientific curation and long-term core storage of the sediment core working and archive halves in the XYZ core facility at XYZ. If at any time in the future this core storage facility is to be closed or if the facility does not allow free access to the cores by the scientific community, ICDP will immediately be informed and seek for an alternative repository. In accordance with LacCore and NSF Policy, a two-year moratorium period following generation of samples or data will limit access and use exclusively to the project scientific team. At the conclusion of the moratorium, access to the samples or data will be unrestricted, subject to LacCore curatorial policy.

3) Reports

The PIs will describe the status of the project through reports as described in Attachment 4 in detail.

All drilling operations, down-hole measurements or experiments have to be captured in real time in the DIS or a similar system that allows easy exchange of data with DIS or comparable system *(such as LacCore Drill Site Database)* with upload to the DIS on a daily base. In the case of events that endanger the budget plan or schedule of the project the ICDP will be informed immediately directly.

4) Approval of Invoices

It is the responsibility of the PIs to review and forward invoices for payment within 5 business days of receipt.

5) Data Sharing and Publication

The PIs and members of the scientific group are expected to publish or otherwise make publicly available the results of the work conducted with ICDP and e.g. NSF support. It is expected to publish a Science Report in the Scientific Drilling Journal shortly after the drilling operations including an Operational Report and the corresponding data sets as electronic supplements (see 2). The PIs will require that all cooperating scientists inform them with citation information and copies in advance of all presentations and publications related to this project. The timing, authorization, and appearance of presentations within electronic or other media will be managed through the PIs.

All publications by the PIs and the scientific group will be reported to the ICDP and e.g. the NSF in advance; copies should be sent to the funding agencies in order to allow recording and long-term availability of project publications, including publications after the moratorium period.

On-site measurements (e.g., downhole and whole core physical properties) and initial core data shall be shared with and openly accessible to all cooperating project scientists during the moratorium period. Nevertheless, data are owned by the scientists generating the data and will only be published in accordance with those scientists’ institutional policies preferably as open access under certain Creative Commons (CC) licenses.

Acknowledgement of Support: The PIs and all cooperating scientists are obligated to acknowledge the ICDP, XYZ, and ZYX on any publication of any material, whether copyrighted or not, based on or developed under this international project (Article 2).

6) Additional responsibilities for lake drilling

In addition, it will be the responsibility of the PI’s to provide the following.

1. A Service Boat capable of supplying the drilling barge.
2. Site preparation for staging the barge and drilling equipment, including permission, permits, and costs associated with use of the launching point at XYZ on XYZ shore of XYZ
3. All permits and authorizations necessary to conduct drilling on XYZ
4. Transportation for all scientific and drilling personnel between xy - zy
5. Daily transportation for all scientific and drilling personnel between the XYZ and the launching point at XYZ on the XYZ shore of XYZ.
6. Suitable staff on the drill site / drilling platform for the proper documentation and handling of core and other sample material. This normally requires three to four people per shift. One member of the science team on each shift will have the authority to make drilling decisions in consultation with the lead (*e.g. XYZ*) driller. These decisions will be documented in the daily drilling or shift report. This member is also responsible that a copy of the daily drilling or shift report is transferred from the driller to the PIs and ICDP on a daily base.
7. Personal Safety gear for all personnel working on the drilling barge, including steel-toe boots, hearing protection, safety glasses, hard hat, high-visibility vest, work gloves and suitable work clothes.

7) Health and Safety Regulations

The PIs will establish specific HS regulations compulsory for all project participants. This duty may be delegated to a contractor. The regulations have to comply with ICDP’s HSE rules unless authorities or contractors regulations require more demanding safety. The PIs or his/her delegate will make the HS regulations available to all participants by means of on-site safety introduction, training or similar.

**ARTICLE 6 - Intellectual Property Rights**

This project does not expect to produce any data or products, other than normal copyrighted scientific publications and outreach materials (e.g., films, animations, and broadcasts), which would otherwise involve intellectual property rights.

**ARTICLE 7 - Confidence**

The Parties will provide each other with any information which they can dispose of and which is useful for them to carry out their obligations under this contract. The Parties take care that any confidential information or any information restricted to authorized persons will not be distributed to unauthorized persons or the public. Information that shall be held confidential shall be labeled clearly as confidential.

**ARTICLE 8 - Liability**

The Parties cannot assume any liability for accidents, illness, or claims arising out of any work performed under this JRV. Each Party will attempt efforts to take such steps as may be deemed necessary to insure or protect itself, its employees and its property.

**ARTICLE 9 - Entry into Force, Duration and Termination**

This JRV shall enter into force upon signature and remain in force while the Project is in progress and all duties as defined in Articles 4-9 have been fulfilled or by written declaration of termination.

Financial support of the project may be suspended or terminated in whole or in part, when the funding agencies collectively believe that the PIs have materially failed to comply with the terms and conditions of the support, or when ICDP has other reasonable cause, or for any reason by mutual agreement between the ICDP and the PIs upon the request of either Party. Normally, action by ICDP to suspend or terminate a support will be taken only after the Parties have been informed by ICDP, or informed of any deficiency on its part and given an opportunity to correct it. No costs incurred during a suspension period or after the effective date of a termination will be allowable, except those costs which, in the opinion of ICDP, the PIs could not reasonably avoid or eliminate, or which were otherwise authorized by the suspension or termination notice, provided such costs would otherwise be allowable under the terms of the grant.

**ARTICLE 10 - Amendment**

This JRV may be amended and extended by written agreement of the Parties. The parties agree that this MoU may be changed with the approval of all parties.

**ARTICLE 11 - Resolution of Conflicts**

The Parties will attempt, in good faith, to resolve any controversy or claim arising out of, or relating to, this JRV. In the case of non-resolved controversy the chairman of ICDP´s SAG will be asked for arbitration.

**ARTICLE 12 - Representatives**

For the purpose of this JRV, the representatives of the Parties are:

ICDP-OSG at German Research Centre for Geosciences - GFZ (GFZ):

1. Dr. Ulrich Harms or a person duly authorized by him.

Principal Investigator(s):

1. XYZ

**Signatures**

GFZ German Research Centre for Geosciences

 …….……..…………………….. ……………………….

 Prof. Dr. R. Hüttl date

 …………….…………………….. ……………………….

 Dr. S. Schwartze date

ICDP

 …………….…………………….. ……………………..

 Prof. Dr. B. Horsfield date

XYZ

 …………….…………………….. ……………………..

 Dr. XYZ date

XYZ

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 XYZ date

XYZ

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 XYZ date

# Attachment 1: Project Proposal Summary

# Attachment 2: Budget Plan

**Approved Funding for Operational Costs**

International Continental Scientific Drilling Program ZYX US Dollar

XYZ Foundation (drilling expenses) XYZ US Dollar

# Attachment 3: Cost Breakdown & Time Plan

# Attachment 4: Specific Reports to ICDP

1. **While Drilling**

**a) Daily Drilling Reports (article 3.9)**

(for internal use, partly sharing among the Science Team and archiving)

(per shift and/or day)

**b) Data Updates (article 5.3)**

(for sharing among the Science Team and archiving)

(incremental Updates of the basic data sets per day)

**c) Message of the Day (article 5.3)** a short simple message per for project specific Web page in the ICDP portal that may include but is not limited to

* An “Image of the Day”
* Plus a number of selected images (optional)
* Both including short captions with creator and copyright
* Message of the Day: informative text describing the progress and highlights of the day including creator and copyright
1. **After Drilling (article 5.2 and 5.5)**

**a) Scientific Report** (to be published in the journal “Scientific Drilling”). PIs will publish an open access Science Report in the journal Scientific Drilling shortly after the completion of the drilling operations, but not later than the first sampling party. This Science Report is accompanied by a detailed Operational Report, and the basic data sets as digital DOI-referenced published supplements (see b). The moratorium period for that data should not be longer than two years after the completion of the drilling operations or the first sampling party respectively. Analytical data shall be made publicly available after publication or after a finite period to be defined by the PIs or as required by third-party funding agencies. This time period will reflect both the time needed for the analytical work and the working conditions of the scientists conducting the research.

The Scientific Reports shall include:

* A summary of overall progress, including major results obtained to date,
* A comparison of actual accomplishments with proposed goals for the period,
* An indication of any current problems or favorable or unusual developments,
* A summary of work to be performed during the succeeding period,
* Other information pertinent to the project and
* A list of Publications resulting from the project.

**b) Operational Report** (to be published as digital supplement to the Science Report in the Scientific Drilling Journal under open access under certain Creative Commons (CC) licenses (CC-BY or CC-BY-SA))

* Personnel
* The Project Targets
* Scientific Objectives
* Preparations / Mobilizations/ Demobilizations
* Technical Operations description including e.g.
* Infrastructure at the location and drill site set up,
* Rig type and specifications of installed components (e.g. hook load capacity, draw works, pumps, rotary table, power swivel, handling equipment),
* A summary of drilling and coring operations (incl. BHAs, bits, core bits, core recovery, used mud systems, mud pressure, mud density and mud flow, ROP, WOB, RPM, etc.),
* A casing scheme and description of cementing operations,
* Description of problems encountered e.g. fishing operations, mud loss, breakouts and a
* Summary of progress and costs including a drill-time log and a depth vs. cost breakdown.
* Scientific Operations
* Inventory of Sample Material
* The Basic Data Sets
* Storage of Sample Material / Sampling Party
* Preliminary Scientific Assessment
* Conclusions
* Acknowledgements
* Glossary

See example: The COSC-1 Operational Report (doi: 10.2312/ICDP.2015.002)

**c) The Basic Data Sets**

Example: The COSC-1 Operational Data Sets (doi: 10.1594/GFZ.SDDB.ICDP.5054.2015) and: Explanatory remarks on the operational data sets (doi: 10.2312/ICDP.2015.001)

1. **Financial reports**

The PIs or the project manager in charge of finances and budget have to provide at least monthly oversight of income (ICDP and other funding sources covering operational costs) and payments in oversight form to ICDP-OSG; these reports shall show differences to Budget and Cost plans as planned and detailed in Attachment 2 and 3.

A full financial report is due 3 months after the projects operational phase (drilling and completion) ended.