



Penonomé Wind Farm Project, Panama

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List of Acronyms

ANAM	Panamanian National Environmental Agency (<i>Autoridad Nacional del Ambiente</i>)
ANATI	Panamanian National Agency for Administration of Lands (<i>Autoridad Nacional de Administración de Tierras</i>)
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CRC	Community Relations Coordinator
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
EPC	Engineering, procurement and construction
EP	Equator Principles
EHS	Environment, health and safety
GIIP	Good international industry practice
ha	Hectares (10,000 square meters)
IBA	Important Bird Area
IFC	International Finance Corporation
IUCN	International Union for Conservation of Nature
MW	Megawatt
NTS	Non-technical summary
OHS	Occupational Health and Safety
PS	Performance Standards
PWP	Penonomé Wind Project
ROW	Right of way
RPM	Rotations per minute
UEP	Unión Eólica Panameña, the original concessionaire and project developer
UEPI	UEP Penonomé I, S.A., a Special Purpose Company controlled by Goldwind Capital
UEPII	UEP Penonomé II, S.A., a Special Purpose Company controlled by InterEnergy Holdings Ltd.
VEC	Valued environmental and social component
WTG	Wind turbine generator

1 Project Description

The Penonomé Wind Project (PWP or Project) is the first commercial wind farm development in Panama. The Project is located on a ‘greenfield’ site in Penonomé, in the Province of Coclé, approximately 110 km southwest of Panama City. The area is characterized as modified habitat and consists largely of pasture, agricultural land and teak plantations.

The Project is being developed in phases and will cover a licensed area of approximately 18,500 hectares (ha). The estimated total physical footprint of Project (all phases) is approximately 80 ha. This includes approximately 5 ha for a new electrical substation (already completed), which is located adjacent to an existing 230-kV transmission line that connects to the national grid.

The first three phases of the Project involve the installation of up to 108 Goldwind G109 2.5 megawatts (MW) Wind Turbine Generators (WTGs). These will have a hub height of 90 meters. Phase I (22 WTGs, 55 MW) has already been completed and is operational. Phases II and III, which will be developed by UEPII (see below), will involve 86 WTGs and the civil works are on-going. Phase IV, which may involve up to 27 WTGs, is still in the planning stage and has yet to be fully defined, engineered, contracted or financed. The Project is licensed to generate a total of 337.50 MW.

Table 1: Penonomé Project construction phases

Phase	WTGs	Rated (MW)	Installed Capacity (MW)	Developer	Planned Completion
Phase I	22	2.5	55	UEPI	Completed
Phase II	66	2.5	165	UEPII	2014
Phase III	20	2.5	50	UEPII	2014-2016
Phase IV	27	2.5	67.5	UEP	2016
Total	135	2.5	337.5		2013-2016

Note: WTGs is Wind Turbine Generators

2 Project Sponsors (Phases I to III)

Unión Eólica Panameña (UEP) is the project developer and original concessionaire. UEP is majority owned (92%) by five partners who were formerly also the owners of Unión Eólica Española (UEE). UEE was a Spanish wind farm development company that had developed more than 186 MW in its home market of Spain. A group of Panamanian investors, Grupo Eólico del Istmo, own the remaining eight percent of UEP.

UEPI Penonomé I, S.A. (UEPI) is a Special Purpose Company (SPC) controlled by Goldwind Capital (Goldwind). The parent company of Goldwind, Xinjiang Goldwind Science & Technology Co., Ltd., is one of the largest wind turbine supplier in the world. As of December 31, 2012, it’s accumulated wind power installations exceeded 15 gigawatts, and it has installed more than 12,000 wind turbine units around the world. UEPI successfully completed and is operating Phase I (22 WTGs, 55 MW) of the Penonomé Project. Goldwind will also be supplying the WTGs for Phases II and III.

UEP Penonomé II, S.A. (UEPII) is a Special Purpose Company (SPC) controlled by InterEnergy Holding (InterEnergy). This is a holding company that owns and operates power generation and distribution assets in Latin America and the Caribbean. UEPII is developing Phase II and Phase III of the Project.

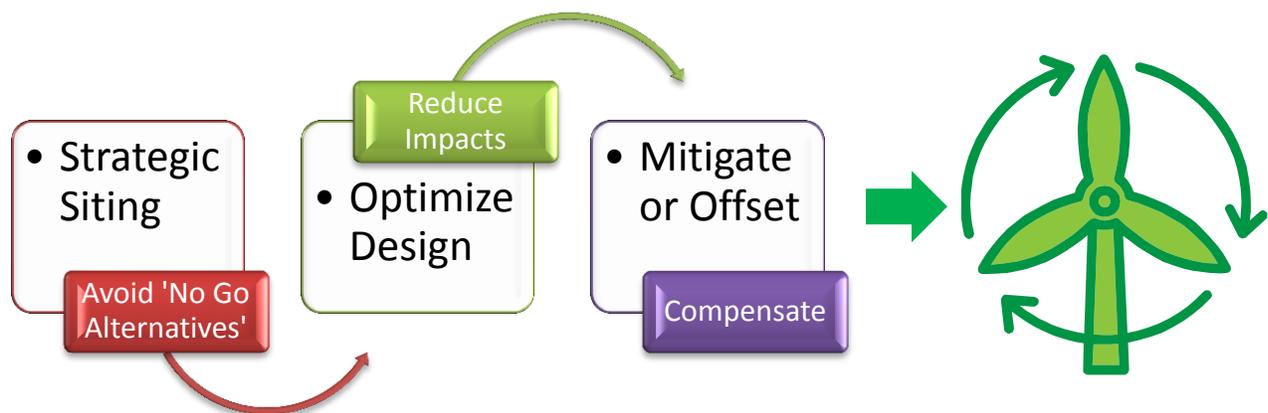
3 Project Justification

Most of Panama’s energy is supplied by hydroelectric (approximately 66 percent) and thermal (fossil fuel) power plants (approximately 30 percent).¹ Total annual energy production is approximately 6.5 GWh, with an annual average of approximately 120 MWh exported and up to 75 MWh imported, depending on the annual variation in production from hydro sources. The hydro power plants generally operate less during the summer while the reservoirs that are filled during the rainy season are depleted. During this period there is increased generation by thermal power plants. Over the recent years, Panama has experienced energy shortages during the summer periods resulting in energy imports, electricity rationing and brown outs. This Project will contribute to Panama’s National Energy Plan by creating more renewable energy that will be available through the dry season.

4 Strategic Siting & Project Location

The siting of the Project followed a strategic mitigation hierarchy process. This means that UEP considered alternative project locations to avoid or minimize significant environmental and social impacts through a strategic site selection process. Site selection criteria took into consideration wind resources, protected areas and biodiversity, touristic centers, constructability, distance to the national electric grid, and general land use. Additional potential site specific risks were addressed by adopting Good International Industry Practice, and benefited from public consultation and good faith negotiations.

Figure 1: Conceptual Mitigation Hierarchy Approach Adopted for Penonomé Project

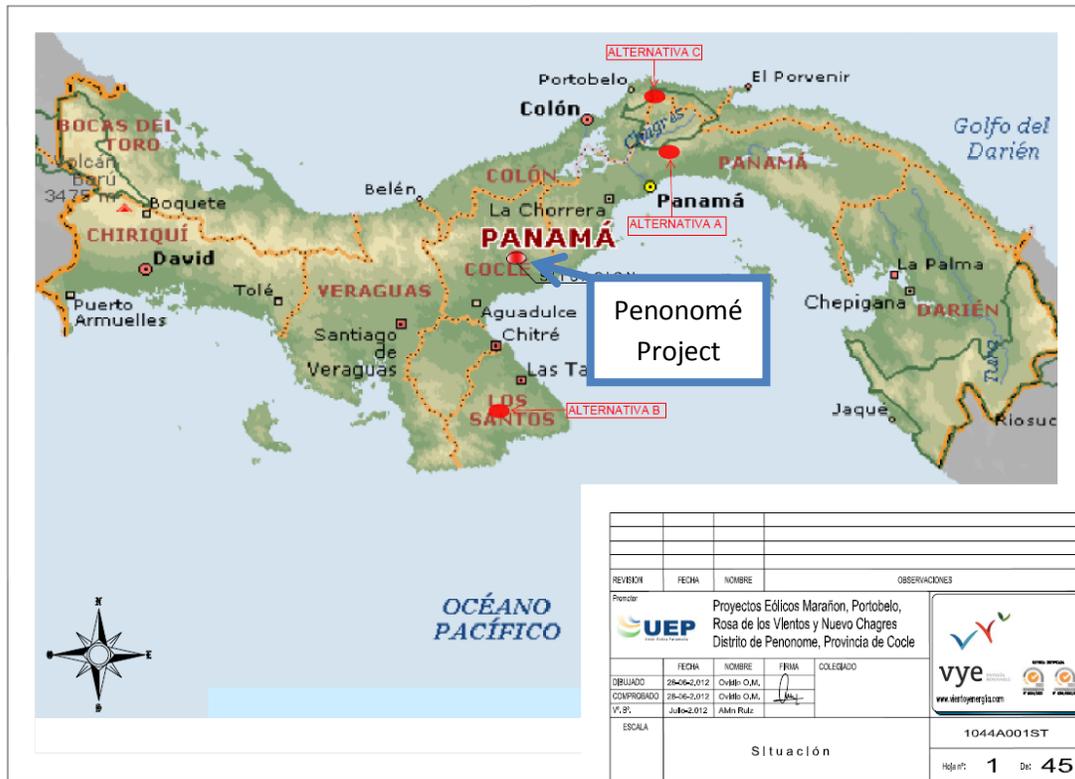


¹ <http://www.cnd.com.pa/>

Table 2: Alternative Project Sites Considered

Alternatives	Environmental and Social Aspects	Constructability & Feasibility	Decision
Alternative A: Cerro Azul, eastern Panama	Located in a forested area in the vicinity of a protected area, large property owners not eager to negotiate	Difficult to access, required construct through mountainous terrain	Rejected
Alternative B: Las Tablas, south of Penonomé	Mountainous location with more significant access road construction impacts	No existing access roads, long distance to connect project to national grid, mountainous terrain which creates costly constructability challenges	Rejected
Alternative C: Portobello, area near Colon	Natural area with intact forests	Access would entail significant environmental impacts, long distance to connect project to national grid	Rejected
Alternative D: UEP Penonomé Project	No material environmental & social footprint, supportive community and landowners	Flat area, easy site access, vicinity to national grid	Preferred and selected alternative

Figure 2: Project Alternatives considered by UEP in Panama



5 ESIA and Construction Status

The Environmental and Social Impact Assessments (ESIA) and public consultation required to satisfy the Panamanian regulatory requirements have already been successfully completed and approved since 2012. Additional studies completed since the Panamanian ESIA were approved include ornithological, bat, noise and shadow flicker studies, which are summarized in the Supplementary ESIA Information (also referred to as ESIA Addendum). Project categorization using the Equator Principles, a framework used by certain banks to manage environmental and social risks in project financing, is described in section 12.

At the time of drafting this NTS (June 2014), the Project had completed all land leases required for the 22 WTGs (Phase I), completed one land purchase required for the completion of the new El Coco electrical substation, and all additional land leases required for the construction of Phase II and Phase III² (see also Socio-Economic section). Phase I has been completed and is delivering electricity to the grid. The construction of foundation and laydown areas is currently progressing for Phase II and Phase III.

6 Environmental Baseline

The Project area occurs at elevations between 50 and 70 meters above sea level and is primarily flat with slopes generally ranging between 0 and 3 percent. The site is characterized by pasture (mainly for cattle) and agricultural land (mainly rice, sugar cane crops, and teak plantations). The Project area exhibits a tropical climate with uniform, relatively high temperatures and humidity, with minimal seasonal variation. Average temperatures at the Project area vary between 26.4 °C and 27 °C. There are no significant stationary emission sources in the Project site, which results in generally good air quality.

Rainfall in Panama varies from less than 1,300 mm (51.2 in) in the lower elevations to over 3,000 mm (118.1 in) in the higher elevations. Generally, the majority of the annual rainfall occurs between the months of April and December. There are no significant permanent surface water features within the Project area. One minor permanent stream (second order) and four minor (first order) ephemeral streams (flow only for part of the year) begin within the Project boundaries or transect the site. One man-made reservoir (with a surface area of approximately 16 ha) is located in the north-central portion of the Project area. Natural hazards, including flooding and seismic risk, were also evaluated and determined to be low.

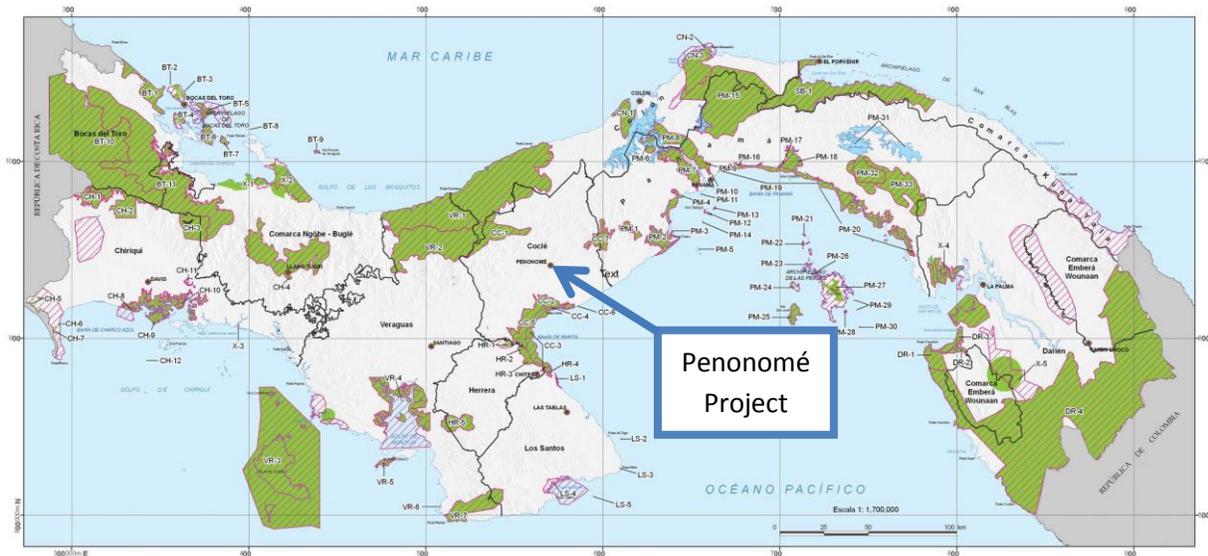
7 Biodiversity, Protected Areas and Cultural Heritage

As illustrated in the following figure, the Project area is not located within any protected areas recognized under the Panamanian National System of Protected Areas, or within any areas identified as high priority for biodiversity conservation. The nearest areas identified as important for biodiversity conservation recognized internationally by the International Union for Conservation of Nature (IUCN) as a Category II protected area include the Parita Bay Important Bird Area (IBA), located approximately 13

² Public land lease agreed with ANATI (Panamanian National Agency for Administration of Lands) and now subject to administrative ratification

km from the Project, and the General de División Omar Torrijos Herrera National Park, located approximately 25 km from the Project site. Migratory/congregatory birds from the Parita Bay IBA, which is designated by Birdlife International as an area of high importance for migratory/congregatory birds, could occasionally cross into the Project area.

Figure 3: Location of Penonomé Project and Regional Conservation Areas in Panama



Source: Atlas Ambiental de la República de Panamá, 2010

The pre-existing regional forests are described as Savanna Tropical dry forests. However, all of the land in the Project area and most of the land in the immediate region has been cleared for agricultural purposes. The Project area can be classified as modified lands, dominated by grasses suitable for grazing with most of the suitable lands also utilized for rice crops during the rainy period. A teak plantation covers approximately 1,339 ha and is located within the Project’s concession area.

Thus, the Project area is mostly an open modified habitat, with a few native tree species, of which, only the *Cedrella odorata* is listed on the global IUCN Red List as Vulnerable (VU) species. Similarly, the fauna of the Project area is only a small subset of the diverse fauna of Panama’s Savanna Tropical dry forests that was once there. The species documented at the site are all species that are able to live in modified habitats and thus are not threatened species. All of the species documented have a fairly wide distribution outside of the Project area and, thus, are not endemic to the area or the region of the Project.

The presence of a municipal landfill within approximately 1-2 km of WTG 8 (located at Camino 1, towards the north central part of the concession area), has resulted in the presence of a large number of vultures (between 1,000 to 2,000). These vultures are very common (not only at the land fill area near the Project) and do not feature a conservation status. Few mammals, amphibians or reptiles are expected to enter the Project area and be affected by the Project.

The Project's impact assessment concluded that the Project would have no significant impacts on the local flora or fauna. There may be low to moderate impacts on some species that may enter the Project area and that are known to exist in the protected areas and the Parita IBA, which are located at distances of 13 km or greater from the Project. In addition, a low to moderate impact of no biodiversity significance can be expected for the vultures congregating at the landfill area.

Animal groups of particular interest include those that may collide with the turbines while they are in operation. These groups include:

- High-flying soaring birds such as raptors (eagles, hawks, etc.),
- Migratory shorebirds known from the IBAs,
- Black Vultures attracted to a nearby landfill,
- Birds congregating in rice fields within the project area, and
- Bats.

Thus, special attention will be given to these species groups during monitoring activities to identify any potentially significant impacts on them. Bird and bat monitoring plans have been developed for Phases I, and Phases II and III and are being implemented to document any significant impacts, and develop any adaptive management or compensatory practices, if needed.

Bird and bat mortality surveys, which have been on-going since January 2014 for the completed Phase 1 area, have recovered approximately 2-3 common bat carcasses per month, along with a total of one common vulture. These monitoring results are not indicative of any significant biodiversity concern.

8 Socio-Economic Baseline

The socioeconomic characteristics of the community as well as its opinions towards the project were documented in household surveys undertaken in October and November 2009. This survey broadly examined the demographics, education levels, health, literacy, livelihoods, employment, land tenure, income and assets, services, and other aspects of the areas inhabitants. The initial survey comprised of a sample of 25 percent of the total number of households in the Direct and Indirect Areas of Influence of the Project was taken for the community at large. The survey covered 100 percent of the households directly affected by Project impacts (including land lease and purchase). In July 2011, further socioeconomic surveying was undertaken in regards to the electrical substation and access roads. Additional reviews and interviews were conducted in June 2014 to generate a Land Use Report and Compensation Plan, and update an existing Stakeholder Engagement Plan and Grievance Mechanism.

Communities considered to be within the Direct Area of Influence during the Panamanian ESIA stage were those located in proximity to the planned physical Project activities, impacts and infrastructure. These include Agua Fria, El Rosario, El Coco, Las Lajas, Coclé, El Congo, and Pan de Azúcar. The size of the population in the Direct Area of Influence is approximately 3,466. The District of Penonomé has approximately 81,000 residents.

Land use in the area is dedicated largely to residential and agricultural activities. These include cattle grazing, growing of cash crops such as rice and sugar cane, and teak plantation. In general, the communities in the Direct and Indirect Areas of Influence grow pig and poultry to produce meat and eggs for their own consumption.

The Project is not located within Indigenous Peoples territories. The Project's socioeconomic studies determined that vulnerable groups, including poor, women or elderly would not be significantly or disproportionately affected by the Project. However, community meetings, typically notified also through radio announcements, the Public Hearings and the Grievance Mechanism were/are designed to also provide reasonable access to vulnerable groups.

9 Impacts and Mitigation

A high level summary of the environmental and social impact assessment is provided in the following table and detailed further below. Due to favorable strategic siting (see section 4), no major environmental and social risks (including any 'no go' risks) were identified for the Project. The Project does not require the construction of new ancillary facilities, such as a high voltage transmission lines. There will be no construction camps. Interviews with the regional environmental agency and other sources did not identify any significant cumulative impacts from other significant developments in the vicinity of the Project that would necessitate additional mitigation measures. Risks and impacts identified can be readily mitigated using standard mitigation measures aligned with Good International Industry Practice (GIIP).

Table 3: High Level Summary of ESIA

ID	Criteria (Overall Rating)	Summary of impact assessment
A	Constructability (very low)	Very low constructability constraints due to relatively flat surface, largely existing access roads and proximity to major roads, including the Pan-American Highway.
B	Environmental (limited to intermediate)	Good site selection eliminated and/or materially reduced environmental and cumulative risks. Although project is not located within or in the immediate vicinity of protected areas or migration corridors of birds and bats with conservation status, there remains a risk of bird and bat collision. However, this is not expected to raise significant biodiversity concerns as demonstrated by on-going monitoring for the completed Phase I. Bird and bat monitoring plans updated for Phases II and III will help identify, mitigate or offset any significant biodiversity impacts, if required.
C	Socio economic (limited)	Good site selection eliminated and/or materially reduced socio-economic and cumulative risks. No significant concerns raised during public consultation about visual impacts. No opposition registered during statutory required public hearings. Limited and temporary adverse impacts during construction due to incremental traffic, noise, and dust. No physical resettlement required for construction. Limited grievances voiced during completion of Phase I typical for construction projects and addressed appropriately. Land leases and one land acquisition followed “willing buyer – willing seller” approach. All economic displacements were deemed marginal and fairly compensated. Interviews with a sample of landowners found that all welcomed predictable lease income, owned additional properties, and voiced interest in having additional turbines on their lands. One group of affected tenants is a rice growers’ co-operative that is not a land owner but uses state-owned land to grow cash crops. Less than 1% of this land will be impacted by the project and fair compensation rates have been formally agreed but other negotiations remain ongoing. As part of future noise mitigation, negotiation is on-going with one land owner (residing elsewhere) to remove one dwelling located within a 500 m buffer zone of the Project. See also section 9.1 on land issues.
D	Geology & hydrogeology (very low)	Very low impacts due to the short-duration of construction phase and routine mitigation measures required (such as installations of culverts and site drainage).
E	Cultural resources (No)	No impacts due to the absence of archaeological sites or other cultural resources. The wind farm will be visible from the Pan-American Highway and may itself become a tourist attraction.
F	Footprint of the project (limited)	Limited adverse impact due to the small footprint of the Project (approximately 80 ha of footprint within a licensed area of nearly 18,500 ha).

Note: color code as detailed in ESIA Addendum Section 5.1 Methodology (dark green: No or very low constraints; light green: Limited constraint. These can be controlled with good international industry practice; yellow: Intermediate constrain, potential impacts require implementation of monitoring or mitigation measures; orange: Significant constrain. These can be mitigated and/or compensated only with specific action plans and measures, alternative options should be reviewed; red: “no go” criterion, alternative option required.

9.1 Land Lease and Acquisition

As detailed further in the Land Use Report and Compensation Plan, the land requirements of the Project comprises sites for up to 135 WTG (all phases) and associated access roads (approximately 0.55 ha in total per WTG) and one 5 ha site for the Project's sub-station.

All land for the turbines has been made available to the Project through negotiation in good faith with the relevant landowners.³ As detailed further in Annex 2, the Project has a total of twenty one land owners from whom land has been leased for Phases I to III inclusive. Twenty of the landowners are private persons, companies or co-operatives, and one is the state land agency (ANATI). Some owners have leased multiple land parcels to the Project. In addition, the Project is negotiating the acquisition and removal of one dwelling (owner residing elsewhere) that is located within the Project's mandatory 500m buffer zone. The land leasing process for Phase IV has not started but would follow the "willing buyer – willing seller" process as outlined for previous phases.

The land leased and procured by the Project has a limited impact on existing land use. The size of land leased from each affected parcel is on average only approximately 3.5 percent and, in all cases, under 10 percent of the properties. Additionally, the Project has provided financial and technical assistance and covered associated transaction costs, including formal titling of property, where necessary. As soon as construction is completed, farmers are free to cultivate or graze the land around the turbine.

The first lease payment⁴ is made when construction starts, followed by annual payments in arrears. As of June 2014, all the private land owners who have leased land to the Project have received at least one payment (combined total exceeding \$700,000 to date, representing a significant injection of cash in the local community). Interviews conducted in June 2014 with a sample of landowners who have leased land to the Project found that all welcomed the lease payments as a predictable addition to their income from farming, the latter fluctuating according to weather, output and prices. All those interviewed own other properties in addition to those partially leased to the Project, and voiced an interest in having additional turbines on their lands.

One group of tenants is also affected by the Project. This is a rice grower co-operative that uses land owned by the state (through the land agency ANATI). ANATI has agreed to lease a small part (<1%) of this land to the Project, and agreed with the Project an annual lease payment for this land. The Project will make additional annual payments to the rice co-operative to offset the economic loss they incur. Formal agreements about the level of payment per square meter impacted by the Project have been reached with the rice growers cooperative. A review showed these rates to be fair. Compensation payments are currently awaiting the completion of a survey to establish affected areas. More recently, the cooperative, which is a tenant and not a land owner, has been seeking to re-open the negotiation

³ Panamanian legislation for the electricity sector (Law 18, March 2013) provides the Project with the option to seek compulsory access through the relevant government agency to land if agreements cannot be reached with landholders. The Project has not, and does not intend to, use this power. For each phase of the Project, the locations of WTGs are based on negotiated and willing access to land by the land owners.

⁴ Annual lease payment per WTG (0.55 ha) range from \$6,000 - \$7,500. Estimated gross revenues from rice crops in 2012 ranged from US\$2,160 to US\$2,790 per ha (ignores costs of seed, fertilizer, fuel and labor).

process in order to secure payments that match those provided to private land owners. The Project continues to work with the cooperative in order to solve this matter amicably.

The Project accepts the obligation to pay compensation should any crops, structures or other assets be damaged during construction. The Project plans to recruit a Community Relations Coordinator (CRC) based in Penonomé. The CRC will provide a supplementary point of contact for landowners (as well as others in the community).

9.2 Noise

The Project has identified two dwellings and one office/workshop facility that is under construction located at or within the 500 m buffer zone for WTGs 17, 18 and 88. The first dwelling is situated approximately 100 m from the site of WTG 17 (Phase II). The owner is resident in Penonomé but does not live in the house in question. She is a professional person understood to be teaching at a local institution. The Project is negotiating with the owner to build a new home of similar size and with better quality materials within the same property. This new dwelling would be located outside of the Project's buffer zone. The Project has obtained estimates for constructing the new house, and has a draft agreement that forms the basis for negotiation. Alternative approaches under consideration include purchasing the property directly.

A second dwelling is located at a distance of approximately 430 m from the WTG 88 (Phase I) and is occupied by the local mayor. The owner of this dwelling has signed a declaration with ANAM indicating knowledge and acceptance of the placement of a turbine within 430 meters of the dwelling. A set of offices/workshops is under construction approximately 500 m from the nearest WTG 18 (Phase I). The owner has made a formal declaration to ANAM that no person will permanently live in these buildings, and that the associated dormitories are restricted to short stays. The site for a new cement mixing plant (unrelated to the Project) that is not yet under construction lies between the offices and the turbines. Although no significant noise impacts are expected from the WTGs at these distances, noise mitigation measures such as trees or double glazed windows would be installed by the Project if requested.

9.3 Flora, Fauna and Biodiversity

The Project area is not within any area of special conservation interest, such as nature parks, wetlands (including RAMSAR sites), national monuments, cultural assets, or biosphere reserves. Regional protected areas and IBAs are located at distances exceeding 13 km from the Project Site. The Project is not expected to have direct impacts on these areas or their species. No significant impacts to local or regional flora and fauna (including birds and bats) with conservation status are expected from Project activities.

The highest risk for impacts is associated with potential bird and bat collisions with the turbine blades that could result in injury or death. High-flying soaring birds such as raptors (eagles, hawks, etc.), migratory shorebirds known to occur in the regional protected areas and IBAs, black vultures and other birds attracted to a nearby landfill (approximately 1-2 km north of WTG13) and the rice fields, and bats are at highest risk. Thus special attention will be given to these species groups during future monitoring activities to mitigate or offset potential impacts, as needed.

The Project is located adjacent to an existing high voltage transmission line. This means that no new transmission line will need to be constructed for this Project. Power distribution lines within the Project area for Phase I were constructed underground. For Phase II and III, 34.5 kV collection lines that extend for approximately 15.6 km will be constructed above ground along an existing right-of-way (ROW). By siting the collection lines above ground along an existing ROW, the Project avoided impacts associated with vegetation suppression and potential impacts to rice growers. During the construction of underground collection lines for Phase I, the developer generated and implemented a local rescue and relocation plan for fauna and flora, in alignment with ANAM's requirements. Mortality rates and species involved potentially associated with the power lines will be monitored as part of the monitoring program during the operational phase of the Project, and compensatory initiatives will be enacted if biodiversity impacts are proven to be significant.

The developer is also required to present a Reforestation Plan to the Regional Administration of Coclé. For each tree that is cut, the developer is required to plant 10 specimens of native flora species that are typical of the area of the Project. Restoration efforts will be conducted in an area to be approved by the Regional Administration of Coclé and the Project will be responsible for the care and maintenance of such restoration area for a period of five years. The developer has paid environmental compensation for areas impacted by site preparation activities and areas utilized for Project components and infrastructure (e.g., access roads, WTGs, substation). In line with the condition of the environmental authorization, the Project will not significantly affect agricultural activities, including rice, corn, sugar cane, and cattle grazing and related activities.

9.4 Visual impacts

Visual impacts generated by the Project are not deemed to be significant. This is due to the siting of the Project in an area which does not feature touristic centers, unique land marks, archeological sites or protected areas. Also, during the public consultation process, the local communities did not express significant concerns or opposition regarding visual impacts. The Project, the first such commercial development in Panama, is visible from the Pan-American Highway.

The results of the shadow flicker model indicate that no receptor will be exposed to more than 23 hours of shadow flicker effect, on an annual basis. Even though the model was run using conservative assumptions and average sunlight hours, the results are well below the generally acceptable value of 30 hours of flicker effect per year that would be deemed acceptable according to Good International Industry Practices.

Impacts from blade glint are deemed to be temporary in nature and are expected to disappear due to soiling of the blades by insects, dust, and other debris within a few weeks of operation.

9.5 Traffic Impacts

In accordance with conditions of the environmental authorization and national regulations, the developer will work in close coordination with the ATTT (governmental transit authority agency) and the Ministry of Public Works to ensure safe conditions along highways, bridges and access roads to be used to transport heavy equipment. The Project is currently requesting the required authorizations from

these agencies and will follow their technical recommendations, including requirements related to noise and air quality standards established in the Executive Decree 255 of December 18, 1998, Norms DGNTI-COPANIT 44-2000 and Executive Decree 1 of January 15, 2004. The Project's specialized logistics contractor has already developed a Traffic Management Plan, including an associated Emergency Response Plan.

Large and heavy equipment will be transported to the Project site between 10 PM to 6 AM to minimize traffic disruption on the Pan-American Highway. Construction-related vehicles will be generally only allowed to operate between the hours of 7:00 am to 7:00 pm near the local communities to minimize nuisances caused to local communities. The total number of workers is expected to be approximately 150 during peak construction, and will consist of mostly local residents. Vehicles associated with the construction of the Project are required to travel at a maximum speed of 40 km/h in and around the site to minimize dust and to prevent potential accidents.

9.6 Occupational Health and Safety

The Project will be constructed under a turn-key contract. Grupo Cobra has been contracted as the engineering, procurement and construction (EPC) contractor for UEPII. Grupo Cobra has extensive experience with the development, building and operation of industrial infrastructures projects, and has successfully completed Phase I (22 WTGs) for the Penonomé development on behalf of UEPI. Cobra has developed and implemented occupational health and safety plans and procedures that are based on good practices and in alignment with Panamanian norms to prevent accidents and to protect workers' health. Such plans and procedures include personal protective equipment (PPE) program, handling and storage of chemicals, fuels and hazardous wastes, fire prevention training and onsite brigade, work at height, risk identification and prevention program, among other standard practices for the construction industry. In addition, there will be an ambulance onsite along with a paramedic and ambulance driver to provide first-aid and, if required, to transport workers to a nearby hospital. During the construction of Phase I, when 22 WTG, most of the main access roads and a substation were installed, there were no fatalities reported at the site.

9.7 Soils, Hydrogeology, Air Quality, Water, Wastewater and Waste

Project impacts related to soils, hydrogeology, air quality, water, waste water and waste were not deemed to be significant. This also considered the scale, duration, baseline conditions and receptors along with the ability of the EPC Contractor to manage and/or mitigate such impacts by adopting standard construction management and housekeeping practices (see also section 10).

9.8 Socio-Economy

The development of the Project enjoys broad community support and will bring positive benefits to the local, regional and national economies through the creation of temporary indirect and direct jobs during construction, long-term annual payments for land leased for the Project (exceeding revenues which could be generated by cash crops), the generation of up to 337.5 MW of clean, renewable electrical energy with minor incremental environmental and social impacts. In addition, during construction, the Project will purchase goods and services from local suppliers, thus providing benefits to the local economy.

Overall, the potential adverse socio-economic impacts on the most directly affected stakeholders, which include in particular those who have signed lease agreements or are otherwise compensated for Project-related impacts, are not considered to be significant and are fairly compensated (see section 9.1).

Overall, the Project is expected to have a positive impact on the prevailing economic conditions and will not restrict existing activity, which consists of agriculture, cattle grazing and teak plantation.

9.9 Community Health, Safety and Security

The peak number of workers during construction is estimated to be approximately 150, most workers will be recruited from local communities, and, therefore, no significant influx of migrant workers is expected. The site is within relatively short bicycling or driving distance to local urban centers. These result in no need for the installation of workers camps.

During the operational stage of the Project, operation and maintenance (O&M) will be conducted by approximately 10-20 workers, including administrative staff. Specialist support services, such as heavy cranes, will be procured as and when needed. The great majority of the construction and operation workforce (approximately 80 percent) will consist of local residents from communities around the Penonomé District, which reduces the probability of communicable/endemic diseases being introduced by migrant workers.

In addition to the support by the Panamanian Government, the Penonomé Project also enjoys broad community support. During Phase I, now completed, the Project experienced and appropriately addressed a small number of grievances typical of construction projects. These include damaged fences or gates, and, one case, where this led to cattle moving onto a rice field and causing crop damage. All of these incidents were communicated directly by landowners to the Project manager by phone, and resolved through the prompt payment of compensation, and followed up with additional control of contractors.

UEPII plans to recruit a Community Relations Coordinator (CRC) based in Penonomé. The CRC will provide a supplementary point of contact for landowners (as well as others in the community). The Project plans approximately quarterly meetings and/or other suitable communication channels with communities, their representatives and/or media during the construction phases of the Project. A Grievance Mechanism has also been developed to record, manage and amicably address potential concerns or complaints that may be associated with the Project.

Through strategic site selection and optimization of the project design, potential community health and safety risks and impacts have been avoided and/or mitigated. For instance, with three exceptions, a 500-meter buffer zone was successfully implemented by the Project around the WTG, in alignment with the conditions of the license established by ANAM, in order to prevent close proximity to dwellings that could be adversely affected by potential noise and other impacts (see section 9.2).

The Project will be able to access an existing port infrastructure in Panama, which requires minor upgrades, to accommodate the large and/or heavy components which will be shipped from China.

The Project area is considered stable, without violent unrest or human right abuses of community members involving security personnel. The Project maintains a small number of professional, unarmed, security personnel. They are deployed around the clock and focus on allowing only permitted individuals on the Project site, and reduce the risk of theft and vandalism. The security personal perform their duty in alignment with applicable laws, which includes respecting human rights, and professional standards.

9.10 Cumulative Impacts

According to IFC's Good Practice Handbook on Cumulative Impact Assessment and Management, cumulative impacts can encompass a broad spectrum of impacts at different spatial and temporal scales. For wind farms, bird and bats with conservation status and visual aspects typically constitute the key valued environmental and social components (VECs) of concern. In this context, the presence of large scale land use changes (such as conversion of forest to agriculture) or development of other wind farms sharing the same migration corridors, or presence of species with conservation status would be expected to provide the most significant risk for cumulative impacts on birds and bats. Significant cumulative visual impacts is more subjective and can be linked to the perception of synergistic "visual intrusion" on spectacular landscapes, significant cultural resources, protected areas or touristic attractions.

The analysis of interviews with the local environmental agency based in Coclé and other sources suggests that there are no reasonably well defined and significant major developments within the Project area that would, when combined with the Project, be expected to generate significant cumulative impacts on VECs noted above. This includes the phased development of the Penonomé Project itself.

The Project ESIA's (and supplements) reviewed risks to birds and bats in the Project's concession area (all phases) and did not identify significant risk of cumulative impacts. On-going bird and bat monitoring has not detected any significant biodiversity concern for Phase I (now operational) and would be able to detect such impacts, should it materialize. In turn, this can trigger adaptive management, if needed. Also, the lack of concerns about visual impacts during formal public hearings for the Project, lack of public opposition prior and during construction of Phase I, the existing rural setting around the Project (no significant cultural resources, no protected areas, no primary forests, no touristic attractions) is not indicative of cumulative visual impacts once all phases have been completed.

Other ongoing developments in the Project area include small housing developments, a bus terminal, a small business center, and concrete mixing plant. There may also be one or more photovoltaic (solar) project development. The Project is not expected to generate or be affected by significant cumulative visual or biodiversity impacts from these developments given their different nature and risk profiles.

Two other planned wind projects are situated at approximately 15 and 50 km distance to the Penonomé Project, both being developed by Fersa's Panamanian subsidiary. The nearest is the Anton de Férsa wind project (105 MW) which, according to the media reports, appears to have been delayed due to legal issues since 2010. The Toabre development, located at a distance of approximately 50 km from the Project, announced in early 2014 that it would start building the first phase of 102 MW project in 2014,

and expects this to be expanded to 225 MW at a later date. A media search reveals similar announcements from previous years. It is understood that land-related administrative delays as well as the need for additional transmission line capacity may continue to constrain the size of the project and/or push its development further into the future. The distances of these two other wind developments to the Project suggests that there would be no significant cumulative visual impacts. Also, the Penonomé Project has not been identified to feature a migration pathway of birds and bats with conservation status. This means that there is also no significant risk of shared migration pathway linked with the Anton de Férsa or Toabre wind developments.

9.11 Decommissioning

In general, the environmental and social impacts of decommissioning of wind farms are not believed to exceed the impacts associated with the construction phase. Also, a suitably sited, permitted and constructed wind farm is likely to see a continuation of its life expectancy by re-powering (replacing) its WTGs with next generation WTGs. This means that the life expectancy of a wind farm can typically be measured in decades.

The Penonomé Project will develop a Conceptual Decommissioning Plan in consultation with the Panamanian regulatory agencies within five years of commissioning the Penonomé Phase I. The main elements of the Decommission Plan will include removal of platform infrastructure down to a depth of approximately 36 inches below grade, enabling previous land use (agricultural).

10 Environmental and Social Management

As summarized in this NTS and detailed further in the ESIA Addendum, the Project does not trigger high, unusual or unique environmental and social risks. Risks and impacts identified can be readily mitigated using standard measures aligned with Good International Industry Practice (GIIP).

The following components comprise UEPII's Environmental and Social Assessment and Management System (ESMS), which is scaled to the limited and readily manageable risks associated with the Project:

- (i) Environmental and Social Policy (see section 2.5);
- (ii) Identification of risks and impacts (ESIA process);
- (iii) Management and emergency response plans (see section 6);
- (iv) Organizational structure (see sections 2.5 and 6);
- (v) Stakeholder engagement (see Stakeholder Engagement Plan, Grievance Mechanism); and
- (vi) Monitoring and review (see section 6, Grievance Mechanism).

As typical for such capital project developments, UEPII with and through its EPC Contractor and other consultants, has also developed a series of plans, ranging from Environmental Management Plan to a Project Grievance Mechanism, to manage and monitor related risks during the construction phase of the Project. In addition to external inspections by the relevant Panamanian regulatory agencies, the implementation of the environmental and social plans will be supervised by experienced UEPII staff, contractors and external consultants. UEPII also plans to hire a dedicated project-level Environmental Coordinator and Community Relations Coordinator (see also section 6).

Table 4: Status of Key Environmental and Social Management Plans

Key Plans	Status of Plans	Comments
Occupational Health & Safety (OHS) Plan	Comprehensive OHS plan for construction phase will include standard UEPII OHS procedures as well as OHS from major contractors.	Includes emergency response plans. Supervised by UEPII
Erosion and Sedimentation Control Plan	Procedures included in the document “Plan de Manejo Ambiental” for the construction phase	Project includes site drainage and culverts for creeks. UEP II will be provide (or outsource) the implementation of access road maintenance, which include erosion and sedimentation control during the O&M phase.
Wildlife Rescue Plan	Procedures presented in the document entitled “Plan the Rescate y Reubicación de Fauna – UEP”	Updated in biannual reports to ANAM.
Traffic Management Plan	Local traffic management is included in the OHS Plan for Construction. A Traffic Management Plan, including an associated Emergency Response Plan, has already been developed for oversized and heavy loads.	Transportation of oversized and heavy loads is conducted by a specialized logistics company in coordination and upon permit from the Transit Authority.
Waste and Hazardous Waste Management Plan	Plan is included in the comprehensive OHS plan for construction	Results submitted in biannual reports to ANAM. Environmental Coordinator to be recruited.
Environmental Monitoring Plan	Procedures included in the document “Plan de Manejo Ambiental”	Results submitted in biannual reports to ANAM. Environmental Coordinator to be recruited.
Bird and Bat Monitoring Plan	On-going for Phase I, and updated for Phase II & III	Updated in biannual reports to ANAM. Environmental Coordinator to be recruited.
Stakeholder Engagement Plan	Updated in June/July 2014	Community Relations Coordinator to be recruited
Land Use Report and Compensation Plan	Updated in June/July 2014	Community Relations Coordinator to be recruited
Project Grievance Mechanism	Updated in June/July 2014	Community Relations Coordinator to be recruited
Conceptual Decommission Plan	Not required at this stage of the Project.	Conceptual decommission plan to be developed and updated within 5 years of commissioning of Phase I.

11 Stakeholder Engagement

Since 2009, the Project has employed a number of tools and methods to engage in open, transparent, and meaningful two-way communication with Project stakeholders. These include socioeconomic and opinion surveys, community workshops, meetings, and forums, and direct personal engagement with those directly affected by the project. As part of the overall environmental and social assessment process, the Project developed and implemented a Citizen Participation Plan, a Panamanian requirement for certain types of ESIA's, to identify and engage with stakeholders in the project area.

The Project conducted a series of Community Workshops between October and December 2009 to disclose preliminary Project information and to provide engagement opportunities in advance of the formal Public Hearings to present the Project ESIA's. The formal Public Hearings events took place in January 2010. These Public Hearings were coordinated with local and government authorities. The Project notified the local community and the public at large about the Public Hearings through radio and newsprint media, flyers, door-to-door canvassing and formal invitations. Logistical support included provision of two vehicles to further enable the participation of residents of the communities located in the Area of Direct Influence of the Project.

The Project also held a number of other formal and informal meetings. Examples of these include:

- Presented Project to the Penonomé Municipal Council, and supplied informational materials.
- Direct engagement and negotiations with Project-affected land-users (see Land Use Report)
- In addition to the socioeconomic survey, a public opinion survey was carried out in March 2011 to gauge the awareness and concerns about the Project.
- In 2013, the Project held public meetings in March and October with the local communities at the community hall (*casa communal*) in El Coco to provide updates on Project activities.
- Project inauguration ceremony with dignitaries including Panama's President in August 2013.
- 'School Day' involving students and the community in October 2013, further meetings are planned for 2014.

The Public Hearings, which formed part of the Panamanian ESIA process, concluded with none of the attendees objecting to the Project. The key issues that have emerged from meetings were largely positive in nature, with jobs and employment the foremost among these. Key concerns expressed included the fact that many of the jobs would be temporary (limited to construction), and that these would largely benefit people from outside the Project area. Concerns were raised about dust from project vehicles; few concerns were expressed in regards to impacts on flora and fauna, and deforestation.

Landowners have raised issues directly with the Project by phone in the cases where there has been damage from construction activity to fences, gates or crops. Such incidents have been responded to promptly with compensation.

Public Hearing participants expressed their desire to see community benefits, and improved road infrastructure was a recurring expectation. Additional details about past and planned stakeholder

engagement activities are presented in the Stakeholder Engagement Plan. Details related to Project's engagement relating to its land leases and acquisition is provided in the Land Use Report and Compensation Plan. The Project has also developed a formal Grievance Mechanism, which is expected to be harmonized across the different Project phases.

12 Equator Principles Categorization

The Independent Engineer, Mott MacDonald, advising lenders and applying the Equator Principles, already classified the Phase I Project (55 MW) as 'B-level'. Category B projects are defined as those likely to have limited adverse environmental or social risks and/or impacts that are few in number, generally site-specific, largely reversible, and readily addressed through mitigation measures.

After considering the specific risk profile of the total Project (all phases) and reviewing categorization of other wind farm developments disclosed by EBRD, MIGA and IFC in recent years, Prizma, the consultant commissioned to develop this NTS and the ESIA Addendum for UEPII, deems that the Project (all phases) can also be classified as 'Category B'. This can be justified as follows:

- Project area comprises modified habitat (agriculture), no recognized conservation areas within 10 km radial distance, and not located within associated bird migration routes
- Project does not require major new road constructions or new high voltage transmission lines
- Other major developments identified in consultation with local environmental agency and other sources do not combine with this Project to generate potentially significant cumulative impacts affecting VECs (birds and bats, visual impacts)
- Not located within indigenous territories
- Presence of broad community support

This means that, overall, impacts associated with the Project (all phases) are expected to have limited adverse environmental or social risks and/or impacts, which are few in number, generally site-specific, largely reversible, and readily addressed through mitigation measures.

Appendix 1: WTGs associated with Phases I to III of the Penonomé Project

Table 5: WTGs associated with Phase I (completed and operational)

WTG	LONGITUD	LATITUD	CONCESSION
49	80° 22' 43.4" W	8° 25' 8.5" N	Nuevo Chagres Phase I
50	80° 22' 34.3" W	8° 25' 6.6" N	Nuevo Chagres Phase I
51	80° 22' 25.0" W	8° 25' 4.8" N	Nuevo Chagres Phase I
52	80° 22' 11.0" W	8° 25' 17.7" N	Nuevo Chagres Phase I
53	80° 22' 4.3" W	8° 25' 14.3" N	Nuevo Chagres Phase I
72	80° 23' 34.0" W	8° 24' 7.1" N	Nuevo Chagres Phase I
73	80° 23' 26.4" W	8° 24' 7.5" N	Nuevo Chagres Phase I
74	80° 23' 18.8" W	8° 24' 7.9" N	Nuevo Chagres Phase I
75	80° 23' 11.1" W	8° 24' 10.6" N	Nuevo Chagres Phase I
76	80° 23' 3.2" W	8° 24' 10.4" N	Nuevo Chagres Phase I
77	80° 22' 52.7" W	8° 24' 9.8" N	Nuevo Chagres Phase I
78	80° 22' 45.7" W	8° 24' 9.3" N	Nuevo Chagres Phase I
79	80° 22' 36.7" W	8° 24' 9.1" N	Nuevo Chagres Phase I
80	80° 22' 28.9" W	8° 24' 8.5" N	Nuevo Chagres Phase I
81	80° 22' 20.8" W	8° 24' 17.0" N	Nuevo Chagres Phase I
82	80° 22' 10.0" W	8° 24' 19.8" N	Nuevo Chagres Phase I
83	80° 22' 2.2" W	8° 24' 20.9" N	Nuevo Chagres Phase I
84	80° 21' 54.8" W	8° 24' 22.3" N	Nuevo Chagres Phase I
85	80° 21' 47.6" W	8° 24' 24.3" N	Nuevo Chagres Phase I
86	80° 21' 40.3" W	8° 24' 26.4" N	Nuevo Chagres Phase I
87	80° 21' 33.5" W	8° 24' 30.2" N	Nuevo Chagres Phase I
88	80° 21' 27.4" W	8° 24' 32.7" N	Nuevo Chagres Phase I

Source: UEP

Table 6: WTGs associated with Phase II (civil works in progress)

WTG	LONGITUDE	LATITUDE	Concession
1	566859.8760	935873.9170	Rosa de los Vientos
2	567098.2600	935865.0530	Rosa de los Vientos
3	567331.9460	935807.2340	Rosa de los Vientos
4	567655.1440	935660.0080	Rosa de los Vientos
5	567852.0010	935637.3870	Rosa de los Vientos
6	568037.5350	935670.6830	Rosa de los Vientos
7	568250.7850	935708.9520	Rosa de los Vientos
8	568464.9170	935747.3800	Rosa de los Vientos
9	568645.5580	934862.5670	Rosa de los Vientos
10	568865.5560	934857.7430	Rosa de los Vientos
11	569084.4160	934857.7430	Marañón
12	569294.2530	934863.8160	Marañón
13	569635.9280	934889.3470	Marañón
14	570002.1440	935288.8470	Marañón
15	570216.6940	935221.8820	Marañón
16	570431.2440	935157.8290	Marañón
17	570645.7960	935127.6950	Marañón
18	565534.5120	934800.7780	Rosa de los Vientos
19	565740.3050	934693.8410	Rosa de los Vientos
20	565915.7100	934589.9780	Rosa de los Vientos
21	566087.7740	934488.0920	Rosa de los Vientos
22	566263.9070	934383.7980	Rosa de los Vientos
23	566446.8540	934275.4690	Rosa de los Vientos
24	566637.6530	934162.4910	Rosa de los Vientos
25	566955.0420	933363.4750	Rosa de los Vientos
26	567121.5460	933251.8450	Rosa de los Vientos
27	567321.3320	933260.5700	Rosa de los Vientos
28	567622.5540	933108.9550	Rosa de los Vientos
104	567243.6607	931042.7135	Nuevo Chagres
105	567493.8836	930920.1901	Nuevo Chagres
106	567713.9211	930812.4472	Nuevo Chagres
32	563304.3660	931800.4450	Nuevo Chagres
33	563524.8560	931757.3410	Nuevo Chagres
34	563784.0770	931818.4110	Nuevo Chagres
35	563993.6680	931756.2770	Nuevo Chagres
36	564228.3230	931657.7050	Nuevo Chagres
37	564457.5710	931645.9820	Nuevo Chagres
38	564668.9460	931667.9450	Nuevo Chagres

WTG	LONGITUDE	LATITUDE	Concession
39	564977.9650	931907.8860	Nuevo Chagres
40	565231.2700	931945.2920	Nuevo Chagres
41	565471.2740	931983.1730	Nuevo Chagres
42	565688.3580	931838.7240	Nuevo Chagres
43	565906.6330	931752.1790	Nuevo Chagres
44	566172.3000	931750.7000	Nuevo Chagres
45	566440.5920	931664.8060	Nuevo Chagres
46	566691.4440	931546.3570	Nuevo Chagres
47	566901.8520	931446.9430	Nuevo Chagres
48	567136.6630	931336.0370	Nuevo Chagres
54	562563.8550	929273.8830	Portobelo
55	562750.2310	929334.5440	Portobelo
56	562952.1040	929376.8280	Portobelo
57	563161.5670	929367.0090	Portobelo
58	563353.5750	929317.9160	Portobelo
59	563553.2200	929244.8220	Portobelo
60	563765.9560	929192.4570	Portobelo
61	563941.6180	929094.9960	Portobelo
62	564291.0570	929005.8490	Portobelo
63	564605.4040	928935.3240	Portobelo
64	564844.9220	928842.6900	Portobelo
65	565097.3950	928752.8490	Portobelo
66	565355.9500	928674.9360	Portobelo
67	565608.5260	928605.6960	Nuevo Chagres
68	565856.7000	928539.7490	Nuevo Chagres
69	566108.4210	928469.1420	Nuevo Chagres
70	566360.6560	928557.1010	Nuevo Chagres
71	566594.9750	928571.0840	Nuevo Chagres

Source: UEP

Table 7: WTGs associated with Phase III (civil works in progress)

WTG	LONGITUDE	LATITUDE	Concession
89	568766.182	933542.6957	Rosa de los Vientos
90	568979.495	933368.2356	Rosa de los Vientos
91	569192.8055	933193.7775	Rosa de los Vientos
92	569442.3487	933132.9912	Rosa de los Vientos
93	569699.1594	933129.113	Rosa de los Vientos
94	569955.9702	933125.2349	Rosa de los Vientos
95	570212.7809	933121.3567	Rosa de los Vientos
96	570469.5916	933117.4786	Rosa de los Vientos
97	569873.9239	931898.169	Rosa de los Vientos
98	570066.9353	931896.3466	Rosa de los Vientos
99	570259.9467	931894.5243	Rosa de los Vientos
100	570453.0211	931892.7014	Rosa de los Vientos
101	570662.9518	931890.7193	Rosa de los Vientos
102	570872.8824	931888.7372	Rosa de los Vientos
103	571082.8421	931886.7548	Rosa de los Vientos
29	567810.6510	933172.3300	Rosa de los Vientos
30	568007.6800	933179.1710	Rosa de los Vientos
31	568204.7090	933177.8030	Rosa de los Vientos
107	567933.9585	930704.7043	Rosa de los Vientos
108	568154.7186	930596.6075	Rosa de los Vientos

Source: UEP

Appendix 2: Listing of landowners who have leased land to the Project

ID	Land Use	Total Plot Size (m2)	Land Required (m2)	% of Total Plot	No. Of WTGs	Project Phase
1	Grazing	145,460	10,439	7.2	3	I
2	Grazing	43,450	3,745	8.6	1	I
3	Rice Crops/ Grazing	337,434	8,343	2.5	2	I
4	Grazing	1,000,524	24,073	2.4	4/2	I/II
5	Grazing	183,084	6,252	3.4	1	I
6	Grazing	108,089	953	0.9	1	I
7	Grazing	87,404	5,325	6.1	1.4	I
8	Rice Crops/ Grazing	123,667	9,327	7.5	2	I
9a	Rice Crops/ Grazing	176,179	11,204	6.4	3	I
9b	Rice Crops/ Grazing	183,084	5,103	2.8	1	I
9c	Rice Crops/ Grazing	475,629	4,005	0.8	0.6	I
9d	Rice Crops/ Grazing	183,084	7,994	4.4	2	I
10a	Grazing	268,146	15,334	5.7	5	II
10b	Grazing	268,146	6,261	2.3	2	II
10c	Grazing	268,146	5,687	2.1	1	II
11	Grazing	934,458	19,878	2.1	5	II
12*	Rice Crops	11,927,359	73,203	0.6	20	II
13	Grazing	1,609,712	31,981	2.0	10	II
14	Rice Crops	58,707	3,635	6.2	1	II
15	Rice Crops/ Grazing	892,810	20,553	2.3	5	II
16	Grazing	667,826	10,432	2.3	3	II
17a	Rice Crops/ Grazing	373,188	7,680	2.1	2	II
17b	Rice Crops/ Grazing	257,604	7,698	3.0	2	II
18	Grazing	231,324	5,934	2.6	2	II
19	Grazing	279,896	6,967	2.5	2	II
20	Rice Crops	135,309	13,257	9.8	4	II
21	Teak	1,339ha	10ha	<1	20	III

