



MONITORING PROTOCOL UNDER PROJECT

LIFE20 ENV/BG/001042

**“Process water treatment unit for better
river basin management”**

LIFEWATEROIL

A small blue icon of a water droplet falling into a pool of water, creating ripples.

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Index

1. INTRODUCTION

1.1 Project Summary

1.2. Scope of the document

2. DELIVERABLES PRODUCTION AND REVIEW

3. ENSURING CONTINUITY OF THE MONITORING PROCESS

4. RISK MANAGEMENT

5. QUALITY CONTROL LEVELS

6. COMMUNICATION FRAMEWORK



Chapter 1. Introduction

1.1 Project Summary

Operating in the Black Sea district, LUKOIL Neftohim Burgas JSC (LNB) is dependent on the freshwater resources of the Mandra Dam. The local wastewater treatment facility enables the site to meet the requirements for wastewater discharges in line with the Integrated Pollution Prevention and Control permit. Over the coming years, however, the EU regulatory framework will introduce stricter standards, creating a risk of non-compliance with discharge and odour limits. Currently, LNB does not have the technological ability to improve the facility's operations.

The LIVE WATEROIL project aims to demonstrate a sustainable water treatment approach of relevance to high water-demanding industries. The goal is to decrease the emission of pollutants in water and air and improve the ecological condition of the Mandra-Poda water basin through exploitation of alternative water sources and the application of a more effective wastewater processing technology. Furthermore, the project aims to show the viability of substituting fresh water with treated water.

Specifically, the project aims to:

Introduce and optimise a novel integrated concept for alternative water supply, pertinent to the crude oil desalting stage, through establishing conditions for recirculation and reuse of stripped water;

- Optimise and demonstrate the feasibility of a new wastewater treatment process based on the (i) application of enzyme-microbiological bioactivators to degrade and neutralise compounds (H₂S, mercaptans, dissolved hydrocarbons) and the (ii) establishment of closed environment for transportation of sulphide-containing wastewaters through construction of a closed pipeline, which will replace the existing non-hermetic scheme;
- Ensure better oxygen uptake and more effective processing in the WWTP of the compounds that were not evaporated from the wastewater stream through reconstruction of the biobasins aeration system;
- Encourage the replication of the project solution and its application in other refineries and other sectors such as pulp production, waste treatment and chemicals.

The project supports the implementation of Water Framework Directive at the pilot location and will provide recommendations for the third cycle of national WFD reporting and the drawing up of river basin management plans for Bulgaria. It also contributes to the EU Refining



of Mineral Oil and Gas Best Available Techniques Reference document, along with the implementation of the 2030 Biodiversity Strategy, the Birds Directive and the Habitats Directive.

1.2. Project beneficiaries

Name	Type	Country	Role in the project
LUKOIL Neftohim Burgas	Coordinator	Bulgaria	<p>LUKOIL Neftohim Burgas JSC (“LNB”) is an oil refining enterprise located in South-Eastern Europe on the Balkan peninsula (15 km from Burgas). It is part of the Lukoil Group, one of the world’s largest international vertically integrated oil and gas companies with businesses located in over 30 countries worldwide. LNB is the major supplier of fuels for the domestic market and is the only Bulgarian enterprise that is among the ten best performing companies in Southeast Europe in terms of turnover - it ranks fifth in the TOP 100 SEE for 2019.</p> <p>The general objective of LIVE WATEROIL is to demonstrate a sustainable water treatment approach of relevance to high water-demanding industries. The ultimate aim is to decrease emission of pollutants on the refinery’s site and to and improve the ecological condition of the Mandra – Poda water basin through exploitation of alternative water sources and application of a more effective wastewater processing technology.</p>
Eurovix S.p.A, Italy	Participant	Italy	<p>EUROVIX Spa is a leading research organization with wide international partnership network, covering universities, public authorities and industry representatives. Its focus on studies to design, test and develop innovative products and technologies allow the company to be an international benchmark in the field of applied biotechnology. The experience of the entity’s team regarding treatment of highly saturated wastewater streams is considerable and as a result of the conducted tests, trials and assessments, promising results regarding the technical feasibility of the solution have been obtained.</p> <p>In the framework of the project, their involvement will be focused on the formulation of the biologically active reagents, effectively destroying the S-C and S-H bonds and eliminating odours into the ambient air, as well as support when it comes to development, testing and application of the new process.</p>



University "Prof. Dr. Asen Zlatarov" - Burgas, Faculty of Technical Sciences	Participant	Bulgaria	<p>FTS is one of our long-standing partners as during the years we have participated through joint actions in the improvement of the Bulgarian industrial legislation in terms of its better compliance with the EU environmental priorities. It possess extensive experience with some of the major technological and environmental aspects of the treatment process therefore will support us when it comes to development of integrated monitoring mechanism, process validation, environmental impact and toxicity assessment.</p>
Municipality of Burgas)	Participant	Bulgaria	<p>BM is the biggest municipality in South-eastern Bulgaria. BM will be responsible for odour and air quality monitoring as they have necessary expertise to detect and reliably assess the spread and concentration of harmful emissions, which would be utilized for the monitoring of the ambient air quality. BM possesses specific knowledge regarding the major policy issues/deficits in dealing with environmental threats, as well as the relative authority as a public entity to influence them. When it comes to public authorities, their role in the project is of great importance since they can act as a catalyst for change, both at legislative and practical level. BM as associated beneficiary brings substantial added value to the project, as it could act as intermediary between LNB and the identified public institutions (other municipalities, ministries, agencies, inspections, etc.), as well as to enhance the trust among industry representatives and the general public towards the developed solution. We are going to work closely with the municipal experts in order to disseminate the project objectives and results, which could be replicated in other regions and transferred to different industries, specific to the local context.</p>

1.2. Scope of the document

The current Monitoring Protocol is going to serve as a reference point when it comes to general rules regarding follow-up of project results, reporting and their communication. It would be continually edited and updated (“living document”), thus reflecting the latest project developments.



The information included has been subject to continuous discussions and demonstrates the agreement between the beneficiaries in regard to deliverables production and review, continuity of the monitoring process, risk management, quality control, communication framework, etc.

The document directly interrelates with other strategic papers (Impact Report, Detailed Work Plan, Report on the intervention scope parameters, Baseline Analysis and others), providing concrete framework for the proper implementation and communication of the assignments under the different WPs.

Throughout the project duration, the Monitoring Protocol and its provisions could be amended - consensus of the designated experts, representing the project beneficiaries is required, and further advanced with view to adequately follow the implementation progress, the encountered issues and the faced constraints.

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DELIVERABLES PRODUCTION AND REVIEW

A structured process for creation and review of deliverables was decided at the Kick-off Meeting (Burgas, 29.10.2021) and is described below:

Definition of responsibilities

1. The Work Package Leader (“WPL”) is responsible for implementation of respective deliverable;
2. The WPL appoints the DVL Contributors (all partners active in the Task/WP);
3. The Steering Committee appoints at least 1 DVL Reviewer (person from any partner institution; ideally without own direct strong contribution to the DVL);

Process for Deliverables Review

→ The timeframe for the implementation of the deliverable is being defined, taking into account the provisions of the Grant Agreement, but also considering the latest project developments, the internal and external factors, relevant to the tasks, as well as the expected risks and constraint, correspondent to the assignment’s complexities and the specific context for its production. Selection of WP Leaders, Contributors and Reviewers. **Responsible parties:** PM, project coordinators, horizontal experts.

→ Elaboration of simplified yet comprehensive checklists with key requisites for each deliverable. **Responsible parties:** WP Leaders, TWG, horizontal experts.

→ Regular meetings of the parties, involved in the implementation process. Disseminating information and data of high importance for the deliverable and the tasks, associated with its realization with direct or ancillary influence. **Responsible parties for the organisation of the meetings:** WP Leaders, LNB project coordinator

→ Provision of Table of contents (ToC) if applicable or summary of progress achieved, issues encountered, probability of divergences **minimum 60 days prior to deliverable end date** or, alternatively, decision on individual time span depending on the type of the product to-be-produced, its strategic importance and interrelation to the overall project timeline. **Responsible parties:** PM, WP Leaders, horizontal experts.

→ Updated DVL sent to the PM, incorporated in the project dossier and disseminated among the relevant parties through notification e-mail.

In addition, the following quality standards would be applied to documental outputs: evidence-based approach; clearly defined rationale, objectives and methodology; maintenance of internal logical sequence; proposed measures are correspondent to the identified issues and possess the capacity to enable positive change.

ENSURING CONTINUITY OF THE MONITORING PROCESS

To ensure **continuity of the implementation**, we have assigned teams of experts to the **deliverables/milestones**, responsible for guiding the process towards their achievement (methodologies, instruments, engagement of relevant parties, dissemination frameworks, quality control, etc.) and supervise the generated effect. Below are summarized the main outputs and the people, accountable for their realization.

Main deliverables and milestones

Deliverable/ Milestone Name and WP	Justification of importance	Due Date according to project timeline	Assigned teams
D: Report on the intervention scope parameters, A 1	Key data for determination of the intervention points and treatment plan, as well as the selection and development of bioactivators by Eurovix	30/12/2021	Lead: Gabriele Gagliardi Supporting: Nicola Secchi Alessandro Pezzucchi Yuliya Gesheva Petya Dimova Husein Yemendjiev
M: Provided financial support to local NGO, D3	As a results of the provided support to the Bulgarian Society for Protection of Birds, the awareness and interest of the citizens of the region (special focus on young people) towards environmental protection and preservation of the natural resources would be tangibly strengthened.	31/01/2022	Lead: Natalia Dimitrova Supporting: Borislav Stanchev Kostadin Simeonov
D: Methodology for identification of the malodours intensity, sources and impact on citizens of Burgas Municipality, A 2	The results are going to support LNB and Burgas municipality in the implementation of a more efficient approaches and techniques for malodours identification and prevention. The end-goal would be the normative definition of the methodology and its application as a standardized practice at municipal level.	16/04/2022	Lead: Petar Bachvarov Supporting: Yuliya Gesheva Petya Dimova Husein Yemendjiev
M: Operational pipeline for wastewater from desalters from Treatment facility to WWTP, B2	Needed in order to substitute the scheme in place for gravitational transportation of sulfide-containing	30/12/2022	Lead: Zhelyazko Yovchev Supporting: Georgi Stoyanov Nacho Nachev Anton Popov

	Wastewaters (non-hermetic; substantial source of risk for emissions into ambient air with negative impact on process safety)		Stanislav Atanasov
M: Operational pipeline system for re-use of stripped water, B3	Providing relevant conditions for actual reuse of stripped water from Section 90 of KPTO complex.	30/12/2022	Lead: Zhelyazko Yovchev Supporting: Georgi Stoyanov Nacho Nachev Anton Popov Stanislav Atanasov
D: Report on the experimental application of the new methodology for odour assessment and prevention, B 5	Would allow pro-active approach for an effective reducing of the situations in which unpleasant odours are generated. Principal point of relevance in defining prospective measures.	01/05/2023	Lead: Petar Bachvarov Supporting: Yuliya Gesheva Petya Dimova Radostina Karadjova Husein Yemendjiev
M: Reconstructed and operational aeration system, B4	Reduction of the energy consumption with at least 50 %, while increasing the oxygen content of wastewaters with 30% through realization of progressive fine-bubble pneumatic aeration.	30/05/2023	Lead: Ivan Georgiev Supporting: Michail Ivanov Nikolay Kerensky Plamen Bogdanov Plamen Ivanov Anton Popov Stanislav Atanasov
M: Start of the core monitoring process of the biodiversity parameters, C3	For evaluating the potential of the project actions on biodiversity, a monitoring program focused on status (prior to project activities, during the project duration and after its completion) will be implemented. Key parameters will be zoo-benthos, plankton and fish species, since these organisms are the backbone of the feed chain in the Poda ecosystem.	31/08/2023	Lead: Veselin Valchanov Supporting: Ivailo Dimchev Asparuh Ranov Ivailo Burzilov
M: Start of the core monitoring process of the project actions, C2	Measure the effectivity of the proposed activities and quantify their contribution to the LIFE Programme	31/08/2023	Lead: Petar Bachvarov Supporting: Yuliya Gesheva Asparuh Ranov Ivan Georgiev Petya Dimova Georgi Valkanov Husein Yemendjiev Gabriele Gagliardi
D: Proven operational readiness of the system	Upon the successful completion of actions B1-B4, full - scale implementation of the wastewater treatment system would be reached, which provide	31/08/2023	Lead: Ivan Georgiev Supporting: Zhelyazko Yovchev Georgi Stoyanov Mihail Ivanov

(actions B1-B4) - completed tests, trials and adjustments, B 5	ground for exhibition of multiple operational and environmental impacts.		Nikolay Kerensky Petar Bachvarov Anton Popov Yuliya Gesheva Asparuh Ranov Nicola Secchi Gabriele Gagliardi Giovanni Carminati Alessandro Pezzucchi Petya Dimova Ivailo Burzilov
M: Established conditions for the commercialization of the project solution, B6	Structuring the scope, concrete parameters and financial aspects of the commercialization process	01/02/2024	Lead: Svetoslav Minkov Supporting: Borislav Stanchev Kostadin Simeonov. Nevena Petkova Gabriele Gagliardi Petya Dimova Yoana Angelova
D: Life-Cycle Report, C5	Evaluation of the environmental implications of the technological solution.	31/07/2024	Lead: Petar Bachvarov Supporting: Yuliya Gesheva

Every member of the operational team has her/his own strategic importance and any change in the team composition can impact the project developments and the achievement of the pre-defined outputs negatively.

Nevertheless, our access to top expertise allows us to react quickly and effectively when a replacement is needed. In the replacement timespan, backup is ensured by our Project Manager and by our technical staff. To minimize impact, we will implement the following [turnover plan](#):

Impact assessment

The PM and Backstopper (Yordan Tenev) will conduct an analysis of the impact the missing team member inflicts on the quality of the services considering the duration of its absence and the position occupied. In any case, the Task Manager will be notified within maximum 3 days since taking notice of the absence.

Reallocation of roles and responsibilities

Assuming absence of a team member, the PM will reallocate responsibilities among the other team members to minimise the impact of her/his absence. In case of a change in the team composition, the allocated responsibilities will be fine-tuned until the proper induction of a replacement is completed.



Search and identification of new expert team member

Firstly, the PM will identify the suitable replacement among the backup profiles pre-selected in the proposal preparation and consult with the consortium partners. In case of availability of the backup expert, the position will be filled in. Presupposing that suitable backup persons are not available, based on the experience of LNB, one or more replacements can be proposed for validation in 20-30 days and the mobilisation of the selected expert can be completed upon 10 days after the validation.

Induction training

The selected expert will be included in the Technical Team and introduced to the Task Manager. The new team member will be trained and provided with an introduction to the project (objectives, scope, processes and impact) offering descriptive information as well as access to relevant documentation regarding their role and the quality procedures. The project team will assist the new team member in its integration.

Formal replacement

The Baskstopper will update all project documents and the PM will communicate with the Task Manager the new expert and the position occupied.

Shadowing of tasks

In the case of planned replacements, a period takes place during which the replacement staff 'shadows' the tasks of the outgoing staff to acquire a thorough understanding and acquaintance with all tasks to be undertaken

RISK MANAGEMENT

The management team will be responsible for the development, application and monitoring of the risk management strategy regarding the project results, deliverables and milestones. When probabilities of unsound implementation of a single aspect and/or a specific combination of potentially unfavourable circumstances arise, they would be categorized depending on their type, magnitude and impact in due course and subsequently assigned to a team member(s), who will carry the responsibility to monitor their development and propose appropriate response measures to reduce negative effects. Beside the regular discussions, ad hoc meetings are also envisioned, which could also include representatives of the stakeholders if deemed necessary.

An internal risk register would be elaborated, which would be consistently updated and accessible by the team members with view to establishment of a coherent and orderly perspective towards the developments of the project so that negative spillover effects, intrinsic to the tasks due to their interrelation, would be controlled and adequately mitigated.

In the table below, we have summarized the initially identified risks, which would be further streamlined and expanded in the course of the project.

Potential Risk	Likelihood	Description	Mitigating and Recovery Plan
Disturbed continuity of the monitoring process	High	Possible deficiencies/discrepancies /delays in the implementation of the deliverables due to unavailability of key personnel, which is acutely exacerbated in terms of the COVID- 19 pandemic.	Preliminary Turnover Plan Developed (to-be continuously refined during the project). Established internal communicational framework with proven validity to complex projects with larger teams. Backups for all key project positions have been identified during the preparation phase and can be mobilised at a short notice.
Misinterpretation of the assignment	Medium	Misinterpretations/ lack of sufficient understanding towards the essence, scope and particular needs, defining the rationale behind the deliverables could compromise the implementation and result in impaired cooperation framework, respectively – noncompliance with the objectives of the contract and practical execution of limited substance and value.	LNB and the project beneficiaries possess a considerable experience with implementing projects of similar type/range. However, our approach has been refined in accordance with robust analysis, independent research and active consultation process with experts who, as part of the daily operations of the intervention sites, possess first-hand knowledge and proven capabilities to explore matters in systematic manner.
Scope deviations	Medium	It is possible that the actions deviate from their original purpose and the engagement parameters cannot meet the pursued technical goals.	Relevant project documents (baseline analysis, impact report, detailed work plan, etc.) would be elaborated, reconfirming the nature and scope of the work to be undertaken, as well as the responsible parties. Any amendments to the scope will be agreed and signed off as a revision to the respective strategic paper.
Complexity of datasets		There is a risk that analysis of data needed	Project team with prior experience of the same data

		<p>to define the 'as-is' situation in the participating entities and to compile 'to-be' narrative would take longer than expected due to the complexity of the datasets.</p>	<p>sets and the expert knowledge and skills to extract and work with the relevant data. Should the data analysis take longer, we will discuss the impact on relevant deadlines and whether to implement a recovery plan in the form of timeline modification or bringing in additional resources.</p>
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QUALITY CONTROL LEVELS

The **first level of quality control** will be performed by the Leading Experts assigned to the main deliverables/group of deliverables. They will support the PM in performing the quality assurance. They will work in close cooperation with the Work-Package Leaders (if different), who, for their part, would supervise the work performed in the work packages, report on the work progress and assure the flow of information to the other WPs.

The PM and the coordinator's sound thematic knowledge will guarantee that the minimum technical quality standards are met in every deliverable produced by experts, as a **second level quality control**. Moreover, all members of the PM team count with hands-on-experience in EU methodological procedures, which will also ensure that all products follow the agreed guidelines and reports are well structured and contain all relevant elements. **The horizontal experts** (legal, environmental, procedure control expert, etc.) would also play a vital role through provision of expert opinions, guidance and recommendations for strengthening the plausibility and appropriateness of the methodological framework, as well as the practical value of the specific approaches thus maximizing impacts and ensuring greater validity/uptake potential of the outputs.

Other contributors:

- The Steering Committee ("SC") will be responsible for the monitoring of the project progress and will provide counselling when it comes to meeting the set goals and timeframe. Its members will also approve changes related to the project scope and budget, manage conflict resolution and proper risk governance. They will meet 2 times per year or upon necessity.
- The members of the Technical Working Groups ("TWG") will meet at regular intervals - at least 4 times per year (online/live), however the intensity of the meetings could be increased depending on the concrete tasks to be completed and the specific needs of the project. Their role will be to discuss, identify and solve technical issues, evaluate necessities for technical modifications, assess and approve the final technical results, etc.

COMMUNICATION FRAMEWORK



In order to ensure regular, timely and accurate reporting of the progress in the implementation and the results of the planned activities, a dedicated mechanism for monitoring and internal evaluation will be established by the PM. The monitoring will be carried out constantly, and the evaluation will be periodic and built upon the following indicators:

- Agreed steps, approaches and methods for implementation of the contract;
- Held meetings and consultations with the partners and stakeholders' representatives;
- Interaction with NEEMO EEIG and CINEA and received feedback;
- Compliance of the final products with the requirements specified in the Grant Agreement and its annexes;

Measures to overcome possible delays: allocating more man-days to key experts if necessary; coordination of draft variants of the products under the WPs in order to allow implementation under subsequent activities while the official approval of the final products is underway; parallel implementation of sub-activities according to the presented time schedule; strict adherence to the agreed time schedule.

The project coordinator and beneficiaries will use **an interactive model of communication**, including the processes of interaction and feedback through the use of various communication channels and feedback mechanisms - official correspondence, e-mail, fax, telephone, skype and others; organizing meetings (live and through online platforms) to discuss the implementation of activities and current problems and issues.

A standardized procedure for collection of data will be set in order to guarantee a stable flow of functional information, sufficient for the assessment of the achieved effect regarding each project indicator. It would ensure that:

- There is a single storage place of all the information and know-how;
- Overlapping and redundancy are eliminated;
- The smooth document flow is ensured;
- All experts are informed about the development in other parts of the project;
- The PM has the access to all on-going work online and in case of doubts/deviations can act immediately;
- Real-time progress can be evaluated;
- Support from other experts might be put in place when needed;

Main contents, subject to progressive dissemination:

Contractual information, logistical information (dates, travels, etc.), administrative information (contracts, working days, etc.), financial information (cost control, invoicing, etc.): nurtured / updated by the PM, the financial unit and the horizontal experts.

Technical information on the execution and achievement of Project tasks and deliverables, against set deadlines, milestones and qualitative criteria (also representing a detailed checklist



of project “to-does” to achieve expected results and desired quality): nurtured / updated by the Project Manager with the support of the Task Leaders and the horizontal experts.

Strategic information, with particular concern to KPIs (key dimensions of our technical performance, including quality, timeliness, etc.) and Change Indicators (=key dimensions of our strategic achievements vis-à-vis the contractually set objectives): nurtured, updated and regularly checked by the Project Manager, Coordinators, TWG members.

LNB, Burgas Municipality, Eurovix and FTS would be the beneficiaries, responsible for the coordination, implementation and analysis of the impact monitoring programme and tools, designed in accordance with the particularity of each monitored field: wastewater (FTS/Eurovix), air quality (BM/FTS), biodiversity (LNB, biodiversity expert) and resource effectivity (LNB).

The experts, involved in the process **will communicate the results directly and regularly to the project manager and the coordinators**. In this way they would be able to address timely any flows identified during development and monitoring process e.g. through propositions for modifications, which if major, would have to be then approved by the Steering Committee.

Furthermore, the monitoring process will be explained and formalized in a document which would summarize all the crucial stages for the correct usage and implementation of the monitoring system. It would also set some key principles and standards to be reflected during the analysis of the obtained results. The report will be drafted in the initial stages of the project with the involvement of all beneficiaries and each would be able to put forward suggestions in line with its expertise and specific role in the project.

The consistent monitoring of the project impact would allow the project management team either to confirm the adequacy of the developed means for addressing the specific problems and threats or to question these means and alternatively develop new ones.