



LIFE Project Number

LIFE10 ENV/SK/086

Mid-term Report

Covering the project activities from 10/10/2012 to 09/08/2013

Reporting Date

10/08/2013

**The impact of geological environment on health status of
residents of the Slovak Republic**

GEOHEALTH

Data Project

Project location	Slovak Republic (whole territory)
Project start date:	01/09/2011
Project end date:	31/08/2015 Extension date: <dd/mm/yyyy >
Total budget	418,112 €
EC contribution:	207,273 €
(%) of eligible costs	49.57

Data Beneficiary

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Notes:

According to the Common Provisions Article 12 – Technical activity reports, the coordinating beneficiary must provide the Commission with:

- for projects with a duration exceeding 24 months and a Community contribution of more than 300.000€, one mid-term report, together with the request for mid-term pre-financing, after the threshold defined in Article 28.3 of CP (150% of the first pre-financing consumed) has been reached;

By way of exception, if the threshold defined in Article 28.3 is reached within the first nine months of the project duration, the inception report and the mid-term report might be merged into one.

The mid-term report shall contain the necessary information for the Commission to evaluate the state of implementation of the project, the respect of the work plan, the financial situation of the project and whether the project's objectives have been achieved or are still achievable.

In addition to the abovementioned information, the mid-term report shall contain a statement of expenditure and income and sufficient information to allow for a preliminary assessment of the eligibility of costs incurred so far.

Identical copies of the mid-term report, in both paper and electronic versions, shall be simultaneously forwarded to the Commission and to the external monitoring team designated by the Commission, both of them receiving one complete copy of the technical reports, including annexes.

National authorities may request a copy of the mid-term report.

- Mid-term report shall not exceed 50 pages, excluding annexes. Please use font Times New Roman 12 or equivalent.
- The technical part should contain a concise statement of the tasks undertaken and a forecast for the next reporting period. Any problems encountered during the period and possible deviations from project plans must be covered.
- Mid-term report can be accompanied by annexes such as specific technical reports on issues relating to the project or reports and dissemination deliverables or other outputs from the project.
- Mid-term report should be submitted in paper and electronic form.
- In annex, if relevant, a set of slides/colour photo/electronic images illustrating the main actions and results of the project, any other document, map, publication which is envisaged as an identifiable product of the project or which is useful to assess the success of the project,

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1. List of key-words and abbreviations (when appropriate).

MŽP SR – Ministry of the Environment of the Slovak Republic

ÚVZ SR – Office of Public Health of the Slovak Republic

SEGH – Society for Environmental Geochemistry and Health

ŠGÚDŠ – State Geological Institute of Dionýz Štúr

WHO – World Health Organization

SR – Slovak Republic

EU – European Union

US EPA – United States Environment Protection Agency

NIPH – National Institute of Public Health

2. Executive summary.

1.1. General progress.

Project is governed in accordance with the project schedule and in terms of Common Provisions and rules of LIFE+ programme. Within two years of project running valuable results were achieved with potential value not only for the whole territory of the Slovak Republic but they can also contribute to the improvement of health state of the entire EU population.

The elaboration of environmental indicators (more than 30,000 chemical analyses of groundwater/drinking water and soils, about 1 million of analytical data) and health indicators (10-year averages for about 43 health indicators for around 2,900 municipalities of the Slovak Republic, about 1,250,000 data) resulted in confirmation of assumption that health state of residents of the Slovak Republic is significantly influenced by geological structure of the territory. The variability of geological structure, it means various geochemical background, has marked response in health state of residents of SR.

The favourableness of geological environment for human health was identified in following order: Paleogene Flysch (sandstones, shales), Carbonatic-silicate Mesozoic (marls, limestones, shales), Carbonatic Mesozoic (limestones and dolomites), Neogene (clays, sands, gravels), Quaternary sediments (sands, gravels, rock fractions), Crystalline (granitoids, shales), Paleozoic (metasediments, metavolcanics) and Neovolcanics (andesites, basalts). For example the mortality on cardiovascular diseases is in the most favourable geological unit (Paleogene Flysch) about 50% lower in comparison with the most unfavourable geological unit (Neovolcanics).

Comparing the health state of residents in 3 regions contaminated by risk elements such as As, Sb, Pb, Cd, Hg etc. with neighbouring regions with the same geological structure (and similar socio-economic status – rural population, the same economic level, similar situation regarding unemployment etc.) led to conclusion that the health state of residents living in contaminated and non-contaminated regions does not differ at all. In contrast with current world knowledge, the impact of risk potentially toxic elements upon health state of residents living in historical mining areas was not confirmed.

In accordance with the project schedule the first 3 technical actions (**A1, A2, A3**) were finalized and the results are available on the project website (www.geology.sk/geohealth/). Due to one-year delay of public tender within action **A4** (Linking of environmental and health indicators) we have made progress in other actions **A5** (Environmental analysis) and **A6** (Elaboration of proposal of measures) in accordance with adapted schedule

approved in Progress report No. 1. These works include the excerption and summarization of relevant data information useful for elaboration of environmental-health regionalization of the Slovak Republic and factsheets “cause – effect – measures” for unfavourable geological environment.

All further actions including accompanying and disseminations works (**B1** to **C6**) are continuously running or have been already completed according to project timetable. They are described in more details in technical part of this mid-term report. We thoroughly respect the principle of publishing actual results and information on running actions (technical, dissemination) on the website of the project (www.geology.sk/geohealth/).

1.2. Assessment as to whether the project objectives and work plan are still viable.

The project's objectives are fully valid and achievable. All activities planned within the project are running according to the project timetable, except of action **A4** (Linking of environmental and health indicators). This action is necessary for realization of decisive part of all other actions planned within the project.

Through linking of environmental and health indicators by neural networks we will be able to identify those elements having the most significant impact on the health state of Slovak population and to define limit and risk values, optimal and minimal necessary concentrations of chemical elements from the point of view of human health.

We suppose the very beginning of running of works on this action in September 2013. In May, 2013 the public tender for the realization of computing (statistical) works was realized. At present, the entire documentation of the public tender is administered by MŽP SR within the controlling process. We are waiting for the approval by MŽP SR. We assume that if works on this action begin no later than in September 2013 we will be able to meet all planned objectives of the project with exceptional effort. There is still presumption that we will ask for the prolongation of the project running period for about several months in the Progress report No. 2.

There is no need of modification of project financing due to these changes.

1.3. Problems encountered.

We did not meet any technical problems within the project running. From the scientific point of view (technical part of the project) the project is running in accordance with project schedule and timetable and the results achieved so far are reliable. The only problem is very protracted administration regarding the public tender.

ŠGÚDŠ is the organization directly governed by MŽP SR. For every single public tender primarily we have to ask MŽP SR for the approval for start of the public tender. After the end of public tender we have to provide the entire documentation of public tender to MŽP SR for the control process. MŽP SR does not have any deadline for giving the approval for public tender start or approval of public tender and subsequent approval for making contract for work realization. This is the reason of about one-year delay of start of action **A4** (Linking of environmental and health indicators). Therefore we have begun works on actions **A5** (Environmental analysis) and **A6** (Elaboration of proposal of measures) in advance of original project schedule.

We meet similar problem of delay in case of purchasing notebook and data projector necessary for dissemination of the project (delay more than 18 months). This is not such a big problem for us because we solve this problem by lending this equipment from other than ŠGÚDŠ sources. For this reason all following planned public tenders we will start much more earlier in the future as they were planned within the project schedule.

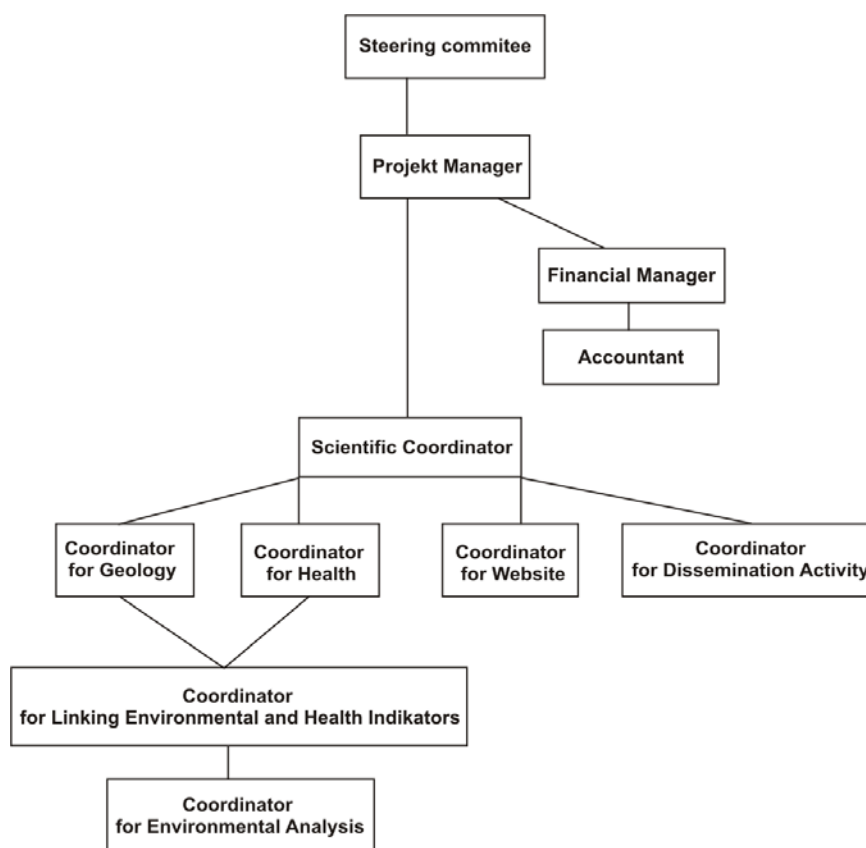
3. Administrative part

Project is managed from the very beginning in accordance with the rules of LIFE+ programme. Every month consultative meetings participated by members of project team are organized. Consultative meetings deal with the evaluation of project progress and planning further tasks to be solved during next period. The records from consultative meetings are available on the website of the project. The two sessions of *steering committee* were also organized according to planned project schedule. The conclusions and recommendations of the steering committee are also available at project website. In addition, monitoring report for the project is once a year compiled by project manager and is also available at the project website. Project team works from the very beginning of the project in following structure:

NAME	POSITION
doc. RNDr. Stanislav RAPANT, DrSc.	project manager, scientific coordinator
Mgr. Renáta Tesařová/Ing. Ivan TAMAŠOVIČ	financial manager
Mgr. Veronika CVEČKOVÁ	coordinator for geology, coordinator for elaboration of proposal of measures
Mgr. Katarína FAJČÍKOVÁ, PhD.	coordinator for linking of environmental and health indicators, coordinator for environmental analysis
RNDr. Ladislav MARTINSKÝ	coordinator for dissemination activity
Ing. Kristína LACENOVÁ	coordinator for website
Jana BUDÍNOVÁ	accountant
MUDr. Zuzana DIETZOVÁ	coordinator for health
MUDr. Darina SEDLÁKOVÁ, MPH	epidemiologist

The only one change in project team was the replacement of the financial manager. The primary financial manager has gone on maternity leave in 30.03.2013. From the 01.06.2013 was nominated on the position of financial manager co-opted Ing. Tamašovič (new employee of ŠGÚDŠ). In April and May 2013 the financial manager was deputized by the head of economic division of ŠGÚDŠ Ing. Sokolíková. We have planned to extend the project team with the position of translator from 01.01.2013 from permanent staff of ŠGÚDŠ (coordinating beneficiary) as we have mentioned in the Progress report No. 1. The director of ŠGÚDŠ did not approve the position of translator from the permanent staff. We have solved this situation by subcontract, in the form of external assistance in accordance with the primary project plan. Progress reports, website etc. are translated by the project team members and external assistance of translator is used for translation of scientific articles published in international magazines. In the future we plan to use the translator for the translation of Layman's report and final monograph.

The organigramme of the project team and project management structure is following, in accordance with the project:



In accordance with planned project schedule so far two reports were elaborated: Inception report (15.12.2011) and Progress report No.1 (10.10.2012). With respect to recommendations of European Commission we attach detail specification of output indicators in the section of Annexes of this mid-term report.

From the 01.01.2013 ŠGÚDŠ has adopted new payment/salary system taking into account inflation and achieved education. Salaries of all members of project team were modified (increased). Only in case of project manager the current salary slightly exceeds (about 2 €/hour) the planned salary – direct personnel cost within the project schedule due to the fact that the project manager has the highest scientific degree in geology – Dr.Sc. The other members of project team have their salaries slightly lower than it was planned in the project. Totally the direct personnel costs do not exceed financial amount planned in the project. The works on action **A4** (Linking of environmental and health indicators) were began in advance (before the final arrangement of economic contract) and willingly (without the final agreement) by the winning selected organization. In this way we solve protracted administrative process lasting more than 3 months after the end of public tender. We hope successful collaboration with this organization which we suppose will lead to meet all planned actions and objectives in time. There is still possibility that we will not be able to meet project schedule and in this case we will ask within the Progress report No. 2 for prolongation of project duration without any changes in project financing.

In addition we propose another small administrative modification of works including restriction of printing conference materials and conference book of abstracts. Conference book of abstract will not be distributed to conference participants in print form but only in electronic form – using USB key media. Total amount for this issue will be finally lower. We will use financial means allocated in project for printing of conference materials and book of abstract for the purchasing of USB keys (we suppose about 250 pieces).

4. Technical part

All actions are still running in accordance with project schedule and planned timetable, except of action A4.

4.1. Actions

4.1.1 Action 1 – Compilation of data set of environmental indicators

Within this action, datasets of environmental indicators for groundwater (more than 20,000 samples) and soils (more than 10 000 samples) were planned to be compiled. Final datasets include 20,344 chemical analysis of groundwater and 10,738 chemical analyses of soils. They were elaborated in numeric as well as map form for Slovak administrative units (municipalities, districts) and are published on the project website. However, there is possibility of some small changes of the datasets after mathematical-statistical data elaboration. It is possible that exclusion of some values (“extremes”) will be necessary. This action was completed on time, in accordance with the project schedule (see 4.1.19, tables of completed deliverables and milestones) and the planned objectives were fulfilled. The related deliverable “Dataset of environmental indicators in numeric and map form” was finalized 20.05.2012 and 2 associated milestones “Purchase of 2 PC” and “Completion of excerption of environmental data” were finalized 10.01.2012 and 15.01.2012, respectively.

The 2 datasets of environmental indicators (table form, map form) are included in main project deliverables and were specified as output indicator as “Others – datasets (tables, maps). This output indicator was successfully fulfilled and attached in Annex within the Progress report No. 1 (6.1.2).

4.1.2 Action 2 – Compilation of data set of health indicators

Within this action dataset of health indicators was compiled. Total number of health indicators is finally 43. Project objective was primarily based on compilation of dataset of 40 – 45 health indicators. The final dataset of health indicators was in accordance with the project schedule elaborated in map as well as table form (database). On the website of the project 30 selected health indicators are presented because of space limitation due to huge amount of data.

This action was completed on time, in accordance with the project schedule (see 4.1.19, tables of completed deliverables and milestones) and the planned objectives were fulfilled. The related deliverable “Dataset of health indicators in numeric and map form” was finalized 20.04.2012 and 1 associated milestone “Completion of excerption of medical data” was finalized 20.02.2012.

The 2 datasets of health indicators (table form, map form) are included in main project deliverables and were specified as output indicator as “Others – datasets (tables, maps). This output indicator was successfully fulfilled and attached in Annex within the Progress report No. 1 (6.1.3).

4.1.3 Action 3 – Elaboration of environmental and health indicators

This action includes division of datasets of environmental and health indicators compiled for the whole Slovak territory according to geological environment and especially for selected contaminated sites. Project had in plan delineation of 7 basic geological compartments and 5-6 contaminated areas of the Slovak Republic.

Finally we have realized the division of datasets in following 8 geological compartments: 1. Paleozoic metamorphic rocks, 2. Granitoides and crystalline complexes, 3. Carbonatic rocks of Mesozoic complexes and basal Paleogene, 4. Carbonates of Mesozoic complexes and Paleogene Klippen Belt, 5. Paleogene Flysch, 6. Neogene volcanics, 7. Neogene sediments, 8. Quarternary sediments.

Contaminated areas were selected in following way. Instead of 5 – 6 contaminated areas we delineate 3 contaminated and 3 neighbouring non contaminated areas that are similar from the geological as well as socioeconomic aspect within:

1. Slovak Ore Mts. (geogenic contaminated area due to historical mining activities),
2. Central Slovak Neogene volcanics (geogenic contaminated area due to historical mining activities),
3. Upper Nitra region (anthropogenic contamination due to combustion of brown coal).

The results of this action were published as project on the project website (<http://www.geology.sk/geohealth/category/vysledkyresults/ciastkove-vysledkypartial-results/>). This action is completed.

This action was completed on time, in accordance with the project schedule (see 4.1.19, tables of completed deliverables and milestones) and the planned objectives were fulfilled. The related deliverable “Datasets of environmental and health indicators divided according to geological environment and contaminated areas in numeric form” was finalized 25.11.2012 and 1 associated milestone “Organization of workshop with international participation and agreement on methods of data elaboration” was fulfilled 30.05.2012.

4.1.4 Action 4 – Linking of environmental and health indicators

This action was realized only at minimum rate. Within this action optimized datasets of environmental and health indicators that are evaluated in other actions were elaborated. “Optimized datasets of environmental indicators and health indicators in text form – tables” were finalized as the project deliverable for this action up to 20.05.2013 (see 4.1.19, table of completed deliverable) and were published on the project website (<http://www.geology.sk/geohealth/category/vysledkyresults/ciastkove-vysledkypartial-results/>). In addition, 1 associated milestone “Organization of workshop with international participation and agreement on methods of data elaboration” was fulfilled 30.05.2012. The other associated milestones “Selection of subcontractor for calculation of neural network and fuzzy cluster analysis” and “Linking of datasets on environmental and health indicators” were not completed yet (see 4.1.19, table of completed milestones).

The beginning of running this action was planned from 01.12.2012. In February 2012 we have requested MŽP SR for start of public tender (calculation of neural network). Up to 09.08.2013 subcontractor of these works was not selected. MŽP SR did not give us the approval yet. From the timetable of the project we are not able to complete this action in planned date. We have to solve this situation in such a way that capacities of technical staff will be moved to works on actions **A5** and **A6**. Action **A4** will be realized after the public tender approval by MŽP SR (explained in more detail in section 1.3. “Problems encountered”).

4.1.5 Action 5 – Environmental analysis

Within this action geochemical and health data are elaborated for environmental-health regionalization of the Slovak Republic. The quality level of the environment and health state of residents for each municipality of the Slovak Republic are assessed. Short report

entitled “The evaluation of impact of geological environment on health status of residents of the Slovak Republic“ was compiled in accordance with project schedule 17.07.2013 as one of the project deliverable (see 4.1.19, table of completed deliverable) and it was published on the website of the project. It is also attached in Annexes if this mid-term report (Annex 6.1.1) This short report is attached in the section of annexes of the mid-term report. This short report is included as output indicator within the main project deliverables “Others – short report”.

Regarding other associated deliverables to this action we propose new dates for their completion reviewed below:

Name of the Deliverable	Code of the associated action	Deadline	Actual date
Elaboration of limit values for environmental indicators, tables	A5	30/08/2013	*20/12/2014
Compilation of environmental-health regionalization of the Slovak Republic (maps, tables, short text)	A5	30/12/2013	*01/01/2015
Delineation and characteristics of areas with unfavorable health status of inhabitants, maps, tables, short text	A5	30/01/2014	*30/01/2015

These 3 deliverables represent also the output indicators and are included in the main project deliverables “Others – short reports” (see table of output indicators in Annex of this mid-term report).

This action is still in progress. We expect successful reaching of objectives for this action and associated deliverables after the realization of action **A4**. One milestone is associated to this action “Selection of subcontractor for calculation of neural network and fuzzy cluster analysis” that is not still completed due to encountered problems within the action **A4**.

4.1.6 Action 6 – Elaboration of the proposal of measures

This action consists of elaboration of summarizing factsheets of proposal of measures to reduce or eliminate negative impact of geological environment on health state of residents in SR. The factsheet presents summarizing information for each of evaluated environmental indicators from the point of view of:

- Toxic effects on human organism (due to excess or deficit) and minimal risk levels,
- Concentration levels in geological environment of the Slovak Republic (groundwater and soils) and the source of their origin (natural / anthropogenic sources).

The factsheet has the form of small brochure (double side A4 form) that provide all above mentioned information in summary way easy to understand and easy to be distributed to public. This action is in progress. The associated project deliverable “text report and factsheets” is planned to be compiled later on in accordance with the new proposal of the project schedule attached in the Annex of this mid-term report. New proposed deadline for this deliverable which is also considered as one of the output indicators – main project deliverables “Others – short reports” is following:

Name of the Deliverable	Code of the associated action	Deadline	Actual date
Proposal of measures for reduction of negative impact of geological environment on health status of residents, text report and factsheet	A6	30/06/2014	*30/02/2015

4.1.7 Action 7 – Realization of measures

These actions are to be run later on in accordance with project timetable. One output indicator is associated with this action considered as one of the main project deliverables “Guidelines – legislative proposal”. Because of delay in action A4 we have proposed new deadline for the associated deliverable “Proposal of list of environmental and health indicators and limit values of environmental indicators for implementation into Slovak legislatives, tables, factsheet” from 30.04.2015 to 30.06.2015 (see attached table of new dates for deliverables in Annex of this mid-term report).

To this action is associated one milestone “Organization of at least 10 informative meetings for public” that will be realized in accordance with the project schedule (deadline 30.06.2015). These meetings are defined as output indicators within “Training activities” (see table of output indicator in Annex of this mid-term report). We assume total number of trained persons 600. To this action, another output indicator is associated, section “Publications – Posters” including publication of 5 types of posters – information posters for public audience.

4.1.8 Action B1 – Overall project operation

The main task of this action is an effective and operational management of the project. Project team and steering committee meet in accordance with project schedule. Records from regular month consultations and meeting of steering committee are published on project website. Project management is fully in accordance with project schedule and rules of LIFE+ programme.

The final report represents the deliverable associated to this action. We expect to meet the planned deadline in accordance with the project schedule (30.10.2015). The two of 3 associated milestones “Establishment of project management” and “Establishment of Steering committee” were successfully completed in accordance with the project schedule (see 4.1.19, table of milestones). The last milestone – “Project end” is supposed to be reached successfully on time (30.08.2015) in case of not protracted delay in action A4 (see 4.1.4).

4.1.9 Action B2 – Monitoring

This action is focused mainly on regular control and evaluation of each project action. The results of project monitoring are summarized in monitoring report from **20.01.2013** that is also published on the website (<http://www.geology.sk/geohealth /aktualitynews/monitorovacia-sprava-januar-2013/>).

4.1.10 Action B3 – Audit

This action is planned to run later on project running. We attach the information on auditor in Annex of this mid-term report as requested by the European Commission. We expect to meet the primary planned deadline for this milestone “Audit” (30.09.2015).

4.1.11 Action B4 – Networking with other projects

The main objective of this action is the study of all available materials relevant for the issue that project is focused on, communication with other groups and teams interested in and dealing with this issue and presentation of achieved results on the project through active participation on events at national as well as international level. So far we did not find any other project or working group that solve project of similar focus on summary evaluation of environmental and health indicators. Only partial projects exist focused on evaluation of certain group of elements, e.g. heavy metals, some deficit elements like e.g. I, Se, Zn, etc. The project GeoHealth is highly innovative in the field of medical geology and for this reason we were not able to create networking group of the project so far.

We continuously excerpt and study findings and results of all other LIFE+ projects and available literature sources (mainly SCOPUS). We actively collaborate and exchange the information with ÚVZ SR, WHO office in Slovakia, Slovak Health University and other scientific and research institutions in the Slovak Republic.

On the international level we have actively communicated by e-mail with representatives of e.g. US EPA (prof. Nauman, Dr. Lobdell), NIPH Prague (Dr. Kožíšek), Dallas University in Texas (prof. Finkelman) and WHO Europe – Centre for Environment and Health (Dr. Egorov). Two members of project staff participated the European meeting (of 27 EU countries) organized by WHO Regional Office for Europe (29. – 30.10.2012, Bonn, Germany) dedicated to formation of European Environment and Health Information System (ENHIS). In July, 2013 three project team members actively participated (2 posters, 1 oral presentation) the International Symposium on Environmental Geochemistry and Health held in Toulouse, France (SEGH conference). This action runs according to project plan.

4.1.12 Action B5 – After – LIFE Communication plan

The running of this action is planned later on. The elaboration of “After – LIFE communication plan” – project represents project milestone and is supposed to be meet on time in accordance to primary project schedule (30.07.2015, see 4.1.21, table of milestones of the project).

4.1.13 Action C1 – Notice board

Project planned two notice boards to be displayed, in the premises of ŠGÚDŠ and Open-Air Mining Museum in Banská Štiavnica. Notice boards are displayed at strategic places in accordance with the project plan. This action - “Notice boards displaying” was completed as one of the project deliverable fully in accordance with the project plan (30.11.2011). 2 notice boards are also included in output indicators within “Media and other communication and dissemination work” (see table of output indicators attached in Annexes of this mid-term report).

4.1.14 Action C2 – Website

The website running – one of the project deliverable was started with a little delay (20 days) but at the present project website is fully in operation and we continuously add all important information, partial results and dissemination activities.

All relevant information and news related to the project running are published and updated on the website. The total number of website views up to 09. 8. 2013 was more than 6700. This is one of the output indicator of the project within “Media and other communication and dissemination work”. The planned number of visitors per month was set to 100 (see

table of output indicators attached in Annexes of this mid-term report). At present time we have exceeded this output indicator more than 2.5 times. We can conclude that this output indicator is successfully fulfilled during the entire period of the project running and it reflects big interest of public but also scientific audience in our project and the results of our work.

This action runs fully in accordance with project schedule and plan.

4.1.15 Action C3 – Layman’s report

This action was not run yet. We propose to postpone the deadline for associated deliverable to this action “Layman’s report” from 30.07.2015 to 15.08.2015 (see attached table of new dates for deliverables in Annex of this mid-term report). Layman’s report is also included as output indicator within the section “Publications” (see table of output indicators attached in Annexes of this mid-term report).

4.1.16 Action C4 – Any media work

The objective of this action is intense widespread propagation of project results to layman and professional audience and to rise up general interest in objectives and achievement of project results. Within the project two press conferences held in the Ministry of the Environment (project start/project end) are planned. These are considered as output indicators of the project. The press release planned at the very beginning of the project was realized and fulfilled as project milestone in accordance with the project schedule (20.08.2011).

Based on general interest other activities were planned to be run: newspaper articles – in national press (planned 3 as output indicators) and local press (planned 5 as output indicators), radio reportage (planned 3 as output indicators) and TV sessions (planned 2 as output indicators), mainly in the stage of last year of project running (when we will have all relevant results) and after the project end. In addition we plan to publish internet articles through the project website (planned 7 internet articles as output indicators).

All these activities are included in the table of output indicators in section “Media and other communication and dissemination work” (see table of output indicators attached in Annexes of this mid-term report).

Beside the two newspaper articles and 1 radio session mentioned in the Progress report No. 1, we have participated on compilation of 1 article in national press (magazine “Pravda”, 27.10.2012) and contemporaneously published also as internet article (28.10.2013, <http://spravy.pravda.sk/domace/clanok/251563-sever-slovenska-je-zdravsi-ako-juh/>) and 1 article in Slovak specialized monthly magazine “Zdravie” (January 2013, http://www.geology.sk/geohealth/wpcontent/uploads/2013/01/Zdravie_kdetozijete_72_2012.pdf). We have also published 2 internet articles – “Newsletters” presenting the project objectives and partial results. We have several representatives of public as well as scientific audience which have subscribed to be given the information about the project through the project website - section Newsletter. The two so far published newsletters are attached in Annexes of this mid-term report (Annex 6.2.1).

We can conclude that up to the mid-term report we have already published 4 newspaper articles, from which 3 of them were published in modified manner also as internet articles (total number of published internet articles is 5).

We have already published on the project website the news about the organization of the International Conference SEGH in Bratislava in June/July 2013 (Annex 6.2.2).

All so far realized “media works” had origin in direct interest and request from the journalists (they had primary information about the project from the project website) without our primary intervention.

In the third and fourth year of project running (when we will have more results) we will contact media and we hope that wide dissemination of project results will be done through different type of media. In addition we were contacted by e-mail and phone by more than 150 inhabitants with queries related to environment issue and health state of Slovak population. We have answered all queries in short time.

The action is running in accordance to project schedule.

4.1.17 Action C5 – Workshop, seminar, conference

In accordance with project schedule, one workshop (international, 0-25 participants), two seminars (national, 1 for administrative officers, 25-75 participants and 1 for public audience and scientists, more than 100 participants) and one conference (international, more than 100 participants) are planned to be organized. These activities are considered as output indicators of the project and are included in table of output indicators in section “Workshops, seminars and conferences” (see table of output indicators attached in Annexes of this mid-term report).

Workshop (international) was held during 31.05.-01.06.2012 in Bratislava, Slovak Republic in the head of ŠGÚDŠ. Three leading foreign researchers, representatives of WHO and ÚVZ SR were participated on the workshop (total number of all participants was 22). The main objective of the workshop was reached. The group of environmental and health indicators was agreed as well as methods of linking two datasets were discussed and agreed. The results of workshop including all oral presentations are available online on the project website.

Organization of national seminars and international conference is included in milestones of the project, with deadline in 2015. We suppose to meet the planned deadline in accordance with the project schedule. At the present we have successfully arranged the organization of the International conference SEGH 2015 planned at the end of the project (in accordance with the project schedule) in Bratislava, Slovak Republic. The arrangement of the conference organization is very significant output of the active participation of project team members on the International conference SEGH held this year (8-12 July, 2013) in Toulouse, France. The alert for this event is published on the project website (<http://www.geology.sk/geohealth/conference/?lang=en>) to attract most participants from the academic and scientific community.

4.1.18 Action C6 – Technical publications of the project

Project has in plan to publish results in several forms. Except of final monograph and English brochures mainly publishing of scientific articles (3 in international magazines, 6 in Slovak magazines) and several papers in different conference books of proceedings / abstracts are planned to be realized. We also plan to publish at least 5 posters and present them on national and international level. The output of the organization of the conference, seminars will be the publication of at least 2 Books of abstracts.

All above mentioned activities are included in output indicators of the project, section “Publications” (see table of output indicators attached in Annexes of this mid-term report). In the period from the date of Progress report No. 1 up to the date of the mid-term report we have published one scientific article in international magazine “Open Journal of Geology” (online April 2013, printed version No. 3, 101-112 pp., 2013). We have also prepared the second article that was sent to editorial board of international magazine

“Environmental Geochemistry and Health” (10.06.2013). At the present this article is in status of reviewing by independent reviewers. We have also published article in the Conference Book “Geochemia 2012” (06.12.2012, http://www.geology.sk/geohealth/wp-content/uploads/2012/12/Geochemia2012_Geohealth.pdf). In addition, we have participated in active form at the international conference in Toulouse, France where we have presented 1 oral presentation and 2 poster presentations. These presentations were published in the Conference Book of abstract with highlighted acknowledgement and reference to the LIFE + programme. All these materials are published on the project website and are attached in the form of list in Annexes of this mid-term report, Annex 6.2.3, 6.2.4). We attach certificates of attendance of SEGH conference held in Toulouse in Annexes of this mid-term report (Annex 6.3).

In conclusion up to the mid-term report we have already published 3 posters. One of them we have presented at national conference “Geochemia” (06.-07. 2012) and two posters we have presented on international level (conference in Aveiro, Portugal 2012 and Toulouse, France 2013). Two published posters within the period from the Progress report No. 1 and Mid-term report (1 at national and 1 at international level) are attached in Annexes of this mid-term report (Annex 6.2.3).

The action is running without any problems encountered and in accordance with project schedule and intentions. Nevertheless (due to possible delay in start of works on action **A4**) we propose new dates for realization of project deliverables associated to this action summarized in table below:

Name of the Deliverable	Code of the associated action	Deadline	Actual date
Publishing of results in international impacted magazines – 3 publications	C6	30/03/2015	*30/08/2015
Technical publications of project – monograph (in Slovak) and brochure (in English)	C6	30/06/2015	*30/07/2015

4.1.19 Other dissemination works

During the project running we actively present partial results of the project on various forums. In the period between the Progress report No. 1 and Mid-term report the following presentations were realized:

- Conference Enviro i forum (Technical University Zvolen, 14.-15. May, 2013),
- “Tuesday discussion with science” (Alumni club, Slovak Technical University, 2. April, 2013) based on special request for the presentation that is made only for the most reputable personalities from the scientific but also political community of the Slovak Republic. Both these presentations are available to download on the project website and the title pages are included in Annexes of this mid-term report (Annex 6.2.4).

4.1.20 Educational activities

The project has not directly in plan any educational activities included, nevertheless the project team members are very active and act in the field of education of students including:

- Secondary school - Medical High school, University of Pavol Jozef Šafárik, Košice (subject “Hygiene of the Environment”, lecturer Z. Dietzová),
- University (higher education) - Comenius University Bratislava (division of environmental geochemistry, subject – “Environmental Geochemistry 2”, lecturer S. Rapant, K. Fajčíková).

These educational activities are considered as output indicators (see table of output indicators attached in Annexes of this mid-term report).

In addition, we have started 1 Diploma thesis and 1 PhD thesis focused on the issue solved within the project (relationship between environmental and health data), in accordance with other planned activities within the project.

4.1.21 Completion of deliverables, milestones, significant indicators of progress and report foreseen

The completion of planned deliverables, milestones and indicator of progress and reports is reviewed in table form below. All planned issues were accomplished on time or earlier than set deadline.

Deliverables products of the project

Name of the Deliverable	Code of the associated action	Deadline	Actual date
Website– running	C2	1/12/2011	20/12/2011
Dataset of environmental indicators in numeric and map form	A1	30/05/2012	20/05/2012
Dataset of health indicators in numeric and map form	A2	30/04/2012	20/04/2012
Datasets of environmental and health indicators divided according to geological environment and contaminated areas in numeric form	A3	30/11/2012	25/11/2012
Optimized datasets of environmental indicators and health indicators in text form – tables	A4	30/05/2013	20/05/2013
Assessment of impact of geological environment on health status of inhabitants – short report	A5	30/07/2013	17/07/2013
Elaboration of limit values for environmental indicators, tables	A5	30/08/2013	
Compilation of environmental-health regionalization of the Slovak Republic (maps, tables, short text)	A5	30/12/2013	
Delineation and characteristics of areas with unfavorable health status of inhabitants, maps, tables, short text	A5	30/01/2014	
Proposal of measures for reduction of negative impact of geological environment on health status of residents, text report and factsheet	A6	30/06/2014	
Publishing of results in international impacted magazines – 3 publications	C6	30/03/2015	
Proposal of list of environmental and health indicators and limit values of environmental indicators for implementation into Slovak legislatives, tables, factsheet	A7	30/04/2015	
Technical publications of project – monograph (in Slovak) and brochure (in English)	C6	30/06/2015	
Layman´s report	C3	30/07/2015	
Final report	B1	30/10/2015	
Significant indicators of progress that should be included in “deliverables”			
Notice boards – displaying	C1	01/12/2011	30/11/2011

Milestones of the project

Name of the Milestone	Code of the associated action	Deadline	Actual date
Establishment of project management	B1	30/09/2011	20/09/2011
Establishment of Steering committee	B1	30/10/2011	20/10/2011
Purchase of 2 PC	A1	15/12/2011	10/01/2012
Completion of excerption of environmental data	A1	30/01/2012	15/01/2012
Completion of excerption of medical data	A2	28/02/2012	20/02/2012
Organization of workshop with international participation and agreement on methods of data elaboration	A3, A4	30/05/2012	30/05/2012
Selection of subcontractor for calculation of neural network and fuzzy cluster analysis	A4, A5	30/08/2012	
Linking of datasets on environmental and health indicators	A4	28/02/2013	
Organization of seminar (for Slovak participants)	C5	30/04/2015	
Organization of at least 10 informative meetings for public	A7	30/06/2015	
Organization of conference with international participation	C5	15/06/2015	
Organization of propagation seminar for administrative officers	C5	30/07/2015	
Project end	B1	30/08/2015	
Significant indicators of progress that should be included in „milestones“			
Press conference /Press release at the beginning of the project	C4	30/09/2011	20/08/2011
After – LIFE communication plan	B5	30/07/2015	
Audit	B3	30/09/2015	
Press conference at the end of the project	C4	30/09/2015	

Report foreseen

Type of report	Deadline	Actual date
Inception report	30/12/2011	15/12/2011
Progress report n° 1	30/10/2012	10/10/2012
Mid-term report	30/08/2013	10/08/2013
Progress report n° 2	30/10/2014	
Final report with payment request	30/10/2015	

4.2. Envisaged progress until next report.

We firmly believe that works on action **A4** (Linking of environmental and health indicators) will begin no later than in September 2013. In the case of delay the successful fulfilment of project objectives will not be met on time and we will have to ask European Commission for prolongation of the project end. If the works on action **A4** in September 2013 we will concentrate all personnel capacities of project team on running this action. The output of this action will be the identification of the impact of chemical elements on individual health indicators. Also we will define optimal, minimal necessary and maximal permissible concentrations of all chemical elements. Then we will be able to finalize the

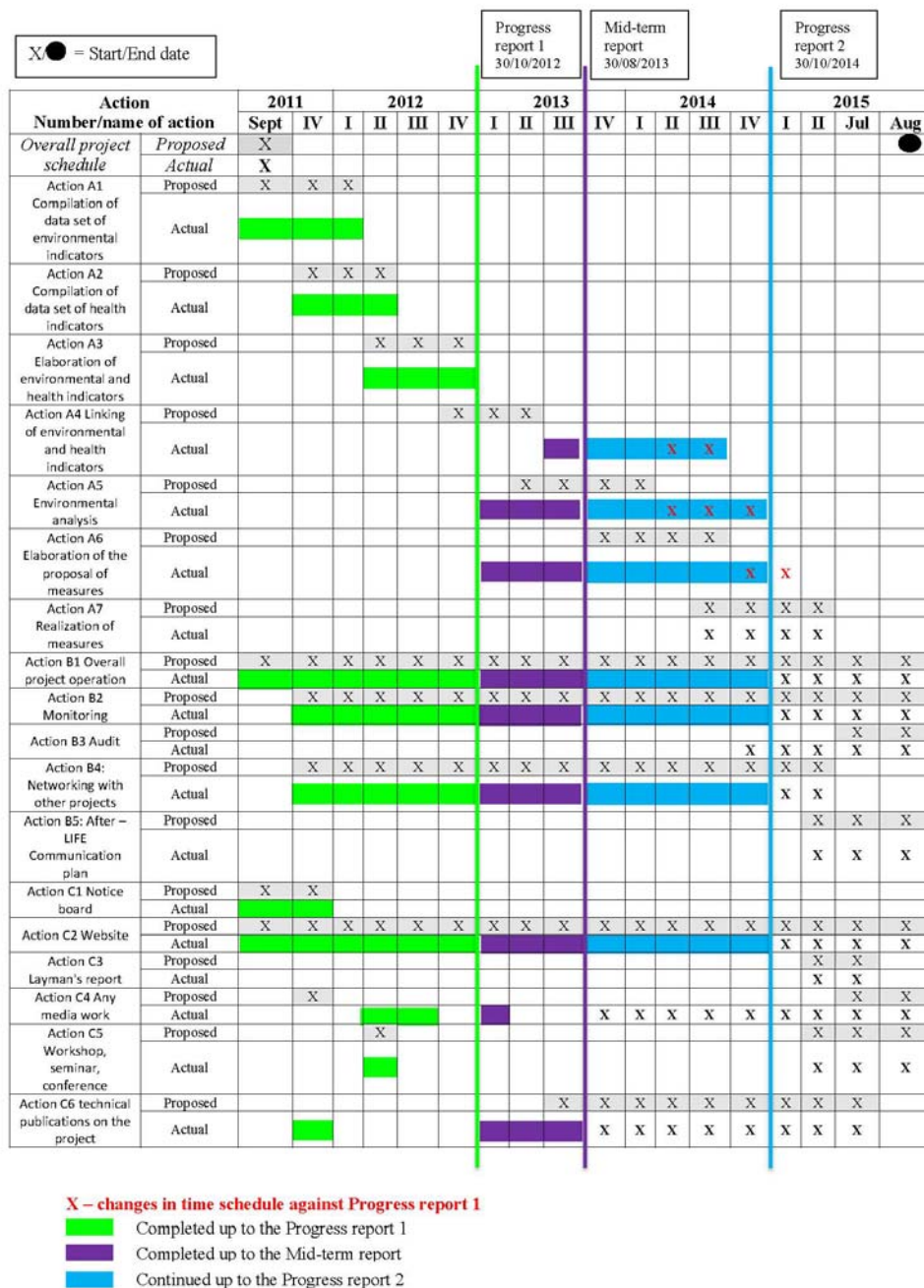
action **A5** (Environmental analysis) and **A6** (Elaboration of proposal of measures). We assume that these 3 actions will be finished in following terms:

A4 – up to 30/09/2014, **A5** – up to 30/11/2014, **A6** – up to 30/12/2014.

Simultaneously we will prepare realization of action **A7** (Realization of measures), mainly informative meetings for inhabitants.

In the case of delay of works on action **A4** (later than September 2013) we will immediately inform about the situation the European Commission and project monitor. Technical and personnel capacities on the project will be shifted to other running projects of ŠGÚDŠ. Limited capacities of members of project team will be concentrated on finalization of pre-prepared scientific articles.

Process of other works is reviewed in Gantt chart below.



4.3. Impact:

Project concept is based on following principles: first 3 years running and solving of technical (scientific) issues and last year after the completion of results their dissemination will follow. Then we will be able to evaluate project impact in objective manner.

Project impact can be expected from following reasons. Up to date in Slovakia there is missing relevant quantitative information on possible negative impacts of unfavourable geological environment on health status of residents except of significantly contaminated areas. Our project is based on realization of comprehensive identification of causes and possible negative effects of geological environment on health status of resident population. The realization of proposal of measures for minimizing of the impact of geological environment will be run in collaboration with not only administrative organs but also common inhabitants and mayors of concerned municipalities. Project impact can be expected and evaluated in 4 levels:

1. *Community of professionals / experts,*
2. *Media,*
3. *Administrative organs,*
4. *Inhabitants, mayors of municipalities.*

Impact on experts

We are observing the impact of our project on community of experts. We have already registered more than 20 requests, mainly from the foreign experts for publications and information on our project.

Impact on media

Media have shown interest in our project. 4 newspaper articles presenting current results of the project were published. Other articles are in progress. We were also addressed request for short session by two Slovak national televisions. They had information about our project from the project website. Also we have realized 1 radio session.

Impact on administrative organs

Administrative organs did not have interest in our project so far officially. Unofficially we were asked to discuss and present our results achieved within the project. The administrative organs but also the members of the *Steering committee* recommend us to present the project results in very restrained and gingerly manner towards media. After the realization of action **A4** (Linking of environmental and health indicators) and identification of those chemical elements that have the most significant impact on human health, we are prepared for publishing our results, mainly for medical community.

Impact on inhabitants, mayors of municipalities

We have registered big interest in our project by the inhabitants and mayors of municipalities. We have more than 6700 views of our project website from the very beginning of the project (20 months of website running) and we suppose that the majority was this group of persons concerned in project objectives and results. In addition, we have registered at least 150 requests by e-mail, post and phone for more detail information about the environment and health status of residents in their municipalities.

The review of various impacts (for the entire period of project running) according to individual objects of impact is summarized in table below.

Object of Impact		Type of impact	Status to 09/08/2013
Community of experts		Request for information on project, publications	20
Media	Newspaper	Newspaper articles	4
	Radio	Sessions	1
	Television	TV-shots	0
Administrative organs		Legislative proposals	0
Inhabitants, mayor of municipalities		Website information	> 6700
		Direct phone, post, e-mail requests	150

The presented impacts are included in “output indicators” specified in accordance with instructions of European Commission in section of annexes of mid-term report.

The main impact of the project GEOHEALTH will be the improvement of the health state of residents of the Slovak Republic through proposal and dissemination of measures necessary for elimination of the negative impact of the geological environment. These measures will be disseminated during the final stage of the project realization.

Indirect impact

The indirect impact that is not the direct output of our project can be considered the project dissemination based on ECOWEB – dynamic e-dissemination platform for EU research results through which we were given request for project propagation. This platform gives to our project eco-innovation potential and asks us to make available partial results of the project on the website www.ecoweb.info. We consider very useful this possibility for disseminate our project to public through this tool and we have accepted this request.

4.4. Outside LIFE

Presentation of project results by the team members on 29th SEGH conference held in Toulouse, France (July, 2013) was met with very positive response. Mainly the methods of compilation of dataset for health indicators and further use of this dataset for linking of environmental and health indicators were found to be very innovative. Based on the partial results of the project, project team GEOHEALTH is preparing new project of similar character in collaboration with other 5 EU countries and in years 2014 or 2015 will try to apply and register this project for financing as multi-national scientific project through 7th Framework Programme.

5. Financial part

5.1. Financial review by actions

During the 23 months of the project running (IX. 2011 – VII. 2013) 91,872.62 euros were spent so far. It is nearly 22 % from the projected final costs. This is conditioned by the fact, that the Action **A4** (Linking of environmental and health indicators) with planned end in 30.05.2013, was not started yet due to problems with public tender delay. About 23 % are allocated to this action from the total project budget. Since the results of this action are necessary for the running of further planned actions within the project we had to partially reduce the personnel capacities on the project (permanent employees are working

on other projects of ŠGÚDŠ). Since the public tender for mathematical – statistical part of this action was finalized and the subcontractor was selected we assume that after the approval of public tender by MŽP SR this action will start in September 2013. For this reason we do not assume any budget modification to be necessary.

Following table in action costs is filled in according to the project proposal.

Action number and name	Foreseen costs	Spent so far	Remaining	Projected final cost
Action 1 "A1"	13,976	12,770	1,206	13,976
Action 2 "A2"	6,936	6,242	694.0	6,936
Action 3 "A3"	17,486	17,486	0	17,486
Action 4 "A4"	94,406	1,000	94,406	94,406
Action 5 "A5"	39,232	7,219.4	32,012.60	39,232
Action 6 "A6"	19,692	7,467.6	12,224.40	19,692
Action 7 "A7"	69,870	0	69,870	69,870
Action 8 "B1"	20,790	10,022.21	10,767.79	20,790
Action 9 "B2"	6,380	1,980.8	4,399.20	6,380
Action 10 "B3"	6,000	0	6,000	6,000
Action 11 "B4"	24,106	10,050	14,056	24,106
Action 12 "B5"	0	0	0	0
Action 13 "C1"	2,861	2,096	765.0	2,861
Action 14 "C2"	7,760	5,620	2,140	7,760
Action 15 "C3"	3,103	0	3,103	3,103
Action 16 "C4"	1,003	254	749	1,003
Action 17 "C5"	29,435	1,493.5	27,941.5	29,435
Action 18 "C6"	27,876	2,201.12	25,674.88	27,876
TOTAL	390,912	85,902.63	305,009.37	390,912

5.2. Auditor Data

We provide the identification auditor data as requested although maximal LIFE+ contribution to our project does not exceed 300.000 € (but the external audit is set by the project). We attach the official registration number, organisation, name and address of the auditor in the section of annexes - financial part of this mid-term report (Annex 6.5). The final selection of auditor will be the object of public tender in 2014 in accordance with the project schedule.

CHECKLIST MID-TERM REPORT

ITEM	MID TERM REPORT
Technical Report (including annexes) Electronic format and paper number of copies:	1 to the Commission 1 to the Mon. Team
	-
Financial Report (Use BASE/ Standard Statement of Expenditure and Income): check list of forms below number of copies – 1 set of originals signed and stamped for the Commission:	1 to the Commission 1 to the Mon Team
Standard statement of expenditures and income (Cover Note) – Signed	Yes
Coordinating beneficiary’s Certificate	Yes
Project consolidated statement of expenditure	Coordinating Beneficiary
Project Statement of Income (Finance Plan)	Coordinating Beneficiary
Associated beneficiary statement of expenditure to be completed by all beneficiaries (coordinating beneficiary and associated beneficiaries)	To be provided by all beneficiaries (coordinating beneficiary and associated beneficiaries)
LIFE Form F1 – Direct Personnel Costs	To be provided by all beneficiaries (coordinating beneficiary and associated beneficiaries)
LIFE Form F2 - Travel and subsistence Costs	To be provided by all beneficiaries (coordinating beneficiary and associated beneficiaries)
LIFE Form F3 - External Assistance Costs	To be provided by all beneficiaries (coordinating beneficiary and associated beneficiaries)
LIFE Form F4.a – Infrastructure Costs	To be provided by all beneficiaries (coordinating beneficiary and associated beneficiaries)
LIFE Form F4.b – Equipment Costs	To be provided by all beneficiaries (coordinating beneficiary and associated beneficiaries)
LIFE Form F4.c – Prototype Costs	To be provided by all beneficiaries (coordinating beneficiary and associated beneficiaries)
LIFE Form F5 - Land Purchase or long term lease of land / use rights (ONLY FOR LIFE NATURE)	To be provided by all beneficiaries (coordinating beneficiary and associated beneficiaries)
LIFE Form F6 – Consumables	To be provided by all beneficiaries (coordinating beneficiary and associated beneficiaries)
LIFE Form F7 – Other Costs	To be provided by all beneficiaries (coordinating beneficiary and associated beneficiaries)
Justification over/under spending >10%	yes
Auditor Data provided	yes