# ENVIRONMENTAL MANAGEMENT AND MONITORING EFFORTS (UKL-UPL) FOR OIL AND GAS SECTOR

by
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## I. INTRODUCTION

Environmental monitoring is an integrated activity of the environmental management in general. Normally, any activity or industry has a written environmental management program called Environmental Management Plan or *Rencana Pengelolaan Lingkungan* (RKL). This document that has to be legalized or approved by the government describes an environmental management program that shall be implemented by the industry following the establishment of a project. Eventually, success of the RKL implementation can be monitored through environmental monitoring program that has been described in a document defined as Environmental Monitoring Plan or *Rencana Pemantauan Lingkungan* (RPL). Both RKL and RPL are the environmental management system planning documents that are established following the environmental impact assessment (EIA) or AMDAL (*Analisis Mengenai Dampak Lingkungan*) study for a new project. Regulation regarding with the compulsory for conducting AMDAL is defined in the Government Regulation (*Peraturan Pemerintah,* PP) No. 29/1986, which is then revised by PP No. 51/1993, and finally by PP. No. 27/1999 [1-3].

Many questions are launched by the oil and gas industries in Indonesia, since these industries have been started their activity long before the AMDAL regulation being put into effect. Moreover, the recent ministerial decree[4] (Ministerial Decree of Environment No. 17/2001) describing the scale limit of the project that has to be preceded by AMDAL study has added confusion to the oil and gas industries. This is not surprising since many of the contracting parties for oil and gas industries in Indonesia have handed over their concession area of oil and gas fields to other parties. The new contracting parties have some difficulties in interpreting the regulations, especially when they intend to develop their contracting area. Shall they conduct EIA/AMDAL study or just Environmental Management and Monitoring Efforts (*Upaya Pengelolaan Lingkungan dan Upaya Pemantauan Lingkungan*, UKL-UPL) before implementing the activities?

In order to give information especially to the new contracting companies of oil and gas exploration and production those who have bought the concession from the previous companies, the author eager to write this paper describing environmental study that shall be conducted prior the implementation of a new project. Mechanism for requesting a government permit is also included in this paper focusing on upstream activity.

## II. ENVIRONMENTAL IMPACT STUDY FOR OIL AND GAS ACTIVITY

Any human activity will induce an environmental impact in some extent. Whether it will result a postive or negative impact to the environment, it depends on type, scale, and duration of the activity. Beside of the internal factors of the activity, environmental impacts are also influenced by the environment surrounding the activity. Two similar activities or project will certainly induce different environmental impacts when the environments surrounding the project are different. It is, therefore, impact scales are defined differently according to the activity and the project environment. In the regulation established by the government of Indonesia (PP. No. 27/1999) environmental impact is defined according to the extent and significant of impacts. The regulation states the type of activity that will induce environmental impact in term of extent and significant impacts as: (i) deformation of land and nature, (ii) natural resource exploitation, either sustainable or not, (iii) processes or activities that potentially result lavishness, pollution and environmental damage, and declining natural resources during their uses, (iv) processes or activities that the products can influence natural, man-made, and socio-cultural environment, (v) processes and activities that the products can influence the preservation of natural resource area and/or

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the protection of cultural preserve, (vi) introduction of certain plants, animals, and microorganisms, (vii) manufacturing or application of biological or non-biological substances, (viii) technology application that is predicted having potential influence to the environment, and (ix) activities having high risk and/or influencing defense of the state.

In order to clasify these impacts, the regulation describes guidance for criteria of the impacts as: (i) number of people impacted, (ii) area of the impact spreading, (iii) intensity and duration of impacts, (iv) number of environmental component impacted, (v) properties of the impact cumulative, and (vi) reversibility or irreversibility of impacts.

Oil and gas sector will - regarding to the extent of concession area, type of activities and industrial processes, as well as factors described in the PP mentioned above - certainly induce significant environmental impacts. The oil and gas industry that has obtained a concession area, therefore, shall conduct an environmental impact study before performing the exploration and exploitation activity for their area.

Such environmental impacts, for example, land opening involving forest cutting during pre-production phase will induce an impact to fauna and flora of the area. During production phase, waste diposal such as produce water and oily sludge disposal, will create environmental problems if not managed properly. It is also noted that during the post-production phase, such as closuring of an abonden well, will also arise an environmental impact.

Several matters mentioned above are some impacts of the oil and gas activity to the environment. The impacts shall be managed accordingly in order to minimize or even eliminate negative impacts and favor positive impacts. These impacts can be predicted and managed through EIA/AMDAL study. This study is normally preceded by sumbission of Term of Referrence (*Kerangka Acuan*, KA) to the government describing the project activities that will be conducted. After the KA has been approved by the government, the proponent then performs EIA/AMDAL study that consist of environmental impact analysis (*Analisis Dampak Lingkungan*, ANDAL), environmental management plan (*Rencana Pengelolaan Lingkungan*, RKL), and environmental monitoring plan (*Rencana Pemantauan Lingkungan*, RPL).

Type of projects for oil and gas sector that shall be completed with the environmental impact study is presented in Table 1. This provision is extracted from the Ministerial Decree (KEPMEN) of Environment No. 17/2001 entitled: "Type of Effort and/or Activities that should be completed with EIA ("*Jenis Rencana Usaha dan/atau Kegiatan yang wajib dilengkapi dengan AMDAL*"). This KEPMEN is issued as an implementation guidance following the establishment of the Government Regulation (*Peraturan Pemerintah*), PP.27/1999, describing Environmental Impact Assessment (*Analisis Mengenai Dampak Lingkungan*).

Oil and gas activity, especially during exploration and development phase, is very dynamic. In order to maximally exploite the oil reservoir, new well has to be drilled. Field developments is also a normal activities that are performed by oil and gas industries. These activities will also induce environmental impacts in some extent. Should they perfomed EIA/AMDAL study each time they implement such activity within their concession area.

Actually, every activity, either small or large scale, shall be preceded by environmental study because the activity would pose environmental impacts. Environmental impacts that are less extensive, generally defined as not potential and not significant in properties, are not necesserally studied through EIA/AMDAL. Furthermore, as far as the project scale does not exceed the project scale limit as stated in KEPMEN No. 17/2001, industry does not oblige to conduct EIA/AMDAL study. For such cases, Indonesian government has provided regulation concerning environmental study through UKL-UPL (Environmental Management and Monitoring Efforts, *Upaya Pengelolaan Lingkungan-Upaya Pemantauan Lingkungan*) rather than EIA/AMDAL study.

## III. ENVIRONMENTAL MANAGEMENT AND MONITORING EFFORT (UKL/UPL)

UKL-UPL is an Environmental Management and Monitoring Efforts Document written by the industry and approved by the government describing the environmental management and monitoring program that shall be conducted by the industry before, during and after implementing the proposed activity. This approved document, likewise EIA/AMDAL documents, is a prerequirement for getting the permit before conducting the project. It should be noted, however, UKL-UPL is not a part of EIA/AMDAL.

Why shall industry conduct UKL-UPL rather than EIA-AMDAL study? UKL-UPL differs from EIA/

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**Table 1**
**Type of activities that should be completed with EIA in oil and gas sector**

| No | Type of Activities | Scale of Activities | Scientific Reasonings |
|---|---|---|---|
| 1 | Oil and gas exploitation and on-shore production development | | |
| | a. Oil field | =5,000 BOPD | - Potentially induce hazardous wastes from drilling mud<br>- Potentially produce explosions<br>- Air, water and soil pollution<br>- Ecosystem damage<br>- Economic consideration |
| | b. Gas field | = 30 MMSCFD | - Potentially induce hazardous wastes from drilling mud<br>- Potentially produce explosions<br>- Air, water and soil pollution<br>- Economic consideration |
| 2 | Oil and gas exploitation and off-shore production development | All scales | - Potentially induce hazardous wastes from drilling muds<br>- Potentially produce explosions<br>- Air, water and soil pollution<br>- Ocean ecosystem damage<br>- Economic consideration |
| 3 | Oil and gas transmission (not including field piping)<br>a. On-shore<br>- Length<br>- Or pipe diameter | = 50 km<br>= 20 inches | - Fairly large of land clearance (could be border crossing of town or regency<br>- Construction phase could induce land erosion<br>- Potentially clear away public activity<br>- Could be dangerous if passing through public settlements due to high operational pressure of piping |
| | b. Off-shore | All scales | - Use of area that overlap with fisheries, fairly large area that could be border crossing of town or regency, and could disturb fisherman activity<br>- Construction phase could influence sensitive area<br>- Piping operation could be impacted by sand mining and cast anchoring<br>- Could be dangerous to fisherman activity, sand mining and ship's channel due to high operational pressure of piping |
| 4 | LPG and LNG Refinery building<br>- LPG<br>- LNG | <br>= 50 MMSCFD<br>= 550 MMSFD | - Potentially induce social conflict<br>- Strategic industry<br>- Potentially induce impact due to special supporting means<br>- Use of raw materials that potentially produce secondary waste<br>- Use of large area<br>- Especially LNG, potentially produce H2S waste |
| 5 | Petroleum Refinery Establish-ment | = 10,000 BOPD | - Potentially induce social conflict<br>- Strategic industry<br>- Potentially induce impact due to special supporting means<br>- Use of raw materials that potentially produce secondary waste<br>- Potentially produce very large of gas, solid and liquid wastes<br>- Potentially influence geo-hydrology<br>- Potentially change ecosystem produce H2S waste |
| 6 | Used Oil Refinery | = 10,000 ton/year | - Potentially induce social conflict<br>- Strategic industry<br>- Potentially induce impact due to special supporting means<br>- Use of raw materials that potentially produce secondary waste<br>- Potentially produce very large of gas, solid and liquid wastes<br>- Use of large area<br>- Potentially influence geo-hydrology |

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AMDAL in term of impacts that are less significant for the following criteria: (i) number of populations that might be impacted by the activity, (ii) total area of the environmental impact, (iii) Intensity and duration of the impact, (iv) number of the environmental components impacted, (v) impact accumulation, and (vi) reversible or irreversible of the impacts. Regarding with these definitions, then what scope of activity that shall be studied with regard to UKL-UPL?

UKL has objectives to formulate various policies and efforts to prevent, handle or control the negative impacts which might be brought about, and to develop the positive impacts as the consequences of the activities, and to formulate the parties involved in the coordination and to control of the environmental management activities. While UPL has objectives to provide detailed steps of monitoring activities which will be carried out by the industry for a number of environmental components which might change due to these activities, and to supply input for the improvement of the management which is being and will be undertaken.

Following the establishment of PP 27/1999, the government through Ministry of Energy and Mineral Resources has established a technical guideline for managing environment in the oil and gas sector. This guideline is described in the Ministerial Decree (KEPMEN) of Energy and Mineral Resources No. 1457 K/28/Mem/2000[5]. Table 2 summarizes type of activities in oil and gas sector that shall be preceded with UKL-UPL study.

## IV. MECHANISME AND PREPARATION OF UKL-UPL

### A. *Mechanism*

The following steps are mechanism for requesting UKL-UPL

a. Preparation of the Written Document for the Plan of Activity/Development (POD) by Industry (Note: POD is similar to KA).
b. Report to BP Migas for the POD approval
c. Requesting to Migas by BP Migas to conduct UKL-UPL
d. Agreement letter from Migas to the industry to conduct UKL-UPL
e. Appointment by the industry to the consultant for preparation the UKL-UPL document
f. Implementation study and preparation of the UKL-UPL document
g. Presentation and Discussion (Consultant, Industry, Migas, and BP-Migas)

**Table 2**
**List of oil and gas activities that shall be preceded by UKL-UPL**

| No | Type of oil and gas sub-sektor | Activity |
|---|---|---|
| 1 | Oil and gas exploration | 1. On-shore and off-shore seismic acquisition<br>2. On-shore and off-shore exploration of oil and gas |
| 2 | Oil and gas exploitation and production | 1. On-shore exploitation and production development (oil field ≤ 5000 BOPD; gas field ≤ 30 MMSCFD).<br>2. Off-shore exploitation and production development (oil field ≤15000 BOPD; gas field ≤ 90 MMSCFD). |
| 3 | Refinery | 1. Mini Refinery of LNG/LPG < 50 MMSCFD.<br>2. Used oil Refinery < 10000 ton/year<br>3. Refinery < 10000 bbls/day. |
| 4 | Petroleum product commercial sub-sector | 1. On-shore and off-shore transmit ion of oil and gas < 100 Km, diameter < 20 inches<br>2. Fuel and gas Depot<br>3. Fuel Blending of Premix; Special Fuel<br>4. Lube Oil Blending Plant<br>5. Filling Station of Bulk Asphalt<br>6. Filling Station of Fuel, Gas, and LPG |

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h. Revision and Recommendation by Migas

i. Statement Letter from the industry describing the commitment to conduct the approved UKL-UPL

j. Submission of Permit by Migas to the Industry.

**B. *Preparation of UKL-UPL Document***

UKL-UPL study can be conducted by the industry them selves or with the assistance of a competent consultant. Normally, in order to be more objective in perspectives, the industry hands over the study to the consulting agency. Since the job scale is not as big as EIA/AMDAL study, the industry may appoint directly the study to a consulting agency which is considered competent to conduct UKL-UPL study without by means of tendering or bidding process. The following phases are the steps that will be done by the consultant:

a. Reviewing the plan of activity/development (POD) by the consultant,

b. Conducting field survey, sampling and analysis of the environmental component for gathering the primary and secondary data (physical-chemical parameters of air, water and soil, biological parameter such as flora and fauna, and socio-economic and socio-cultural data),

c. Performing laboratory analysis of the samples taken from the field (optional),

d. Writing UKL-UPL Document.

After conducting field survey and laboratory analysis of the samples (air, water, and soil samples) the consultant then prepares UKL-UPL Document containing the following paragraphs:

(1). General (Name of Activity, Responsible Officer, Address, etc),

(2). Description of Activity (Name of Field, Location, Type of Rig, Duration of Activity, etc),

(3). Description of the Environmental Components,

(4). Environmental Impacts arisen by the Activity,

(5). Environmental Management Effort,

(6). Environmental Monitoring Effort,

(7). Supervision and Reporting,

(8). Appendices.

After having finished the study, an intensive discussion normally is conducted between the consultant and the industry concerning the results of the study before the UKL-UPL document be submitted to the government (Migas). The following steps are the submission of the UKL-UPL document and evaluation the document by Migas:

(1). Ten exemplars of the temporary bounded document shall be submitted by the industry to Migas,

(2). Evaluation of the document by Migas that takes about 2 weeks,

(3). Announcement of Migas regarding with the schedule of presentation,

(4). Presentation by the industry/consultant in front of Migas Team,

(5). Revision and Recommendation by Migas,

(6). Final preparation of the revised document by consultant in Bahasa Indonesia for government approval (15 Exemplars),

(7). Distribution of the approved document by the industry to the related institutions (Migas, BP-Migas, Local Government, etc).

## V. CONCLUSIONS AND RECOMMENDATION

UKL-UPL is a document describing an environmental management and monitoring efforts that shall be prepared by industry preceding project implementation. Likewise EIA/AMDAL, UKL-UPL is a compulsory document in order to get a permit from the government before implementing the project.

UKL-UPL differs from EIA/AMDAL in term of scale of the project and environmental impacts which are less significant. Even when industry has conduced EIA/AMDAL study, they shall prepare UKL-UPL document for project extension as far as the project does not exceed the scale limit as stated in KEPMEN No. 17/2001. Type of oil and gas activities that shall be completed with UKL-UPL is described in the Ministerial Decree (KEPMEN) of Energy and Mineral Resources No. 1457 K/28/Mem/2000.

It is recommended that oil and gas industries prepare a detail description of the activity, such as plan of development (POD), plan of activity (POA), drilling plan, etc, before requesting to conduct UKL-UPL study. This activity description is similar to *Kerangka Acuan* (KA) in EIA/AMDAL study but differs in term of commission that will evaluate the document.

## REFERENCES

1. Anonymous, 1986, Government Regulation (PP) No. 29/1986, describing the Environmental Impact Assessment (AMDAL).

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2. Anonymous, 1993, Government Regulation (PP) No. 51/1993, describing the Environmental Impact Assessment (AMDAL).

3. Anonymous, 1999, Government Regulation (PP) No. 27/1999 describing the Environmental Impact Assessment (AMDAL).

4. Anonymous, 2001, Ministerial Decree of Environment, No. Kep. -17/MenLH/2001 describing the EIA for the industries.

5. Anonymous, 2000, Ministerial Decree of Energy and Mineral Resources, No. 1457.K/28/MEM/2000 describing the Technical Report Guidelines. •