Comment Matrices from the Regional and National Consultation Processes

I. Matrix of comments, responses, and consideration in the draft Technical Review Report (TRR) of the Pak Lay Hydropower Project

From the 1st Stakeholder Forum on the Prior Consultation Process of Pak Lay Hydropower Project,
Vientiane, Lao PDR
20 September 2018

The comments, questions and recommendations (and MRC responses) expressed in the plenary and group discussions on Pak Lay have been classified and recorded within the following MRC comment matrix. They are grouped by the following issues: PNPCA process, Pak Lay Hydropower Project, Hydrology, Sedimentation, Environment and Water Quality, Fisheries, Socio-Economic, Dam Safety and Navigation.

PNPCA Process

	COMMENTS/ SUGGESTIONS	RESPONSES BY MRCS	RESPONSES BY LAO PDR FOR 2ND DRAFT TRR	Consideration in the 2nd draft TRR
Knowledge Related	Does the PNPCA process require the notifying country to submit the case, and then the MRCS has one month for its internal review (completeness check) before submitting to other (notified) countries?	Yes, it is. The MRCS will have a one-month period to review/check completeness prior to the actual review process commencing.		This is not a requirement of the PNPCA. It has however become the standard practice, and allows the MRC to verify the completeness of the information and set the official start and end dates of PC. This will be clarified in the 2nd draft.
Approach Related	**COMMENTS/SUGGESTIONS**	**RESPONSES BY MRCS**	**RESPONSES BY LAO PDR FOR 2ND DRAFT TRR**	**Consideration in the 2nd draft TRR**
	Any standardized procedures among four MCs for the design / commenting on the project? Means of quality control on construction among MCs?	As part of the PNPCA, the Lao Government usually submits the projects at the Feasibility Study stage. The 1995 Mekong Agreement is basis for cooperation mechanism. In terms of quality control, it would typically be carried out	The JAP process for the PLHPP may allow ongoing engagements on the final design and construction. QC would typically be carried out by the independent panels recommended in the TRR.	There are no standardized procedures for the design or responses. However, there are guidelines for good practice. QA/QC is undertaken by the developer and any independent panels if established. This will be clarified in the 2nd draft

		by the independent panels that recommended in the TRR.		
	How can we divide the responsibility of different stakeholders to cover assessment of all impacts and how to address the role of private sector? Are there opportunities for other stakeholders to participate in because the fields are vast: education, health, etc.?	MRCS will continue stakeholder engagement in a meaningful manner, in its functions and authority. This issue will be further discussed with MCs for better engagement and involvement of multi-stakeholders in the process.		The regional consultation processes are open to all interested parties, and all have an equal opportunity to have input. The national processes are driven by the MC according to their own procedures. This will be strengthened in the 2nd draft.
	There need some linkages between national consultation meetings and regional meetings in the PNPCA process to be improved.	MRCS is ready to support the MCs in conducting national consultations. The suggestion is noted for organization of the 2nd Regional Consultation Meeting		The outcomes of the national meetings are reported to the MRC and included in the overall process. These responses can be made available to the regional process. This will be highlighted.
	Request for more information regarding national-level consultations/participation for Pak Lay? What has happened so far / will happen and how?	The national consultation meetings are led by the Member Countries. The MRCS will work with MCs to enhance the national consultation process.	MRCS will work closely with each Member Country to enhance the national consultation process and encourage them to broaden the participation of other stakeholders outside the government circle	As above. The national processes must be driven by the MC. However, the MRC can advise them.
	How has the notifying country (e.g. Lao PDR) taken into account the lessons learnt that were presented?	All four Countries have reviewed and discussed lessons learnt through the MRC Joint Platform, which normally focusing on implementation of all Procedures; MRCS believes the notifying country has also considered the lessons learnt.	MRCS will work with LNMCS and MEM to document the effort made and attention paid in taking into account the lessons learnt for betterment of PNPCA process as well as its post implementation	Engagements and exchange of knowledge is an ongoing process with the goal of improving the outcomes of the PC process for all parties. This will be emphasized in the 2nd draft.

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		MRCS will work with LNMCS and MEM to document the effort made.		
	Given the expressed interested in a good and sustainable project and the fact that a lot of outdated data is referenced in the project documents, please clarify whether there is any strategy or plan to update, e.g. with MRC Council study and other updated information?	Acknowledgement that the studies took long with some starting already in 2007; the reports were completed several times and internal government processes are very slow; the documents were submitted to MONRE in 2016, but took longer to approve; the FS was already approved in 2015; everything will be modified/updated during detailed design	All the data will be checked and updated in the detailed design. The TRR recommends that the MRCS is requested to investigate options in this regard. Special emphasis will be given to the use of the MRCS data, studies and tools for the Pak Lay impacts assessments.	The TRR outlines where the data used in the feasibility studies could be improved using the MRCS data. Options to highlight this in a separate section can be considered for the 2nd draft. The developer has also subsequently committed to collating new data.

Lao hydropower development strategy and Pak Lay Hydropower Project in general

	COMMENTS/SUGGESTIONS	RESPONSES FROM LAO PDR AT FORUM	RESPONSES BY LAO PDR FOR 2ND DRAFT TRR	Consideration in the 2nd draft TRR
Knowledge Related	The submitted documents indicate intended export to Thailand. Will EGAT agree to purchase the power?	Acknowledge the issue of the power market that Lao PDR is facing, EGAT and Lao Government are coordinating to update the power development plan, priority projects include those that serve the 9000MW MoU.	Follow up by the hydropower strategy update of the MRC. Lao Government will coordinate in updating the power dev. Plan.	This analysis is beyond the scope of the TRR. The assumption is made that the project will only go ahead if there is a power purchaser.
	Request to confirm whether the FS and EIA reports are already approved by the Lao Government?	Following internal process, Lao Government has to approve each stage of each study before submission to the	MRC will work with LNMC for clarification.	The PC process is based on the submitted documents and will be considered subject to the provisions of the PNPCA.

	In case other MCs have concerns, how to go about in case the documents are already approved?	MRC to undertake the technical review; however, comments from riparian countries will be taken into consideration for detailed design and may re-optimization occur. E.g. for Xayaburi a lot was changed (new spillway design-bottom outlet, improved fish-pass etc.), under such circumstance the project cost has increased, and Lao Government has complied as an effort toward a good and more sustainable project. The issue will be further discussed with GoL and MCs.	The MRC may include these concerns in their replies, Lao Government will complete the internal process.	The challenges with the FS and EIA reports are addressed in detail, and the MRC JC may which to include some recommendations in this regard in any Statement that may be formulated at the conclusion of PC. This will be further highlighted in the 2nd draft of the TRR.
	Pak Beng – Joint Statement and Joint Action Plan (JAP) – what is the opinion of Lao Government on this plan?	The JAP is still under consideration by the Joint Committee – MRC needs to have JAP approved in order to pave the way for its implementation. It is expected to get approval in 2018 as a working version	It is hoped that the JAP for PBHPP can be approved in 2018 as a working version and related schedule.	This is beyond the scope of the TRR for Pak Lay.
	Regarding necessary coordination in the cascade, Lao Government conducted some study 10 years ago acknowledging that some Government entity for coordination would be needed, e.g. to coordinate	Currently CNR, through AFD funding, is supporting GoL on establishment of a Coordination and Monitoring Centre (CMC). It is acknowledged that this study is not yet completed but	MRCS will work with MEM through the implementation of JAP for Pak Beng HPP.	This issue is addressed at length in the TRR.

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	sediment flushing – what is the progress on that study?	MEM needs to advance fast on the monitoring center. It started with EDL and there will be real-time transmission of water levels etc. to the MEM, including data from CCTV installed up- and downstream of the reservoirs. For large dams in mainstream, all dams need to share information, MEM also discussed this with PowerChina, upstream dams in China also need to share data.		
	The operation rules of other dams should be considered for the operation of Pak Lay.	Proposed operational rules for Pak Lay HPP was submitted. We noted the issue of cascade dam and also plan to have a recommendation in this regard. These may also be taken up in a post PC JAP.	For the dam site at Pak Lay HPP, the effect of regulation by the HPPs at the upper cascades like Xiaowan HPP and Nuozhadu HPP has been taken into consideration. Due to the lack of detailed information about the HPPs that have been already built or under construction or planning on the tributaries upstream of Pak Lay HPP on the Mekong River, we are unable to make a quantitative assessment on the impact of the operation mode of these HPPs on Pak Lay HPP. However, generally speaking, after the HPPs on the tributaries have been built, the flow at Pak Lay HPP in the rainy season	As above

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			will decrease and the flow in the dry season will increase, which is favorable to increase the power generation efficiency for the project. Besides, as Pak Beng HPP and Xayaburi HPP at the upstream of Pak Lay HPP are both run-of-the-river type HPPs, their operation rule has basically no impact on the reservoir inflow at Pak Lay HPP.	
	What are the different between Chinese and International Standards?	For this issue, the MRC has asked for the Chinese standards to be translated in English. As responded by the Chinese developer, since the ICOLD has more flood parameters that Chinese standard, they follow the flood parameters of ICOLD. But for the calculation methodologies, using Chinese standard. It's a common concern, and the TRR has recommended that a more stringent of the standards should be used.	The developer of the Pak Lay HPP has already sent two Chinese standards with translation to English: <DL5108-1999 Design Specification for Concrete Gravity Dams> and <SL319-2005 Design Standard for Concrete Gravity Dams>. According to 125-2003 Guidance for Dam and Flood and Cases issued by ICOLD and Flood Design issued by the French Branch of ICOLD (CFBR in Jun. 2013), the structures such as concrete water retaining structures, water releasing structure, riverbed type powerhouse, upper gate head of ship lock shall have a design flood standard of 2,000-	We are yet to receive the copies of the stated translated Chinese standards. Although the developer has indicated that translated versions have been provided. The areas of concern relate more to the standards relating to the flood and seismic load criteria. The developer states that they have followed ICOLD Bulletin 125 and the French guidance document. However, the bulletin sets flood standards based on the hazard categorisation and the developer does not appear to have carried out any hazard categorisation. Also, we have reviewed the French guidance document and cannot find reference to a 2,000 yr flood. In addition to the wish to clarify the reasoning behind the selected flood category, the PDG 2009 requires that there is consistency in flood passage down the mainstream

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			year flood (500-year flood in Chinese standard) and a check flood standard of 10,000-year flood (2,000-year flood in Chinese standard). For the energy dissipation and anti-scouring structures, their design flood standard shall be 100-year flood (50-year flood in Chinese standard). The flood standard of the downstream guide wall and retaining wall shall be in consistency with the energy dissipation and anti-scouring structures. Regarding the PDG, it is suggested to use the PDG 2009 as the standard for the design of Pak Lay HPP considering that the new PDG is still in process of discussing.	river. Xayaburi has been designed for the PMF and therefore the developer must show that their dam can safely pass the PMF. At present there is also a discrepancy between the size of floods and further clarification is sought on why they are using a smaller flood than at Xayaburi.
	If both Chinese standard and ICOLD are proved as performance standards, will they acceptable for MRC?	If the Chinese Standards are equivalent or better than the ICOLD standards, then the PLHPP would be considered aligned with the PDG2009. MRCS will have further assessment and inform the results later.		If the Developer provides evidence that the Chinese standards are equivalent or better than the ICOLD recommendations and the local standards, then yes they will be acceptable. It is important that the Developer demonstrates the compliance with the LEPTS as well as ICOLD.
	MRC should adopt the lessons learnt from the current Xayaburi Dam Project into the review method.	The revision of DG will consider the lessons learnt from Xayaburi and the developers should benefit from the revision. As planned, MRCS through the 6-month prior consultation process will adopt the lessons learned from the previous PNPCA processes especially the Xayaburi case and the DG2018 to fill the gaps and		This has been included in the TRR, specifically with respect to a Statement and JAP process that may be considered by the JC.

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		provide clarity for TRR for Pak Lay HPP		
	Suggestion to take real time data from Xayaburi project into consideration of Pak Lay design.	The comment is noted for further consideration.	According to the data-sharing plan, the real-time data of Xayaburi HPP will be adopted. Besides, the TRR includes clear recommendations in this regard. These may be taken up in a post PC JAP.	This has been addressed in the TRR.
	Given the expressed interested in a good and sustainable project and the fact that a lot of outdated data is referenced in the project documents, please clarify whether there is any strategy or plan to update, e.g. with MRC Council study and other updated information?	Acknowledge the long process of studies and reports that started in 2007 and the documents were submitted to MoNRE in 2016. The TRR recommends that special emphasis will be given to the use of the MRCS data, studies and tools for the Pak Lay impacts assessments.		This has been addressed in the TRR through the recommendations to make better use of the MRC's data. The 2nd draft will place further emphasis on the fact that this is in the developer's best interests as it affects the financial viability of the HPP.
	In case MCs still do not approve the results of CS, however part of the results can be used for the TRR of Pak Lay, then it might affect the TRR.	The Siem Reap Declaration considers the key findings from the Council Study, including at both policy and technical levels in order to capture development opportunities and address trade-offs, benefit sharing, risks as a reference for planning and implementation of national plans and projects, and in relevant MRC work.		The outcomes of the various studies undertaken in the CS are used in the TRR, to the extent that they reflect good science and practice. However, there is no reference to the CS being an approved document, or that the results are accepted by all the MC.

Hydrology

	COMMENTS/SUGGESTIONS	RESPONSES BY MRCS	RESPONSES BY LAO PDR	Consideration in the draft TRR
Knowledge Related	Consider methodologies on hydraulic, hydrology and sediments assessments (tools, hydra	MRCS will work closely with the international team in order to get this detailed information from the developer.	Detailed information will be provided in the next stage. The TRR includes clear recommendations in this regard.	TRR shows where information is insufficient to evaluate the used methods, and recommends alternatives motivated by international practice or Mekong-experience. TRR recommends a clear description and evaluation of the methods, and reporting of the final results. The developer notes that the most practical approaches were used at the feasibility level, and that new data are being collated.
	Lao Government ppt indicates 240 masl as operating water level; what is the backwater effect under normal flow conditions?	This is a common concern that will be addressed in the TRR.	In the backwater calculation, we have calculated the schemes with floods of various frequencies and the corresponding water levels upstream of the dam. We have also calculated the scheme with a water level upstream of the dam of 240m and a reservoir inflow of 16700m3/s. The calculation process and results are presented in the feasibility study report.	The TRR confirms that the results of backwater simulations have been documented. However, the TRR also notices some issues regarding the used 1D modelling approach. The TRR does not consider the backwater impacts to be transboundary.

Sediment

	COMMENTS/SUGGESTIONS	RESPONSES BY MRCS	RESPONSES BY LAO PDR FOR 2ND DRAFT TRR	Consideration in the 2nddraft TRR
Review Method Related	Study other reservoirs (infrastructure) that also impedes sediment transport, other than only dams	Council Study has addressed this issue. This issue will also be considered in the Technical Review Report (TRR) under cumulative impacts assessment for the proposed Pak Lay HPP.	The TRR includes references to large storage dams.	The TRR recommends greater assessment of the changes to sediment transport in a regional and transboundary context. This analysis should take into account other activities, such as sand mining, trapping in tributary and mainstream dams and land use changes, that can affect sediment transport in the LMB

Fisheries, water quality and aquatic ecology

	COMMENTS/ SUGGESTIONS	RESPONSES BY MRCS	RESPONSES BY LAO PDR 2ND DRAFT TRR	Consideration in the 2nddraft TRR
Knowledge Related	How strong of fish data survey and how long of the fish survey? What is the priority urgency to solve the problem?	Only 1 time in 4 days (dry season) and 4 days (in wet season) but can't find what year. In the downstream, it was found that the fish survey was conducted in 2011 only 1 time.	The methodology of survey has been identifying in EIA part "Existing Biotic Environment in the Project Area". The fish sampling has been conducted the same time with water quality. The sampling was representing the two seasons (wet and dry seasons). The Wet season sampling was from 13-16 Sep 2011. The dry Season Sampling was 3-6 Feb2012. The baseline from sampling will use for future planning and monitoring. Recommendations to improve this are included in the TRR, for implementation during the final design stage.	The sampling protocol in terms of frequency, number of locations and methodologies used are not extensive and older methods are used. The fisheries surveys should have been conducted with a variety of methods including gillnets and traps. This should have been conducted at least 4 times per year for 2-3 years, prior to submission of the PNPCA as baseline status. Seine netting is restricted to the margins of the river. Fisher log books should have been collected weekly for 2-3 years prior to the submission

				of the PNPCA. Water quality monitoring needs to daily and preferably continuous for a range of parameters, not spot samples twice many years ago.
Review Method Related	COMMENTS/ SUGGESTIONS	RESPONSES BY MRCS	**RESPONSES BY LAO PDR FOR 2ND DRAFT TRR**	**Consideration in the 2nddraft TRR**
	Concerning the fish survival. How can we assure the survival rate of migrated fish to the downstream with the effective mitigation measures?	The effective reservoir management is required. The TRR already includes clear recommendations in this regard. These may be taken up in a post PC JAP. It is recommended that the PLHPP fish pass is compatible with the Xayaburi fish pass. The JEM will also assess the long-term effectiveness of fish pass designs.	It is recommended that the PLHPP fish pass is compatible with the Xayaburi fish pass. The Brazil institute IAV has given very positive comments on the fish pass designs. Technically the project has designed that the fish swim through many ways such as fish passage, spill way, slow turbine (environmental friendly turbine), navigation lock. Operating water level and layout of fishway: The partition of the fishway will be of two-side vertical-slot type, arranged on the bank slope left to the powerhouse. The fishway will have a width of 6m, a water depth of 2.5m, a total length of approximately 1016.97m, and an average gradient of 2.1%. The upper end of the fishway is located about 100m upstream of the power station, and its lower end about 250m downstream of the tail water channel of the power station, meeting the requirements for normal operation of the	The TRR notes that the fish passage design is inadequate and will not sustain migratory fish populations. This is reflected in the comments from the Brazil report. No indication of the redesign to upgrade the facilities as recommended by the CNR review has been provided thus the comments on redesign recommended in the TRR remain. The submitted comments restate the design which is reviewed in detail in the TRR. The developer nevertheless contends that the design is acceptable based on the CNR review – and hence assumes that the recommended changes will be implemented. All turbines cause damage particularly to the larval life stages. No data are presented on pressure, shear or blade strike, which impact fish.

			fishway at the lowest downstream water level. Resting pools are arranged along the fishway at a certain spacing and at all turning points. The gradient of the bottom of the resting pools is 0. The structural mode of the fishway: The total flow of the two fishways is 3.7m3/s, and the average flow velocity in the vertical slots is 1.08m/s, complying with the migration requirements of the targeted fishes. The water replenishment system is arranged along the right side of the fishway, with a flow of about 4.7m3/s. The upstream intake of the system is adjacent to the right side of the fishway, and the water will be taken from the fishway in the reservoir. According to the overall model test of the project, the flow velocity at the water surface at the upper entrance zone of the fishway is about 0~0.5m/s. The water replenishment system and the fishway will totally take a water flow of 8.5m3/s approximately. The flow velocity at the upper entrance zone of the fishway will be significantly greater than that in the reservoir area, creating an obvious flow change. That will have good fish guiding effect and make the fishes to the	The suggestion that opening the floodgates at high flows will facilitate upstream or downstream passage of fish is not supported by data. Velocities are too high for upstream passage and downstream passage should be facilitated needs to be at all times of the year not just when the gates are open. The reservoir will likely remain a barrier to downstream migration. This issue needs greater attention and linking to the cascade of dams as this can have cumulative impacts. It is noted that the developer has indicated that the fishway design complies with the requirements of migrating fish, but the MRC expert team does not concur.

			downstream find the entrance of the fishway easily. The water replenishment system will be provided with two outlets on the downstream side. Outlet 1 is arranged downstream of the lower entrance of the fishway, and the water flow will fall into the river channel from the outlet and form an artificial waterfall. That will create fish-guiding water flow and sound at the downstream of the fishway entrance and enhance the fish-guiding effectiveness. Outlet 2 mainly aims to increase the flow in the lower section of the fishway. In practice, various fish-guiding flow patterns will be adopted based on the seasons and fish species to enhance the fish-passing effectiveness of the fishway. Additionally, the fishway is designed with a large resting pool in the middle section. Nature-imitated ecological bank slopes will be adopted for the pool. The fishes can take a rest and find food in the pool so as to have energy to complete the migration. In addition to the large resting pool, a 10m-long horizontal section will be arranged every 50m, where the average flow velocity is 0.25m/s and fishes can slow down and take a short rest. Fish passing in flood season: when the inflow exceeds 3-year flood (16700m3/s), the power station will stop power generation, all the gates for the flood-	

			releasing structure will open, and the river channel will be recovered to the natural status. The water surface profile across the dam will be smooth and free of rolling, with an average flow velocity at the cross-section 5~6m/s. Therefore, the fishes can pass smoothly with no harm. Moreover, this duration is short normally (similar to Stage 2 of the construction period). During the construction period of the project, the left side of Stage 1 construction cofferdam will be basically in a status of natural river channel, and fish passing will not be affected. In Stage 2 of the construction period, all the water-releasing structures will be completed, with the reservoir not filled with water, so the difference between the water levels upstream and downstream of the water-releasing structures will be small and will not affect the fish passing too.	
	The cascade dams make change to the river system, MRCS and relevant line agencies should collect fish species adequately to design the fish passage. The current surveyed fish species is small comparing to the natural fish species in tributaries.	The issue is well noted. For Pak Beng, there are around 100 fish species. The RCS produced a list of fishes for all the dams (Pak Beng, Xayaburi, Luang Prabang). It is important to look at the species to adjust design accordingly. Some additional sampling is required. All the dams should list the targeted fish species and share information with other		There is sufficient knowledge in the MRC fisheries database and Council Study to provide background information on fisheries throughout the Mekong. The Developer should be carrying out robust sampling using multi-gear methods at least quarterly and preferably monthly to assess the fish species in the dam site. Fish passage design should be based on range of species that are representative of the 10 guilds (plus

		dam operators. MRCS already recommended to consider the fish passage and variety of fish species and sizes.		invasive species) found in the Mekong as well as range of fish sizes and swimming capacities. The latter should be investigated by the developer using well-designed flume tank experiments and learn from, and improve, the Xayaburi experiments.
	Recommendation is made to developer invest in local fish measures, e.g. in case local fish species are endangered, through aquaculture or breeding and restocking - also has socio-economic effect aside of health/nutrition benefit	We note the recommendation for consideration through the 6-month prior consultation process.	It's suggested to determine whether it's necessary to build a fish restocking station according to the fish passing status in the operation period. Besides, MRCS through the 6-month prior consultation process will consider this issue in its recommendations in the TRR	Little consideration has been given to food security and nutritional deficits in the documentation. These issues need greater attention in the socio-economic sections and ESIA. The practicality of breeding and stocking endangered species is limited because the bottlenecks to recruitment need to be addressed first and this is loss of spawning habitat and disruption to longitudinal connectivity. It is suggested in the TRR that offsets elsewhere in the LMB are used to enhance the populations of endangered species
	Concerned expressed on the impacts on fish resources especially on the single migration zone from the downstream. How can the perfect fish passage design can mitigate these impacts?	This issue of fish pass design would need coordination between dam operators. It will be considered for further discussion.		The best designs available for large tropical rivers pass only a proportion of the fish, and are not 'perfect'. The TRR and fisheries appendix indicate a complete redesign is required and does not concur with the developers assertions. The optimal design of the pass must include consideration

				of other fish barriers in the upper cascade as it is impractical to consider PLHPP in isolation. This is addressed in the TRR.
	With regard to fish pass in the downstream, we need more details on layout of upstream migration during construction. In consideration that dimensions are much smaller then what was done for Xayaburi, then whether this dimension is adequate, especially in case fish biomass increases further downstream?	MRCS through the 6-month prior consultation process will further discuss this issue and refer to Xayaburi fish pass for Pak Lay's consideration.		This is addressed in detail in the TRR, which recommends that the Xayaburi fishpass standards should be followed.
	Regarding Xayaburi lessons learnt and the timeline: will Xayaburi monitoring information be available prior to construction of Pak Lay, e.g. regarding effectiveness of fish pass?	It takes a bit longer time to see effectiveness of fish pass for Xayaburi. The MRC Joint Environment Monitoring (JEM) is planned to look into this issue.	MRCS through the 6-month prior consultation process will use the TRR to link and refer to Xayaburi fish pass to be considered in Pak Lay for design consideration. In term of understanding the effectiveness of fish pass for Xayaburi it needs longer time to be undertaken by the MRC Joint Environment Monitoring (JEM)	Although Xayaburi HPP have indicated they will share data this has not happened to date. It is unlikely that the studies being carried out by Charles Sturt University of Australia will be available in the immediate future or that the outputs of the JEM pilot study will be available in full to influence decision during the design phases of PLHPP. Much depends on the start of construction of PLHPP which currently is unknown.

Socio-economic

	COMMENTS/ SUGGESTIONS	RESPONSES BY MRCS	RESPONSES BY LAO PDR FOR 2ND DRAFT TRR	Consideration in the 2nd draft TRR
Review Method Related	Concern of the impact of Pak Lay to Lao communities in the lower area → flood happened in Thailand. Sometimes there has not good coordination between the countries and the region on mainstream management → How can we fill the gap? How can we adapt the water management from upstream to downstream to mitigate negative impacts? How can we suggest prolonging the prior consultation to address all of the issues?	This is a common concern. The TRR will include recommendations in this regard.	The project has identified the villages in the downstream area. In the future we will discuss the policy to manage, mitigate and monitor downstream villages in Lao territory. We believe that the environmental and social management committees will set out the upstream and downstream communication and provide information in term of using the modern technology to avoid potential impact. Besides, the TRR includes clear recommendations in this regard.	Recommendations on improved prediction, mitigation and monitoring of impacts on downstream communities are covered in the TRR. No change required.
	How can we carry out the Tb-social impacts and link to the technical areas?	The draft DG 2018 will be used for further reviewing and link among different sectors that might affect the livelihood of local communities. If the DG2018 has been used by the developers with the maximum	In the report we have divided the study area by zoning. The information in the project area like upstream and downstream has been identified. In the future the environmental and social management committee of GOL will plan for details by using new technology.	It is international good practice to follow the steps outlined in section 4.6.2 (Overview) in a social impact assessment and social management plan. This is irrespective of where social impacts occur, domestically or

		mitigation measures, MRCS believes that all impacts will be reduced into the residual impacts.		in neighboring countries. Section 5 then describes how to deal with identified transboundary social impacts in the Mekong context. The link to technical areas is strengthened through a small change to section 4.6.2.
	There should be explicit in gender component in this project. Also, the people migration due to the nutrition changes should be considered.	The comment is noted and considered for recommendation in the TRR.	The TRR includes clear recommendations in this regard. These may be taken up in a post PC JAP.	Differentiation by gender and other categories, for impact assessment and mitigation, has been added to the TRR. All primary impacts (such as reduced food security) may have secondary or induced impacts (such as migration), but these are generally not easily predictable and thus not covered in ESIAs. No change to TRR.
	CIA in the social component should be well-addressed in this Project.	CIA and Transboundary impacts are common concerns and will be reflected in the TRR.	The TRR includes clear recommendations in this regard. These may be taken up in a post PC JAP.	The TRR covers this.

	Cost and benefit analysis in social context.	MRCS took note this issue and will consider for the TRR.	The TRR recommends that the MRCS is requested to investigate options in this regard.	Cost benefit analysis can help to quantify positive and negative impacts and make them comparable but requires monetary valuation after all impacts have been established. It would add another level of complexity to the ESIA, and is not recommended in this case, where the priority should be on the robust prediction of impacts. This aspect is also complicated by the requirements of Articles 7 and 8 of the Mekong Agreement which require that the notified countries must provide evidence of substantial damage. No change to TRR.
	Will be Energy assessment done? Is that a component in the socio-economic impacts?	MRCS is undertaking a comprehensive review and update of the Basin-wide hydropower development strategy. This issue will be addressed in the strategythat planned to be completed early 2019	We will consider all of the cumulative assessments.	There is no assessment of the local electrification impacts of the project, if that is meant with 'energy assessment'. That is acceptable since electrification is mainly a distribution, not a generation issue. No change to TRR.
	Who will be responsible for community resettlement and what is the strategy?	Project's Developer and GoL will take the responsibility of resettlement action plan including in the provincial, district and community levels.		Resettlement areas have been identified preliminarily. The objective of the RAP is actually improvement of livelihoods, through approaches covered in the RAP.

	Where are the resettled areas for this Project? How can we assure to restore the same livelihood before the commencement of the Project?	These issues have been addressed in SIA and SMMP reports. ~~MRC will be responsible for transboundary issues. The draft TbEIA includes the responsibility and financial support for transboundary issues.~~		The developer has noted this which has been included in the TRR.

Dam Safety

	COMMENTS/ SUGGESTIONS	RESPONSES BY MRCS	RESPONSES BY LAO PDR FOR 2ND DRAFT TRR	Consideration in the 2nddraft TRR
Design Related	Earthquake impact is considered in the design or not?	Yes. The seismic hazard management, structure stability and flood standards are taken into consideration, but more information is need.	The basic seismic intensity at the project site was recommended to be degree VI at the initial stage. In Oct. 2015, GEOTER SAS, a French company, was entrusted by our company to carry out the seismic hazard assessment for the project site according to ICOLD Bulletin 148 (2010). In Jan. 2016, GEOTER SAS finished the assessment and submitted the Laos Pak Lay HPP Project Site Seismic Hazard Assessment Report, in which the recommended peak ground acceleration with an exceeding probability of 10% in 50 years (with a return period of 475 years) at the dam site is 0.133g, that with an exceeding probability of 4% in 100 years (with a	We have requested a copy of the Geoter SAS report so that we can understand the methods used and be satisfied that the seismic hazard assessment confirms with the ICOLD recommendations. One issue in particular we would like to clarify is the probability used for the SEE. ICOLD Bulletin 148 sets different probabilities for dams of different consequence classes. The Developer has not clearly provided an assessment of the consequence class. There is the same concern with the flood standard. Also Bulletin 148

	COMMENTS/ SUGGESTIONS	RESPONSES BY MRCS	RESPONSES BY LAO PDR FOR 2ND DRAFT TRR	Consideration in the 2nddraft TRR
			return period of 2475 years) at the dam site is 0.290g and that with an exceeding probability of 2% in 100 years (with a return period of 5000 years) at the dam site is 0.384g. According to this report, the recommended basic seismic intensity at the dam site is degree VII. In the dam design, the impact of earthquakes is considered. According to ICOLD148-2010 "Selecting seismic parameters for large dams - Guidelines", the OBE is considered as per a return period of 475 years (with an exceeding probability of 10% in 50 years); the SEE is considered as per a return period of 5,000 years (with an exceeding probability of 2% in 100 years). The impact of earthquake on the hydraulic structures for the ship lock has been considered and the basic seismic intensity at the project site is degree VI. According to DL5180Classification and Design Safety Standard of Hydropower Projects and DL5073-2000Code for Seismic Design of Hydraulic Structures of Hydropower Project, the upper head of ship lock in this project is Class I water retaining structure and its design seismic intensity is considered as degree VII. This has been calculated according to Chinese standards.	does not refer to a 1 in 5000 yr SEE, it uses either 10000, 3000 or 1000. It would be useful if the Developer could provide a copy of the Chinese standard in English so that we can understand their design. Could the Developer also clarify what they mean by their seismic intensity degree, which seismic classification method are they using? Are they using the Modified Mercalli scale or is it another Chinese scale? We note that the developer has indicated that this translation has been provided, but it has not been made available yet.

	COMMENTS/ SUGGESTIONS	RESPONSES BY MRCS	RESPONSES BY LAO PDR FOR 2ND DRAFT TRR	Consideration in the 2nddraft TRR
	What type of the model used for the dam safety?	No information of the failure modes provided by the developer. More information is needed for further assessment. The TRR includes clear recommendations in this regard. These may be taken up in a post PC JAP.	The TRR includes clear recommendations in this regard. These may be taken up in a post PC JAP.	The TRR recommends that a detailed specific Failure Modes Assessment is carried out early in the detailed design stage as it will identify areas where the design needs modification, is useful in designing the instrumentation and surveillance and monitoring systems.
	What are the impacts to the downstream in case the Pak Lay dam break? Is there any simulation?	MRCS is asking developer more information about dam break and consequence analysis.	The TRR includes clear recommendations in this regard. Currently there is no assessment on the flood of the failure mode. It is proposed that at the next stage, as the work on Pak Lay HPP progresses, preliminary analysis or special study will be done on the flood of the failure mode according to the demand in our work.	At present the Developer has not demonstrated if there any transboundary impacts due to dam failure. This can only be confirmed one way or the other by carrying out a dam break study and preparation of inundation mapping. Both normal operation and extreme flood failure should be carried out. Therefore, it should be carried out as soon as possible. Additional benefits of the dam break study is that the maps are also needed for the preparation of emergency plans.

	COMMENTS/ SUGGESTIONS	RESPONSES BY MRCS	RESPONSES BY LAO PDR FOR 2ND DRAFT TRR	Consideration in the 2nddraft TRR
	Dam safety: What are the Chinese Standards? What are key differences? What was used for other mainstream dams?	Similar objectives for both Chinese and other standards; MRC has asked for the Chinese standards to be translated to English for understanding better. In short, Flood Return Period uses ICOLD standard, because it is higher, while Calculation follows Chinese Method.	In the Chinese standard, different design criteria are adopted according to the scale of the dam and the impact of the consequence on the lower reaches. The developer of the Pak Lay HPP has already sent two Chinese standards with translation to English: < DL5108-1999 Design Specification for Concrete Gravity Dams> and < SL319-2005 Design Standard for Concrete Gravity Dams>. Regarding the standards used for other mainstream dams, please see the clarification above.	As stated in the Lao PDR response the impact of consequence on the lower reaches is required to set the design standard. This requirement is the same in the Laos, ICOLD and Chinese standards. However, the Developer has not carried out any consequence assessment and therefore it is difficult to understand how they have selected their design criteria. Copies of the Chinese standards in English have not been received yet.

IV. Matrix of comments and responses

From the National Meetings in: CAMBODIA

On: The draft Technical Review Report (TRR) of the Pak Lay Hydropower Project

Submitted date: 13 November 2018

No.	National meetings in Cambodia	Date
1	1st national meeting, Siem Reap	28 September 2018

No.	Comments from the National Meetings in CAMBODIA	Responses for the inclusion in the 2nd draft TRR
General		
1	Properly refer to and take into consideration all MRC tools, procedures and guidelines in study and assessment of the project especially in regard to transboundary aspects (PDG, RSAT, ISH guidelines…)	This is done on the TRR, at the start of each section. The 2nd draft of the TRR will provide greater clarity.
2	Compare/verify and indicate that the selected tools is the best.	The various technical sections are based on the best available knowledge. The evaluation is against approved documents.
	Implementation of joint monitoring/ joint action plan then adaptive management.	The JEM and JAP are beyond the scope of a technical review, and it is the JC who must decide whether these will be taken up. However, the 2nd draft will make this clearer.
3	Provide/share more data and information including models.	This recommendation is made in all the technical sections.
4	Since there will be number of projects on the mainstream, assessment on possibility of joint cascade operation may be needed. Or operation of the	This is included in the 1st draft, and the 2nd draft will provide further emphasis.

No.	Comments from the National Meetings in CAMBODIA	Responses for the inclusion in the 2nd draft TRR
	PLHPP needs to consider also the operation of upstream, downstream dams and important tributaries.	
5	Establish mechanism for risk management and compensation, especially for dam break.	The 2nd draft will highlight the processes by which this can take place – under the provisions of Articles 7 and 8 of the Agreement.
Hydrology and Hydraulics		
6	Hydrological data for the dam site have been derived mainly from the data from distant hydrometric base stations at Luang Prabang and Chian Khan. As indicated by CNR, there is some missing data (1960-1966). More data is needed for dam site to improve the quality of data used or accuracy. Harmonisation and verification with MRC data is needed.	Agreed, all these points have been addresses in the TRR.
7	Minimum flow/environmental flow downstream of Pak Lay project be determined or elaborated	The TRR emphasizes that a proper environmental-flow assessment needs to be carried out and reported. This assessment is missing in the submitted documents, although it is one of the most relevant 'hydrology' parts of the PDG-2009. This shortcoming is addressed in the TRR, for instance section 4.2.8.
Sediment and River Morphology		
8	The analysis of transboundary impacts should include an estimate of the potential incremental increase in impacts attributable to the Pak Lay HPP in the context of existing and potential future development scenarios.	A recommendation for a comprehensive regional and transboundary analysis of the incremental impact of Pak Lay is included in the TRR. The recommendation includes consideration of Pak Lay as the final dam in the cascade and as an intermediate power station in the cascade.
9	Mechanism for communication in the cascade is needed, especially when flushing sediment to minimise transboundary impacts. In order words, coordinated monitoring with the other HPPs in the cascade should be discussed.	The TRR recommends that sediment management be conducted in a coordinated manner between the HPPs on the mainstream and in the tributaries. The mechanism for coordination may be beyond the responsibility of an individual HPP operator, so the TRR

No.	Comments from the National Meetings in CAMBODIA	Responses for the inclusion in the 2nd draft TRR
		recommends that information about coordination of operations be provided by the GOL.
10	Information on model calibration, selection of parameter adopted, and equipment should be shared.	The TRR includes a recommendation to provide more information about model set up and calibration, and to provide a comparison of the numerical and physical model results where both types of models have been applied. This recommendation also applies to the hydrologic and hydraulic model results.
Dam Safety		
11	The developer does not indicate if an Independent Panel of Experts has been appointed or will be appointed and elaborate the compliance with World Bank operational manual OP4-37 or ICOLD. The Panel of Experts should be independent of the developer and the Designer and have international experiences.	We agree this is not clear and has already been noted in the TRR.
12	Developer refers to Chinese standard, but International Standards should be compared or elaborated.	We agree and clarification is being sought from the Developer on the key design criteria used for the design
13	Dam break modelling and consequence assessment should be carried out before development of Emergency Preparedness Plan in consultation with possible affected people and establish joint mechanism for relief and/or compensation.	We agree. The dam break modelling should be carried out as soon as possible in order to identify any transboundary impacts. The development of the EPP and the consultation with the stakeholders is something that should be developed during the design phase so that it is ready for the star of construction
Navigation and Ship Lock		
14	Cambodia had very little or no experience on ship lock.	The MRCS see it as a very valid point that there is no lock in the region (except the lock at the Xayabury) leading to the fact that not only Cambodia but also other MC experts don't have experience in this subject. The MRCS will consider to provide some training on the basic knowledge of the ship locks and how they are operated.

No.	Comments from the National Meetings in CAMBODIA	Responses for the inclusion in the 2nd draft TRR
15	We want to see confirmation from developer by designing ship lock in compliance with PDG 2009 to ensure that navigation route can still be operated as it is with safe and without delay.	That is the aim of the developer's feasibility study and the TRR. Navigation will of course have to stop at the ship lock for the lock-operation but that should not take longer than 30 minutes (PDG2009). The only navigation difficulty may come from the approaches which are not fully compliant with PDG2009 and certainly not with the PIANC recommendations. Both approaches require some adaptations, especially the downstream approach channel which needs a re-design.
Water Quality		
16	The use of water will have a significant impact to water quality and flows in the river. There is little information of the impacts on other aquatic organism (such as Phytoplankton, Zooplankton, and Benthic macroinvertebrate) by annual flood cycle and natural variation. Therefore, water use monitoring system (response to PWUM) in the mainstream is important and has to be in place and taken action accountably and systematically, and especially should have the model on how Pak Lay HPP will affect/change on water quality both downstream and upstream.	PLHPP will unlikely change the flow regime downstream as it is a run-of-river scheme with minimal storage. There will be some hydropeaking. In addition there will be a change in habitat from lotic to lentic upstream. The developer has not yet provided a robust baseline sampling regime and data and no modelling of the condition of the river WQ was provided. Recommendations to improve the sampling regime and assessment are made in the TRR.
17	Moreover, as river water quality is one of the important factors/indicators to determine river ecological health as well as river environmental issue. Hence water quality is required to properly assess and monitor before dam construction, and monitor regularly and technically during construction and operation of PLHPP, which also could align with the Water Use Monitoring System.	Similar comment to 16.
Aquatic Ecology		
18	Should provide a proper technical study of aquatic ecology in downstream and upstream of PLHPP, including cumulative impact assessment of cascade hydropower dams in the mainstream.	Recommendations to this effect are provided in TRR

No.	Comments from the National Meetings in CAMBODIA	Responses for the inclusion in the 2nd draft TRR
19	Should have enough data and information on the fundamental and critical issue of the available fish/aquatic habitats and its values, which will be lost, or potential impact on the wider LMB ecosystem, especially the lost of biodiversity's aquatic productivity.	Recommendations to this effect are provided in TRR
20	EMMP should pay attention on the different aquatic habitats, its ecological importance, ecological health and biological hotspot, with enough budget allocation from the developer.	Recommendations to this effect are provided in TRR
Fisheries and Fish Passage		
21	PLHPP is located in Zone 1 of the Mekong's Ecological Reach (MRC, 2010), associated with fish spawning habitats of important migratory species. Therefore, baseline data and information during PLHPP preparation must be collected including the use of available MRC data (MRC Council Study, fish abundance and diversity monitoring, ecological health monitoring…) for preparing the effective impact mitigation measure of fish migration and spawning, with proper design of fishpass facilities for both upstream and downstream migration to be met PDG 2009.	Recommendations to this effect are provided in TRR
22	Should have a detail technical analysis of upstream and downstream fish passage facilities and design, which require to meet the appropriate capacity of fish migratory species and behaviour, through all mainstream cascade dams.	Recommendations to this effect are provided in TRR
	Should conduct a comprehensive transboundary and cumulative fisheries impact assessment	Recommendations to this effect are provided in TRR
23	EMMP should pay attention on the monitoring for fish passage and key related fisheries issues.	Recommendations to this effect are provided in TRR
Socio-Economics		
24	Inconsistency statement from developer for socio-economics (validated)	A more consistent presentation is recommended in a number of places in the TRR; no further change required.

No.	Comments from the National Meetings in CAMBODIA	Responses for the inclusion in the 2nd draft TRR
25	To make clear mitigation measures for transboundary impact downstream zone, especially zones 4 and 5.	The lack of mitigation measures for transboundary downstream zones is described in section 4.6.3. Text added on mitigation options with a reference to current good practice.
26	MRCS assessment tools should be employed	Text is added to this effect.
27	Requires clear assessment methodology of the impacts from other sectors were related to socio-economics. To do so will minimize on socio-economic impacts.	The links between technical and bio-physical impacts and socio-economic outcomes are described in various sections of the TRR. No further changes required.
28	Provide for baseline information on socio-economics as much as possible, this will be useful for M&E before and during dam construction and during operation.	Recommendations to improve baseline information are included; no further change required.

V. Matrix of comments and responses

From the National Meetings in: Thailand

On: The draft Technical Review Report (TRR) of the Pak Lay Hydropower Project

Submitted date: 20 November 2018

No.	National meetings in Thailand	Date
1	Chiang Khan District, Loei Province	09 November 2018

No.	Comments from the National Meetings in Thailand	Responses for the inclusion in the 2nd draft TRR
Fisheries/Fish Passage		
1	The impact on fisheries in terms of decreasing numbers of fish caused by the project development. The solution coping with this impact shall be discussed and provided by the Project Developer.	The developers suggest that mitigation measures will be stocking and aquaculture plus fish passage facilities. These are highlighted as being inadequate in the TRR, which further recommends wider consideration of mitigation measures.
2	The Project Developer shall implement activity concerned with reproducing more natural fish breeds to meet consumers'demand.	The developer suggests they will support indigenous species but it is questioned how successful such activities will be given the change in habitat.
3	There shall be an organization to carry out activity on economic of fish breeding.	Unclear the meaning of the query – clarification needed.
4	Provision of both upstream and downstream fish passages	Recommendations to this effect are provided in TRR
5	Since the Project can reduce the quantity of sediment, causing the alteration of the river ecosystem and bank erosion, these issues shall be addressed and rectified/mitigated by the Developer.	The TRR recommends that additional details about river bank monitoring and potential mitigation strategies be provided.
6	Local traditional livelihood along the Mekong will be changed for example: harvesting of Kai)local algae(shall be addressed.	The local ecosystem will be altered and thus livelihoods may be affected. No provision is made to maintain these livelihoods and they will likely be lost from the impounded area.
7	Public participation/involvement on data collection regarding biodiversity and ecosystem services is necessary and must be implemented.	It is unclear how this can be achieved as it would involve considerable coordination issues. It is recommended in the TRR that a robust biodiversity sampling programme is designed and implemented to provide adequate baseline conditions for fisheries and aquatic ecology in the impacted region and transboundary conditions are assessed.
Impact from the Project and mitigation/rectification measures		

No.	Comments from the National Meetings in Thailand	Responses for the inclusion in the 2nd draft TRR
8	There shall be mitigation measures and compensation for the affected people. These shall be arranged and provided by the Project Developer and the Project Owner.	Recommendations on socio-economic mitigation and compensation are covered in section 4.6.3. No further change. Articles 7 and 8 provide the mechanisms for this. There is no automatic right to transboundary compensation, and there is a problem of attribution of impacts.
9	Information on the mitigation and compensation are still unclear. There shall be a specific agreement on power purchase agreement to deal with this issue.	Commitments and responsibilities for mitigation and compensation will need to become more detailed as the project nears approvals and investment decisions, and need to be specified in enforceable regulatory and contractual documents (PPA, Concession Agreement, Environmental Licence etc). How this is done is not an issue for the TRR.
10	The stakeholders requested further literature reviews on the impact studies of cascade dams whether in Mekong system or in other regions/river basins.	This is beyond the scope of the TRR, but the MRC can consider this under a separate process if needed.
11	The impact study shall utilize the lesson learnt from Xayaburi Hydropower Project.	The primary source of Tb impact assessments is the CS.
Backwater Effect		
13	The stakeholders were concerned with the backwater effect and its impacts on the tributaries on the Thai side.	The Mekong river reach between Xayaburi dam and Pak Lay will be experience a raised water level because it will be impounded. Tributaries will experience a rise of erosion base, with impacts upstream depending on backwater length. Because of the distance between the tributary mouths and the Thai border and the mountainous area (steep slopes), a direct transboundary impact has not been anticipated. Still, a comment is added to the TRR to verify that this is correct, and does not require further attention.
PNPCA Process		

No.	Comments from the National Meetings in Thailand	Responses for the inclusion in the 2nd draft TRR
14	The stakeholders proposed to invite the Project Developer to participate and provide information and response to enquiries in the PNPCA process.	This request must be transmitted to the LNMC for consideration.
15	The information sharing on the platform were lack of certain issues such as the insight details of engineering information, monthly dam operation data and period of water flow releasing from the dam site to Thailand, sedimentation, early warning system to the downstream during the construction, fish passage design etc.	In the TRR these concerns on lack of detailed information on hydrology and hydraulics have been expressed, and recommendations have been given which information should be provided to minimize the potential risks to the downstream river. Recommended is to demonstrate in detail the occurrence of flow alterations (notably the fluctuations) near the Thai border. The TRR recommends that a more comprehensive transboundary EIA assessment be completed that includes greater analysis of potential regional and transboundary impacts. This should include impacts to sediment transport considering Pak Lay as the most downstream dam in the cascade and as an intermediate hydropower station in a cascade, and the potential impact of water level fluctuations on river bank stability. The TRR recommends that more information is provided about joint operations between the tributary and mainstream power station operators. Recognising that this may be beyond the responsibility or ability of an individual operator, the TRR recommends that GOL provides information about the coordination of operations and communication strategies. Any lack of information in the PNPCA presentations was most likely due to the lack of information provided by the Developer.
16	The socio-economic information accuracy shall be revised.	Recommendation to provide detailed, up-to-date, quantitative information is included. No further change required.

No.	Comments from the National Meetings in Thailand	Responses for the inclusion in the 2nd draft TRR
17	Public participation/engagement is necessary and important for water management in Mekong Basin, especially for the impacts caused by development projects along the Mekong mainstream.	The MRC has committed to increasing involvement of stakeholders. The 1st draft highlights this, and the role the stakeholders can play.
18	There shall be a promotion for youth participation in data collection and monitoring.	This is beyond the scope of the TRR. However, this may be taken up in the JEM.
Navigation		
Dam Safety		
20	Dam design in term of its technology and safety is still not reliable to be good enough because there is no clear information on dam safety of Xayaburi Hydropower Project which is considered as the model of other development projects.	The safety of Xayaburi is important to the users of the Mekong and the downstream inhabitants. However, the Developer of Pak Lay cannot be held responsible for the safety of Xayabouri and has to assume in their design that it is safe.
21	The design standard of the Pak Lay Hydropower Project shall be clarified and provided.	Clarification on the design standards and key design parameters are being sought from the Developer.

VI. Matrix of comments and responses

From the National Meetings in: Viet Nam

On: The draft Technical Review Report (TRR) of the Pak Lay Hydropower Project

Submitted date:

No.	National meetings in Viet Nam	Date
1	Ho Chi Minh city	18 September 2018

[Type here]

No.	Comments from the National Meetings in Viet Nam	Responses for the inclusion in the 2nd draft TRR
General		
1	There are some differences in term of format and level of details in analyses on different topics.	The 2nd draft will try to standardize as much as is feasible given the different technical fields.
2	TRR provides the appropriated technical views of the IEs. Many important findings on the shortcoming of current document of PLHHP and useful recommendations have been pointed out, which help the project owner and Lao Government considering contributing for the sustainable development of the LMB.	The positive comment is welcomed.
3	TRR should have a section on lessons learnt from the 3 previous HPPs	This is included in the 1st draft as section 1.7.
4	Data: More detail review on the data available, data use in the FS (for example: sources, series, consistency, and/or required QA/QC…) to provide the guidance to developer to further collect/analysis;	This is addressed in detail in the various subject matter sections. Generally, very little data has been made available.
5	The monitoring/forecasting/warning system: should be consistent with common MRC practice, TRR should focus on the link between a number of monitoring systems (hydrology, sediment, social, dam safety …) of this project with other existing or to be proposed systems.	This is addressed in detail in the various subject matter sections, and the need for standardized approaches to be adopted. The dam break warning systems have not been elaborated in the documentation provided, and this has been highlighted.
Hydrology and Hydraulics		
Comment to TRR		
6	No or less specific comments on adequacy of used data, or on exact inconsistence between those of developer and MRC	The TRR discusses the limited attention for QA/QC and inconsistencies in the data sets. Recommendation for assessing and

No.	Comments from the National Meetings in Viet Nam	Responses for the inclusion in the 2nd draft TRR
		reporting inconsistencies, error and other quality issues is added to the TRR.
7	Neither information on identified gaps on used data (sources, series and/or required QA/QC…) nor recommendation to fill up was found	Is addressed in combination with the previous comment.
8	Lack of inserting needed expertise instead of unnecessary number of requests for further verification	The TRR refers to international practice for hydrological methods and assessments where appropriate, while inadequate reporting of impacts and data processing are translated to recommendations for further analysis and verification. It is up to the developer to provide the necessary expertise for improving the information. The developer has indicated that this will be done.
9	Review on Flood design, Physical model, impact, monitoring are principle acceptable	Noted. Important is that the information for flood design and physical modelling is mostly reported in a 'modelling report' that has not been submitted for PNPCA review, but has been promised.
10	Impact: Lack of attention on specific and widely concerned variation of WL at a shorter interval (daily, hourly…) on downstream, especially caused by hydropeaking and drawdown… and for the whole cascade.	Noted. The TRR includes an analysis of these aspects.
	Mitigation: Further focus to Emergency or dam failure.	Noted. This has been addressed the dam-safety topic.
<u>Recommendations to improve TRR</u>		
11	Review of data needed for modeling (info on contribution and river profile…)	The TRR considers the data used for the models, as far as the submitted documents provide this information. The documentation provided is insufficient assess the quality of the data used as input for the models. therefore, the TRR only reflects on these results reported. This lack of information is addressed in the TRR. The TRR does not provide recommendations with respect to good-modelling practice (it

No.	Comments from the National Meetings in Viet Nam	Responses for the inclusion in the 2nd draft TRR
		is assumed that the developer employs experienced modellers to carry out the modelling work).
12	Update rating curves at LBP and CKN	Has been added to the TRR.
13	Details of simulated impacts	Recommendations have been provided in the TRR to address the relevant downstream impacts (relevant for large-scale and transboundary impacts).
14	Attention to inconsistence between EIA and FS (such as the fluctuation of water level)	The inconsistencies have been addressed in the TRR.
15	Neither info nor descriptions on mathematic models found (data needs, software, set-up, quality…)	See point 11 above. The TRR proposes that the JC requests more detailed information on the models.
16	Objectives, details on set-up, and outputs of each model (both mathematic and physical)	Annex, section 3.2, summarizes the objectives and some details of the models. However, as mentioned in points 11 and 15 above, it is also necessary for the developer to provide additional information on the details of the model setup and results.
17	Scenarios: BL(2010) too far away; Need add more details about the impacts of 2017, 2030 development; request the dam failure study	The TRR recommends analyses of the future situations, including the proposed dam development in the catchment, and climate change scenarios. An update of the most recent hydrological conditions should also involve the inclusion of data collected at the dam site. The recommendation for a dam-failure study is presented in the section for Dam Safety.
Sediments and River Morphology		
Comment to TRR		

No.	Comments from the National Meetings in Viet Nam	Responses for the inclusion in the 2nd draft TRR
18	Question if all available, not only most up-to-date, have been used or adequate for analysis	The TRR recommends that the JC requests more information about the source(s) of data included in the analysis, and calls for the use of all recent and applicable results.
19	Need more detail of request on Information of measured data	The TRR includes a recommendation that more information is provided about the source(s) of data included in the analysis.
20	Need more detail of Recommendations on additional sources and filling data in the region (regional sediment data review)	TRR recommends inclusion of all recent, applicable and available data be used in the analysis, along with a description of the source(s) of the information
21	Infrastructure seems to be ok, agreed that Xayaburi example should be considered, but no concrete conclusion on flushing measure effectiveness was made	TRR highlights that no information about the quantity of sediment able to be flushed through the proposed outlets is provided, and there is no information about optimising sediment flushing under different flow regimes and draw-down rates.
22	Need a proper reference to previous PC of Xayaburi, Pak Beng… for similar parameters or impacts…	The information provided in the documentation provided has been compared with the relevant clauses in the PDG2009 for sediment transport and geomorphology, and the proposed HPP has been reviewed using the same criteria, parameters and impacts as applied to previous cases. The details are contained in the Sediment Transport and Geomorphology Annex of the TRR. The TRR recommends greater harmonisation with the Xayaburi project with respect to operations and infrastructure.
Recommendations to improve TRR		
23	Need mention on sediment data collected during Mekong Delta Study (MDS) that VNMC transferred to Laos	The TRR includes a recommendation to enhance and improve the level of analysis included in the TbEIA. Specifically, the impact of Pak Lay at a regional and transboundary scale needs to be considered. In this context the use of basin wide data sets is important, and the

No.	Comments from the National Meetings in Viet Nam	Responses for the inclusion in the 2nd draft TRR
		MRCS and MDS datasets are recommended for inclusion in the analysis.
24	More review and recommendation on Model (objectives, outputs, data needs if adequate, software capable of partition simulation capacity, set-up, quality…)	The TRR includes a request for more information about the setup and calibration of the numeric models.
25	Need quantification of sediment trapping	The TRR states that 1D modelling of the impoundment will not capture the variability in hydraulics in the impoundment and may not be an accurate representation of sediment trapping. The TRR also highlights that the grain-size distribution used in the model may under-estimate the quantity of sand present in the sediment load, which would lead to an under estimation of sediment trapping in the impoundment. Additional modelling of sediment trapping is recommended.
Navigation		
26	Agree with TRR as reviews, recommendations, especially is conclusion of the TRR "This review does not concur with the developer's assessment that the navigation facilities mostly comply with the PDG2009". However, the TTR still has some points needed to recheck and improve, as followings: ▪ More recheck hydrological data in analysis (to correct some important parameter as maximum working head of the navigation lock is 21 m? Highest Operational Level, Lowest Operational Level, and Normal Operational Water Level …) ▪ Just focusing on reviewing design only, lack of attention to operation stage ▪ Lack of the impacts caused by fluctuating WL d/s due to hydropeaking ▪ Conclude questionable feasibility of expansion plan (for the second lock?)	The maximum water head of the ship lock is indeed 21 meters, and that corresponds to the highest operational level upstream, which automatically also comprehend the normal operational level and the lowest operational level. The ship lock can operate under all these levels in a normal way. Once the ship lock is completed and operational, it will be monitored under a River Information System which is a life-time information system allowing all ship locks in the cascade to operate with the highest efficiency to reduce the waiting times to a maximum. The operation itself of the ship lock is programmed in all its consecutive sequences that cannot be overruled by incidental wrong commands. Hydro peaking has no significant impact on the lock operations as the entire lock with its approaches is neatly separated from the power

No.	Comments from the National Meetings in Viet Nam	Responses for the inclusion in the 2nd draft TRR
		house and the spillway. The condition however is that the hydro peaking will not result in producing excessive upstream [low] water levels for which the structure has not been designed. There will always be a 4 meters water depth above the threshold of the upper lock head. The decision to construct a second ship lock depends on the increase of navigation and is well described in the PDG2009. ***When*** this will happen is not known yet and depends on many external economic factors that cannot be evaluated at this time.
27	Lack of sections in the report: transboundary impacts and Impacts on river borne trade potential	Ship locks do not have transboundary impact. They assure the continuity of the navigation and. The PDG2009 describes well the periods that should be foreseen for maintenance and repairs. However, accidents or accidental breakdowns can always happen and the RIS will automatically dispatch this information to all stakeholders and riparian countries concerned. A carefully established list of vital spare parts can certainly contribute to a tangible shortening of the time for repair. The influence on river borne trade potential will mainly be felt by the certainty that future potential navigation in theory can be done with barges of 2,000 tonnes. The infrastructure and the ship locks guarantee such. Article 10 of the Mekong Agreement makes the impair of navigation subservient to other uses of the Mekong mainstream.
28	Lack of review on the sediment management in navigation channel, ship-lock: How will be deposition, plan for dredging.	The TRR recommends a timely hydrographic survey of both approach channels. However, since the quantities will not be dramatic, disposal areas for the limited dredged material will likely be found easily

No.	Comments from the National Meetings in Viet Nam	Responses for the inclusion in the 2nd draft TRR
29	Correct review 33rd about numbers: 2000T, 1000 T because this design just for 500 T (same Xayaburi, Pak Beng) "It is also recommended to consider cargo vessels of 2,000 t instead of only 1,000 t."	The design vessel is indeed 500t (even a convoy of 2 x 500t barges with pusher). Some of the free-flow sections for the time being cannot accommodate bigger ships to pass on the Mekong. But once the cascade will be fully built, few free flow sections will remain and can be improved from a carefully designed enlarged and deepened channel. That's why the lock chambers have been chosen at 120x12x4, in order to accommodate these barges without extra civil engineering work. The report never mentions "only 1,000t".
Water Quality		
30	There are numerous inconsistence and inaccuracy of information on water quality in the PLHPP reports. It should be highlighted and mentioned in detail in which documents, sections, page number they are referred	This information is provided in the WQ appendix
31	In several sections, the TRR mentioned the lack of provided data. It is necessary to conduct thoroughly the literature review and make references from available data from LMB and other sources. It would be useful if the TRR should provide in detail sources of the reference documents/reports on water Quality monitoring in the LMB, those have been carried out by MRCS.	This information is provided in the WQ appendix
32	It is necessary to provide the recommendation on what is available data and what data needs to be collected in order to assess currents status on water quality those will support to predict the trend on water quality for the preparations, construction and operation phases.	The TRR is a review of existing documentation received as part of the PNPCA procedure. It was highlighted that the WQ monitoring was inadequate to establish the baseline status but providing guidance on monitoring needed is not the task of the TRR – such information is provided in the DG2018 and more detailed in JEM guidelines.
33	It is necessary to provide the recommendation on what WQ Model should be used by Developer for prediction of further change in water quality.	The TRR is a review of existing documentation received as part of the PNPCA procedure. It was highlighted that the WQ monitoring was inadequate to establish the baseline status but providing guidance on monitoring needed is not the task of the TRR – such information is provided in the DG2018 and more detailed in JEM guidelines.

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34	TRR should provide in detail information on the appropriate assessment methodology on trans-boundary impact assessment and cumulative impacts assessment for the water quality.	Same response as above – this information is provided in the JEM
35	TRR should provide the further recommendation on the detailed long - term and broader monitoring program (up/ down stream, transboundary) linked with Joint Environmental Monitoring (JEM)	Same response as above – this information is provided in the JEM
36	TRR should provide in detail information for the Environmental Monitoring Programme as water quality monitoring parameters and monitoring regime for construction, operation phases.	Same response as above – this information is provided in the JEM
Ecology		
37	TRR should provide in detail sources of the reference documents/reports on aquatic life and EHM monitoring in the LMB those carried out by MRCS.	Same response as above – this information is provided in the JEM review and guidelines
38	TRR should provide in detail information on the appropriate assessment methodology on trans-boundary impact assessment and cumulate impacts assessment for the aquatic life, ecological health, environmental flow.	Same response as above – this information is provided in the JEM guidelines
39	TRR should provide the further recommendation on the detail long - term and broader monitoring program (up/ down stream, transboundary) linked to JEM.	Same response as above – this information is provided in the JEM guidelines
40	TRR should provide in detail information for the EMP as Ecological health indicator and monitoring regime the construction, operation phases.	Same response as above – this information is provided in the JEM guidelines
Fisheries		
41	With reference to the gap and poor sources of baseline data and information on fisheries biodiversity, ecology and abundance in the LMB, TRR should provide developer in detail the sources of reference documents/reports on	Same response as above – this information is provided in the JEM review and guidelines

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	available data and information those have been carried out by MRCS and should referred to.	
42	TRR should provide the detailed recommendation on additional monitoring progamme/study/ for base-line information on fish swimming ability, fish migration, spawning ground, fish drift to support the appropriate fish pass design.	Same response as above – this information is provided in the JEM guidelines
43	For assessment methodology, the DRIFT tool is recommended by TRR to be used for impact assessment on fisheries as well as aquatic ecology. How to do that in practice? MRCS will hand DRIFT tool to the developer? For fish biology analyzing, the category of Mekong Fish Guilds in DG 2018 should be applied and will be better for impact assessment, instead of only "white", "black" and "grey" guilds.	The MRC holds a full working version of the DRIFT tool and the developer is recommended to work with MRC to benefit from this tool and potential outputs in the TRR. This requires the developer to approach the MRC.
44	In connection with fisheries monitoring programme during construction and operation phases, TRR should elaborate the scope (parameters/indicator, monitoring sites, frequency…linked to JEM) with strong focus on transboundary and cumulative impact assessment, including fisheries resources in Mekong Delta and Tonle Sap.	Same response as above – this information is provided in the JEM guidelines
45	If the navigation lock is considered recommended as a facility of fish passage, the design and operation of this work should be integrated and recommended in the TRR.	The integration of the fish lock as a passage facility is recommended in the TRR appendix F on fish passage.
Dam Safety		
	Comment on the TRR	
46	Some statements of the TRR are not consistent such as: The Feasibility Study for Pak Lay provides a comprehensive description of how the dam has been designed and the plans for integrating a dam safety management system, it is	The Feasibility Study does not provide a sufficiently clear description of the design and in particular the selection of the design criteria and

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	appears appropriate for this stage, while the annex B shows there are 2/8 of the PDG do not conform and 4/8 do not enough info to assess;	the consequence of failure. We cannot find the actual text referred to here. However, 'comprehensive' does not necessarily mean compliant.
47	Some recommendations are not detail enough to guide Developers such as: Emergency Preparedness Plan should continue to be developed and consultations are made with the local communities	At this stage it is not expected that the EPP will have been fully developed. The Developer has indicated the broad outline of the plans and the discussions that they will have with the local stakeholders. This is sufficient at this stage provided they carry out this work prior to the start of construction. The JAP will pick up on these aspects.
	Recommendation to improve TRR	
48	Use up-to-date international guidance and ICOLD bulletin such as: bulletin 154 (2017) to guide developer on the Dam safety management	We agree. The Developer must use the most up to date guidance, including the DG 2018 and the latest LEPTS. This is included in the 2nd draft.
49	Some Chinese designs standards have been compared with international practice (for flood and Seismic). TRR need to compare some keys design standards with Lao national standards or international practice (Bulletin-47: Quality control of concrete; Bulletin-36: Cements for concrete for large dams, etc.) to confirm the safety of the dam design.	We agree. The Developer needs to provide this comparison. The Developer has indicated that an English translation has recently been provided, but the review team has not seen this.
50	The TRR should assesses dam safety during the construction period;	The Developer needs to consider this in their planning of the construction. Detailed plans will only be developed during the detailed design stage, and this will be addressed in the JAP.
51	The TRR recommended using the PMF (probable maximum flood) to be consistent with Xayaburi HP, however it is also need to comment on the flood hydrograph.	We agree. The PMF is not just a peak flow but as identified by Vietnam, the hydrograph is also important. This aspect is included in the TRR
52	More clarify the inconsistent on the CNR assessment and TRR (may be because of design standards?)	We cannot provide detailed comment on why CNR have indicated their level of compliance, we can only comment on our findings of the

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		Developers design. However, it appears that CNR has assumed that their recommendations will be taken up.
Economics		
53	The TRR should provide recommendations on the methodology use in the Cumulative assessment and Transboundary impact assessment.	It is international good practice to follow the steps outlined in Section 4.6.2 (Overview) in a social impact assessment and social management plan. This is irrespective of where social impacts occur, domestically or in neighbouring countries. Section 5 then describes how to deal with identified transboundary social impacts in the Mekong context. It would be beyond the scope of the TRR to provide detailed recommendations on cumulative assessment methods, but these are readily available in the literature (e.g. IFC 2013: Good Practice Handbook on Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets). No change to TRR. It should also be noted that Articles 7 and 8 of the Mekong Agreement require that the notified countries should indicate with valid evidence where 'substantial damage' has occurred.