

PRELIMINARY ENVIRONMENTAL IMPACT ASSESSMENT (PEIA)
for
PROPOSED TIMBER LATEX CLONE PLANTATION AT HSK SUNGAI BEROK (1,015.0 HA), HSK
GUNONG SUNGAI BEROK (97.0 HA), MUKIM ULU NENGGIRI, DAERAH BERTAM, GUA MUSANG,
KELANTAN DARUL NAIM

EXECUTIVE SUMMARY

This **Preliminary Environmental Impact Assessment (PEIA)** report is prepared in accordance with the schedule of the **Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order, 1987 Item 1(a): Land Development schemes covering an area of 500 hectares or more to bring forest land into agricultural production, made under the Environmental Quality Act 1974 (Act 127)**. The **PEIA** as required by the **Department of Environment (DOE)** is an essential tool in assessing the overall impact that may result from the proposed timber latex clone plantation project on the surrounding environment where the report is done on the guidelines, conditions and procedure from **DOE**. The process is a mandatory requirement under **Section 34A(2), 34A(6), 34A(7) & 34A(8) of the Environmental Quality Act, 1974**. As stipulated in the **Section 34A(2)**, any person or parties intending to carry out any prescribed activity shall, before any approval for the carrying out of such activity is granted by the relevant authority, submit a report to the **Director**. The **PEIA** report is done based on the guidelines, conditions and procedures contained in the **Handbook of Environmental Impact Assessment**. The outline of **Environmental Management Plan (EMP)**, **Environmental Monitoring Exercise (EME)** as well as **Environmental Auditing Exercise (EAE)** is also presented in the report, as a brief guide in implementing the recommendations made herewith as well as to monitor the project from the environmental of view.

The report entitled “**Preliminary Environmental Impact Assessment For Proposed Timber Latex Clone Plantation At HSK Sungai Berok (1,015.0 Ha) & HSK Gunong Sungai Berok (97.0 Ha), Mukim Ulu Nenggiri, Daerah Bertam, Gua Musang, Kelantan Darul Naim**” has been prepared for the project proponent, **Gagah Kukuh Sdn Bhd-Peka Azamat Sdn Bhd-Rich Forte Sdn Bhd (GPR)**. **GPR** has identified the project is economically feasible for the proposed timber latex clone plantation with an area of 2,747.801 acres (1,112.0 hectares), where approximately two (2) cycles of timber latex clone plantation programme can be carried out by the project proponent. A permit of the development for a period of 50 years has been granted from **Department of Forestry Negeri Kelantan** on 3rd August 2008 and 11th November 2008. In the agreement **GPR** has a responsible and commitment to undertake an area of **HSK Sungai Berok** and **HSK Gunong Sungai Berok** for proposed timber latex clone plantation project with certain term and conditions as agreed in the approval and agreement with respective government agencies.

The proposed project site is basically part of **HSK Sungai Berok** and **HSK Gunong Sungai Berok** which is approximately within Latitude 4° 37' 12.3" N to 4° 41' 46.8" N and Longitude 101° 37' 54.6" E to 101° 42' 11.3" E. The proposed project site is approximately 8.0 km south of Simpang Pulai-Lojing-Gua Musang-Kuala Berang highway, 16.0 km southwest of Orang Asli Pos Belau community area, 22.0 km southeast of Orang Asli Pos Hendrop community area, 30.0 km east of Orang Asli Pos Berok community area, 35.0 km southwest of Orang Asli Kuala Betis community area, 39.0 km southwest of Kg Pulau community area, 42.0 km northeast of Kg Raja community area, 47.0 km southwest of Gua Musang town area, 50.0 km northeast of Cameron Highland town area, 103.0 km southwest of Kemubu area, 146.0 km southwest of Kuala Krai town area, 150.0 km south of Jeli town area, 177.0 km southwest of Tanah Merah town area, 221.0 km southwest of Kota Bharu town area. The proposed project is part of the state government initiative in promoting privatization of agriculture plantation project as well as to encourage more private sectors participation in the industry. All the proposed project site area consists of mixed terrain profile with flatter area in certain part whilst some hilly in terrain. According to the **Laporan Rancangan Struktur Majlis Daerah Gua Musang (1995-2020)** the proposed project site area has been identified as forest reserve area known as **HSK Sungai Berok** and **HSK Gunong Sungai Berok**.

The proposed project site area are easy accessible which can be accessed from ex-logging tracks and plantation roads via Simpang Pulai-Lojing-Gua Musang-Kuala Berang highway which located some 21.0 km at northeast of proposed project site areas. There are three (3) main rivers found within and nearby the proposed project site which is Sg Kepak, Sg Cheras and Sg Kelahok. A part of that, there is a quite number of unknown small seasonal rivulets, stream and rivers found scattered within and surrounding of the proposed project site area which is known as Sg A, B, C, D, E and F. Information gathered from the various fieldwork exercises revealed that there is no local settlement within the proposed project site area. **GPR** will develop the area in stages by constructing the site office, worker quarters, storage facilities and utilities at the selected location within the proposed project site area. The project activity will begin with deforestation and partially logging and clearing during the initial stage followed by lining, holing, planting of timber latex clone trees as well as planting of cover crops. The project will increase the value of land resource as well generate revenue which can be gained by the local communities in Daerah Bertam, Jajahan Gua Musang, **State of Kelantan** as well as **Federal Government of Malaysia**.

Chapter 7.0 and **9.0** has comprehensively described on the various type of potential impact that may occur as a result of the overall project implementation. In general, the activities which usually pose with potential impacts are site preparation, logging, plantation, operation and maintenance. The impacts may arise from the project development include soil erosion, noise, dust emission, deterioration of river water quality as well as ecological and sociological impact. However, only soil erosion, river water pollution, schedule waste and ecology may pose adverse impacts during planting and operation stage. The noise and dust problems are likely to have a short-term impact during the extraction of valuable timber trees, site clearing, earthworks and planting stages. The noise and water quality result were reviewed for the study and can be found in **Appendix G**. The values were compared with the standard guidelines from **DOE**. Sedimentation problem in the streams and erosion from exposed ground especially during land clearance and earthworks are also expected to give a short-term pollution impact to surrounding existing environment. The potential impact will not only affect the main river, Sg Kepak, Sg Cheras and Sg Kelahok but also to several unknown name of seasonal rivulets and streams (Sg A, B, C, D, E, and F) which is located within and surrounding the proposed project site. Most of the potential environmental impact and adverse impact highlighted in this report is more on short-term, common impact and can be controlled and minimized. With a full commitment that will be given by the project proponent and other respective parties (contractors, sub-contractors and suppliers) in carry out all the suggested mitigating measures and also well-established enforcement system carry out by the respective government authorities can be controlled, minimize and resolved within a short period of time.

During planting and maintenance stages some impacts on water quality are expected due to the use of fertilizers and pesticides as well as sewage from the worker quarters at project site. The movement of fertilizers (nitrate & phosphate) and pesticides into the water bodies is very dependent on the erosion process as well as the flow of surface runoffs. Therefore, erosion process and control application of the fertilizers should be closely monitored and controlled. This would assist in minimizing the pollution of the water bodies by agrochemicals. Several measures are taken to prevent soil degradation and conserve soil fertility. Slope cutting must be minimized as to avoid possible erosion problem especially on the bare land. Area with a slope more 25° can be used for planting purposes but with a very minimal earthwork activity without using of heavy machinery or if possible to be remained undisturbed. Total clearance of vegetation at one time should be avoided at all. The site clearance activity direction toward the river or other water body shall be avoided. Some natural landscape and buffer zone is suggested to be preserved especially along main streams and rivers. Proper natural buffer zone based on the guidelines produced by **Department of Irrigation and Drainage (DID)** must be developed as possible along small seasonal rivulets and all the main rivers which found within and nearby the proposed project site. Sediment basins and silt traps are recommended to be constructed during early stage of site clearing works at the strategic location (as suggested) to prevent eroded and silt materials from leaving the proposed project site. Other method of erosion control such as perimeter earth drains are also suggested to be constructed along the boundary of sub-catchments areas for the purpose of intercepting surface runoffs and channeling them into the sediment basins and silt traps. The project proponent is suggested to use an existing road network and as possible to minimize the construction of new road. Any construction of new access road and road network within the proposed project site must follow the

guidelines produced by **JKR** and **Department of Forestry**. Soil conservation practice such as access road alignment, stream crossings, maintenance of waterway and soil compaction should be implemented when developing the plantation. In any agricultural activity, a considerable portion of the grown or harvested materials ends up as waste materials. Disposal of those wastes leads to environmental and aesthetic pollution. The project proponent shall also carry out the proper management, storage and disposal system of the schedule wastes (oil wastes) generated from the daily plantation activity as according to the **Environmental Quality (Scheduled Wastes) Regulations, 2005**. Improper management such as oil waste may potentially affected the water sources nearby. Even though the generation of schedule waste on-site might be in small quantity, it can give a major impact once it's enter to the water body. It will not only affect the living organism in the water but also to the human who use the water as their water supply.

There are a few discussions on the disease and health impact being focused. The matter however become more and more important since there is a lot of development involve in conversion of natural forest area which known to be natural habitat for most of wildlife, insect, birds, reptilian and etc. The potential impact that may generate as a result of the conversion activity is spread out of disease that may affect the human health such as malaria which is commonly occurred. A part of that, there is also another common disease may occur in any development of agriculture activites especially when water pollution which commonly known as cholera. This disease can very fast to be spread out and became a major outbreak when it appears in certain community area. However, the project proponent is advised to take seriously the disease and health problem for all their workers to overcome, controlling and minimizing the disease problem occur on-site. One of the ways in preventing the spread of vector-borne disease, **GPR** should have proper waste disposal and drainage to prevent water stagnation that can harbor vectors which can spread disease.

Burning causes severe losses of organic matter which would otherwise return to the soil. In addition, losses of mulch and humus would take place and in the recent and sub-recent soils this could also lead to loss of soil moisture. Under section **29A** of the **Environmental Quality Act 1974** and which read together with section **29B** of the **Environmental Quality Act 1974**, open burning is prohibited. This means that no open burning exercise should be adopted either within or surrounding the proposed project site (strictly prohibited) at all time. The occurrence of the wildfires not only influences the development of the plant community but also contributes to the selection of the composition of the ecosystem. The fires caused extensive damage to vegetation, wildlife, environment and the health of people surrounding the affected areas. This has to be made very clear to all parties involved in the plantation activity. Any incompliance may subject to action that can be taken by **DOE Negeri Kelantan** to the project proponent as stipulated clearly in the **Environmental Quality Act 1974** and a heavier penalty of a fine not exceeding RM 500,000.00 or to imprisonment for a term not exceeding 5 years or both. Stumps and other unwanted materials generated from the land clearing activities should be left to rot on the ground or dumped at designated dumping area within the proposed project site. These will create as a temporary surface cover to the soil as well as it is good for invertebrates, which important for soil reconditioning. Some ecological impact is anticipated to be experienced by the flora and fauna communities inhabiting the area. A proper phasing and direction of clearing exercise shall be practiced as to allow an ample period of time for wildlife (if any) to naturally migrate to a new area. A part of that it can minimize the possible erosion may occur on-site. Mitigation measures and also guidelines issued by the respective agencies (**DOE Negeri Kelantan, Department of Forestry & Department of Wildlife and National Parks**) as highlighted in the report are recommended to be carried out as to minimize, control and resolve the potential impact that may arise during the execution of the overall timber latex clone plantation project on the wildlife available within and surrounding the proposed project site area.

In terms of socio-economy the proposed timber latex clone project is expected to initially generate profit income in six (6) years time. And by the year nine (9) of plantation period, **GPR** were expected to make almost double profit as compared to the total overhead cost that they had already invested during the early stage of the timber latex clone plantation activity. It is forecasted that the timber latex clone based industry market prices will be continued increase and stable, more profit is expected to be gained by the project proponent as the project being continuing implementing. A large amount of timber latex clone

seed is estimate to be tapped for fifteen (15) to twenty (20) years and harvested for timber at the end of a twenty (20) to twenty five (25) year cycle. This will help sustain the natural rubber and wood industry in the state as well as federal level. The proposed project site area has a great potential in producing a high marketable timber latex clone trees that can be harvested and easily transported using ex-logging tracks via Simpang Pulai-Lojing-Gua Musang-Kuala Berang highway. The current road access will provide a very easy access and cost effective in transporting the seed, raw material, machine, equipments, fertilizers and workers needed for the proposed projects. The location of the proposed project is quite far from a local community area but there is still a local community within Daerah Bertam and it will also give an advantage in term of workers needed for the overall timber latex clone plantation activities. On the other way, the proposed timber latex clone plantation activity will beneficial the surrounding local community in providing the employment, small business opportunity, enhance the infrastructure facility, sharing the latest timber latex clone plantation technology thus increase the land value. The project proponent shall imposed a regulation and security system to all the workers and also other respective parties involved in the timber latex clone plantation project as to prevent illegal transported of timber latex clone tree, illegal open burning and illegal hunting exercise within or outside the proposed project site. These to ensure that nobody can come in and out from the project site as they like. A part of that, the project proponent shall impose a restricted no hunting exercise within or surrounding the proposed project site to all workers and parties involved in plantation activity. Any event of illegal hunting activity shall be reported to the respective government agencies such as **Police** and **Department of Wildlife & National Parks**. All environmental compliances matter shall be stated clearly in the any official agreement made within the parties involve in the overall project development.

The proposed project site is also suitable for such development due to the location, climate, existing surrounding landuse and topographical characteristics. In ensuring the effectiveness of mitigation measures in place during the project implementation, the **Environmental Management Plan (EMP)**, regular **Environmental Monitoring Exercise (EME)** and **Environmental Auditing Exercise (EAE)** is recommended to be carried out covers river water quality, noise level and air quality, waste management and ecological changes. All aspect of environment monitoring are carefully planned and implemented during the overall development of proposed timber latex clone plantation. Environmental monitoring allows the actual impact of the project to be measured and improves the data-base for future prediction. Workers involved in the project should be briefed on the need to protect the environment and to take the necessary mitigating measures to ensure that there is no adverse impact on the surrounding environment. A part of that the project proponent is required to prepare an **Emergency Response Plan (ERP)** for any emergency cases that may occur within or outside the proposed project site. The implementation however, shall be discussed with respective government agencies such as **DOE Negeri Kelantan, DID, Department of Forestry, Department of Agriculture** and other relevant government agencies as to incorporate the proposed project in a proper and environmental friendly way. All the exercises as well as **ERP** document shall be presented and submitted in advance to the **DOE Negeri Kelantan** for auditing purposes.

In conclusion, with proper implementation complete with a proposed mitigating measure, the proposed project will provide myriad of tangible and intangible benefits to nearby local community surrounding the project site area, Daerah Bertam, Jajahan Gua Musang, **State Government of Kelantan** as well as **Federal Government of Malaysia**. Impacts that may arise are mainly short term and expected can be controlled, minimized and resolved by the project proponent. As we know, the timber latex clone industry is considered as a high risk business with high capital investment but confirm returns. This will contribute to the overall government policy in implementing the agriculture plantation management and wise use of natural resources. Various approaches and technologies aimed to reduce the impact of the industry on the environment have been converted to successful practices in timber latex clone plantation. According to some researchers, the most understated aspect of timber latex clone tree cultivation is that of its role as a carbon sink. Physiological studies have shown that timber latex clone trees are more effective than teak grown in plantation conditions in taking up carbon dioxide. More importantly, the greening of the respective area may in directly contribute in producing an oxygen and carbon dioxide needed by the human being, trees (flora) and any other living organism within and surrounding the proposed project site area.

KAJIAN AWAL PENILAIAN KESAN-KESAN ALAM SEKITAR
Untuk
CADANGAN PENANAMAN POKOK GETAH KLON BALAK
DI HSK SUNGAI BEROK (1,015.0 Ha) & HSK GUNONG SUNGAI BEROK (97.0 Ha), MUKIM ULU
NENGGIRI, DAERAH BERTAM, GUA MUSANG, KELANTAN DARUL NAIM

RINGKASAN EKSEKUTIF

Kajian Awal Penilaian Kesan Alam Sekitar (PEIA) disediakan mengikut peruntukan yang ada **Akta Kualiti Alam Sekeliling (Aktiviti Terjadual) (Penilaian Kesan Alam Sekitar) 1987** di bawah **Perkara 1(a): Pembangunan kawasan seluas 500 hektar atau lebih kawasan hutan kepada kawasan pertanian, di bawah Akta Kualiti Alam Sekeliling 1974 (Akta 127)**. Kajian **PEIA** ini diperlukan oleh **Jabatan Alam Sekitar** sebagai alat untuk mengukur atau menilai kesan-kesan terhadap alam sekitar yang mungkin wujud hasil dari pelaksanaan cadangan projek penanaman pokok getah klon balak di mana laporan ini disediakan mengikut garis panduan, syarat dan prosedur dari **Jabatan Alam Sekitar**. Penyediaan Laporan **PEIA** ini adalah satu proses yang wajib dilaksanakan seperti yang terkandung di dalam **Seksyen 34A(2), 34A(6), 34A(7) & 34A(8) Akta Kualiti Alam Sekeliling 1974**. Sebagaimana yang terkandung di dalam **Seksyen 34A(2)**, sesiapa atau mana-mana pihak yang ingin melaksanakan mana-mana aktiviti terjadual dimestikan menyediakan Laporan **PEIA** serta mengemukakan kepada **Ketua Pengarah Jabatan Alam Sekitar** untuk penilaian serta kelulusan terlebih dahulu sebelum sesuatu aktiviti tersebut dapat dijalankan. Panduan **Pelan Pengurusan Alam Sekitar (EMP)**, kerja-kerja pemantauan kualiti alam sekitar secara berkala (**EME**) dan juga kerja audit alam sekitar (**EAE**) juga terkandung di dalam laporan ini sebagai panduan dalam melaksanakan cadangan dan juga memantau keseluruhan projek.

Laporan “**Kajian Awal Penilaian Kesan-Kesan Alam Sekitar Untuk Cadangan Penanaman Pokok Getah Klon Balak Di HSK Sungai Berok (1,015.0 Ha) & HSK Gunung Sungai Berok (97.0 Ha), Mukim Ulu Nenggiri, Daerah Bertam, Gua Musang, Kelantan Darul Naim**” ini disediakan untuk pemaju projek **Gagah Kukuh Sdn Bhd-Peka Azamat Sdn Bhd-Rich Forte Sdn Bhd (GPR)**. **GPR** telah mengenalpasti kawasan tapak projek tersebut adalah sesuai bagi penanaman pokok getah klon balak dengan keluasan 2,747.801 ekar (1,112.0 hektar), di mana sekurang-kurangnya dua (2) kitaran penanaman pokok getah klon balak boleh ditanam oleh pihak pemaju projek. Konsesi pajakan selama 50 tahun telah diperolehi dari **Jabatan Perhutanan Negeri Kelantan** pada 3hb Ogos 2008 dan 11hb November 2008. Di dalam perjanjian tersebut, **GPR** bertanggungjawab untuk membangunkan kawasan **HSK Sungai Berok & HSK Gunung Sungai Berok** dengan tanaman pokok getah klon balak dengan terma-terma sebagaimana yang dipersetujui dengan pelbagai agensi kerajaan yang terbabit.

Cadangan tapak projek ini secara amnya terletak di dalam kawasan hutan simpan iaitu **HSK Sungai Berok & HSK Gunung Sungai Berok** dan berada pada kedudukan Latitud 4° 37' 12.3" N hingga 4° 41' 46.8" N dan Longitud 101° 37' 54.6" E hingga 101° 42' 11.3" E. Lokasi kedudukan kawasan tapak cadangan projek adalah kira-kira 8.0 km selatan lebuhraya Simpang Pulai-Lojing-Gua Musang-Kuala Berang, 16.0 km barat daya kawasan petempatan Orang Asli Pos Belau, 22.0 km tenggara kawasan petempatan Orang Asli Pos Hendrop, 30.0 km timur kawasan petempatan Orang Asli Pos Berok, 35.0 km barat daya kawasan petempatan Orang Asli Kuala Betis, 39.0 km barat daya kawasan petempatan Kg Pulai, 42.0 km timur laut kawasan petempatan Kg Raja, 47.0 km barat daya kawasan bandar Gua Musang, 50.0 km timur laut kawasan bandar Cameron Highland, 103.0 km barat daya kawasan Kemubu, 146.0 km barat daya kawasan bandar Kuala Krai, 150.0 km selatan kawasan bandar Jeli, 177.0 km barat daya kawasan bandar Tanah Merah, 221.0 km barat daya kawasan bandar Kota Bharu. Kawasan tapak cadangan projek adalah sebahagian daripada inisiatif kerajaan dalam mempromosikan projek pertanian dan juga menggalakkan penglibatan lebih ramai sektor swasta menceburi bidang ini. Keadaan muka bumi bagi kesemua kawasan tapak cadangan projek pada keseluruhannya adalah berbukit dan rata pada sesetengah kawasan. Menurut **Laporan Rancangan Struktur Majlis Daerah Gua Musang (1995-2020)**, kawasan tapak cadangan projek terletak di dalam kawasan hutan simpan iaitu **HSK Sungai Berok & HSK Gunung Sungai Berok**.

Kawasan tapak cadangan projek boleh ditujui melalui jalan bekas aktiviti pembalakan yang terletak 21.0 km timur laut dari kawasan cadangan tapak projek. Terdapat tiga (3) sungai utama ditemui dalam kawasan tapak cadangan projek iaitu Sg Kepak, Sg Cheras dan Sg Kelahok. Terdapat beberapa anak sungai kecil tanpa nama yang ditemui di sekitar tapak cadangan projek iaitu Sg A, B, C, D, E dan F. Maklumat yang diperolehi hasil dari kerja-kerja ditapak mendapati terdapat tiada kawasan penempatan ditemui dalam kawasan tapak cadangan projek. **GPR** akan membangunkan kawasan tapak cadangan projek secara berperingkat dengan menyediakan tapak pejabat, kuarters pekerja, kemudahan tempat penyimpanan barang dan kemudahan awam di lokasi yang telah ditetapkan. Kerja-kerja di kawasan tapak cadangan projek akan dimulakan dengan aktiviti pembalakan dan pembersihan hutan, diikuti dengan kerja-kerja penyediaan tapak, penanaman pokok getah klon balak dan seterusnya penanaman tanaman tutup bumi. Projek ini akan meningkatkan nilai sumber tanah dan menjana hasil yang boleh diperolehi oleh penduduk tempatan di Daerah Bertam, Gua Musang, **Kerajaan Negeri Kelantan** dan juga **Kerajaan Persekutuan**.

Bab 7.0 dan **9.0** menerangkan secara komprehensif kesan-kesan negatif yang terhasil akibat daripada penanaman pokok getah klon balak ini. Pada umumnya, aktiviti yang dikenalpasti akan memberi kesan negatif adalah semasa kerja-kerja penyediaan tapak, pembalakan, penanaman, operasi dan senggaraan. Antara kesan yang wujud ialah hakisan tanah, bunyi bising, habuk dan asap kenderaan, kualiti air sungai dan ekologi hidupan liar. Masalah habuk dan bunyi bising dijangkakan akan memberi kesan jangka pendek iaitu sewaktu kerja-kerja pembersihan tapak dan pembinaan ladang ini dijalankan. Walaubagaimanapun masalah hakisan tanah, pencemaran sungai dan ekologi dikenalpasti memberi kesan pada peringkat penyediaan tapak sehingga peringkat operasi. Keputusan laporan analisis bunyi bising dan kualiti air telah disertakan dalam **Lampiran G** dan nilai-nilai yang diperolehi dibandingkan dengan garis panduan yang telah ditetapkan oleh **JAS**. Masalah pemendakan lumpur di sungai-sungai dan hakisan daripada permukaan tanah yang terdedah dijangkakan memberi kesan sementara kepada masalah pencemaran bukan sahaja kepada sungai utama iaitu Sg Kepak, Sg Cheras dan Sg Kelahok tetapi juga kepada beberapa sungai kecil yang lain (Sg A, B, C, D, E dan F) yang terletak di dalam dan juga sekitar kawasan tapak projek. Kesan ini dijangkakan hanya sementara dan tidak memudaratkan kawasan di luar dari kawasan tapak cadangan projek. Dengan adanya kerjasama dari pihak pemaju projek dan pihak lain (kontraktor, sub-kontraktor, pembekal) dalam melaksanakan langkah-langkah kawalan yang disyorkan, kesan ini akan dapat dikawal dan diminimumkan dalam jangka masa pendek dan seterusnya melindungi keadaan persekitaran dan ekosistem semulajadi kawasan tapak cadangan projek dari terjejas teruk hasil dari pelaksanaan aktiviti penanaman pokok getah klon balak ini.

Ketika proses penanaman hinggalah ke peringkat penyelenggaraan, kesan negatif terhadap kualiti air sungai adalah sudah dijangka, memandangkan terdapatnya penggunaan baja, racun rumpai dan air sisa yang terhasil dari penempatan pekerja-pekerja ladang getah ini terutamanya. Pergerakan baja (nitrat & fosfat) dan racun rumpai ke dalam air adalah bergantung kepada proses hakisan dan juga aliran air permukaan. Oleh itu, proses hakisan dan pengawalan penggunaan baja perlulah diawasi dan dikawal. Ini dapat membantu mengurangkan pencemaran air oleh bahan agrokimia. Beberapa langkah pengawalan boleh diambil bagi mengelakkan degradasi tanah pemeliharaan kesuburan tanah. Kawasan yang mana mempunyai kecerunan melebihi 25° boleh juga digunakan untuk tujuan penanaman tetapi hendaklah dengan kerja-kerja tanah yang minima sahaja dibenarkan tanpa penggunaan jentera-jentera berat iaitu bagi mengurangkan risiko berlakunya kejadian hakisan tanah. Pembersihan tumbuhan secara keseluruhan hendaklah dielakkan dan pemetongan cerun-cerun hendaklah seminima yang mungkin. Zon-zon penampakan semulajadi sebagaimana garis panduan yang dikeluarkan oleh **Jabatan Pengairan dan Saliran (JPS)** dan lanskap semulajadi hendaklah diwujudkan terutama di sepanjang anak-anak sungai bermusim dan juga sungai-sungai utama yang berada di dalam dan bersempadan dengan kawasan cadangan tapak projek. Kolam mendapan, kolam perangkap lumpur, longkang tanah serta lain-lain langkah-langkah kawalan yang dicadangkan hendaklah dibina terlebih dahulu sebelum kerja-kerja pembersihan kawasan dijalankan. Pemaju projek juga disarankan supaya menggunakan jalan-jalan sedia ada ketika pelaksanaan projek ini bagi mengurangkan berlakunya hakisan. Pembinaan jalan-jalan ladang yang baru sekiranya perlu hendaklah dibina mengikut garis panduan yang telah ditetapkan oleh pihak **JKR** dan juga **Jabatan Perhutanan**. Pemuliharaan tanah seperti penajajaran jalan masuk, lintasan

sungai, pengekalan jalan air dan pemadatan tanah perlulah dilaksanakan apabila projek penanaman dibangunkan. Dalam aktiviti pertanian, bahagian yang penting bagi bahan yang tumbuh dan dituai akan berakhir dengan bahan sisa. Pelupusan bahan sisa ini akan membawa kepada pencemaran alam sekitar dan estetik. Pihak pemaju juga disarankan untuk melaksanakan kerja-kerja pengurusan serta penstoran sisa-sisa berjadual (sisa minyak) yang terhasil dari aktiviti harian sebagaimana tertakluk di dalam **Peraturan Kualiti Alam Sekeliling (Buangan Terjadual), 2005**.

Terdapat beberapa isu dan perbincangan yang perlu diberi perhatian dalam sebarang projek pertanian iaitu penyakit dan kesan-kesannya. Hal ini dilihat sebagai satu keutamaan dan semakin penting memandangkan terdapat banyak pembangunan di dalam kawasan hutan semulajadi yang diketahui umumnya adalah habitat semulajadi hidupan liar, serangga, burung, reptilia dan sebagainya. Kesan-kesan negatif yang terhasil akibat daripada aktiviti ini adalah penyebaran wabak yang boleh memberi kesan kepada kesihatan manusia seperti penyakit malaria yang kebiasaannya berlaku. Di samping itu, terdapat juga penyakit lain yang wujud daripada pencemaran air iaitu penyakit taun. Wabak ini lebih cepat merebak dan meletus apabila melewati sesebuah kawasan penempatan. Walaubagaimanapun, pemaju projek dinasihatkan supaya mengambil serius akan wabak dan masalah kesihatan semua pekerja dengan mengambil langkah-langkah yang sewajarnya dalam mengawal dan meminimumkan masalah ini berlaku di kawasan projek. Salah satu cara untuk mengelakkan penyebaran penyakit bawaan vektor, **GPR** perlulah menyediakan tempat pelupusan sisa yang sesuai dan saluran untuk mengelakkan air bertakung yang boleh membiakkan vektor yang seterusnya menyebarkan penyakit.

Pembakaran akan menyebabkan kehilangan bahan organik. Kehilangan humus di dalam tanah juga akan menyebabkan kehilangan lembapan tanah. Di bawah seksyen **29A Akta Kualiti Alam Sekeliling 1974** dan **29B Akta Kualiti Alam Sekeliling 1974**, pembakaran secara terbuka adalah dilarang sama sekali. Ini bermaksud, aktiviti pembakaran terbuka tidak boleh dijalankan di antara dan di sekitar tapak cadangan projek (dilarang secara tegas) pada setiap masa. Pembakaran yang tidak terkawal bukan sahaja mempengaruhi penduduk persekitaran malah memberi kesan kepada sesetengah ekosistem. Sepertimana yang kita ketahui, pembakaran terbuka boleh memudaratkan kesihatan, mendatangkan risiko kepada alam sekitar dan menjejaskan ekonomi persekitaran. Semua pihak perlu diberi kesedaran atau peringatan betapa pentingnya mengelak pembakaran terbuka terutamanya semasa musim kemarau. Perkara ini hendaklah dipastikan supaya dipatuhi oleh semua pihak yang terlibat dengan projek penanaman pokok getah klon balak ini. Sebarang pelanggaran boleh dikenakan tindakan oleh **Jabatan Alam Sekitar Negeri Kelantan** iaitu kompaun sebanyak RM 500,000.00 atau lima tahun penjara atau kedua-duanya sekali sepertimana termaktub di dalam **Akta Kualiti Alam Sekeliling 1974**. Akar-akar serta ranting-ranting pokok dan daun-daun yang terhasil dari kerja-kerja pembersihan kawasan hendaklah dibiarkan reput atau dibuang ke kawasan yang telah dikenal pasti sebagai tempat pelupusan sisa di dalam kawasan tapak projek. Sedikit kesan akan dijangka terjadi ke atas ekologi iaitu tumbuhan dan haiwan liar yang menghuni kawasan ini. Dengan perlaksanaan kerja-kerja penebangan serta pembersihan kawasan secara berfasa akan dapat memberi masa yang cukup serta membantu hidupan-hidupan liar ini (sekiranya ada) untuk berpindah ke kawasan penempatan yang baru. Ianya juga secara tidak langsung dapat mengelakkan hidupan-hidupan liar ini dari terperangkap ketika kerja-kerja pembersihan kawasan dijalankan dan di samping itu juga dapat meminimumkan berlakunya hakisan tanah di kawasan tapak projek. Namun begitu dengan langkah-langkah kawalan dan pemantauan yang akan diambil oleh pihak pemaju projek sebagaimana dicadangkan, masalah ini dijangkakan tidak menjadi serius dan boleh diatasi. Langkah-langkah kawalan dan garis panduan yang dikeluarkan oleh agensi terbabit (**Jabatan Alam Sekitar Negeri Kelantan, Jabatan Perhutanan dan Jabatan Perlindungan Hidupan Liar & Taman Negara**) sepertimana yang dicadangkan dalam laporan ini hendaklah dilaksanakan sepenuhnya untuk meminimumkan kesan yang mungkin berlaku hasil dari pelaksanaan cadangan penanaman pokok getah klon balak ini terhadap hidupan liar yang terdapat di sekeliling kawasan tapak cadangan projek.

Dari segi sosio-ekonomi pula, cadangan penanaman pokok getah klon balak ini dijangkakan dapat menghasilkan pulangan selepas tempoh enam (6) tahun pelaksanaannya. Dalam tempoh sembilan (9) tahun penanaman, **GPR** dijangka menghasilkan keuntungan dua kali ganda dibandingkan dengan jumlah kos overhead yang dilaburkan pada peringkat awal penanaman pokok getah klon balak ini.

Diramalkan bahawa harga pasaran dijangka akan terus kukuh dan stabil dan ini memberi keuntungan yang lebih kepada pihak pemaju projek sekiranya aktiviti penanaman pokok getah klon balak ini dijalankan secara berterusan. Lebih banyak pokok getah klon balak dianggarkan dapat ditoreh bagi tempoh 15 hingga 20 tahun dan kayunya boleh dipasarkan di akhir tempoh kitarannya iaitu 20 ke 25 tahun. Kawasan tapak cadangan projek mempunyai potensi yang tinggi dalam memasarkan pokok getah klon balak dan mudah diangkut dengan menggunakan laluan utama iaitu lebuh raya Simpang Pulai-Lojing-Gua Musang-Kuala Berang. Laluan semasa memberi laluan mudah dan menjimatkan kos terutamanya semasa mengangkut biji benih, mesin, peralatan, baja dan pekerja yang diperlukan untuk melaksanakan cadangan projek ini. Dalam erti kata lain, cadangan penanaman pokok getah klon balak ini akan mendatangkan kebaikan kepada penduduk tempatan dalam menyediakan peluang pekerjaan, kemudahan perniagaan, peningkatan kemudahan infrastruktur, perkongsian teknologi terkini penanaman pokok getah klon balak dan seterusnya meningkatkan nilai guna tanah. Selain dari itu pihak pemaju projek juga hendaklah mewujudkan peraturan-peraturan serta kawalan keselamatan bagi mengelak berlakunya aktiviti-aktiviti terlarang seperti pemburuan binatang liar, pembakaran terbuka dan pengangkutan hasil getah klon balak secara haram atau tanpa permit. Ini adalah untuk memastikan tidak ada sesiapa pun yang boleh keluar masuk kawasan tapak cadangan projek sesuka hati. Sebarang aktiviti pemburuan binatang liar hendaklah dilaporkan kepada agensi kerajaan yang terbabit seperti **Polis** dan **Jabatan Perlindungan Hidupan Liar & Taman Negara**. Tindakan yang tegas perlu diambil dan dilaksanakan sekiranya ianya dilakukan oleh pekerja-perkerja dan pihak-pihak yang terbabit terus dengan penanaman pokok getah klon balak ini. Peraturan-peraturan ini hendaklah dibuat secara perjanjian bertulis dan ditandatangani oleh kedua-dua pihak pemaju projek dan juga pihak-pihak yang terlibat dengan urusan penanaman pokok getah klon balak ini.

Cadangan penanaman pokok getah klon balak ini adalah bersesuaian dari segi kedudukan, cuaca, gunatanah semasa dan ciri-ciri topografi. Walau bagaimanapun untuk mengekalkan keadaan alam sekitar yang bersih dan harmoni, program pengawasan alam sekitar secara terjadual yang dicadangkan perlu dilaksanakan oleh pihak pemaju projek. Bagi memastikan hal ini, penyediaan **Pelan Pengurusan Alam Sekitar (EMP)**, kerja-kerja pemantauan kualiti alam sekitar secara berkala (**EME**), kerja audit alam sekitar (**EAE**) adalah dicadangkan supaya dilaksanakan oleh pihak pemaju projek. Pemonitoran alam sekitar akan membolehkan impak sebenar projek diukur dan meningkatkan data untuk peramalan pada masa akan datang. Pelaksanaan program ini akan berjalan lancar dengan adanya kerjasama dari jabatan – jabatan yang berkaitan seperti **Jabatan Alam Sekitar (JAS) Negeri Kelantan, Jabatan Pengairan dan Saliran, Jabatan Perhutanan** serta **Jabatan Pertanian**. Selain dari itu pihak pemaju projek disarankan juga untuk menyediakan **Pelan Tindakan Kecemasan (Emergency Response Plan – ERP)** bagi tujuan persediaan menghadapi keadaan kecemasan luar jangka yang berlaku di kawasan tapak projek ini. Kesemua dokumen-dokumen ini hendaklah dikemukakan sebelum dan semasa projek ini dilaksanakan kepada pihak **Jabatan Alam Sekitar (JAS) Negeri Kelantan** untuk tujuan penilaian dan pengauditan.

Kesimpulannya perlaksanaan yang lengkap dengan langkah pencegahan yang dicadangkan, cadangan projek akan memberikan kesan yang baik kepada penduduk setempat berdekatan kawasan projek, Daerah Bertam, Gua Musang, **Kerajaan Negeri Kelantan** dan juga **Kerajaan Persekutuan**. Kesan yang dijangka wujud adalah lebih bersifat jangka pendek serta boleh dikawal, diminima dan dihapuskan dengan langkah-langkah kawalan yang bakal dijalankan oleh pihak pemaju projek. Sepertimana yang kita ketahui, industri ini adalah berisiko tinggi dengan nilai pelaburan yang besar tetapi ia mampu menghasilkan pendapatan berjuta ringgit. Ini akan menyumbang kepada pencapaian polisi kerajaan dalam melaksanakan serta merencanakan pelbagai projek yang berasaskan pertanian secara pengurusan bersepadu, penggunaan sumber asli yang mapan dan pemuliharaan alam sekitar secara terancang. Pelbagai pendekatan dan teknologi digunakan untuk mengurangkan kesan yang berlaku dalam melaksanakan projek cadangan penanaman getah klon balak ini terhadap persekitaran. Kajian yang dibuat mendapati penanaman pokok getah klon balak adalah lebih efektif jika dibandingkan dengan penanaman pokok jati dari segi penghasilan karbon dioksida. Apa yang lebih penting, penanaman pokok getah klon balak ini akan dapat membantu menghijaukan kawasan dan seterusnya menghasilkan keseimbangan oksigen dan karbon dioksida yang sememangnya diperlukan oleh manusia, flora dan fauna juga hidupan lain di sekitar tapak cadangan projek.