



SHEER WP3 Report, 15.05.2016
for the Progress / PTM Meeting in ...
(WP Leader S. Lasocki IGF PAS, representative GFZ, RSK, AMRA, KNMI, KeU)

Short summary of the progresses of the period

Please provide a concise overview of the progress of the work in line with the structure of Annex I to the Grant Agreement (DoA)

- List of the staff actively involved in the WP

IGF PAS: Prof. Stanislaw Lasocki (WP leader, Task 3.1 leader), Prof. Janusz Jaroslowski (Task 3.4 leader), Dr. Eng. Janusz Mirek, Dr. Jan Wiszniowski, Eng. Wojciech Bialon, Eng. Szymon Cielesta, Eng. Mateusz Lasak.

GFZ: Prof. Torsten Dahm (Task 3.2 leader), Dr. Simone Cesca, Dr. Jose Angel Lopez Comino, Postdoc contracted within the SHEER project since 1.10.2015, Mr. Ralf Bautz, Technician

RSK: Mr. Andrew Gunning, Partner RSK Ltd. (Task 3.3 leader), Dr. Catherine Isherwood, Senior Hygrologist

UGL: Prof. Paul Younger, Dr. Nelly Montcoudiol, Dr. Neil Burnside

AMRA: Prof. Paolo Capuano, Prof. Roberto Scarpa

- Objectives expected after 12 Month

- 1.1. Boreholes to be ready for water quality and seismicity monitoring.
- 1.2. Constant monitoring and collecting data for seismic, hydrology and air pollution analysis.
 - a. Monitoring background seismicity.
 - b. Monitoring the baseline of groundwater condition
 - c. Monitoring the baseline of air pollution
- 1.3. Setting an internet access to gathered data
- 1.4. Obtaining permits from the Operator, PGNiG to collect samples during hydrofracturing.
- 1.5. Collecting data during hydrofracturing process.
- 1.6. Temporal deployment of seismic monitoring equipment in the Groningen area, the Netherlands
- 1.7. Deliverable 3.2 submission
- 1.8. Station maintenance.

- A summary of progress towards objectives and details for each task in the second six months;

Ad. #1.1. Done. Four boreholes drilled for hydrology (GW1,GW2,GW3,GW4) and three boreholes drilled for seismology (GW1S, GW3S, GW4S).

Ad. #1.2. Carried on. Data are being constantly recorded and transmitted on-line or collected sequentially from all monitoring stations.

Ad. #1.2.a. Carried on. Surface and borehole seismic data are being collected and analyzed.

Ad. #1.2.b. Carried on. Three sampling rounds have been undertaken since the borehole installation in November 2015 until today. Samples were collected in December 2015 and in February and March 2016. A fourth sampling visit is scheduled for May 2016.

Ad. #1.2.c. Carried on. Until the end of March 2016 the data from eight full months has been collected

Ad. #1.3. Done. In February 2016 IGF PAS prepared a web interface for sharing the data gathered on site. The data is accessible at <https://sheerwer.igf.edu.pl/fa/> for all participants of the SHEER project. Seismic data is also available through ArcLink interface.

Ad. #1.4. Done. Permission received.

Ad. #1.5. Not done. Hydrofracturing activities have been delayed and will start probably in June.

Ad. #1.6. Not done. The installation is planned as temporal deployment, with a minimum deployment time of 25 days and a maximum deployment time of 45 days. It is desirable that the experiment (deployment) starts not earlier than May 1, 2016 and finish not later than October 1, 2016.

Ad. #1.7. Done. Deliverable 3.2 "Report on monitoring of background levels of seismicity, water condition and air pollution" submitted to the project coordinator.

Ad. #1.8. Carried on. Includes remote maintenance and maintenance site visits.

- Highlight clearly significant results;

2.1. Seismic network comprising 31 surface and 3 borehole seismometers is working properly, all seismometers are collecting data, those with on-line transmission transmit data.

2.2. The boreholes for hydrological monitoring have been drilled and the data is collected.

2.2. The boreholes for seismic monitoring have been drilled and borehole seismometers are registering data.

2.3. Fuel cells have been installed as a power supply for borehole seismometers.

2.4. Air pollution monitoring equipment is set and the monitoring is carried on. Levels of selected air pollutants were determined after eight months of continuous measurements of their concentrations in the vicinity of drilling area.

2.5. In December 2015 commercial automatic meteorological station has been installed on the top of air quality monitoring station's container, providing additional continuous information about weather conditions around the monitoring site

- If applicable, explain the reasons for major deviations from Annex I and their impact on other tasks;

3.1. It turned out that contrary to the original plan the borehole hydrological and seismic monitoring could not share the same wells. Following, in addition to 4 boreholes for hydrological monitoring 3 boreholes dedicated exclusively for seismic monitoring were drilled. This increased considerably the expenditures in WP3.

3.2. AMRA delivered borehole seismometers and in the middle of December 2015 a field group from AMRA with a support of IG PAS personnel installed them in GW1S, GW3S and GW4S boreholes. Because out of these three locations two do not have a permanent electric power supply facility, the seismic stations at these two locations were powered by solar panels (AMRA ownership). However, the panels occurred not sufficient for this task during winter months. Therefore it was decided to power the aforementioned stations with fuel cells (IGF PAS ownership). To secure the fuel cells and other monitoring equipment on site IG PAS had to arrange building two wooden shelters. The additional cost of all activities regarding the change of power supply was approximately 1000 EUR.

3.3. The inspection in February 2016 indicated that none of the three borehole seismometers worked properly

To remedy the problem the next site visit was performed by the field group from AMRA and from IGF PAS on 14-18.03.2016. The problem was fixed only partially. Station GW1S was fixed. Noise on two channels of station GW3S was very high. It was not possible to fix Station GW4S. Following, IGF PAS field group visited the site in April, 2016, uninstalled stations GW3S and GW4S and installed in these boreholes Nanometrics posthole seismometers (IGF PAS ownership). Since then the seismic borehole recording is correct.

- If applicable, explain the reasons for failing to achieve critical objectives and/or not being on schedule and explain the impact on other tasks as well as on available resources and planning;

4.1. Ad. #3.2 & 3.3. The borehole seismometers did not work and register data properly. The complete seismic borehole monitoring began only in April, 2016.

- If applicable, propose corrective actions.

- Publications and papers in print

None.

This section should not exceed two pages.

Deliverables due at the date

Please complete this table if deliverables are due for the reporting period

Table 1. Deliverables due at the date											
Del. no.	Deliverable name	Version	WP no.	Lead beneficiary	Nature	Dissemination level¹	Delivery date from Annex I (proj month)	Actual / Forecast delivery date Dd/mm/yyyy	Status No submitted/ Submitted	Contractual Yes/No	Comments
D3.1	A plan of monitoring campaign agreed with the Operator (PGNiG)		WP3	IGF PAS	Report	CO	30/06/2015	13/07/2015	Submitted		
D3.2	Report on monitoring of background levels of seismicity, water condition and air pollution		WP3	IGF PAS	Report	CO	30/04/216	06/05/2016	Submitted		

¹PU **Public**
 PP **Restricted to other programme participants (including the Commission Services)**
 RE **Restricted to a group specified by the consortium (including the Commission Services)**
 CO **Confidential, only for members of the consortium (including the Commission Services)**

