

**Partial Contract concluded on the basis of the Framework Agreement signed on 12 October 2016
with the title:**

**Utilization of foreign experience in the siting process for a deep geological
repository for radioactive waste in the Czech Republic**

CONTRACTING PARTIES

Client: **Česká republika – Správa úložišť radioaktivních odpadů**

Registered office: Dlážděná 6, 110 00 Praha 1, Czech Republic

Represented by: JUDr. Jan Prachař, Managing Director

ID: 66000769

Tax ID: CZ66000769

Banking details:

Name of Bank: ČNB, Na Příkopě 28, Praha 1

Account No.: CZ29 0710 0000 0000 6472 6011

(hereinafter referred to as the “**Client**”) and

Name of company: **Posiva Oy (lead party) in a consortium with Saanio & Riekkola Oy (from 31 August 2018 onwards, the company name is A-Insinöörin Civil Oy)**

Registered office: Olkiluoto, FI- 27160 Eurajoki, Finland

Represented by: Janne Mokka

ID: 1029258-8,

Tax ID: FI10292588,

Banking details:

Name of Bank: Nordea (NDEAFIHH)

Account No.: FI 281660 3001 1003 98

(hereinafter referred to as the “**Supplier**”)

(hereinafter both referred to as the “**Contractual Parties**”)

The Contractual Parties hereby conclude the following Partial Contract (PC) in accordance with the provisions of Article 5 and in the format of Annex No. 4 of the Framework Agreement.

Utilization of foreign experience in the siting process for a deep geological repository for radioactive waste in the Czech Republic

Name of the Partial Contract:	PC16: Impact of the evolution of the geosphere on radionuclide transport from the deep repository for radioactive waste to the biosphere, " Paleo "
Area of Services:	iv. the assessment and/or development of specific site characterization methods
ID of Services:	2016-120-16

	Function	Name	Date	Signature
Client approved for chapter 1	Project Manager	xxxxxxxxxxxxxxxx		
Compiled by	Project Manager of the Partial Contract	xxxxxxxxxxx		
Partial Contract approved by the Client	Managing Director	Jan Prachař	29.6.2020	
Supplier approved - project manager	Project Manager	xxxxxxxxxxxxxxxx	2.7.2020	
Supplier approved - manager of the partial contract	Project Manager of the Partial Contract	Xxxxxxxxxxxxxx	8.8.2020	
Partial Contract approved by the Supplier	Sales Director, Posiva Oy	Mika Pohjonen	3.7.2020	
	Vice President, A-Insinöörin, Civil Oy	xxxxxxxxxxx	3.8.2020	
	Managing Director, Posiva Solutions Oy	Mika Pohjonen	3.7.2020	

Note: This Partial Contract (PC) has been concluded in compliance with the conditions of a Framework Agreement (FA) signed on 12 October 2016 entitled: "Utilization of foreign experience in the siting process for a deep geological repository for radioactive waste in the Czech Republic".

1 CLIENT'S ASSIGNMENT

1.1 Requirements concerning the scope and technical specifications

SÚRAO is involved as an observer in a Czech domestic project which is supported by the Technology Agency of the Czech Republic (TAČR), reference number TK02030120 “Vliv změn vlastností geosféry na vývoj transportu radionuklidů z prostoru HÚ do biosféry” in English: “The impact of the evolution of the geosphere on radionuclide transport from the deep repository for radioactive waste to the biosphere”. The project is concerned with the research of possible long-term geological, geomorphological and climatic changes and their impacts on the evolution of the transport of radionuclides (RN) from the deep geological repository for spent nuclear fuel and high-level waste into the biosphere. The aim of the project will be the research of possible long-term geological, geomorphological and climatic changes and their influence on the development of radionuclide transport from the DGR area to the biosphere. Integrated transport models will be created in order to predict the migration of substances from the DGR taking into account the long-term geological evolution of the area. The models will reflect predictions of both geological and climatic changes. The objective will consist of the preparation of geological scenarios and related input data for the models, which will be created via the use of several software (SW) programs. The results will be mutually compared in order to validate the models, whilst fully taking into account the various strengths and weaknesses of SW applied to complex rock environments over the long term. Depending on the outcomes, SW will be designed to include predictive scenarios of the development of the geosphere. With respect to this project, a range of research activities are planned, concerning which SÚRAO would welcome the services of experts to provide consultancy and recommendations and, finally, confirmation of the proposed solution to the project principally with concern to:

- Setting up the evolutionary climate development scenario
- The assessment of the models, integrated descriptions and numerical calculations
- The evolution of hydraulic properties and the scenario evolution source term
- The long-term morphological evolution of the geomorphology
- Supervision activities for SÚRAO personnel aimed at enhancing their understanding of research activities and interpretations related to the paleo-hydrogeological process and the design of a conceptual modelling solution.
- The description of the Finnish conceptual understanding with regard to paleo-hydrogeological scenarios including climate, geomorphological changes, etc.

The partial contract will cover cooperation with SÚRAO in the form of e-mail enquiries, teleconferencing and meetings, and one report of recommendations based on Posiva's experiences and international guidelines. Following the fulfilment of the “Paleo” partial contract, Posiva will prepare a final report that summarises the results of the cooperation process and defines the most important parameters, field activities, interpretation and modelling methods in terms of the research and development activities/tools necessary for the evaluation and monitoring of long-term geological, geomorphological and climatic changes and their impact on the evolution of radionuclide transport from deep geological repositories for spent nuclear fuel and high-level waste into the biosphere. Moreover, the report will include a section that will describe Posiva's definition of the research related to paleo-hydrogeological processes and provide practical recommendations based on Posiva's and other international approaches in this field. The report will also cover summary research recommendations with respect to the paleo-hydrogeological field issued by the IAEA, WENRA etc. and related legislation and guidelines.

This PC should provide SÚRAO with consultancy activities principally in the following fields:

- a.) The preparation, realisation and analysis of the conceptual design of hydraulic models of the candidate sites and efficient validation methods with regard to long-term scenarios.
- b.) The preparation, implementation and analysis of hydraulic and transport models including the long-term evolutionary development of the environment.
- c.) Information on the preparation of concepts for individual aspects of the evolutionary development of the environment in the form of models.
- d.) The analysis and processing of geomorphological and geological data, the interpretation of geomorphological and morpho-stratigraphic analysis, the verification of model scenarios.
- e.) The processing of hydraulic models of groundwater flow in the geosphere based on long-term scenarios of the development of geological, tectonic and climatic conditions.

The work ensuing from the “Paleo” Partial Contract is very closely linked with domestic project TK02030120 financed by the Technology Agency of the Czech Republic, which supports research and innovation in the Czech Republic. This project already has set targets and an approved structure including a timetable. SÚRAO is willing to modify the objectives concerning the applicability of the results to your needs. Cooperation with Posiva will help SÚRAO better coordinate these modifications. We principally plan activities related to the critical evaluation of input data and information as well as the critical evaluation of modelling methods, approaches and concepts. Moreover, activities are planned relating to recommendations of modelling activities, simulation plans and the revision of the proposed scenario of the development of geological, tectonic and climatic conditions. This part of the work will also include reporting. The final report will summarise the cooperation between SÚRAO and POSIVA with respect to this project and include a list of the most important parameters and indicators with concern to the long-term evaluation of the hydrogeological process. A more detailed specification of the report is provided above.

The Client nominates the following person as the Project Manager for the Partial Contract (PC: xxxxxxxx xxxxxxxx, e-mail: xxxxxxxxxxxxxxxx The Supplier will communicate directly with this person, with correspondence copied on all occasions to xxxxxxxxxxxxxxxx, e-mail: xxxxxxxxxxxxxxxx).

The Client requires the Supplier to nominate those PC participants that will be financed from this Partial Contract.

Changes of persons nominated either by the Client or the Supplier are permitted without the requirement for amending the PC. In case of a change of Project Manager either on the side of the Client or the Supplier, the Project Manager of the one party shall be required to notify his/her counterpart in writing of the change.

1.2 Required Services deadlines

The whole of the PC will be concluded before the end of December 2020 and the practical work will commence immediately following the signing of the PC. The research team members must have experience with hydrogeological modelling, the analysis of geomorphological and geological data, the interpretation of geomorphological and morpho-stratigraphic analysis and the verification of model scenarios for long-term hydrogeology studies. The time schedule depends to a great extent on the availability of the required information in the English language.

The time schedule depends on the time at which the information to be provided by the Client is delivered to the Supplier. The time schedule is presented in Table 1. The starting time (T0) refers to the time when the Partial Contract (PC) has been signed by both parties and all relevant materials are delivered by the Client. In the case that materials are not available by the time that all parties have signed the PC, T0 will be confirmed by a confirmatory document signed by both parties.

WP1+2	T0+6 Months
– Output: Recommendations for SÚRAO, responses to questions, teleconferences, meetings, supervision activities	
WP 3: Final report	T0+6 Months
– Output: A concise report describing the whole of the cooperation process and the most important points concerning the evaluation of the paleo-hydrogeological research and modelling plan.	

1.3 Estimated labour intensity and/or its limitation

The Client estimates that the work involved in the PC will amount to 440 hours.

Point in the PC	Activities	Estimated labour intensity [hours]
WP 1	Recommendations, supervision activities	250
WP 2	Teleconferences, meetings	40
WP 3	Summary report	150

1.4 Specific requirements concerning the organisation of the Services

The Supplier shall propose the location and timing of those meetings with the Client's experts deemed necessary for the fulfilment of the objectives of the Partial Contract. Communication via telephone, email and videoconferencing will be acceptable provided the security of the information disclosed is ensured.

2 CONFIRMATION / MODIFICATION OF THE ASSIGNMENT OF SERVICES BY THE SUPPLIER

2.1 Scope of the Services and technical specification

The Client provides the relevant documentation for the assignment (as described in Article 1.1) to the Supplier in the English language.

The approach via which the Supplier participates to the assignment is to provide consultancy and recommendations of research areas stated in Article 1.1. by providing responses to questions, teleconferences, meetings (tentatively 1 meeting during the assignment) and supervision activities.

The report will include recommendations discussed in WP1, covering description of the POSIVA's experience from paleohydrogeological field, also selected international recommendations how to cover this research and demonstrate in safety report. The report will be describing the content of the co-operation process covered by the assignment, and POSIVA's understanding concerning of the most important points needed in evaluation of paleo-hydrogeological research and modelling (parameters, analysis and modelling tools).

The Supplier shall suggest the time schedule of the Services provided to the Client as stated in Article 1.2. The time schedule depends on the time at which the information to be provided by the Client is delivered to the Supplier.

The Supplier may suggest changes to the partial deadlines; however, the final deadline shall respect the requirements of the Client. If delays occur with respect to the delivery of information to the Supplier, such delays must be taken into account in the deadlines and overall schedule.

2.2 Price of the Partial Contract

The Supplier states herein the price limit of the Partial Contract which is based on the labour intensity determined in accordance with Article 2.4 of this document and the rates specified in Article 4.3 of the FA. Based on the preliminary allocation of working hours to the various experts and their hourly rates, the price estimate (exclusive of travel costs) is set at 65 187 €. The Supplier shall be required to justify all the expenses incurred.

2.3 Organisation of the Services

The Supplier sets out the various activities corresponding to the work schedule, the persons involved in those activities and their roles in Table 3. When determining labour intensity, the Supplier has taken into account the limit set by the Client in Article 1.3 of the Partial Contract (440 hours).

The Supplier shall set out the accountability of the persons involved in the Partial Contract in Table 3 and estimated hours per category are listed in Table 4.

Table 3. Personnel and roles in the activities set out in the Partial Contract.

Name (hours)	Role/position	Knowledge areas relevant to this PC
Ismo Aaltonen (200)	PC15 Project Manager, Adviser	Site investigations, geology, project management, international guidance
Heini Reijonen (30)	Adviser	Safety case
Aimo Hautojärvi (30)	Adviser	Hydrogeology and hydrogeochemistry; concepts modelling and data sources, safety case
Nuria Marcos (100)	Adviser	Climate, hydrogeochemistry, international recommendations, safety case
Tiina Lamminmäki (25)	Adviser	Hydrogeochemistry; data sources, field investigations
Lauri Parviainen (25)	Senior Expert	Surface hydrogeology, morphology
Pauliina Aalto (30)	FA Project Manager	Project management, (hydrogeology)

Table 4: Personnel hours by category

Category	Hours	~%	Price/€
1	0	0	0
2	415	~94	62138
3	25	~6	3 049
4	0		0
5	0		0
Total	440	100	65 187

2.4 Risk identification

The risk identification, assessment and management procedures are set out in Annex no. 3 of the FA. The time schedule depends to a great extent on the availability of the initial data in the English language.

3 CONCLUSION OF THE PARTIAL CONTRACT

Articles 1 and 2 of this Partial Contract are valid.

The sub-project is subject to the approval of those persons authorised with respect to contractual matters pursuant to Article 1.3 of the FA.

The Partial Contract shall be concluded in line with Article 5 of the FA.

This Partial Contract becomes valid and comes into force on the date of its signing by authorised representatives of the two Contractual Parties.