

Dzhankeldy 500MW Wind Farm Republic of Uzbekistan



Environmental and Social Impact Assessment Volume 4 – Appendices: Part A

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APPENDIX A – CONCLUSIONS FROM SCEEP ON NATIONAL EIA



**O'ZBEKISTON RESPUBLIKASI EKOLOGIYA VA ATROF-MUHITNI
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ЗАКЛЮЧЕНИЕ

Государственной экологической экспертизы

По объекту: Оценка воздействия на окружающую среду строительства ветряной электрической станции «ACWA POWER DZHANKELDY WIND» мощностью 500 MBт в Пешкунском районе Бухарской области (проект ЗВОС)

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На государственную экологическую экспертизу представлены материалы первого этапа оценки воздействия на окружающую среду строительства ветряной электрической станции (ВЭС) «ACWA POWER DZHANKELDY WIND» мощностью 500 MBт в Пешкунском районе Бухарской области.

Основанием для проектирования объекта является Постановление Президента Республики Узбекистан от 23.02.2021 г. ПП-5001 «О мерах по реализации инвестиционного проекта «Строительство ветряной электростанции мощностью 500 MBт в Пешкунском районе Бухарской области»».

Площадь, выделенная под ветряную станцию, составляет 280 га. Территория ветропарка разбита на два участка – Западный и Восточный. Данные участки разделяют зона добычи известняка и поселок Джанкельды.

Проектом намечается установить 125 единиц ветротурбин со всеми вспомогательными сооружениями и зданиями. К установке принимаются ветровые турбины модели «GW165-5,6 MWt» с высотой башни 120 м, которые имеют горизонтальную ось, три лопасти, фронтальный ротор, регулятор переменной скорости и переменного шага, синхронный генератор с прямым приводом на основе постоянных магнитов с внешним ротором, а также устройство подключения к сети. Основные компоненты ветряной турбины состоят из: конических трубчатых секций башен из стали; лопастей ротора, изготовленных из стекловолокна, армированной эпоксидной смолы и углеродных волокон; гондолы, в которой находится генератор и коробка передач; ротора, который является центральной точкой, в которой три лопасти соединены с гондольной коробкой; генератора, который преобразовывает механическую энергию в электричество; коробки передач; преобразователя; трансформатора.

В инфраструктуру площадки ВЭС входят дополнительные и вспомогательные объекты такие как – вход на территорию объекта и здание службы безопасности; административное здание, офисы и помещения; центральный пост управления; склад и ремонтная мастерская; система безопасности; система освещения; подъездные дороги между ВЭУ; транспортные средства и гараж; бетонированная площадка под навесом для временного хранения дизельного топлива, со сливной ямой для сбора разливов и площадка для временного хранения образуемых отходов.

Поселок Джанкельды – располагается между двумя участками Западным и Восточным. От Западного участка ветропарка расстояние до поселка Джанкельды составляет 3,1 км, от Восточного участка – 1,6 км. Поселок Калата располагается западнее ближайшей ветротурбины на расстоянии 3,44 км. К материалам первого этапа прилагается письмо отдела службы санитарно-эпидемиологического благополучия и общественного здоровья за №20-8/5544 от 04.08.2021 г., в котором отмечается, что ветровые электростанции (ВЭС) отнесены к I классу с санитарно-защитной зоной в размере не менее 1000 м.

Территория предполагаемого строительства пересекается несколькими инфраструктурными элементами: автодорогой, соединяющей поселок Калата с поселком Джанкельды, которая проходит посередине Западного участка и далее протягивается к южной части Восточного участка; автодорогой, пересекающей по диагонали Западный участок и проходящей поселок Джанкельды и уходящей к городу Газли; надземными линиями электропередачи в пределах Восточного участка; временными стоянками на Восточном и Западном участках.

В результате исследований территории была обнаружена одна каменная мастерская эпохи неолита на северной стороне безымянной впадины, в 10 км к северо-востоку от центра поселка Джанкельды. Согласно письма от 09.04.2021 г. за №286 Бухарского регионального департамента культурного наследия, при Министерстве Культуры Республики Узбекистан, в радиусе 5 км от территории, выбранной для строительства ВЭС, отсутствуют объекты материального культурного и археологического наследия, находящиеся под государственной охраной.

Зона добычи известняка расположена в 1 км к Восточному участку и в 3 км к Западному участку ветропарка.

В районе расположения ВЭС крупные поверхностные водотоки и водные объекты отсутствуют. Во время изучения участка было отмечено сухое русло временного водотока (сая), которое проходит с севера на юг со стороны поселка Джангелди на расстоянии 710 м. К проекту приложено письмо Министерства водного хозяйства за №01/17-2341 от 05.08.2021 г., об отсутствии возражений и где указывается, что на территории ветропарка не имеются объекты водного хозяйства.

Согласно результатам топографических и геотехнических исследований, проведенных СП «UzAssystem» (филиал международной проектно-инженерной компании «Assystem»), в ходе буровых изысканий (16 скважин глубиной до 50 м) на площадке ВЭС грунтовые воды на глубине до 50 м не были обнаружены.

В результате весенних и летних ботанических исследований на территории под строительство ВЭС и вдоль проектируемой ВЛЭП определены следующие краснокнижные виды растений: тюльпан Лемана, Жузгун Закирова, колючелистник горбатоприцветниковый, ширач коровина, ферула кызылкумская, а также краснокнижные виды пресмыкающихся (среднеазиатская черепаха, серый варан и песчаный удавчик, гладкий геккончик) и млекопитающих (длинноглый лысый ёж и джейран) которые также занесены в Красный список Международного Союза Охраны Природы. В ходе мониторинга по орнитофауне, проведенного с марта 2020 года по май 2021 года на территории ВЭС проводился мониторинг птиц по методике Scottish Natural Heritage и были выявлены следующие виды птиц, включенные в анализ моделирования риска столкновений (осень-весна): дрофа-красотка, малый баклан, розовый пеликан, стервятник, черный гриф, белоголовый сип, обыкновенный змееяд, степной орел, могильник, беркут, орлан-белохвост, степная пустельга, балобан, серый журавль, болотный лунь, полевой лунь, черный коршун, перепелятник, канюк, курганник, обыкновенная пустельга, огарь, серая утка, кряква, чирок-свистун, озерная чайка, хохотунья, большой баклан, серая цапля, рыжая цапля, большая белая цапля и кваква. По результатам исследований было проведено «Моделирование риска столкновения». Мониторинг птиц проводился с учетом сроков миграции и размножения целевых видов птиц в регионе: весна (миграция): 16 марта - 15 мая; лето (размножение): 16 мая - 31 августа; осень (миграция): 1 сентября - 15 ноября; зима: 16 ноября - 15 марта. Анализ показывает, что частотой столкновений всех целевых видов уровня 1 не будет превышать 1 за 25 год. Самая высокая прогнозируемая частота столкновений среди целевых видов уровня 2 была у курганника (одно столкновение за 18 лет), за которым следует Обыкновенная пустельга (одно столкновение за 45 лет). Частота столкновений для всех других целевых видов уровня 2 была ниже, чем одно столкновение за 100 лет. В целях минимизации воздействия на флору, фауну и орнитофауну по результатам исследования биоразнообразия для строительства будут выбраны участки, имеющие наименьшее значение для биоразнообразия.

ИП ООО «ACWA POWER DZHANKELDY WIND» разработан план управления окружающей средой и план мониторинга окружающей среды во время строительства ветряной электростанции DZHANKELDY мощностью 500 МВт в Пешкунском районе Бухарской области, включающие мероприятия по сохранению естественной среды обитания (флора и фауна), качества воздуха, воды и почвы, верхнего слоя почвы, флоры и фауны, по гигиене и соблюдению безопасности рабочих, не допущению столкновения и поражения электрическим током птиц при эксплуатации ВЛЭП и т.п., которые утверждены заместителем председателя Госкомэкологии РУз.

Согласно проектным решениям для монтажа ВЭУ предусматривается очистка территории строительства от растительности. Под строительство сооружений по возможности будут выбраны площадки с отсутствием растительного покрова. В период с 17 по 18 августа 2021 года специалистами Бухарского областного управления экологии совместно с представителем Кадастрового агентства Пешкунского района была проведена предварительная оценка вырубки древесно-кустарниковой растительности на территории проектируемой ВЭС и вдоль трассы, проектируемой ВЛЭП и составлен Акт обследования территории. Согласно результатам проведенной оценки, при реализации проекта не ожидается вырубка деревьев и кустарников, указанных в списке ценных сортов деревьев и кустарников, не входящих в государственный лесной фонд согласно Приложению к Постановлению Кабинета Министров Республики Узбекистан №93 от 18.02.2020 г. «О дополнительных мерах по сохранению ценных сортов деревьев и кустарников, не входящих в государственный лесной фонд».

Согласно многолетним метеорологическим данным, район характеризуется ветрами северных и северо-восточных направлений (23,7, 20,23 и 16,7% соответственно). Среднегодовая повторяемость слабых ветров (0 - 1 м/с) составляет 12,8 %. Преобладают умеренные скорости ветра – 2-3 м/с- 53,1%, и сильные - 4-5 м/с – 21,45%. Часты также ветры силой 6-7м/с – 9,05%.

Ветрогенераторы располагаются на расстоянии равным на высоте нескольких ветротурбин. Это расстояние позволяет потоку ветра восстанавливаться, а турбулентность, созданная работой ротора одного ветряка, не влияет на работу соседнего ветряка, находящегося с подветренной стороны. Ветротурбины крепятся и стабилизируются с помощью железобетонных платформ. Фундаментные платформы строятся ниже уровня земли, и над платформой будет размещен грунт, чтобы вернуть видимую область почти в первоначальное состояние.

Принцип действия ВЭС заключается в преобразовании возобновляемой энергии ветра в механическую энергию и далее в электрическую энергию. Технология получения электроэнергии на ВЭС основана на следующих процессах: вращение лопастей с использованием ветра; при вращении лопастей их движение генератор преобразует в электричество, которое аккумулируется в батарее. В этом процессе преобразования отсутствуют выхлопные газы, сточные воды и отходы.

Проектным решением был принят вариант прохождения ВЛЭП по маршруту: ВЭС «Джангельды» - ВЭС «Баш» - существующая ПС «Каракуль» с номинальным напряжением 500 кВ в одной цепи. Данным проектом рассматривается трасса прохождения ВЛЭП исходящая от подстанции 33/500 кВ ВЭС «Баш» до подстанции 33/500 кВ ВЭС «Джангельды», приблизительной протяженностью 128,1 км. Предлагаемая ВЛЭП 500 кВ начинается от ВЭС Баш и заканчивается на проектируемой подстанции 33/500 кВ ВЭС Джангельды. Коридор планируется проложить параллельно к существующей ВЛЭП и автомобильной дороге. Все пересечения с существующими ЛЭП, автомобильными дорогами, трубопроводами и железнодорожными линиями осуществляются под углом 80-90 градусов. Трасса ВЛЭП проходит между участками Восточный и Западный и составит 8,4 км. Расстояние от проектируемой подстанции до поселка Джанкелды составляет 4,3 км.

Техническое обслуживание автотранспорта, имеющегося на балансе предприятия, будет производиться в специализированных организациях. Для заправки строительной техники, будет предусмотрена цистерна, емкостью 10 м³, выброс углеводородов будет происходить неорганизованно через неплотности оборудования. Ориентировочный выброс углеводородов от цистерны временного хранения топлива составляет около 0,0036 т/год.

Резервным источником питания для подстанции является дизель-генератор. Небольшое количество дизельного топлива будет храниться в надземном резервуаре. Трансмиссионные масла для смазки поступают на склад в герметичной таре (катридж, емкостью до 250 гр). Одна заливка из одного герметичного катриджа масла хватает на 1 год, далее происходит доливка. Смазочное масло для доливки в маслonaполненное оборудование не хранится на складе, привозится от поставщика непосредственно в период его заливки. Выброс углеводородов масла минерального происхождения неорганизованно при эксплуатации маслonaполненного оборудования через его неплотности и составляет около 0,0084 т/год.

Проектом предусмотрены асфальтированные подъездные дороги от центра управления к ветрогенераторам шириной 6 метров. Протяженность внутренней дорожной сети составит 79,63 км. Регулярное техническое обслуживание дорог будет включать в себя обводнение и сглаживание, необходимые для поддержания дорожного покрытия, а также осмотр и ремонт систем управления ливневыми водами, необходимых для обеспечения их надлежащего функционирования для борьбы с эрозией.

Для обслуживания ветряной электростанции будет задействовано 20 человек. Режим работы в три смены по 8 часов, 365 дней. В связи с тем, что график работы рабочего персонала ВЭС вахтовый, для размещения рабочего персонала предусматриваются временные жилые помещения. Для приготовления пищи используется электрическая плита.

В процессе строительства ВЭС планируются выбросы загрязняющих веществ в атмосферу и образование строительных отходов, которые **следует рассчитать** в соответствии с параметрами, представленными в ПКМ РУз «О

мерах по дальнейшему совершенствованию порядка проведения работ со строительными отходами» за №40 от 28.01.2021 г. (приложения за №№3-7).

При работе трансформатора будут выделяться, и поступать в атмосферу загрязняющие вещества в виде углеводородов – 0,0084 т/год.

При работе резервного источника питания ВЭС (дизельный генератор), работающего на дизельном топливе, при сжигании которого, будут выделяться загрязняющие вещества в виде оксида углерода, диоксида азота, углеводородов, сажи, сернистого ангидрида и бенз(а)пирена около 0,0004 т/год.

При последующем проектировании уточнить перечень, количество загрязняющих веществ и источников выделения и выброса загрязняющих веществ в атмосферный воздух намечаемой деятельностью.

Процесс получения электроэнергии ВЭС не предусматривает использование воды на производственные нужды и соответственно производственных стоков.

Источником водоснабжения ВЭС будет служить привозная вода из ближайшего поселка. Хозяйственно-бытовые сточные воды в количестве 5,22 м³/сут; 1630,3 м³/год будут очищаться на установке септик, которую планируется расположить на территории ВЭС. Полив осуществляется только в жаркий период года с мая по сентябрь привозной арычной водой либо очищенной водой из биосептика.

Для снижения пылевыведения при проведении строительных работ предусматривается гидрообеспыливание с применением одной поливомоечной машины.

В процессе производственной деятельности рассматриваемого объекта ожидается образование следующих отходов:

- отработанные масла, образующиеся при работе трансформаторов, II класс опасности;
- отработанные лопасти ветрогенераторов, образующиеся при эксплуатации ВЭС, IV класс опасности;
- отходы электродов, образующиеся при сварочных работах, V класс опасности;
- отходы силикагеля, образующиеся от работы трансформаторов, IV класс опасности;
- лом черного металла, образующийся в результате ремонтных работ и состоящий из отработавших свой срок деталей, V класс опасности;
- лом цветного металла, образующийся в результате ремонтных работ и состоящий из отработавших свой срок деталей, III класс опасности;
- промасленная ветошь более 15 %, образующаяся при обтирке механизмов, III класс опасности;
- отработанные светодиодные лампы, IV класс опасности;
- макулатура, образующаяся в здании АБК, V класс опасности;
- пищевые отходы, V класс опасности;
- твердо-бытовые отходы, IV класс опасности;
- мусор, образующийся при уборке территории в виде песчинок, сухой травы, листьев деревьев, IV и V класс опасности.

В настоящее время утилизация лопастей ветрогенераторов из композитных материалов, образующихся по истечению времени эксплуатации либо ликвидации объекта, является существенной проблемой ветроэнергетики. Предлагаемые методы утилизации лопастей генераторов находятся в стадии разработки, а применяемые методы (такие как механическое измельчение, сжигание и пиролиз) обладают рядом недостатков, что не позволило рассматриваемым проектом ЗВОС заявить о решении проблемы переработки лопастей в полной мере.

В качестве наиболее вероятных аварийных ситуаций проектом рассмотрены случаи пожара главного трансформатора и разлива ГСМ, для предотвращения которых разработаны мероприятия, включающие: организацию бетонированной площадки для хранения дизтоплива, применение оборудования, арматуры и антисейсмических трубопроводов, стойких к коррозионным свойствам грунтов, грунтовых и сточных вод и т.п. Для защиты птиц от поражения электрическим током, предотвращения перекрытия изоляции предусмотрены противоптичьи заградители. В качестве основного мероприятия предусматривается повышение видимости вращающихся лопастей в дневное время за счет нанесения контрастных полос на лопасти ВЭУ.

Экологическая экспертиза проекта показала, что материалы содержат информацию, достаточную для принятия решения о допустимости проведения строительства ВЭС в объемах, предусмотренных проектом, а также **соответствие** требованиям природоохранного законодательства к первому этапу оценки воздействия на окружающую среду о допустимости реализации проекта.

Государственный комитет Республики Узбекистан по экологии и охране окружающей среды **согласовывает** проект заявления о воздействии на окружающую среду строительства ветряной электрической станции «ACWA POWER DZHANKELDY WIND» мощностью 500 МВт в Пешкунском районе Бухарской области.

До ввода объекта в эксплуатацию в соответствии с требованиями ПКМ РУз за №541 от 07.09.2020 г. следует разработать Заявление об экологических последствиях, содержащее экологические нормативы для всех видов воздействия проектируемых работ на окружающую среду и представить в установленном порядке для рассмотрения на Госэкоэкспертизу.

ООО «JURU ENERGY CONSULTING» необходимо:

- в материалах ЗЭП представить акт обследования предприятия, утвержденный управлением по экологии и охране окружающей среды Бухарской области, о выполнении вышеизложенных мероприятий: оснащение ветротурбин датчиками вибрации и противоптичьим заградителем, готовность систем водоотведения и специальной заправочной площадки, также площадки временного хранения строительных и твердых бытовых отходов;

- представить оценку воздействия на жителей п. Джанкельды и п. Калата наложение потоков воздуха при работе ВЭС; разработать структуру ветряных потоков, при одновременной работе двух станций;
- своевременно выполнять план управления окружающей средой и план мониторинга окружающей среды во время строительства ветряной электростанции DZHANKELDY, мощностью 500 МВт в Пешкунском районе Бухарской области, утвержденные Госкомэкологии РУз;
- в целях минимизации воздействия на флору, фауну и орнитофауну для строительства ВЭС выбрать участки, имеющие наименьшее значение для биоразнообразия;
- при строительстве ВЭС ветряные турбины размещать с учетом размеров буферных зон археологических находок, строительные и земляные работы в буферных зонах, проводить под непосредственным археологическим надзором;
- соблюдать требования письма отдела службы санитарно-эпидемиологического благополучия и общественного здоровья за №20-8/5544 от 04.08.2021 г.;
- разработать генеральный план территории с нанесением источников выбросов, сбросов и отходов и представить технологическое обоснование источников выбросов, сбросов также отходов и их количества и состава;
- уточнить перечень, количество загрязняющих веществ и источников выделения и выброса загрязняющих веществ в атмосферный воздух намечаемой деятельностью;
- разработать и утвердить в управлении по экологии и охране окружающей среды план технической и биологической рекультивации земель с последующим его выполнением после окончания строительных работ;
- предусматривать срезку почвенно-растительного слоя и обеспечивать его временное хранение до окончания строительных работ; использовать срезанный почвенно-растительный слой в период проведения благоустройства территории.
- разработать и получить «Разрешение на специальное водопользование или водопотребление» (РСВ) в установленном законодательством порядке (ПКМ РУз №255 от 31.03.2018 г. «О порядке оформления и получения разрешения на специальное водопользование или водопотребление»);
- обеспечить выполнение требований ПКМ РУз «О мерах по дальнейшему совершенствованию порядка проведения работ со строительными отходами» за №40 от 28.01.2021 г. (приложения за №№3-7), для хранения строительных отходов необходимо организовать специальное место с бетонированным полом и навесом, предусмотреть отсеки для раздельного хранения отходов;
- заключить договор с ГУП «Тоза худуд» либо иными альтернативными компаниями (для содержания ТБО на санкционированном полигоне), с целью своевременного вывоза стоков и отходов.

Управлению по экологии и охране окружающей среды Бухарской области следует взять на контроль:

- готовность специальной заправочной площадки, также площадки временного хранения строительных и твердых бытовых отходов;

- выполнение плана управления окружающей средой и плана мониторинга окружающей среды во время строительства ветряной электростанции DZHANKELDY мощностью 500 МВт в Пешкунском районе Бухарской области, утвержденный Госкомэкологии РУз;

- соблюдение требований письма отдела службы санитарно-эпидемиологического благополучия и общественного здоровья за №20-8/5544 от 04.08.2021 г.;

- разработку плана технической и биологической рекультивации земель с последующим его выполнением после окончания строительных работ;

- получение «Разрешения на специальное водопользование или водопотребление» (РСВ) в установленном законодательством порядке (ПКМ РУз №255 от 31.03.2018 г. «О порядке оформления и получения разрешения на специальное водопользование или водопотребление»);

- обеспечение выполнения требований ПКМ РУз «О мерах по дальнейшему совершенствованию порядка проведения работ со строительными отходами» за №40 от 28.01.2021 г. (приложения за №№3-7), для хранения строительных отходов необходимо организовать специальное место с бетонированным полом и навесом, предусмотреть отсеки для раздельного хранения отходов;

- заключение договора с ГУП «Тоза худуд» либо иными альтернативными компаниями (для содержания ТБО на санкционированном полигоне), с целью своевременного вывоза стоков и отходов.

Не допускать ввода рассматриваемого объекта в эксплуатацию, без положительного заключения на проект «Заявление об экологических последствиях».

Заместитель председателя



И. Бокижонов

Иск: Вастева Н.С.
Тел: 71 203 00 22 (внутр. 1006)

THE CONCLUSION
of The State Ecological Expertise

On the object:	Environmental Impact Assessment for construction of ACWA POWER DZHANKELDY WIND wind farm with the capacity of 500 MW in Peshku district of Bukhara region (Preliminary EIA project)
Customer:	JURU ENERGY CONSULTING LTD.
TIN:	303 454 532
Category:	I, p. 32, The Resolution of CoM of RUz No. 541 of 07.09.2020.
Developer:	JURU ENERGY CONSULTING LTD.
Expert:	Valiyeva N.S.

To Director of
JURU ENERGY CONSULTING LTD.
J.U. Yakubov

copy: Bukhara Regional Department of Ecology and
Environment Protection

The materials of the first stage of environmental impact assessment of construction of wind farm "ACWA POWER DZHANKELDY WIND" with the capacity of 500 MW in Peshku district of Bukhara region were submitted for the state ecological expertise.

The basis facility planning is Decree of the President of Republic of Uzbekistan No. PP-5001 dated 23.02.2021 "On measures on implementation of investment project "Construction of wind power plant with capacity of 500 MW in Peshku district of Bukhara region".

The area allocated for the wind farm is 280 ha. The territory of the wind farm is divided into two sections - Western and Eastern. These sites are separated by the limestone mining area and Dzhankelely village.

The project envisages installation of 125 wind turbines with all auxiliary facilities and buildings. Wind turbines model "GW165-5,6 MW" with tower height of 120 m, which have horizontal axis, three blades, frontal rotor, variable speed and variable pitch controller, synchronous generator with direct drive based on permanent magnets with external rotor, as well as the network connection device. The main components of a wind turbine consist of: tapered tubular tower sections made of steel; rotor blades made of glass fibre, reinforced epoxy resin and carbon fibres; nacelle, which houses the generator and gearbox; rotor, which is the central point where the three blades are connected to the nacelle; generator, which converts mechanical energy into electricity; gearbox; converter; transformer.

The infrastructure of the wind farm site includes additional and auxiliary facilities such as - entrance to the site and security building; administration building, offices and premises; central control post; warehouse and repair workshop; security system; lighting system; access roads between wind turbines; vehicles and garage; concrete pad under a shed for temporary storage of diesel fuel, with drainage pit for collecting spills and area for temporary storage of waste generated.

Dzhankeldy village is located between two sections West and East. From the Western section of the wind farm the distance to Dzhankeldy village is 3.1 km, from the Eastern section - 1.6 km. The village of Kalata is located to the west of the nearest wind turbine at a distance of 3.44 km. Letter from the Department of Sanitary and Epidemiological Wellbeing and Public Health Service No. 20-8/5544 dated 04.08.2021, that was attached to the report, categorised the wind power plants as “Class I” (1st Category) with a minimum sanitary protection zone of 1000 m.

The proposed development area is crossed by several infrastructural elements: a road connecting Kalata settlement with Jankeldy settlement, which runs in the middle of the Western section and further extends to the southern part of the Eastern section; a road crossing diagonally the Western section and passing Jankeldy settlement and going to Gazli town; overhead power lines within the Eastern section; temporary parking lots in the Eastern and Western sections.

According to the project materials, during the site surveys, one Neolithic stone workshop was discovered on the northern side of an unnamed depression, 10 km northeast of the center of the Jankeldy settlement. According to the letter No. 286 dated 09.04.2021 of the Bukhara Regional Department of Cultural Heritage, under the Ministry of Culture of the Republic of Uzbekistan, there are no objects of tangible cultural and archaeological heritage under state protection within a radius of 5 km from the area selected for construction of the wind farm.

The limestone mining area is located 1km to the East site and 3km to the West site of the wind farm.

There are no major surface watercourses and water bodies in the area of the wind farm location. During site investigation, a dry channel of a temporary watercourse (sai) was observed to run from north to south from the Jangeldi village at a distance of 710 m. A letter from the Ministry of Water Resources No. 01/17-2341 dated 05.08.2021 is attached to the project stating that there are no water management facilities in the area of the wind farm.

According to the results of topographical and geotechnical surveys performed by UzAssystem JV (branch of Assystem international design and engineering company), no ground waters were detected up to the depth of 50m at the wind farm site during drilling surveys (16 wells up to 50m deep).

As a result of spring and summer botanical surveys, the following Red Data Book species of plants were identified in the area under the wind farm construction and along the projected overhead power line: Lehmann's tulip and Zakirov's calligonum, *Acanthophyllum cyrtostegium* Vved., Korolkow's desert-candle, *Kyzylkum's ferula*, as well as red-listed species of reptiles (Russian tortoise, Caspian Monitor and Desert sand boa, Southern Even-fingered Gecko) and mammals (Brandt's hedgehog and Goitered gazelle) which are also included in the International Union for the Conservation of Nature Red List. Birds were monitored in the WES between March 2020 and May 2021 using Scottish Natural Heritage methodology and the following bird species included in the collision risk modelling analysis (Autumn-Spring) were identified: Houbara Bustard, Pygmy Cormorant, Great White Pelican, Egyptian Vulture, Cinereous Vulture Eurasian Griffon Short-toed Snake-Eagle Steppe Eagle Imperial Eagle Golden Eagle White-tailed Eagle Lesser Kestrel Saker Falcon Common Crane Eurasian Marsh-Harrier Hen Harrier Black Kite

Eurasian Sparrowhawk Common Buzzard Long-legged Buzzard Eurasian Kestrel Ruddy Shelduck Gadwall Mallard Green-winged Teal Black-headed Gull Caspian Gull Great Cormorant Gray Heron Purple Heron Great Egret Black-crowned Night- Heron. Based on the results of the surveys, a "Collision Risk Modeling" was conducted. Birds were monitored according to the timing of migration and breeding of the target species in the region: spring (migration): March 16 - May 15; summer (breeding): May 16 - August 31; autumn (migration): September 1 - November 15; winter: November 16 - March 15. The analysis shows that the frequency of collision of all Tier1 target species will not exceed 1 in year 25. The highest predicted collision frequency among Tier 2 target species was for Long-legged Buzzard (one collision in 18 years), followed by Eurasian Kestrel (one collision in 45 years). The frequency of collisions for all other Tier 2 target species was lower than one collision per 100 years. In order to minimise the impact on flora, fauna and ornithofauna, the areas of least biodiversity significance will be selected for construction based on the biodiversity survey results.

IE "ACWA POWER DZHANKELDY WIND" LLC developed the environmental management plan and the environmental monitoring plan during construction of wind farm DZHANKELDY with capacity of 500 MW in Peshku district of Bukhara region, including measures on preservation of natural habitat (flora and fauna), quality of air, water and soil, topsoil, flora and fauna, on hygiene and safety of workers, prevention of collision and electrocution of birds during operation of wind farm etc., which are approved by the Deputy Chairman of the State Committee of Ecology and Environmental Protection of the Republic of Uzbekistan.

According to the design solutions for installation of wind turbines, the construction area will be cleared of vegetation. Sites with no vegetation cover will be selected for the construction of structures if possible. During the period from August 17 to 18, 2021 the specialists of Bukhara Regional Department of Ecology and Environmental Protection together with the representative of Cadastral Agency of Peshku district conducted a preliminary assessment of cutting down of tree and shrub vegetation on the territory of projected wind farm and along the route, projected overhead power line and made an Act of territory inspection. According to the results of the assessment, during project implementation it is not expected to cut down trees and shrubs specified in the list of valuable varieties of trees and shrubs that are not included in the state forest fund according to the Annex to the Decree of the Cabinet of Ministers of the Republic of Uzbekistan №93 dated 18.02.2020. "On additional measures for preservation of valuable varieties of trees and shrubs not included into the state forest fund".

According to long-term meteorological data, the area is characterized by winds of northern and northeastern directions (23.7, 20.23 and 16.7%, respectively). The average annual frequency of weak winds (0 - 1 m/s) is 12.8 %. Moderate wind speeds 2-3 m/s prevail - 53,1%, and strong winds- 4-5 m/s - 21,45%. Winds with a speed of 6-7 m/s are also frequent - 9.05%.

The wind turbines are spaced at a distance equal to the height of several towers. This distance allows the wind flow to recover and the turbulence created by the rotor of one wind turbine does not affect the neighbouring wind turbine on the leeward side. The wind turbines are anchored and stabilised with reinforced concrete platforms. The foundation platforms are constructed below ground level and soil will be placed over the platform to return the visible area almost to its original state.

The operating principle of wind farm is to convert wind energy into mechanical energy and then into electrical energy. The technology of electricity generation at wind farm is based on the following processes: rotation of the blades using the wind; as the blades rotate, their motion is converted by the generator into electricity, which is accumulated in the battery. In this conversion

process there are no exhaust gases, waste water and waste.

The design solution adopted the option of passing the overhead power line along the route: "Dzhangel'dy" wind farm - "Bash" wind farm - existing "Karakul" substation with nominal voltage of 500 kV in one circuit. The given project considers the route of overhead power transmission line originating from substation 33/500 kV of "Bash" wind farm to substation 33/500 kV of "Dzhankeldy" wind farm, with an approximate length of 128.1 km. The proposed 500 kV overhead power transmission line starts from Bash wind farm and ends at the projected 33/500 kV substation of Dzhankeldy wind farm. The corridor is planned to run parallel to the existing overhead power transmission line and road. All intersections with existing power transmission lines, roads, pipelines and railway lines are carried out at an angle of 80-90 degrees.

The overhead power transmission line route runs between sections eastern and western plots and will be 8.4 km long. The distance from the designed substation to the Jankeldy settlement is 4.3 km.

The maintenance of vehicles on the balance sheet of the enterprise will be carried out by specialized organizations. A 10 m³ tanker will be provided for refuelling of construction equipment, hydrocarbon emission will take place irregularly through the equipment leaks. Approximate emission of hydrocarbons from the temporary fuel storage tank is about 0.0036 t/year.

The backup power source for the substation is a diesel generator. A small amount of diesel fuel will be stored in an aboveground tank. Transmission oils for lubrication will be supplied to the warehouse in a sealed container (cartridge, capacity up to 250 g). One fill from one hermetically sealed cartridge lasts for 1 year, and then the oil is topped up. Lubricating oil for refilling of oil-filled equipment is not stored in the warehouse, it is brought from the supplier directly at the time of its filling. Emission of hydrocarbons of mineral oil occurs irregularly during operation of oil-filled equipment through its leaks and amounts to about 0.0084 t/year.

The project provides asphalt access roads from the control center to the wind turbines with a width of 6 meters. The internal road network will be 79.63 km long. Routine road maintenance will include the watering and smoothing necessary to maintain the pavement and the inspection and repair of stormwater management systems necessary to ensure they are functioning properly to control erosion.

The wind farm will be operated by 20 persons. The work mode is three shifts of 8 hours each. Due to the fact that the work schedule of the personnel is on a rotational basis, temporary living quarters are provided to accommodate the working personnel. An electric stove is used for cooking.

Emissions of pollutants into the atmosphere and formation of construction wastes are planned during construction, which **should be calculated** in accordance with the parameters presented in the Resolution of CoM RUz "On measures to further improve the procedure of work with construction wastes" No.40 dated 28.01.2021, (Annexes No.3- 7).

During transformer operation, pollutants in the form of hydrocarbons will be emitted into the atmosphere - 0.0084 t/year.

During operation of the reserve power source (diesel generator), operating on diesel fuel, the combustion of which will emit pollutants in the form of carbon monoxide, nitrogen dioxide, hydrocarbons, soot, sulfur dioxide and benz(a)pyrene about 0.0004 t/year.

At a subsequent design, a list indicating the number of pollutants and sources of emissions and releases of pollutants into the atmosphere by planned activities shall be specified.

The process of electricity generation by the wind farm does not involve the use of water for operational needs and, accordingly, industrial effluents.

The source of water supply to the wind farm will be imported water from the nearest settlement. Domestic wastewater in the amount of 5,22 m³/day; 1630,3 m³/year will be treated at the septic installation, which is planned to be located on the territory of the wind farm. Watering of the territory is carried out only during the hot period of the year from May to September by imported irrigation water or treated water from the bioseptic.

In order to reduce dust emission during construction works, wet spraying with the use of one sprinkler machine is envisaged.

The following wastes are expected to be generated during the production activities of the facility in question:

- waste oils generated by transformers, II hazard class;
- waste blades of wind turbines generated by operation of the wind farm, hazard class IV;
- electrode waste generated during welding works, Hazard Class V;
- silica gel waste generated by transformers, hazard class IV;
- ferrous metal scrap resulting from repair work and consisting of end-of-life parts, Hazard Class V;
- Non-ferrous metal scrap generated as a result of repair work and consisting of end-of-life parts, hazard class III;
- oiled rags with oil content 15% or more, formed during wiping of mechanisms, hazard class III;
- waste LED lamps, hazard class IV;
- waste paper generated in the administrative building, Hazard Class V;
- food waste, hazard class V;
- municipal solid waste, hazard class IV;
- debris generated during cleaning of the territory in the form of sand grains, dry grass, leaves of trees, hazard class IV and V.

Currently, the utilization of wind turbine blades made of composite materials, formed after the operation time or liquidation of the facility, is a significant problem of wind energy. The proposed methods of utilization of generator blades are under development, and the applied methods (such as mechanical shredding, incineration and pyrolysis) have a number of drawbacks, which did not allow the preliminary EIA project under consideration to declare the solution to the problem of blades recycling in full.

As the most probable emergency situations the project considers cases of fire of the main transformer and fuel and lubricant spillage, to prevent which measures have been developed, including: the organization of a concreted area for storage of diesel fuel, the use of equipment, fittings and anti-seismic piping, resistant to corrosive properties of soil, ground and waste water, etc. To protect birds from electrocution, prevent overlapping of the insulation, anti-bird barriers are provided. As a main measure, the visibility of rotating blades in the daytime by applying contrasting stripes on the blades of the wind turbine is envisaged.

The ecological expertise of the project has resulted that the materials contain sufficient

information to make a decision on the permissibility of the wind farm construction in the volumes envisaged by the project, as well as **compliance** with the requirements of environmental legislation for the first stage of the environmental impact assessment on the permissibility of the project implementation.

The State Committee of the Republic of Uzbekistan on ecology and environment protection **approves** project statement on preliminary environmental impact assessment of construction of wind farm "ACWA POWER DZHANKELDY WIND" with capacity of 500 MW in Peshku district of Bukhara region.

Statement on “Consequences of Environmental Impacts” should be developed and submitted to the State Ecological Expertise prior to commissioning the facility. Statement should be prepared in accordance with the requirements of the Resolution of CoM RUz No.541 dated 07.09.2020 and include norms for all types of environmental impacts of the planned activities.

JURU ENERGY CONSULTING LLC is required:

- To ensure that an act of inspection of the enterprise, approved by the Department of Ecology and Environmental Protection of Bukhara region, on the implementation of the above measures: equipping wind turbines with vibration sensors and anti-bird barrier, readiness of drainage systems and special filling site, also the site of temporary storage of construction and solid waste are included to the report on “Consequences of Environmental Impacts”;
- To provide an assessment of the impact on the residents of Jankeldy and Kalata villages of the overlapping air flows during operation of the wind farm; to develop the structure of wind flows, with simultaneous operation of two stations;
- To ensure implementation of the environmental management plan and environmental monitoring plan in a timely manner during the construction of the 500 MW DZHANKELDY wind farm in Peshku district of Bukhara region, approved by the State Committee of Ecology and Environmental Protection of the Republic of Uzbekistan;
- In order to minimize the impact on flora, fauna and ornithofauna, to select sites of the least importance for biodiversity for the construction of the wind farm;
- When constructing wind turbines, locate them with considering required buffer zones of archaeological finds; construction and excavation work in the buffer zones should be carried out under direct archaeological supervision;
- To comply with the requirements of the letter No. 20-8/3066 of 12.04.2021 of the Department of Sanitary and Epidemiological Welfare and Public Health Service;
- To develop a master plan of the territory with the drawing of sources of emissions, discharges and waste and provide technological substantiation of sources of emissions, discharges and waste and their quantity and composition;
- To specify the list of quantity of pollutants and sources of emission and release of pollutants into the air by the planned activity;
- To develop and approve in the Department of Ecology and Environmental Protection a plan of technical and biological land reclamation with its subsequent implementation after

completion of construction works;

- To envisage the cutting of the topsoil and ensure its temporary storage until the end of construction work; use the cut topsoil during landscaping (recovering project site after completion of construction works);
- To develop and obtain "Permit for special water use or water consumption" in accordance with the procedure established by the legislation (The Resolution of CoM RUz №255 dated 31.03.2018. "On the order of drawing up and obtaining permission for special water use or water consumption");
- To ensure the fulfillment of the requirements of The Resolution of CoM RUz "On measures to further improve the procedure of work with construction waste" No.40 dated 28.01.2021 (Annexes No.3-7), a special place with concrete floor and shed should be arranged for storing construction waste, and compartments for separate waste storage should be provided;
- To sign a contract with SUE "Toza Hudud" or other alternative companies (to maintain household solid waste at the sanctioned landfill), in order to remove wastewater and waste in a timely manner.

The Bukhara Regional Department of Ecology and Environmental Protection should take control:

- readiness of special refueling site, as well as a site for temporary storage of constructional and household solid waste;
- implementation of the environmental management plan and environmental monitoring plan during the construction of the 500 MW DZHANKELD wind farm in Peshku district of Bukhara region;
- compliance with the requirements of the letter No. 20-8/3066 of 12.04.2021 of the Department of Sanitary and Epidemiological Welfare and Public Health Service;
- development of a technical and biological land reclamation plan with subsequent implementation upon completion of construction works;
- obtaining "Permit for special water use or water consumption" in accordance with the procedure established by the legislation (the Resolution of CoM of RUz No. 255 dated 31.03.2018 "On the order of drawing up and obtaining permission for special water use or water consumption");
- to meet the requirements of the Resolution of CoM RUz "On measures to further improve the procedure of work with construction waste" No.40 dated 28.01.2021 (Annexes No. 3-7), a special place with concrete floor and shed should be arranged to store construction waste, and compartments for separate waste storage should be provided;
- contracting with SUE "Toza Hudud" or other alternative companies (to maintain household solid waste at the sanctioned landfill), in order to remove wastewater and waste in a timely manner.

Do not allow the commissioning stage of the current planned facility without

obtaining a positive conclusion on the “Consequences on Environmental Impacts”.

The Deputy Chairman

Signed and sealed

I. Bokijonov

Exec: Valiyeva N.S. (signed)

Tel. 71 203 00 22 (ext. 1006)

APPENDIX B- SCOPING REPORT

Dzhankeldy 500MW Wind Farm

Uzbekistan



Environmental & Social Impact Assessment (ESIA): **Scoping Report**

Prepared for:



March 2021

DOCUMENT INFORMATION

PROJECT NAME	Dzhankeldy 500MW Wind Farm
5Cs PROJECT NUMBER	1305/001/102
DOCUMENT TITLE	Environmental & Social Impact Assessment: Scoping Report
CLIENT	ACWA Power
5Cs PROJECT MANAGER	Eva Muthoni Kimonye
5Cs PROJECT DIRECTOR	Ken Wade

DOCUMENT CONTROL

VERSION	VERSION DATE	DESCRIPTION	AUTHOR	REVIEWER	APPROVER
1.0	11/03/2021	E&S Scoping Report	EFO	MKB	KRW



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2	Social Capital	<i>The 5 Capitals of Sustainable Development</i> to enable long term delivery of its products or services.
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LIST OF ABBREVIATIONS

ABBREVIATION	MEANING
ADB	Asian Development Bank
CESMP	Construction Environmental & Social Management Plan
DEG	Deutsche Investitions- und Entwicklungsgesellschaft
E&S	Environmental and Social
EBRD	European Bank for Reconstruction and Development
EIA	Environmental Impact Assessment
EPC	Engineering, Procurement and Construction
EPFIs	Equator Principles Financial Institutions
ESIA	Environmental & Social Impact Assessment
ESMS	Environmental & Social Management Systems
GBVH	Gender Based Violence and Harassment
GHG	Greenhouse Gas
IBA	Important Bird Area
IFC	International Finance Corporation
ILO	International Labour Organisation
LAO	Land Allotment Order
LLA	Land Lease Agreement
NEGU	National Electric Grid of Uzbekistan
NENU	National Electric Networks of Uzbekistan
NOMAC	First National Operation and Maintenance Co. Ltd
OESMP	Operation Environmental & Social Management Plan
OHTL	Overhead Transmission Line
O&M	Operations and Maintenance
PEF	Purchase Electrical Facilities
PPA	Power Purchase Agreement
PR	Performance Requirement
UNESCO	United Nations Educational, Scientific, and Cultural Organisation
WHO	World Health Organisation
WTG	Wind Turbine Generator
5 Capitals	5 Capitals Environmental & Management Consultancy

1 INTRODUCTION

1.1 National Context

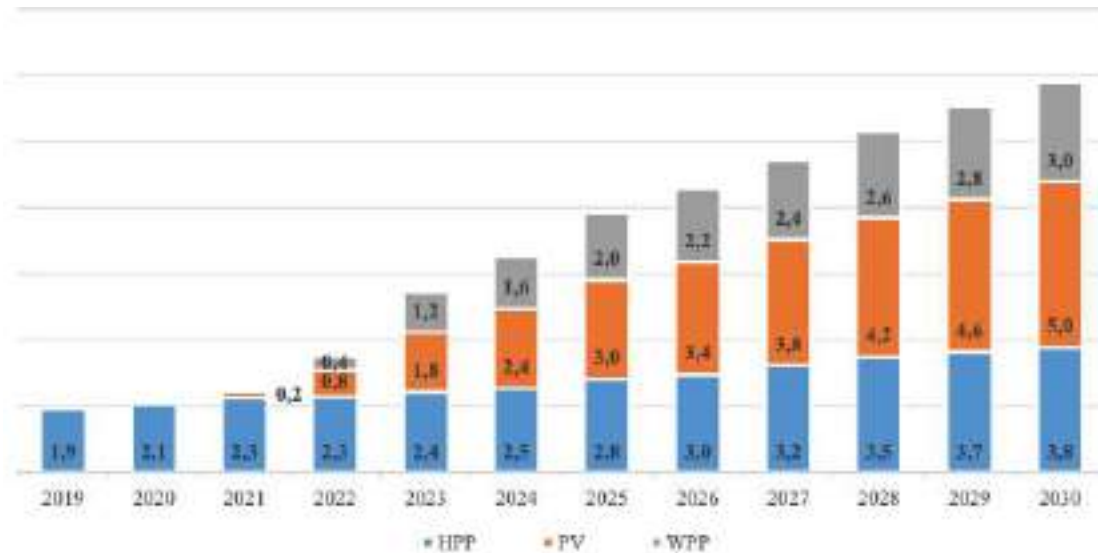
The Uzbekistan 2030 Energy Strategy defines the mid-term and long-term objectives and directions for the development in the power sector for ensuring electricity supply in Uzbekistan between 2020-2030. One of the objectives of the Energy Strategy include the development and expansion of renewables use and their integration into the unified power system. In order to fulfil this objective, the government of Uzbekistan intends to:

- Ensure diversification in power and heat energy sectors through increased share of renewable energy sources and creation of renewable energy investment project mechanism utilising PPP approaches, enhancement of government policies related to development of renewable energy sources, demonstration of renewable projects

In regards to the development of wind farms the Energy Strategy states the following as priority:

“Creation of large-scale wind farms with single site capacities ranging from 100MW to 500MW mostly concentrated in North-Western region (Republic of Karakalpakstan and Navoi region) shall be the main priority of wind power development”

Figure 1-1 Uzbekistan Renewables-Based Generation Targets by 2030



Source: Uzbekistan 2030 Energy Strategy Concept Note, 2020

1.2 The Project

As part of the Uzbekistan 2030 Energy Strategy, ACWA Power has signed an implementation agreement with the Ministry of Energy in Uzbekistan for developing, building and operating a 500MW Wind Farm in Dzhankeldy (the Project) on two adjacent plots of land in Peshku District.

ACWA Power have since established a Project Company, 'FE ACWA Power Dzhankeldy Wind LLC' registered in the Republic of Uzbekistan with registration number 839766. ACWA Power Dzhankeldy Wind LLC has entered into a 25-year Power Purchase Agreement (PPA) with JSC 'National Electric Grids of Uzbekistan', which is based on the ultimate operations of the Project. The Project will include the development financing, construction, operation and maintenance of the Wind Farm including 125 wind turbine generators (WTGs) and wind farm electrical substations.

The Project scope also includes development, financing, construction and transfer of the Purchaser Electrical Facilities (OHTL and common electrical facilities shared with Bash 500MW Wind Farm, switchyard (with transformers) or 500/220 kV pooling station).

JSC National Electric Networks of Uzbekistan will be responsible for the operations and maintenance of Purchase Electrical Facilities (PEF) following transfer from ACWA Power and the development, financing, construction, operation and maintenance of OHTL upstream from the PEF.

1.3 Scope of Document

A key stage in the development of the Project, requires Environmental Impact Assessment (EIA) in compliance with Uzbekistan national EIA requirements (OVOS). As such, it is required to independently prepare an EIA for approval prior to the commencement of the project.

ACWA Power is also seeking an amount of project finance from financial Institutions who have their own internal environmental & social investment policies/standards, or may be members of voluntary agreements such as the Equator Principles. At this stage, it is understood that the European Bank for Reconstruction and Development (EBRD), the Asian Development Bank (ADB) and the Deutsche Investitions- und Entwicklungsgesellschaft (DEG) are involved in discussions relating to provisions of finance. Based on the requirements of these institutions, a process for undertaking Environmental & Social Impact Assessment (ESIA) to assess potential impacts and determine suitable mitigation measures will be necessary as a process to reach financial close.

5 Capitals Environmental and Management Consulting (5 Capitals) has been engaged by ACWA Power to undertake the independent EIA and ESIA processes, as well as certain other environmental & social related scope. In order to undertake the EIA/ESIA, it is necessary to delineate the terms of reference (amongst other items), which is part of the basis for this 'Scoping Report'. 5 Capitals has partnered with a locally based consultant, 'Juru Energy' (Tashkent, Uzbekistan) to undertake certain elements of the scope, including baseline surveys,

consultations and submission of the EIA to the State Committee of the Republic of Uzbekistan on Environmental Protection.

1.4 Objectives of the ESIA Scoping Report

The main objectives of this report in relation to the "Project" are as follows:

- To provide an overview of the Project;
- To provide an overview of the regulatory framework requiring EIA, other obligations and environmental & social standards applicable to the project (such as those required by the lenders);
- To outline preliminary environmental & social baseline conditions and receptors to ensure that proposed assessment techniques (including required baseline surveys) are designed to enable the establishment of representative environmental conditions for the Project and its areas of impacts/influence;
- To identify preliminary environmental & social potential impacts relating to the construction and operational phases of the Project, for the ESIA to assess these issues specifically; and
- To specify the structure and content of the subsequent ESIA.

This Scoping report has been informed by:

- Analysis of the Project details and proposed works (as advised by ACWA Power);
- Study of the relevant mapping and aerial photography;
- Site visits by 5 Capitals' sub-consultant (Juru Energy) from March 2020 onwards;
- Spring, Summer and Autumn bird and bat surveys for the Project;
- Review of available secondary information; and
- Experience of conducting ESIA's for similar wind projects and experience of working with lenders to ensure necessary financing requirements are met.

2 PROJECT INFORMATION

2.1 Key Project Information

Table 2-1 Key Project Information

PROJECT TITLE	Dzhankeldy 500MW Wind Farm
PROJECT DEVELOPER	ACWA Power
PROJECT COMPANY	FE "ACWA Power Dzhankeldy Wind" LLC
OFFTAKER	JSC National Electric Grid of Uzbekistan
EPC CONTRACTOR	To Be Confirmed
O&M COMPANY	First National Operation and Maintenance Co. Ltd (NOMAC)
ENVIRONMENTAL CONSULTANT	5 Capitals Environmental and Management Consulting (5 Capitals) PO Box 119899, Dubai, UAE Tel: +971 (0) 4 343 5955, Fax: +971 (0) 4 343 9366 www.5capitals.com
	Juru Energy Consulting LLC Chust Str. 10, 100077, Tashkent, Uzbekistan Tel: +998 71 202 0440, Fax: +998 71 2020440
POINT OF CONTACT	Ken Wade (Director), Ken.wade@5capitals.com

2.2 Project Location

The western plot of the wind farm is located approximately 2.5km east of Dzhankeldy village and approximately 370m west of Kalaata village. The eastern plot of the wind farm will be located 27km west of Ayakguzhumdy and approximately 92km west of Bukhara town.

Both the western & eastern plot are approximately 47km north of Highway A380. The proposed Project coordinates and locations are provided in the table and figures below.

Table 2-2 Project Site Coordinates

ID	UTM ZONE 41T	
	LONGITUDE (E)	LATITUDE (N)
Eastern Plot		
1	523619.75	4534733.22
2	543599.97	4529733.76
3	536496.75	4510432.45
4	526924.81	4516485.66
5	532348.42	4525452.64
6	523032.36	4532093.13
Western Plot		
7	525738.34	4525288.58
8	515437.34	4532201.45
9	514980.93	4524099.13
10	522031.61	4519603.11

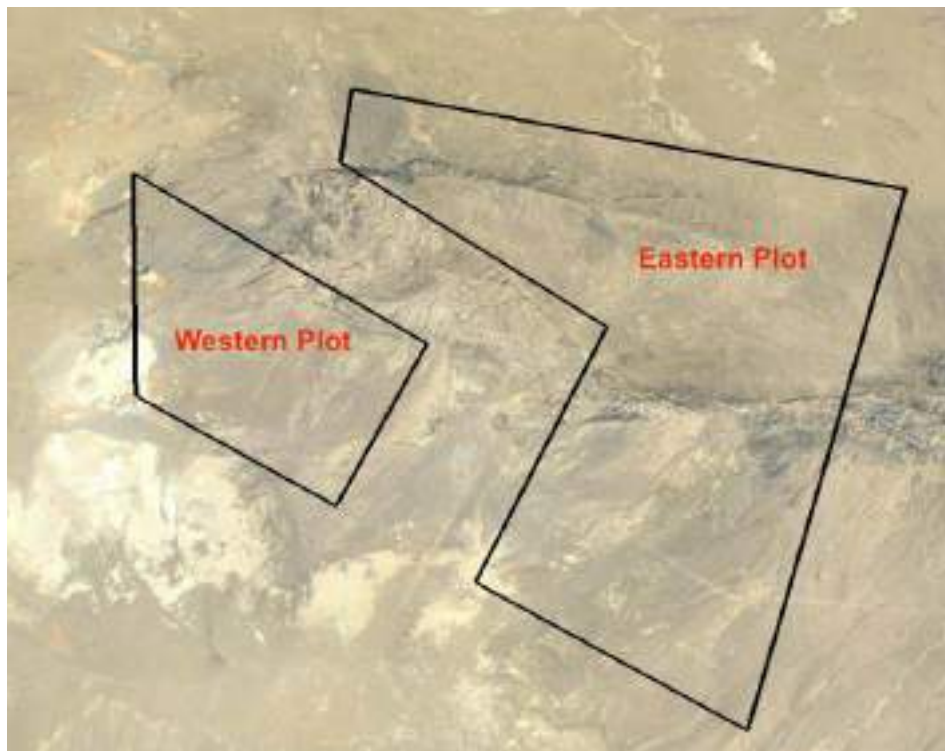
Figure 2-1 Project Location- National Context



Figure 2-2 Project Location – Local Context



Figure 2-3 Eastern & Western Plots



Note: At the time of writing, wind measurement campaign is still on-going as such, the project layout is not finalised as several rounds of layout optimization will be undertaken in correlation with the selection of the WTG OEM/model

2.3 Land Use and Site Conditions

2.3.1 Land Ownership

According to the 1998 Land Code of the Republic of Uzbekistan, all land in Uzbekistan is state property and permits for use of land are granted and monitored by the State through the rayon and oblast administrations.

It is understood that the Khokimiyat of Bukhara region is yet to issue land allotment order. The land allotment order will allow the Project Company and its contractors possession of the Site and the Project Laydown Area, free from any encumbrance, with uninterrupted use and access).

Following issuance of the land allotment order, ACWA Power Dzhankeldy Wind LLC will enter into a Land Lease Agreement (LLA) with The Government of The Republic of Uzbekistan as represented by the Khokimiyat of Bukhara Region.

2.3.2 Land Use and Site Condition

Project Site Condition

Details on land use and site condition is based initial site visit undertaken in May 2020 (for bird & bat survey) and review of satellite imagery.

The Project has two (2) adjacent plots that are open, undeveloped with cliffs that are predominantly found towards the centre & north of each plot. These cliffs are more pronounced in the eastern plot where majority of the site includes large undulations with pointy hilltops. Evidence of areas for runoff drainage are present across the plots as observed via review of satellite imagery. Vegetation is present along these flow paths present on site and in other areas.

Plate 2-1 View of the Eastern Plot from the Southern Extent (May, 2020)



Plate 2-2 View of the Western Plot from the Northern Extent (May, 2020)



Plate 2-3 View of the Western Plot from the Centre of the Plot (May 2020)



Plate 2-4 Cliffs within the Eastern Plot



Few permanent structures are present within the plot boundaries and these includes:

- One (1) access roads which runs from the south east extent to the south west extent of the of the eastern plot. This same access roads connects to the western plots and runs from the eastern extent of this plot to the west;
- Another access road that runs from the west to the north east & northern extent of the eastern plot;
- Existing Overhead Transmission Lines (OHTL) within the eastern plot;
- Unknown structures within the eastern and western plots– It is not clear if some of these structures are still in use or abandoned; and

- Temporary project related meteorological monitoring masts at the eastern & western plot

Plate 2-5 View of the Road at the Southern Extent & Existing OHTL Within the Eastern Plot (May 2020)



Plate 2-6 View of the Road that Runs from West to North of the Eastern Plot



Plate 2-7 View of Unknown Structures – Eastern Plot



Plate 2-8 View of Unknown Structure – Western Plot



Plate 2-9 View of Temporary Project Related Mast – Eastern Plot



Plate 2-10 View of Temporary Project Related Mast – Western Plot



It is understood from meeting with Peshku Municipality (March 2021) that about 600ha of land within the eastern plot is leased by “Dzhankeldy” LLC and used primarily for grazing.

Few camels were identified within the Project site. It is understood that local herders from the Dzhankeldy village graze their livestock at the Project site. However, these herders return to the village in the evenings as such, there are no settlements (temporary or permanent) within the site.

Plate 2-11 Camel Seen on Site



2.3.3 Initial Potential Receptor Identification

In addition to the few permanent structures identified within the Project site, few land uses were identified external to the Project site within a 5km radius during the initial site visit (bird & bat survey) and satellite imagery review.

Approximately 2.5km east of the western plot boundary & 1.4km west of the eastern boundary is Dzhankeldy village . The Kalaata village is located west of the western plot boundary and is directly adjacent to this plot. During the initial site visit, schools, cemetery & farmland were identified within Dzhankeldy village and a temporary living place for geologists was also identified at Kalaata village in May 2020.

An existing road that connects to Highway A380 runs parallel to the western boundary of the eastern plot and this road runs through the plot from the west to the north. A temporary water body was identified during the initial site visit approximately 320m south of the eastern plot and livestock were seen to be near the water body.

The above mentioned features including those identified within the Project site are presented in the table and figures below. These have been provided for context in the scoping report and will be further investigated and assessed in the ESIA.

Table 2-3 Potential Receptors Within 5km of the Project Site

ID	DESCRIPTION	RECEPTOR TYPE	APPROXIMATE DISTANCE TO PROJECT SITE
R1	Access road that runs from the south east to the south west extent of the eastern plot	Infrastructure	Within the Site
R2	Access road that runs from the east to the west of the western plot		
R3	Access road that runs from the west to the north east & northern extent of the eastern plot		
R4	Existing OHTL within the eastern plot	Infrastructure	Within the Site
R5	Unknown structures within the eastern plot	Residential or Commercial	Within the Site
R6	Unknown structures within the western plot		
R7	Temporary Project Masts at the eastern plot	Infrastructure	Within the Site
R8	Temporary Project Masts at the western plot		
R9	Dzhankeldy Village (including school, farm, cemetery and others)	Mixed Use (residential, educational, agricultural)	2.5km east of the western plot and 1.4km west of the eastern plot
R10	Kalata Village (including geologist temporary living place and others)	Mixed Use (residential, commercial)	Directly adjacent to the western plot
R11	Existing road that runs parallel to western boundary of eastern plot	Infrastructure	Approximately 1.4km west and runs across the site from the west to the north east & north
R12	Temporary water body	Ecological	320m south of the eastern plot
R13	Livestock drinking from and resting near the temporary water body	Ecological	350m south of the eastern plot

Figure 2-4 Potential Receptors Within 5km of the Project site

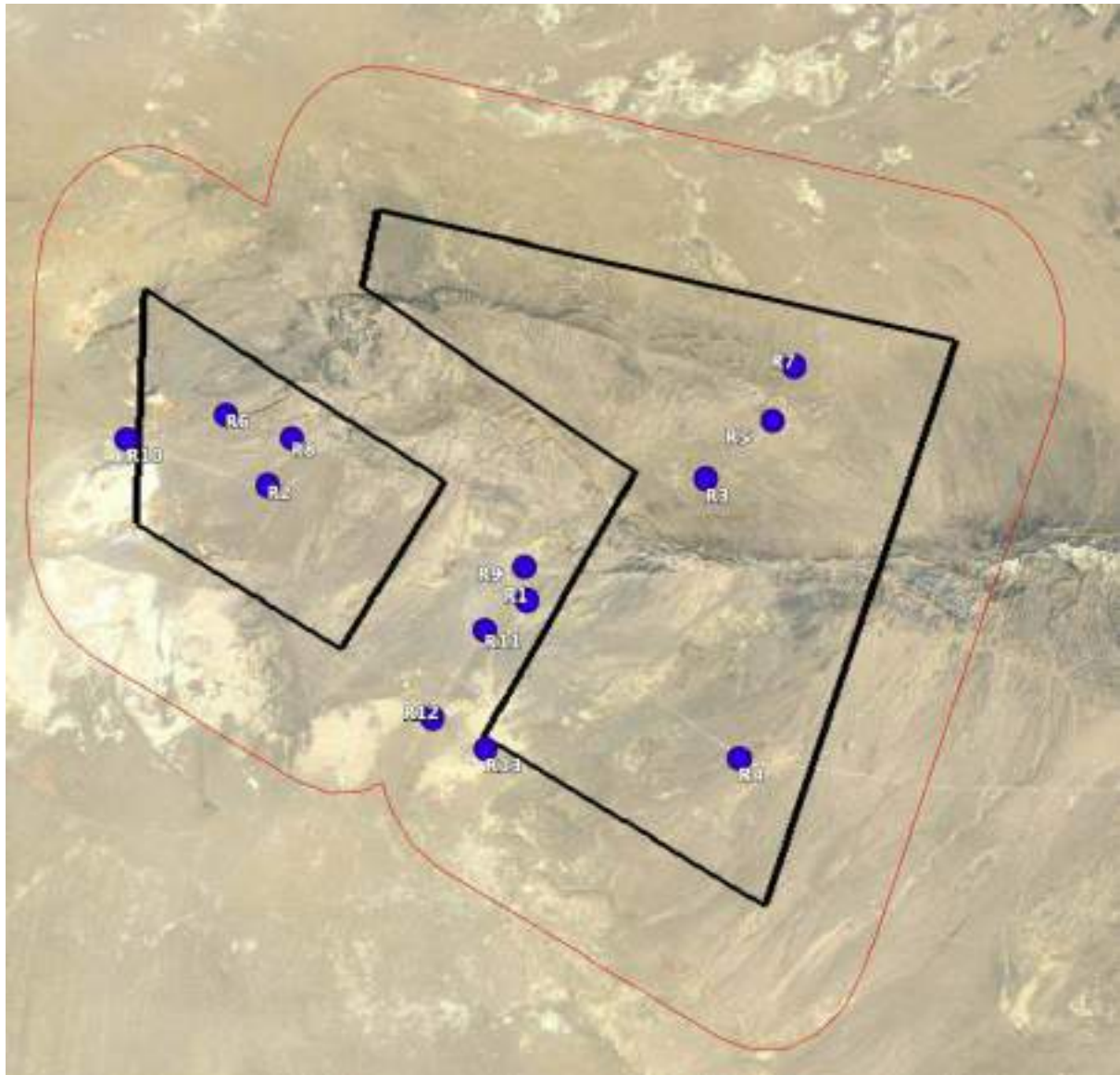


Plate 2-12 #R9 - View of the Dzhankeldy Village from the North



Plate 2-13 #R9 - Some Houses Within Dzhankeldy Village



Plate 2-14 #R10 - View of the Geologist Temporary Living Place at Kalaata Village



Plate 2-15 #R12 - Evidence of Temporary Water Body



2.4 Project Description

Wind turbines have been used to produce electricity on a commercial scale since the 1990s and are well established as a developed renewable energy technology.

Wind turbines harness the energy in the wind and convert it to electricity. The amount of energy produced by wind turbines increases dramatically with increased wind speed and modern turbines are able to adapt efficiently to extract energy from the entire range of wind speeds.

Wind speeds increase with height above ground as turbulence intensity decreases at the same time. This allows turbines with higher hub-heights to produce more energy than a turbine

with a lower height at the same location. In addition, longer blades (the rotor diameter from the turbine) significantly increase the swept area from which wind energy can be extracted.

The Dhzankeldy wind farm will consist of 125 wind turbine generators. The eastern plot will comprise of 91 wind turbines whilst the western plot will comprise of 34 wind turbines. The proposed location of the WTGs within the Project site are presented in the figure below. The turbine technology, manufacturer and supplier for the proposed Project has not been defined at present. Once defined, this will be included in the ESIA.

Figure 2-5 Proposed Location of the WTGs within the Project Site



The basic components of a wind turbine include the following components:

- Conical tubular tower sections made of steel;
- Rotor blades, made of fiberglass, reinforced epoxy and carbon fibres;
- Nacelle, which houses the generator and gearbox;
- Hub, which is the central point at which the three blades are connected to the nacelle;
- Generator, which converts mechanical energy into electricity;
- Gearbox;
- Converter; and
- Transformer.

Wind turbines are usually painted light-grey, with aviation safety lights at the top of the nacelle. The tips of the blades are sometimes painted orange or red to improve daytime visibility of the

blade swept area while remaining unobtrusive to the character of the landscape as far as practical.

Turbines are fixed to the ground and stabilised using reinforced concrete platforms, which ensure that the turbine remains stable. Foundation platforms are constructed below ground level, and soil will be placed over the platform to return the visible area to nearly its original condition. A typical foundation diameter is 20m, with a depth of 2.5m, depending on the turbine design and the subsoil conditions.

At this stage, specific details regarding the wind turbines are not available. According to Appendix A of the PPA, the design of the turbines will meet the following requirements.

Table 2-4 Wind Turbine Generators

STANDARD	DESCRIPTION
IEC 61400	All functional specifications and standards pertaining to the Wind Turbine Generators of the Plant should follow and conform to all relevant parts of International Electrotechnical Commission standard IEC 61400

Table 2-5 Wind Turbine Generator Foundations

STANDARD	DESCRIPTION
DNV GL-ST-0126	Support structures for wind turbines. Edition April 2016
BS EN 1998-1:2004	Eurocode 8 design of structures for earthquake resistance
BS EN 1992-1-1:2004	Eurocode 2: Design of concrete structures
	WTG manufacturer requirements and recommendations

Table 2-6 Transformers

STANDARD	DESCRIPTION
IEC 60076-16	Power transformers – Part 16; transformers for wind turbine application.

Table 2-7 Electrical Equipment

STANDARD	DESCRIPTION
IEC 61936-1	Power installations exceeding 1 kV a.c. – Part 1: common rules.

Final details regarding the wind turbines technology will be provided at the ESIA stage

2.4.1 Project Facilities

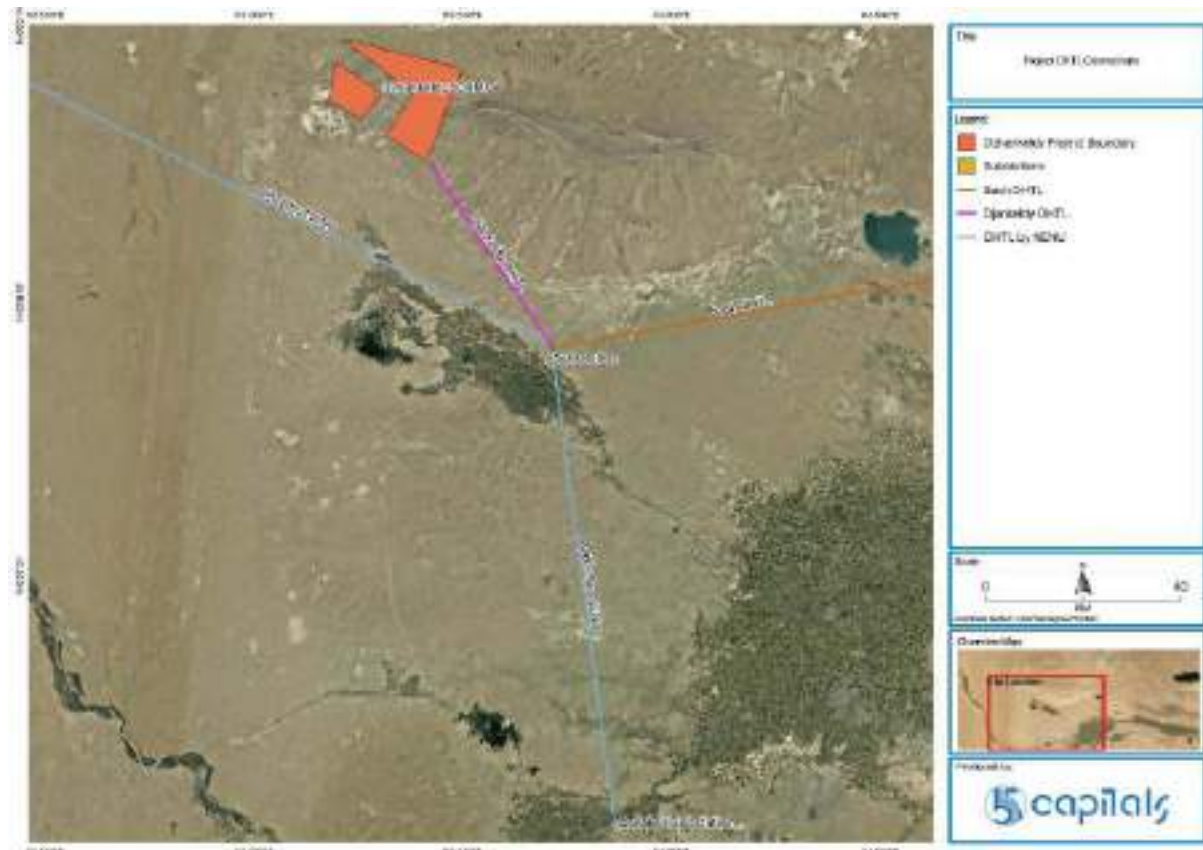
Some of the Project facilities will be shared between ACWA Power's Dzhankeldy 500MW Wind Farm and Bash 500MW Wind Farm which is located approximately 94km north east of the Dzhankeldy site. Preliminary details about the shared facilities are provided below.

OVER HEAD TRANSMISSION LINE & SUBSTATION

At this stage, ACWA Power has advised that the details of the OHTL are still under investigation. It is understood that there are two options under consideration for the routing of the proposed OHTL under the 'Power Evacuation Scheme' for consideration by JSC National Electric Networks of Uzbekistan. The options under consideration include:

- **Option A:** 60km OHTL from the Project site either with a rating of 220kV double-circuit or 500kV single-circuit that will connect to a newly construction substation.
- **Option B:** 250km OHTL (from Dzhankeldy Project site to Bash Project site to an existing substation) with a rating of 500kV single circuit.

Figure 2-6 Location of OHTL & substation (Option A)



[illegible]

Note: The options of the alignment of the OHTLs provided above are indicative and have not been finalised. It is understood from ACWA Power that this is subject to change based on the outcome of the 'Power Evacuation Scheme' and approval by JSC National Electric Networks of Uzbekistan. As a result, this scoping report is unable to define the OHTLs and substation's area of influence and therefore to delineate the baseline surveys to be undertaken. This scoping report does include an expected scope of work based on general potential impacts and understanding of the Project area. Once the alignments are confirmed, further considerations will be made in regards to additional studies

2.4.2 Auxiliary Facilities

Auxiliary facilities for the Project will include:

- Site entrance and security building
- Administration building, offices and amenities
- Central Control Room
- Warehouse and stores
- Security
- Lighting
- Access roads between turbines
- Other mobile plant and vehicles

Internal access roads between turbines will be developed to enable easy access within the Project site. This internal access road is expected to link to existing roads that runs across each plot and connects to Highway A380 in order to facilitate transportation of equipment to and within the site.

2.4.3 Associated Facilities

Associated facilities are those which are not funded as part of the Project, but without which (or without their expansion/expansion) the Project would not be viable.

ELECTRICAL CONNECTIONS

As discussed under section 2.4.1 above, there are two options under consideration for the construction of the Project's OHTL. Under Option A, the National Electric Network of Uzbekistan (NENU) will construct two 500kV lines to Karakul (approximately 99.5km) and to Sarymay (165km). Details regarding associated facilities under Option B are not available at this point and will be included in the ESIA where applicable.

2.5 Project Construction Requirements

Principle construction activities and associated requirements in relation to civil works are anticipated to include but not limited to;

- Detailed project planning and design and consideration of project components by the EPC Contractor;
- Transportation of components to the project site;
- Site preparation (comprising excavation, grading, levelling, and land clearing at WTG platforms) to create flat land area for installation of wind turbine towers and various project components;
- Primary project construction work (comprising excavation and levelling etc.) for installation and laying of transmission cables, collector/switchgear, and the installation of electrical substation(s);
- Additional facilities construction work (comprising excavation and levelling etc.) for access road, internal road network, construction of any building infrastructure (if required);
- Installment of permanent meteorological towers (as necessary);
- Provision of electricity supply, generation and distribution system as required for installation, erection and
- Commissioning tests of electrical infrastructure (including wind turbine generators) and inspection of civil engineering quality records

2.5.1 Temporary Construction Facilities

Temporary construction laydown area(s) will be established within the Project site. These areas will be required during the construction phase of the Project for the storage of materials by the Engineering Procurement and Construction (EPC) contractor as well as sub-contractors. After completion of construction, the construction laydown areas will be disassembled, and the area will be returned to its original condition. The laydown area will include:

- Office containers;

-
- Storage areas for equipment;
 - Parking areas;
 - Bathroom and waste collection facilities;
 - Equipment for power generation;
 - Communications equipment; and
 - Other miscellaneous small items as required.

2.5.2 Utility Requirements

The Engineering, Procurement and Construction (EPC) contractor will be solely responsible for all construction utilities including power supply, potable water, firefighting supplies and systems, erosion and sedimentation control, waste management and temporary medical and welfare facilities. Where possible, the EPC contractor will connect to existing utilities, where this is not possible utilities will be provided by water tankers and generators. Further detail on the construction utility requirements will be included in the ESIA.

2.5.3 Workforce

Requirements for construction workforce are yet to be finalised. At this stage it is understood that about 700-1000 personnel will be present on site during peak construction periods. Out of this 700-1000 personnel, about 350 - 500 will be employed from the local workforce.

Finalised details will be included in the ESIA. Such details will be used in the respective impact assessments related to construction waste, wastewater, as a well as requirements for welfare, working conditions, community health, safety and security and worker accommodation.

2.5.4 Worker Accommodation

It is understood that the location of worker accommodation for the Project will be within the Project site. Such worker accommodation is expected to house Project Company and EPC Contractor staff. At this stage, the exact location of the worker accommodation and other workers accommodation requirements for either the EPC contractor and subcontractor have not been confirmed. However, it is expected that the necessary facilities and standards of facilities for all worker accommodation/camp will be specified by the Project Company and will be in accordance with the IFC/EBRD Worker Accommodation Processes and Standards. Further detail on the size and location of worker accommodation sites will be provided in the ESIA.

2.6 Operation and Maintenance Requirements

The project is expected to be operational for 25 years and operations and maintenance activities will be undertaken by The First National Operations and Maintenance Company (NOMAC), a wholly owned subsidiary of ACWA Power.

The operation of the wind farm will require limited operational activities such as the following:

- Operation and maintenance to include normal daily operation of equipment including maintenance (electromechanical and housekeeping) to optimise energy yield and life of the system;
- Remotely activated turbine shutdown during excessive wind speeds;
- Management of operations in relation to resident bird and bat species and migration periods during Spring and Autumn.

2.6.1 Workforce

The operation of the wind farm is likely to be monitored and controlled from a remote location, as such, only a limited number of operational workforce are likely to be required. At this stage, it is understood that about 15 – 20 local workforce will be engaged to carry out operation and maintenance activities of the wind farm.

Finalised details on the type of workforce (skilled unskilled, management staff, etc.) will be included in the ESIA.

2.7 Project Milestone

Based on the details provided by ACWA Power and Appendix C of the PPA (Project Implementation Schedule), the following timeline is currently in place for the Project.

Table 2-8 Key Project Milestone/Timeline Dates

MILESTONE	DATE
Effective Date (ED)	24 th January 2021
Closing Date (CD)	4 th Quarter 2021
Financial Closing	4 th Quarter 2021
Start of site mobilisation	2-4 months before Closing Date
Site preparation	2-4 months before CD
Earliest Connection Date	19 months after CD
Early Generation	21 months after CD
Scheduled Group 1 (First Group) Commercial Operation Date	21-22 months after Closing Date
Scheduled Group 2 Commercial Operation Date	
Scheduled Group 3 Commercial Operation Date	
Scheduled Group 4 Commercial Operation Date	22-23 months after Closing Date
Scheduled Group 5 Commercial Operation Date	
Scheduled Group 6 Commercial Operation Date	
Scheduled Group 7 Commercial Operation Date	23-24 months after Closing Date
Scheduled Group 8 Commercial Operation Date	
Scheduled Group 9 Commercial Operation Date	
Project Commercial Operation Date (PCOD)	24 months after Closing Date

3 REGULATORY FRAMEWORK

3.1 National Regulations

3.1.1 Constitution of Uzbekistan

The constitution of Uzbekistan has the following provisions relating to environmental aspects:

- Article 50: All citizens shall protect the environment.
- Article 54: Any property shall not inflict harm to the environment.
- Article 55: Land, subsoils, flora, fauna, and other natural resources are protected by the state and considered as resources of national wealth subject to sustainable use.

3.1.2 Law on Nature Protection, 1992 as Amended in 2019

This law is the key national environmental law for the protection of the environment and the sustainable use of resources and the right for the population to a clean healthy environment. This law states legal, economic, and organisational basis for the conservation of the environment and the rational use of natural resources. Article 25 of this law states that the State Environmental Expertise (SEE) is a mandatory measure for environmental protection, preceded to decision making process. In addition, the law prohibits the implementation of any Project without approval from SEE.

3.1.3 Law on Environmental Control, 2013

The main objectives of this law include:

- Prevention, detection and suppression of violation of legislative requirements relating to environmental protection and rational use of natural resources.
- Monitoring the state of the environment, identifying situations that can lead to environmental pollution, irrational use of natural resources, pose a threat to the life and health of citizens.
- Determination of compliance with environmental requirements of any ongoing economic development activities.
- Ensuring compliance with the rights and legitimate interests of legal entities and individuals performing their duties in relation to environmental protection and sustainable use of natural resources.

Other relevant national laws and regulations to the Dzhankeldy Wind Farm include:

PRESIDENTIAL DECREES SPECIFIC TO THE PROJECT

- Decree of the President of the Republic of Uzbekistan
 - Includes measures to implement the investment of the project on construction of a 300- 500MW wind power plant in Peshku district in Bukhara region No.5001 (23/02/2021).

ENVIRONMENT

- The Law of the Republic of Uzbekistan "On water and water use" (1993) as amended in 2019.
- The Law of the Republic of Uzbekistan "On Ecological Expertise" (2001) as amended in 2017.
- The Law of the Republic of Uzbekistan "On Protection and Use of Vegetation" (1997) as amended in 2016.
- The Law of the Republic of Uzbekistan "On Protected Natural Reserves" (2004) as amended in 2019.
- The Law of the Republic of Uzbekistan "On Protection and Use of the Wildlife" (1997) as amended in 2016.
- The Law of the Republic of Uzbekistan "On Wastes" (2002) as amended in 2019.
- The Resolution of the Cabinet of Ministries of the Republic of Uzbekistan №541 "On further improvement of the environmental impact assessment mechanism"
- The Resolution of Cabinet of Ministries of the republic of Uzbekistan №820 "On measures to further improve the economic mechanisms for ensuring nature" dated on 11th October, 2018.
- The Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No 14. "On approval of the regulation on the procedure for the development and agreement of projects with environmental standards".
- Law "On Environmental Expertise" No.73-II of 25.05.2000 (as amended on 22.11.2018).
- The Law of the Republic of Uzbekistan "On Atmospheric Air Protection" (1996, amended on 13.03.2019)
- Resolution of Cabinet of Ministers of Republic of Uzbekistan No.95 "On approval of general technical regulations of environmental safety" (2020).

LABOUR AND EMPLOYMENT

- Ordinance No. 30-31 of the Ministry of Labour and Social Security and the Ministry of Health of the Republic of Uzbekistan approving the list of hazardous jobs mentioned in Article 355, for which the employment of persons under the age of eighteen years is prohibited
- Joint Decree of the Ministry of Labour and Social Protection of the Population (No. 7) and the Ministry of Healthcare (No. 1) of Uzbekistan dated 30 May 2001 to

approve the list of occupations with unfavourable working conditions to which it is forbidden to employ persons under 18 years of age.

- Decree No. 133 of 11 March 1997 to approve normative acts necessary for the realization of the Labour Code of the Republic of Uzbekistan
- Decree of the Cabinet of the Ministers No. 1011 of 22 December 2017 "On Perfection of the Methodology of Definition of Number of People in Need of Job Placement, including the Methodology for Observing Households with Regard to Employment Issues, also for the Development of Balance of Labour Resources, Employment and Job Placement of Population".
- Decree of the Cabinet of the Ministers No. 965 of 5 December 2017 "On the Measures of Further Perfection of the Procedure of Establishment and Reservation of Minimum Number of Job Places for the Job Placement of Persons who are in need of Social Protection and Face Difficulties in Searching Employment and Incapable of Competing in Labour Market with Equal Conditions".
- Decree No. 964 of 5 December 2017 "On the Measures for Perfection of the Activity of Self-Government Bodies Aimed at Ensuring Employment, Firstly for the Youth and Women".

THE NATIONAL/LOCAL REQUIREMENTS THAT REQUIRE THE PREPARATION AND SUBMISSION OF AN EIA/ESIA;

The national Environmental Impact Assessment (EIA) procedure is principally required and regulated by the:

- Law "On Environmental Expertise" No.73-II of 25.05.2000 (as amended on 04.01.2011)
- Resolution of Cabinet of Ministers of Republic of Uzbekistan No.541 "On further improvement of the environmental impact assessment mechanism, 2020".

OVERHEAD TRANSMISSION LINES & SUBSTATION

- Resolution of Cabinet of Ministers of Republic of Uzbekistan No.95 "On approval of general technical regulations of environmental safety" (2020).
 - Requires the implementation of environmental safety measures for the protection of flora and fauna. This includes the prevention of death of wildlife species due to magnetic fields of power transmission lines and sanitary protection zones.
 - Requires transformer substations in power transmission lines, their grids to have equipment (barriers, fences etc..) to prevent animals from entering the territory of the substation.
- Decree of the Cabinet of Ministers of the Republic of Uzbekistan No.1050 "On approval of Rules for Protection of Power Grid Facilities, 2018".
 - This determines the procedure for establishing protected zones for power grid facilities, as well as special conditions for using land located within the protected zones and ensure the functioning and operation of the said facilities.
 - Construction of power grid facilities with 110, 220 or 500kV in protected areas of state nature reserves, protected areas of nature parks and state biosphere reserves etc shall be allowed with the permission of the Cabinet of Ministers of the Republic of Uzbekistan.

- Protected zones of power grid facilities shall be established on both sides of the power transmission line from the outermost wires and along the perimeter of substations at the following distances for voltages:
 - o 110kV: 20 meters;
 - o 220kV: 25 meters; and
 - o 500kV: 30 meters.
- San Rules & Norms No. 0236-07 "Sanitary norms and rules to ensure safety for people living near high voltage power transmission lines, 2007".
 - This regulation sets the requirements for ensuring public safety when overhead power lines pass over populated, unpopulated or inaccessible territories.
 - It requires sanitary norms and rules to be followed in the design, construction and operation of overhead power lines.
 - The distances corresponding to the projection onto the ground of the outer phase wires in a direction perpendicular to the overhead line as follows:
 - o Up to 110kV/m: 10 meters;
 - o Up to 220kV/m: 15 meters;
 - o Up to 330kV/m: 20 meters;
 - o Up to 500kV/m: 30 meters; and
 - o Up to 570kV/m: 40 meters.

LAND RIGHTS, ACQUISITION AND RESETTLEMENT

- Civil Code of the Republic of Uzbekistan "Civil code" (№ 163- I, 21.12.1995, as amended on 22.01.2020);
- Land Code (1998 as amended 2010) (№ 598-I, 30.04.1998, as amended on 28.08.2019);
- Law of the Republic of Uzbekistan on State Land Cadastre No.666-I of 28.08.1998

3.1.4 Environmental Regulator

The main regulatory body for national EIA in Uzbekistan is the State Committee of the Republic of Uzbekistan for Ecology and Environmental Protection of the Republic of Uzbekistan.

The committee performs its activities on the basis of the following legal acts:

- Presidential Decree of April 21, 2017 No. UP-5024 "On improving the system of public administration in the field of ecology and environmental protection."
- Resolution of the President of the Republic of Uzbekistan of April 21, 2017 No. PP-2915 "On measures to ensure the organization of the activities of the State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection".
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated January 15, 2019 No. 29 "On Approving the Provision on the State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection".
- Resolution of the President of the Republic of Uzbekistan dated October 3, 2018 No. PP-3956 "On measures to ensure the organization of the activities of the State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection".

3.2 International Conventions/Protocol

The proposed Project must comply with the environmental requirements of the following protocols and conventions listed in the Table below of which the Uzbekistan is a signatory:

Table 3-1 International Protocols and Conventions

NAME OF INTERNATIONAL PROTOCOL/CONVENTION	SIGNED/ RATIFIED	RELEVANCE TO THE PROJECT
UN Framework Convention on Climate Change	Accession: 20 June 1993	The Project will comply contribute to Uzbekistan's GHG emission reduction targets.
Kyoto Protocol to UNFCCC	Ratified: 12 th October 1999	
Paris Agreement to UNFCCC	Signed: 19 th April 2017	
Montreal Protocol on Substances that Deplete the Ozone Layer (with London, Copenhagen, Montreal amendments)	Accession: 10 th June 1998	The Project will support Uzbekistan's contribution towards the protection of the ozone layer by refraining from use of ozone depleting substances.
Vienna Convention on the Protection of Ozone Layer	Accession: 18 May 1993	
UN (Rio) Convention on Biological Diversity	Accession: 19 th July 1995	The Project will implement mitigation and management measures to ensure the conservation and protection of terrestrial ecology during the Project lifecycle.
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	Accession: 10 th July 1997	The Project staff and workers will be strictly forbidden from trading in any wild flora and fauna found in the Project site or outside the Project boundaries.
Convention on Migratory Species of Wild Animals	1 May 1998	The project will implement mitigation and management measures to ensure conservation of terrestrial and avian migratory species especially because the Wind Farm will be located along the Asian bird migration route and IBA site.
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	Accession: 7 th February 1996	The Project will be required to adhere to all national and international standards for hazardous waste generation and management.
United Nations Convention to Combat Desertification	Ratified: 31 August 1995	The Project will not result in accelerated desertification through

NAME OF INTERNATIONAL PROTOCOL/CONVENTION	SIGNED/ RATIFIED	RELEVANCE TO THE PROJECT
		sourcing of its materials and will contribute to sustainable development.
Paris Convention on Protection of the World Cultural and Natural Heritage	Succession: 13 th January 1993	The Project will implement mitigation and management measures where items/sites/monuments of cultural or natural heritage are identified within or near the Project boundaries and notify the relevant authorities immediately.
Stockholm Convention on Persistent Organic Pollutants	Accession: 28 th June 2019	The Project will implement control measures to eliminate any use of chemicals under Annex A and B and reduce the unintentional release of those under Annex C.

3.3 Lenders Requirements

ACWA Power are pursuing an amount of Project Finance from financial institutions who either:

- Have their own internal E&S investment guidelines;
- Are members of the collective environmental and social agreements such as the Equator Principles; or

At this stage, it is known that the European Bank for Reconstruction and Development (EBRD), the Asian Development Bank (ADB) and the German Investment and Development Company (DEG) are interested in providing finance. The key E&S requirements for these financial institutions, as well as for any other Equator Principles Financial Institutions (EPFIs) that may also be involved are summarised below.

3.3.1 EBRD

POLICY AND PERFORMANCE REQUIREMENTS

The European Bank for Reconstruction and Development (EBRD) has an internal Environmental and Social Policy (2019) and a set of specific Performance Requirement (PRs) covering key environmental and social components for consideration, assessment and management in their investments. These reflect EBRD's commitments to promote EU environmental standards as well as the European Principles for the Environment in their investments. The PRs are outlined below:

- PR1: Assessment and Management of Environmental and Social Impacts and Issues;

-
- PR2: Labour and Working Conditions;
 - PR3: Resource Efficiency and Pollution Prevention and Control;
 - PR4: Health and Safety;
 - PR5: Land Acquisition, Involuntary Resettlement and Economic Displacement;
 - PR6: Biodiversity Conservation and Sustainable Management of Living Natural Resources;
 - PR7: Indigenous People;
 - PR8: Cultural Heritage;
 - PR9: Financial Intermediaries, and
 - PR10: Information Disclosure and Stakeholder Engagement

PROJECT CATEGORISATION

As per EBRD's Environmental and Social Policy (2019), 'EBRD categorises each project to determine the nature and level of environmental and social investigations, information disclosure and stakeholder engagement required'.

Appendix 2 of EBRD's E&S Policy outlines an indicative list of project types that would fall under Category A, which is defined as '*projects with potentially significant adverse future environmental and/or social impacts which require a formalized and participatory environmental and social impact assessment process*'. This includes '*Large scale wind power installations for energy production (wind farms)*' and '*Construction of high voltage overhead electrical power lines*'.

Based on the above, it is expected that the ACWA Power Dzhankeldy 500MW Wind Farm falls under **Category A** though this has not been confirmed by EBRD.

It is noted that this scoping report has been prepared on the basis of undertaking a full ESIA commensurate with a Category A requirements.

3.3.2 ADB

ADB SAFEGUARD POLICY STATEMENT (SPS 2009)

The main objectives of the ADB's safeguards are:

- To avoid adverse impacts of projects on the environment and affected people, where possible;
- To minimise, mitigate, and/or compensate for adverse project impacts on the environment and affected people when avoidance is impossible; and
- Help borrowers/clients to strengthen their safeguard systems and develop the capacity to manage environmental and social risks.

ADB's SPS sets out the policy objectives, scope and triggers, and principles for three key safeguard areas:

- Environmental safeguards;
- Involuntary resettlement safeguards; and
- Indigenous Peoples safeguards.

PROJECT CATEGORISATION

ADB Projects categorisation is based on 3 specific safeguards: Environmental; Involuntary Resettlement; Indigenous People as provided above and based on these; the Wind Farm falls within the following categorisations:

- Environment: The Project will fall under **Category A** because it is expected to have significant environmental impacts. These impacts will potentially affect an area larger than the site or facilities subject to physical works.
- Involuntary Resettlement: Based on preliminary information obtained regarding the project site, although there are no permanent or temporary settlements within the site that will require resettlement, the land is used for grazing by "Dzhankledy" LLC and by local herders for livestock grazing. As such, the project falls under **Category B**.
- Indigenous People: Based on early screening, the project is not expected to have impacts on Indigenous People. Therefore, the project is classified under **Category C**.

3.3.3 Equator Principles

The Equator Principles (EP) is a risk assessment framework used by financial institutions to determine, assess and manage the environmental and social risk in Projects financing. Currently, over seventy-five major financial institutions from around the world have adopted the EPs. These financial institutions operate in more than 100 countries worldwide.

The Equator Principles were updated in 2006 (EPII), 2013 (EPIII) and a further update EPIV came into effect in October 2020. The EPs currently include provisions for the following:

- Principle 1: Review and Categorisation;
- Principle 2: Environmental and Social Assessment;
- Principle 3: Applicable Environmental and Social Standards;
- Principle 4: Environmental and Social Management System and Equator Principles Action Plan;
- Principle 5: Stakeholder Engagement;
- Principle 6: Grievance Mechanism;
- Principle 7: Independent Review;
- Principle 8: Covenants;
- Principle 9: Independent Monitoring and Reporting; and
- Principle 10: Reporting and Transparency.

The Equator Principles are applicable to the proposed Project since part of the Project financing will be provided by DEG.

APPLICABLE STANDARDS

EPIV establishes the minimum E&S standards to be adopted by EP Financial Institution (EPFIs) as those from IFC Performance Standards on Environmental and Social Sustainability (Performance Standards), the World Bank Group Environmental, Health and Safety Guidelines (EHS Guidelines) and/or the relevant host country laws, regulations and permits that pertain to environmental and social issues.

IFC Performance Standards

The IFC Performance Standards are a key component of the IFC's Sustainability Framework and directed towards clients (i.e. party responsible for implementing and operating the project that is being financed), providing guidance on how to identify risks and impacts. The IFC Performance Standards are designed to help avoid, mitigate, and manage risks and impacts throughout the life of a project as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the client in relation to project-level activities.

The IFC Performance Standards (2012) are listed below:

- Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
- Performance Standard 2: Labour and Working Conditions
 - Including International Labour Organisation (ILO) Conventions
- Performance Standard 3: Resource Efficiency and Pollution Prevention
- Performance Standard 4: Community Health, Safety, and Security
- Performance Standard 5: Land Acquisition and Involuntary Resettlement
- Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- Performance Standard 7: Indigenous Peoples
- Performance Standard 8: Cultural Heritage

WBG EHS Guidelines (2007)

The World Bank Group International Finance Corporation (IFC), Environmental, Health and Safety (EHS) General Guidelines of April 2007 superseded the World Bank Handbook issue of 1998.

In terms of specific guidelines to control environmental externalities (e.g. wastewater quality etc.), EHS guidelines have been set out by IFC and the World Bank Group to provide general guidelines for its members when involved in a project or when providing financial support to a

project. These guidelines contain general and industry-specific examples of Good International Industry Practice (GIIP). In summary, it should be noted that the following IFC EHS Guidelines are relevant to this project:

- General EHS Guidelines, Environmental:
 - Air Emissions and Ambient Air Quality;
 - Energy Conservation;
 - Wastewater and Ambient Water Quality;
 - Water Conservation;
 - Hazardous Materials Management;
 - Waste Management;
 - Noise; and,
 - Contaminated Land.
- General EHS Guidelines, Occupational Health & Safety:
 - General Facility Design and Operation;
 - Communication and Training;
 - Physical Hazards;
 - Chemical Hazards;
 - Radiological Hazards;
 - Personal Protective Equipment (PPE);
 - Special Hazard Environment; and,
 - Monitoring.
- Community Health & Safety:
 - Water Quality and Availability;
 - Structural Safety of Project Infrastructure;
 - Life and Fire Safety (L&FS);
 - Traffic Safety;
 - Transport of Hazardous Materials;
 - Disease prevention; and,
 - Emergency Preparedness and Response
- Industry Sector Guidelines, Power:
 - Electric Power Transmission and Distribution (2007)
 - Wind Energy (2015)
- Guidelines for Water and Sanitation (2007)

PROJECT CATEGORISATION

Under the IFC Performance Standards, the proposed project falls under **Category A**. This is described as below:

'Business activities with potential significant adverse environmental or social risks and/or impacts that are diverse, irreversible or unprecedented.'

Note: The Project categorization is subject to confirmation by EBRD, ADB and DEG. However, it is noted that this scoping report has been prepared on the basis of undertaking a full ESIA commensurate with a Category A requirement.

3.4 Applicable Environmental Standards

Applicable standards required for Project compliance are included to the respective environmental parameter sections of this report. This includes national standards and those expected for the lenders.

3.4.1 Lenders Standards

An overview of the lender standards is presented below, whilst the applicable standards are presented in the respective environmental parameter sections of this report.

EBRD

In accordance with the EBRD Environmental and Social Policy (2019), *'The EBRD, as a signatory to the European Principles for the Environment, is committed to promoting the adoption of EU environmental principles, practices and substantive standards⁶ by EBRD-financed projects, where these can be applied at the project level, regardless of their geographical location. When host country regulations differ from EU substantive environmental standards, projects will be expected to meet whichever is more stringent.'*

ADB

In accordance with the ADB's SPS (2009) and Safeguard Requirements 1: Environment, *'During the design, construction, and operation of the project the borrower/client will apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines. These standards contain performance levels and measures that are normally acceptable and applicable to projects.'* Please refer to applicable WB EHS Guidelines below.

EPFIs

In accordance with EPIV, EPFI's require compliance with both national regulations/standards and the applicable World Bank Group EHS Guidelines relevant to the Project. These include:

- General EHS Guidelines (2007);
- EHS Guidelines for 'Wind Energy' (2015)
- EHS Guidelines for 'Electric Power Transmission and Distribution' (2007).

3.5 EIA/ESIA Requirements

3.5.1 National Requirements

PROJECT CATEGORISATION

Project categorisation under the national requirements is determined in accordance with the Resolution of the Cabinet of Ministries of the Republic of Uzbekistan No 541 "On measures for the further improvement of environmental impact assessment procedures".

The indicative list of Category 1 projects with 'high-risk' of environmental impacts, includes:

- Wind farms with a capacity of 300MW or more.
- Power lines of republican and interstate significance.

According to the Resolution, the proposed project falls under **Category 1** which is equal to **Category A** in accordance with international categorization.

EIA PROCESS

In accordance with the resolution of the Cabinet of Ministries of the Republic of Uzbekistan No. 541 "On further improvement of the environmental impact assessment mechanism, 2020", the national EIA process consists of three stages:

- Stage I: "A Preliminary Statement of the Environmental Impact ("PSEI") - this is performed at the planning stage of the proposed Project prior to the allocation of funds for development.
- Stage II: The "Statement of the Environmental Impact" ("SEI") - this is prepared following Stage 1 and where the outcome of Stage 1 identified the need for additional studies or analyses. The SEI shall be submitted to State committee on ecology and environmental protection prior to the Feasibility Study or financing of the Project and, therefore, prior to the beginning of construction.
- Stage III: The "Statement on Environmental Consequences" ("SEC") is the final stage of the SEE process and is performed prior to approval of the Project. The report describes in detail the changes in the project made as a result of the outcomes of Stage 1 and Stage 2, the comments received during public consultations, the environmental standards applicable to the project (as defined by the modelling and assessment process), the environmental monitoring requirements and the main conclusions.

State ecological expertise approval: The State Committee on Ecology and Environmental Protection provides their opinion at Stage I and II is a typically a mandatory document for project financing by Uzbek banks, other Lenders and for Project commissioning at Stage III. The conclusion of the State Committee is typically valid for three years from the date of its issuance. If the project is not implemented within three years from the date of issue of the conclusion, the EIA report needs to be revised and re-submitted for approval.

3.5.2 Lender Requirements

EBRD

In accordance with PR 1, there is a requirement for EBRD financed projects to undertake an appropriate Environmental and Social Assessment in order to:

- Identify and evaluate environmental and social impacts and issues of the Project.
- Adopt a mitigation hierarchy approach to address adverse environmental or social impacts and issues to workers, affected communities, and the environment from Project activities.
- Promote improved environmental and social performance of clients through the effective use of management systems.
- Develop an ESMS tailored to the nature of the Project, for assessing and managing environmental and social issues and impacts in a manner consistent with the relevant PRs.

According to PR 1 *"The ESIA will include an examination of technically and financially feasible alternatives to the sources of such impacts, including the non-project alternative, and document the rationale in selecting the particular course of action proposed. It will also identify potential improvement opportunities and recommend measures needed to avoid, or where avoidance is not possible, minimise and mitigate adverse impacts."*

ADB

Since the proposed ACWA Power Wind Farm falls under Category A (under the environmental safeguard), an environmental impact assessment (EIA) including an environmental management plan (EMP) is required.

EU EIA LEGISLATION

EBRD is committed towards the promotion of the European Union's (EU) environmental requirements and is a signatory of the European Principles for the Environment. The Principles endorse and reinforce the European consensus on the values attached to the fundamental right for both present and future generations throughout the world to live in a healthy environment.

EIA Directive 85/337/EEC was introduced in 1985 and applied to a wide range of defined public and private projects. Since then, the initial Directive of 1985 and its three amendments have been codified by Directive 2011/92/EU of 13 December 2011. Directive 2011/92/EU was amended in 2014 by Directive 2014/52/EU.

Article 3 of the Directive states:

The environmental impact assessment shall identify, describe and assess in appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:

- a) Population and human health;*
- b) Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;*

-
- c) *Land, soil, water, air and climate;*
 - d) *Material assets, cultural heritage and the landscape; and*
 - e) *The interaction between the factors referred to in points (a) to (d).*

The ACWA Power Dzhankeldy Wind Farm falls under Annex II of the EIA Directive as '*Installation for the harnessing of wind power for energy production (wind farms)*' while the OHTL is under Annex I '*Construction of overhead electrical power lines with a voltage of 220kV or more and a length of more than 15km*'. The Project will therefore undergo through a full EIA assessment.

EPFIs

According to EP2, '*The EPFI will require the client to conduct an appropriate Assessment process to address, to the EPFI's satisfaction, the relevant environmental and social risks and scale of impacts of the proposed Project*'.

4 APPROACH TO ESIA

4.1 Scope of Work and Key Deliverables

The key deliverables of the ESIA process for the lenders are:

- Environmental and Social Scoping Report; and
- ESIA Report.

The key deliverables of the EIA process as required by the national legislation are:

- Preliminary Statement of the Environmental Impact (PSEI);
- Statement of the Environmental Impact (SEI), if requested by regulator; and
- Statement on Environmental Consequences (SEC)

The purpose of this Environmental & Social Scoping Report is to identify the key environmental and social issues and sensitive receptor sites at an early stage to ensure that the baseline surveys and assessment techniques for the subsequent ESIA address these issues. In addition, it identifies the structure and content of the ESIA.

The general content of the Environmental Scoping report includes:

- The key features of the proposed project;
- The environmental and social assessment, documentation and approval requirements for the proposed project;
- A brief description of the existing environmental and social conditions of the project site and an evaluation of existing environmental information on the area;
- A gap analysis to determine the additional information that needs to be gathered;
- Potential environmental and social issues and constraints (and opportunities) associated with the proposed project facilities based on the existing information; and
- An outline of the terms of reference, structure and content of the ESIA Report.

4.2 ESIA Methodology

4.2.1 Scope of Assessment

STUDY AREA (AREA OF INFLUENCE)

The primary study area comprises the Project footprint, which includes, the proposed physical WTGs, substations, laydown areas, equipment, internal access roads connecting the Project to the existing road network within the site, and construction/operational activities inside this area. This will also include the alignment of the OHTLs and the substation.

The study area is determined based on the area of influence of Project effects. For this Project, the study area will be generally to a 2 km buffer around the wind turbine areas, substation,

1km on each side of the OHTLs and associated facilities. However, the exact area of effect may vary for certain impacts. This is further described in the subsequent sections in Chapter 5.

ASSESSMENT OF ASSOCIATED FACILITIES

The associated facilities for assessment will include:

- Electrical Connections and Substation; and
- Overhead Transmission Lines (OHTL) to be constructed by National Electric Networks of Uzbekistan (NENU) – coordinates, length are yet to be confirmed.

The assessment of these facilities will include their construction and operations.

CONSTRUCTION ACTIVITIES

Construction of the Project is expected to result in certain environmental and social impacts, which will be assessed in the ESIA.

Temporary Construction Facilities

Temporary construction facilities to include in the ESIA will be:

- Project offices and temporary facilities;
- Contractor compounds and laydown areas;
- Any temporary construction access road (if different to the main access road); and
- Expected construction transportation routes.

Temporary Construction Worker Accommodation

Where details concerning worker accommodation facilities are available, the ESIA will intend to assess related impacts.

It is however expected that the locations of such worker accommodation areas will not be fully confirmed at the ESIA stage. Where information is not available, the ESIA will establish management provisions for these areas to be in accordance with the IFC & EBRD Worker Accommodation: Processes and Standards.

4.2.2 Consideration of Project Alternatives

As a minimum the ESIA will include assessment of:

- No Project option;
- Site selection and layout of WTGs ; and
- Alternative technology

4.2.3 Baseline Studies

Forming an integral part of the ESIA, the baseline studies provide a benchmark of existing conditions and allow a platform for which Project potential impacts can be assessed.

The baseline studies will correspond to those outlined in this ESIA Scoping Report and in accordance with any comments received from the lenders (or regulator) following the scoping report review. The intention is for the studies to capture a representative baseline within the Project's potential area of influence (which will differ for between parameters).

The baseline studies will be described in each relevant chapter of the ESIA, with analysis provided, and necessary results/reports included to the main report or applicable appendices.

4.2.4 Stakeholder Engagement

REQUIREMENTS

National Requirements

According to the Resolution of Cabinet of Ministers of Republic of Uzbekistan No.541 "On further improvement of the environmental impact assessment mechanism", mandatory public consultations is required regarding the project's environmental impact assessment and planned activities relating to Category I and Category II projects

Lender Requirements

Engagement with stakeholders is an essential part of the environmental and social assessment process and there are specific requirements for this stated by both EBRD and ADB. The main objective is to establish dialogue with those parties who may be involved in aspects of the Project or may have an interest in the outcome of the ESIA process.

STAKEHOLDER MAPPING & ESIA ENGAGEMENT PLANNING

This aim of the stakeholder mapping is to identify relevant stakeholders and to assess each stakeholder to understand their relevance so that consultation can be targeted and prioritised.

Due to the current COVID-19 pandemic, the typical face-to-face process for stakeholder engagement may be varied to contact stakeholders by video/phone calls as well as sending/receiving official letters. Due to uncertainty, the exact methods cannot be confirmed at this stage and several options are available as outlined in the table below.

Table 4-1 Stakeholder Mapping & ESIA Engagement Planning

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT: IMPACT-BASED (A), INTEREST-BASED (I), OR DECISION MAKER (D)	AGENDA FOR CONSULTATIONS AND METHODS
Directly Affected Communities	Local residential communities (the distance between Wind farm area and the nearest local communities is approx' 2 kilometres)	A: The closest communities to the site with potential ecological influence from the Wind farm	Issues regarding the environmental and social impact from planned Wind farm Public Meetings/ Phone Calls
	Kalaata village	I: The closest village to the site with potential ecological influence from the Wind farm	Issues regarding the environmental & social impact from planned Wind farm Public Meetings/ Phone Calls
	Dzhankeldy village	I: The closest village to the site with potential ecological influence from the Wind farm	Issues regarding the environmental & social impact from planned Wind farm Public Meetings/ Phone Calls
Land users (PAPs)	Herders/Shepherds	A: Adverse effects from construction activity and land use restriction.	Issues regarding the land use and compensation process, if required. Formal Meetings & Bi-Lateral/ Phone Calls
	"Dzhankeldy" LLC	A: Adverse effects from construction activity and land leasing.	Issues regarding the land use and compensation process, if required. Formal Meetings & Bi-Lateral/ Phone Calls
Vulnerable groups	At the moment there are no known vulnerable groups. The need for further inclusion in the ESIA process and the future SEP will be determined during the social and economic baseline survey that will be undertaken during the ESIA stage. Focus Groups (If Identified)		
Local governmental authorities	Bukhara region khokimiyat (municipality)	D: Responsible for development of the project	These organizations will have certain involvement with the Project development. No specific consultation planned for E&S elements Formal Meetings / Letter Correspondence / Phone Calls
	Peshku district khokimiyat	D: Responsible for development of the project	
	Regional Sanitary-Epidemiological Peace and Public Health Service	I: Statutory Consultees	
State Organisations	"National Power Networks of the Republic of Uzbekistan" JSC	D: Responsible for the operations and maintenance of Purchase Electric Facilities (PEF) following transfer from ACWA Power and development of OHTLs upstream from the PEF.	Ongoing Consultations with ACWA Power
Governmental Bodies	Ministry of Energy of the Republic of Uzbekistan	D: Responsible for development of the project	Issues regarding overall process of Wind farm construction (if necessary, at the scoping stage)

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT: IMPACT-BASED (A), INTEREST-BASED (I), OR DECISION MAKER (D)	AGENDA FOR CONSULTATIONS AND METHODS
			Formal Meetings / Letter Correspondence / Phone Calls (consultation on-going between ACWA Power and MoE)
	Ministry of Transportation	I: Statutory consultees	Issues regarding the delivery of equipment and machinery (if necessary) Formal Meetings / Letter Correspondence / Phone Calls
	Ministry of Employment and Labour Relations of the Republic of Uzbekistan	I: Statutory consultees	Issues regarding the labour relations (if necessary, at the scoping stage) Formal Meetings / Letter Correspondence / Phone Calls
	Ministry of Culture of the Republic of Uzbekistan	I: Statutory consultees	Issues regarding cultural and archaeological sites in the project area. Formal Meetings / Letter Correspondence / Phone Calls
	Ministry of Health	I: Statutory consultees Protection of employee and public safety; establishment of the sanitary zone along the OHTL and substation	Issues regarding health during the scoping process (if necessary, at the scoping stage) Formal Meetings / Letter Correspondence / Phone Calls
	Ministry of Emergency Situations of the Republic of Uzbekistan	I: Statutory consultees (Planning preparedness for emergencies)	Issues regarding the safety (if necessary, at the scoping stage) Formal Meetings / Letter Correspondence / Phone Calls
State Committees	State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection	D: Statutory consultees. Control with National environmental policy and protection standards. Responsible for approval national EIA.	All issues regarding the preparation and submission of national EIA Formal Meetings / Letter Correspondence & Study Submissions / Phone Calls
	Kara-Kir State Wildlife Sanctuary under the Committee of the Republic of Uzbekistan on Ecology and	D: Statutory consultees.	Interested in the development of the proposed substation (if confirmed) Formal Meetings / Letter Correspondence & Study Submissions / Phone Calls

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT: IMPACT-BASED (A), INTEREST-BASED (I), OR DECISION MAKER (D)	AGENDA FOR CONSULTATIONS AND METHODS
	Environmental Protection.		
	State Committee for Land Resources, Surveys, Cartography and the State Cadaster (or Goskomgeodezkad astr)	I: Statutory consultees	Requesting information and discussion of the issues regarding the land use Formal Meetings / Letter Correspondence / Phone Calls
	Institute of Archaeology	I: Statutory consultees	Issues regarding archaeological and cultural objects that may be affected by the Project Formal Meetings / Letter Correspondence / Phone Calls
Research Institutions	Public research institutions working in the region especially in relation to the environmental impacts relating to the impact of WTG on birds and bats	I: Will be interested in the environmental impacts of the Project.	No specific consultation , but may have an interest in publicly disclosed documents
Media	List Regional and local mass media	I: Will potentially be involved in disseminating information about the Project.	Issues regarding the media cover of planned Project (if necessary, at the scoping stage) Public Meeting / Phone Calls / Letter Correspondence
Political parties of environmental focus	Ecological party of Uzbekistan	I: Will be interested in the execution of the Project and its environmental impacts and mitigation measures.	No specific consultation, but may have an interest in publicly disclosed documents Formal Meetings / Letter Correspondence
NGO's	Uzbekistan Society for the protection of birds (UzSPB)	I: interest in the development of the project near an IBA site and within two major migratory bird flyways	Issues regarding existing studies on birds in the region and project impacts. Letter Correspondence/Phone Calls
	Emirates Center for the Conservation of Bustard Beauty		
	Other NGOs at a global level	I: Will be interested in the execution of the Project and its environmental impacts and mitigation measures.	No specific consultation , but may have an interest in publicly disclosed documents
Financial institutions	EBRD/ADB/DEG (and possibly others)	D: Providing finance for the Project	On-going dialogue throughout the process to ensure EBRD Performance

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT: IMPACT-BASED (A), INTEREST-BASED (I), OR DECISION MAKER (D)	AGENDA FOR CONSULTATIONS AND METHODS
			Requirements and ADB Safeguards are met

4.2.5 Stakeholder Engagement – Grievance Mechanism

From the national legislation prospective there is a centralized complaints mechanism (online portal) for all public utility providers that was opened in 2017 by Presidential Decree No728 of 15.09.2017. As this online portal is intended for wide range of issues brought to government attention, it is considered more appropriate to develop a single system/approach for receiving feedback and complains from stakeholders.

It is proposed to provide a grievance redress mechanism as part of the stakeholder engagement process specifically for the Dzhankeldy 500MW Wind Farm. This will be included on the agenda of meetings. Proposed approach:

- Applications/complaints from local individuals or groups will be accepted both in written and verbal forms after conducting the meeting with affected community.
- 5 Capitals as well as local consultant Juru Energy will review and within their authority be responsible for resolving submitted grievances (in co-ordination with ACWA Power).

Where screened as applicable may be passed onto the representatives of Public Administration, People's Representatives. The details below will be provided to the stakeholders.

Table 4-2 Stakeholder Engagement - Grievance Mechanism Contact Details

COMPANY	CONTACT DETAILS
Juru Energy: Inobat Alloberganova – Senior environmental specialist	Email: i.allobergenove@juruenergy.com Mob: +998903487523 Work: +998712020440
Juru Energy: Oleg Kheday - environmental and social consultant	Email: o.khegay@juruenergy.com Mob: +998909414371 Work: +998712020440
Representative of Peshku Khokimiyat (administration)	Detail will be provided to participants

4.2.6 Impact Assessment & Significance Criteria

In order to obtain a credible assessment of environmental and social impacts, the assignment of “effect significance” to each identified impact needs to be a robust, consistent and transparent process. The methodology to assess ‘effect significance’ is outlined below and follows an International Best Practice based on the assumption that the significance of an impact on resources or receptors is considered to result from an interaction between three factors:

- The nature and magnitude of the impact (i.e. a change in the environment, social and/or health baseline conditions);
- The number of resources or receptors affected (i.e. humans and the environment); and
- The environmental value or sensitivity of those resources or receptors to the change.

A three-step approach has been used to determine the significance of environmental effects, as follows:

- Step 1 – Evaluation of value/sensitivity of resource or receptor;
- Step 2 – Assessing the magnitude of the impact on the resource or receptor; a
- Step 3 – Determining the significance of effects.

IDENTIFICATION AND EVALUATION OF SENSITIVE RECEPTORS

Sensitive receptors are defined as:

- Elements of the **environment** that are of value to the functioning of natural systems (i.e. areas or elements of ecological, landscape or heritage value, species, habitats and ecosystems, soil, air and water bodies or land-use patterns);
- **Human** receptors, such as stakeholders (i.e. users of dwellings, places of recreation, places of employment, community facilities or household relocation) and human systems (e.g. employment market, population disease susceptibility and disease communicability, exposure to toxicity of chemicals).

Table 4-3 Environmental Value of Receptor or Resources

VALUE (SENSITIVITY)	DESCRIPTION OF VALUE
Very High	High importance and rarity on an international scale and limited or no potential for substitution. The receptor has already reached its carrying capacity, so any further impact is likely to lead to an excessive damage to the system that it supports. Locations or communities that are highly vulnerable to the environmental impact under consideration or critical for society (e.g. indigenous peoples, hospitals, schools).
High	High importance and rarity on a national scale, and limited potential for substitution. The receptor is close to reaching its carrying capacity, so a further impact may lead to a significant damage to the system that it supports. Locations or communities that are particularly vulnerable to the environmental impact under consideration (e.g. residential areas, vulnerable/marginalized groups).
Medium	High or medium importance and rarity on a regional scale, limited potential for substitution. The receptor is already significantly impacted, but it is not close to reaching its carrying capacity. Further impacts will get increase the stress of the underlying system, but evidence does not suggest that it is about to reach a critical point. Locations or groups that are relatively vulnerable to the environmental impact under consideration (e.g. commercial areas).
Low (or Lower)	Low or medium importance and rarity on a local scale. The receptor is not significantly impacted and shows a large spare carrying capacity. Impacts are not likely to generate any noticeable stress in the underlying system. Locations or groups that show a low vulnerability to the environmental impact under consideration (e.g. industrial areas).

VALUE (SENSITIVITY)	DESCRIPTION OF VALUE
Very Low	Very low importance and rarity on a local scale. The receptor is not impacted and shows a very large spare carrying capacity. Impacts are very unlikely to generate any noticeable stress in the underlying system. Locations or groups that show a very low vulnerability to the environmental impact under consideration (e.g. industrial areas).

IDENTIFICATION AND EVALUATION OF POTENTIAL IMPACTS

During the evaluation undertaken, the following types of impacts will be considered:

- Direct Impacts - Potential impacts that may result from the construction, commissioning, and operations of the Project acting directly on an environmental or social receptor;
- Indirect Impacts – Potential impacts which are not a direct result of a Project activity, that may be realised later in time or at distances further removed from the project footprint, but are normally a result of a complex pathway;
- Cumulative Impacts – Changes to the environment that are caused by an action in combination with other past present and future actions.
- Beneficial Impacts – Those impacts that have a positive, desirable or favourable effect on the sensitive resources or receptors (e.g. landscape providing artificial habitat for a variety of species, jobs opportunities during the construction and/or occupation phases of a project);
- Adverse Impacts – Those impacts that are detrimental and have a negative influence on the environment, social structures, resources or other receptors;
- Secondary Impacts - Potential impacts that may result from the implementation of protection measures applied to mitigate potential direct impacts;
- Event Related Impacts - Potential unplanned or accidental impacts stemming from an unintentional event such as fire, explosion, oil spill, etc.; and

DEFINING IMPACT MAGNITUDE

The magnitude of the impact will be defined wherever possible in quantitative terms. The magnitude of an impact has a number of different components, for example:

- The extent of physical change;
- The level of change in an environmental condition;
- The permanence of impact and the reversibility of the impacted condition;
- Its spatial footprint;
- Its duration, its frequency; and
- Its likelihood of occurrence where the impact is not certain to occur.

Where necessary, the determination of impact magnitude may be assisted through the use of computer modelling (as outlined in the Terms of Reference sections herein). The criteria used for identifying the magnitude of impacts is provided within the table below.

Table 4-4 Criteria for magnitude of Impacts

MAGNITUDE	DESCRIPTION OF MAGNITUDE
Major	Adverse: Loss of resource and/or quality and integrity; severe damage to key characteristics, features or elements. A major impact is usually large scale, permanent and irreversible. Beneficial: Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality.
Moderate	Adverse: Significant impact on the resource, but not adversely affecting the integrity; Partial loss of/damage to key characteristics, features or elements. Moderate impacts usually extend above the site boundary, and are usually permanent, irreversible or cumulative. Beneficial: Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Minor	Adverse: Some measurable change in attributes quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements. Minor impacts usually are only noticeable within the site and are temporary and reversible. Beneficial: Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.
Negligible	Adverse: Very minor loss or detrimental alteration to one or more characteristics, features or elements. Beneficial: Very minor benefit to or positive addition of one or more characteristics, features or elements.
No change	No loss or alteration of characteristics, features or elements; no observable impact in either direction.

4.2.7 Determining Significance of Effects

The significance of effects is a combination of the environmental value (or sensitivity) of a receptor or resource and the magnitude of the project impact value (change). In other words, it is this product of the impact acting on the receptor that produces an environmental effect. The table below provides criterion used for determining the significance of environmental effects through consideration of the potential magnitude of impact and sensitivity of the associated receptor. Definitions of each significance categories are provided.

Table 4-5 Criteria for Determining Significance of Effects

		MAGNITUDE OF IMPACT (DEGREE OF CHANGE)				
		No change	Negligible	Minor	Moderate	Major
SENSITIVITY OF RECEPTOR	Very High	Neutral	Minor	Moderate to Major	Major	Major
	High	Neutral	Minor	Minor to moderate	Moderate to Major	Major
	Medium	Neutral	Negligible to minor	Minor	Moderate	Moderate to Major
	Low	Neutral	Negligible to minor	Negligible to minor	Minor	Minor to moderate

	Very Low	Neutral	Negligible	Negligible to minor	Minor	Minor
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Table 4-6 Definition of Significance of Effects

SIGNIFICANCE CATEGORY	CRITERIA
Very Large	Only adverse effects are normally assigned this level of significance. They represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a most damaging impact and loss of resource integrity. However, a major change in a site or feature of local importance may also enter this category.
Large	Important considerations at a local scale but, if adverse, are potential concerns to the project and may become key factors in the decision-making process.
Moderate	These effects, if adverse, while important at a local scale, are not likely to be key decision-making issues. Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource.
Slight	Local issue unlikely to be of importance in the decision-making process. Effects do not exceed statutory limits. Nevertheless, they are of relevance in enhancing the subsequent design of the project and consideration of mitigation or compensation measures.
Neutral	No effect or effect that is beneath the level of perception, within normal bounds of variation or within the margin of forecasting error. No mitigation is required.

4.2.8 Mitigation & Management Measures

It is noted that the Project will incorporate certain mitigation as a function of its design (e.g. air emissions control, wastewater treatment plants). Where applicable, these measures will be included to the Project description.

In addition to the mitigation incorporated in the Project design, the ESIA will consider the assessed impacts to develop further measures (where necessary) for applicable construction and the operational phase impacts.

4.2.9 Residual Impacts

The residual impacts section will consider the overall significance of impacts following the implementation of the mitigation & management measures not already included to the design. The significance of such impacts will be re-evaluated based upon the same criteria used to determine the impact significance stated above.

4.3 Framework for Environmental and Social Management

The ESIA will include a standalone framework to guide the Project parties in establishing structures for the management of Environmental and Social risks, impacts, opportunities and compliance associated with both the construction and operational phases of the Project.

The Framework will outline systematic structures and management programmes that will ultimately be prepared to comprise the respective construction and operational phase Environmental and Social Management Systems (ESMS).

This framework will ensure alignment with applicable elements of the established ACWA Power corporate level Health, Safety Security and Environment (HSSE) Management System Framework, which is intended to ensure consistent and structured HSSE project management between ACWA Power projects.

It is intended that the EPC Contractor and O&M Company will prepare their respective CESMP and OESMPs as part of their wider ESMS'.

4.4 ESIA Reporting Structure

In order to align the ESIA with the requirements for environmental and social assessment established by the various lenders and expectations of the Uzbekistan environmental regulator, the ESIA report is proposed to be presented in the following format developed by 5 Capitals:

- **Volume 1: Non-Technical Summary**
- **Volume 2: ESIA - Main Text, Tables and Figures**
- **Volume 3: Framework for Environmental & Social Management**
- **Volume 4: Appendices**

Volume 1 will include a Non-Technical Summary (NTS) of the ESIA, including the main outcomes, and conclusions.

Volume 2 will comprise the main text of the ESIA and full impact assessment, with mitigation, management and monitoring measures identified.

Volume 3 will provide the Framework for Environmental and Social Management as outlined above.

Volume 4 will comprise all technical appendices relevant to the studies and ESIA.

5 ESIA TERMS OF REFERENCE

5.1 Terrestrial Ecology (and Avifauna)

5.1.1 Applicable Requirements & Standards

NATIONAL REGULATIONS

- The Law of the Republic of Uzbekistan "On Nature Protection" (1992)
- The Law of the Republic of Uzbekistan "On Protection and Use of Vegetation" (1997),
- The Law of the Republic of Uzbekistan "On Protected Natural Reserves" (2004)
- The Law of the Republic of Uzbekistan "On Protection and Use of the Wildlife" (1997)
- Decree of the Cabinet of Ministers "Regulation on the procedure for using plant world objects and passing licensing procedures in the field of using plant world objects" No. 290 of 10.10.2014
 - Sets out the requirements to obtain permission to cut wood and shrub plantations that are in the zone of the construction site.

LENDER REQUIREMENTS

EBRD

EBRD PR6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources establishes general requirements for the conservation of biodiversity and sustainable management of living natural resources covering aspects such as the assessment of issues and impacts on biodiversity.

Where applicable, the Project will intend to follow the targets set out by the EU Biodiversity Strategy including the Habitats Directive 92/43/EEC, the Birds Directive 2009/147/EC and the EU Regulation 1143/2014 on Invasive Alien Species. It is noted however that the targets are unlikely to be triggered by the Project due to the nature and scale of the Project and the existing ecological conditions within the Project site (primarily modified habitat due to farming).

ADB

An element of the ADB Safeguard Requirement 1: Environment includes, 'Biodiversity Conservation and Sustainable Natural Resource Management'.

It is stated that, *'The borrower/client will assess the significance of project impacts and risks on biodiversity and natural resources as an integral part of the environmental assessment process... The assessment will focus on the major threats to biodiversity, which include destruction of habitat'...* Further, *'The borrower/client will need to identify measures to avoid, minimize, or mitigate potentially adverse impacts and risks...'*

Concerning the proposed Project site, as the land has been used for agriculture, 'the borrower/client will exercise care to minimize any further conversion or degradation of such habitat, and will, depending on the nature and scale of the project, identify opportunities to enhance habitat and protect and conserve biodiversity as part of project operations.'

EPFI's

The assessment of impacts upon terrestrial ecology is required with due consideration to IFC Performance Standard 6 on Biodiversity Conservation and Sustainable Natural Resource Management. PS6 establishes requirements for protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources.

5.1.2 Initial Observation and Baseline Conditions

As observed during the initial site visits conducted by Juru Energy on behalf of 5 Capitals in Spring, Summer & Autumn 2020 the Project site comprises of low-lying shrubs and grasses as well as fauna species (birds, reptiles, insects). The presence or absence of fauna within each plot will be determined at the ESIA stage.

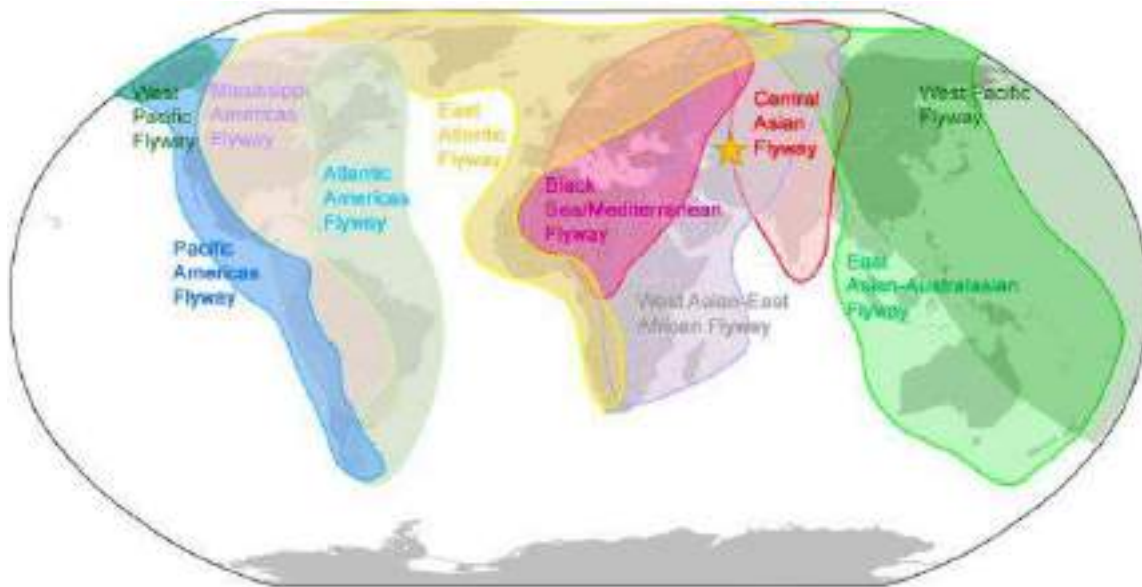
The site mainly comprises of 'Natural Habitat', with some areas of 'Modified Habitat' due to the presence of infrastructure (i.e. OHTL, access roads and temporary project related meteorological monitoring masts). There are minimal agricultural practices, however, local herders allow their livestock to graze within the site.

There are no designated ecological sites or nature reserve located within or in close proximity to the Project site. The nearest Important Bird Area (IBA) to the Project site is the Karakyr Lake which is approximately 25km south east of the eastern plot. This UZ012 IBA site includes approximately 200 avifauna species of which 122 species are waterbirds. The Karakyr Wildlife Refuge was established in 1992 in the eastern part of the IBA site for the protection of the migratory birds and conservation of the natural complex of lakes. According to Bird Life International (2020), typical species include *Podiceps nigricolis*, *Podiceps cristatus*, *Anser anser*, *Netta rufina* and *Circus aeruginosus*. *Porzana parva*, *Gallinula chloropus* and *Fulica atra* which nest throughout.

It is understood that the proposed OHTL route for the Project will be located near the Karakyr lake as well as the Karakyr State Nature Sanctuary. Another IBA; the Ayakaghytma lake is approximately 85km west of the eastern plot which is an IBA drainage lake with important bird species such as Greylag Geese, Marsh Harriers, Mute Swans, Grey Herons, Red-crested Pochards, and several species of terns, gulls and waders.

The Dzhankeldy project area is situated within two major migratory bird flyways; the Central Asia and the West Asian/East African Flyway. The wider regional area is also covered by Houbara Bustard breeding and release program.

Figure 5-1 Project location in Relation to Global Migratory Bird Flyways



Given the nature of the Dzhankeldy Project, the nearby presence of an Important Bird Area and a migratory flyway, bird and bats surveys were undertaken by Juru Energy on behalf of 5 Capitals.

BIRD SURVEYS

Note: A summary has been provided below for the purposes of the ESIA scoping. Full analysis will be presented in the ESIA.

Bird surveys were undertaken by Juru energy on behalf of 5 Capitals at eight (8) vantage points within the eastern plot and two(2) vantage points within the western plot in Spring, Summer and Autumn 2020 to obtain the spatio-temporal distributions of all species that occur within the project's area of influence focusing more on 'target' species. All vantage points (VP) were evenly distributed within the Project site ensuring they were within 2km of the proposed wind turbine locations. At each VP, 36 hours of monitoring was carried out. Locations of the VPS are shown below.

Figure 5-2 Vantage Point Locations



Target species were identified based on the following criteria:

- Threatened species with critical listings on the IUCN Global Red List of Threatened Species and the Uzbekistan National Red List of Threatened Species;
- Species likely breeding in the area;
- Raptor species, which are prone to wind turbine collision due to visual blind spots, attraction to tall structures for perching, larger wingspan;
- Species prone to wind turbine collision due to limited agility or large body size; and
- Species that are sensitive to disturbance and exhibit extreme avoidance behavior.

Target species identified during each monitoring season are presented in the tables below.

Table 5-1 Summary of Target Bird Species Identified within the Project Site

SPECIES COMMON & LATIN NAME	TOTAL SPECIES IDENTIFIED	IUCN STATUS	UZBEKISTAN BOOK STATUS	RED	NATURE OF STAY
Spring 2020 (May 2020)					
Steppe Eagle (<i>Aquila nipalensis</i>)	2	EN	2 (VU:D)		NMW
Egyptian Vulture (<i>Neophron percnopterus</i>)	6	EN	2 (VU:D)		NMW
Summer 2020 (May to August)					
Steppe Eagle (<i>Aquila nipalensis</i>)	8	EN	2 (VU:D)		NMW
Egyptian Vulture (<i>Neophron percnopterus</i>)	30	EN	Listed 2 (VU:D)		R

SPECIES COMMON & LATIN NAME	TOTAL SPECIES IDENTIFIED	IUCN STATUS	UZBEKISTAN BOOK STATUS	RED	NATURE OF STAY
Autumn 2020 (September to November)					
Golden Eagle (<i>Aquila chrysaetos</i>)	1	LC	2 (VU:D)		NMW
Imperial Eagle (<i>Aquila heliaca</i>)	7	VU	2 (VU:D)		NM
Steppe Eagle (<i>Aquila nipalensis</i>)	32	EN	2 (VU:D)		NMW
Egyptian Vulture (<i>Neophron percnopterus</i>)	1	EN	listed 2 (VU:R)		R

Note: **EN**- Endangered, **VU**-Vulnerable, **LC**- Least Concern, **N**- Nesting, **M**- Migrant, **W** – Wintering, **R**- Resident.

BAT SURVEYS

Bat surveys were undertaken at four (4) monitoring locations within the eastern plot and one(1) monitoring location within the western plot in, Summer and Autumn.

Figure 5-3 Bat Monitoring Locations



The bat surveys were undertaken using the Wildlife Acoustics Song Meter SM4 (stationary bat detector) to record bat echolocation calls at all five (5) locations. One detector recorded data in Summer: from 14th August to 2nd September in three locations from the hours of 18:30 to 06:00 every night. In autumn two detectors recorded data on 14th to 30th September and

14th to 31st October at all five locations from the hours of 16:45 to 07:15 every night. Bats were identified from the acoustic recordings by a professional bat biologist.

Calls of six (6) bats species were found in the Project's area. These are: *Eptesicus bottae*, *Eptesicus serotinus*, *Nyctalus noctula*, *Pipistrellus pipistrellus*, *Rhinolophus* sp. (CFcalls) and *Vespertilio murinus*. CF-calls of horseshoe bats had Frequency of maximal energy(FME) = 100.5-101.5kHz which is suspected to be *Rhinolophus bocharicus* (Barataud, 2015). This species is common in Uzbekistan and its FME is different from other horseshoe bats found in Uzbekistan.

The table below presents details of the bat species identified within the project site from the acoustic recordings.

Table 5-2 Relative Abundance and Frequency of Bat Species Identified within the Project Site

SPECIES NAME	TOTAL SPECIES IDENTIFIED	IUCN STATUS	RELATIVE ABUNDANCE (%)	FREQUENCY OF OCCURRENCE (%)
Summer 2020 (August to September 2020)				
<i>Eptesicus bottae</i>	12	LC	30.8	100
<i>Eptesicus serotinus</i>	4	LC	10.3	66.7
<i>Nyctalus noctula</i>	1	LC	2.6	33.3
<i>Pipistrellus pipistrellus</i>	1	LC	2.6	33.3
<i>Rhinolophus</i> sp. (CF 101kHz)	3	LC	7.7	100
<i>Vespertilio murinus</i>	18	LC	46.2	100
Summer 2020 (September to October 2020)				
<i>Eptesicus bottae</i>	0	LC	0.0	0
<i>Eptesicus serotinus</i>	20(19**)	LC	51.4	100
<i>Nyctalus noctula</i>	2	LC	5.4	40
<i>Pipistrellus pipistrellus</i>	1	LC	2.7	20
<i>Rhinolophus</i> sp. (CF 101kHz)	3	LC	8.1	60
<i>Vespertilio murinus</i>	13(12**)	LC	32.4	100

Note: ** - Without data from one monitoring location (location No. 3), **LC**- Least Concern

All of the bat species identified are of IUCN Least Concern value. None of the bat species identified on site are among the four (4) protected bat species listed in the Uzbekistan Red Book.

Additional information in regards to the bird and bat survey will be provided in the ESIA.

5.1.3 Potential Impacts

Table 5-3 Potential Terrestrial Ecology Environment Impacts

ACTIVITY	ENVIRONMENTAL ASPECT	IMPACTS AND ZONE OF INFLUENCE	POTENTIAL RECEPTORS
Construction Phase			
Preparation of Site	Habitat & flora loss, with disturbance to any fauna	Within the Project footprint and areas of associated facility works.	Habitats. Flora and Fauna.
Erection of Wind Turbines	Habitat and disturbance to soaring avifauna	Within the Project footprint, in proximity to each wind turbine generator	Avifauna & Bats
Installation of OHTL	Collision and electrocution of birds	Within the OHTL footprint	Avifauna
Operational Phase			
Operation of wind turbine	Collisions of birds and bats as well as bat related pulmonary barotrauma	Within the Project footprint, in proximity to each wind turbine generator	Avifauna & Bats
Installation of OHTL	Collision and electrocution of birds	Within the OHTL footprint	Avifauna

5.1.4 Proposed ToR for the ESIA

TERRESTRIAL BASELINE SURVEY

Terrestrial ecological survey will be performed by conducting desk study and direct field surveys/observation.

Desk study will be performed by collecting available environmental information, monitoring results, regional reports regarding habitats and flora & fauna of the site area and surrounds. Any further collected information regarding protected environmental sites of national and international designations will be prepared in the and mapped in the ESIA.

Direct field surveys for the Project site and along OHTL as follows

Botanical Survey/Habitat Survey

A Phase I Habitat survey will be undertaken via walkover of the site for four(4) days in mid-April and four(4) days in June to categorise the habitat types of the Project site and OHTL route. Habitats will be classified according standard methodology for Uzbekistan sites/habitats and IFC PS 6. Also, a habitat map of areas and identification of Protected Areas onsite (if any) or on the nearby and presence of protected flora species (IUCN and Uzbekistan Red Data Book).

Flora structure and composition will be described from 50x50m geobotanical sample plots (squares) chosen in an area with homogeneous vegetation. Sample plots (squares) will be located away from roads and boundaries between different vegetation communities. The state of vegetation, disturbance factor, abundance, height etc. will be recorded and any likely IUCN Red-listed species or species of local conservation interest in Uzbekistan will be determined.

Fauna Survey

Mammal species status and distribution at the Project site, its surrounding areas and along OHTL route will be undertaken during the survey. Camera traps will be installed in representative locations across the site from April to June to obtain information on species presence, distribution, abundance seasonal dynamic and behaviour. The exact locations & number of camera traps is to be confirmed but are proposed to be seven (7) cameras which will be situated within different landscape on site and along OHTL route.

Day time & nocturnal walked transect surveys will also be undertaken. This will be conducted in two seasons: in Spring (3 days on the project site and 1 day along OHTL in mid-April) and in Summer (3 days on project site and 1 day along OHTL route in June). Each transect will be walked for 2km and visual sightings of mammals, observation of tracks, feces, burrows and other activities will be recorded. IUCN Red-listed species or species of local conservation interest in Uzbekistan will be determined.]

Stationary and transect surveys will be carried out three(3) days in April on the project site and 1 day along the OHTL route to identify the presence of reptiles and amphibians in the project's area of influence. Information such as species composition, territorial distribution including places of concentration and state of habitats will be obtained.

For all fauna species, any likely IUCN Red-listed species or species of local conservation interest in Uzbekistan will be determined.

AVIFAUNA SURVEY

Project Site

Bird surveys have been undertaken in Spring, Summer and Autumn of 2020 (as described in sub section 5.1.2), The Winter 2020 survey and Spring 2021 is on-going and the same Vantage Point (VP) survey methodology continues to be used for the survey.

OHTL

Bird monitoring surveys along OHTL are required because transmission lines pose a potentially fatal risk to birds through collision and also electrocution. The bird monitoring survey will include a desktop study to determine distribution and abundance of breeding, resident, migrant and wintering birds; and to identify species susceptible to OHTL collisions: raptor species, large water birds, Houbara bustard, etc. The list of species will be confirmed during the ESIA stage.

The transect survey will cover 2km long transects over 5km along the length of the OHTL and the survey will be conducted for two (2) days in mid-April (spring migration season) and two(2) days in early June (summer breeding season). The survey will include in-flight monitoring by passage of migrant bird species and resident bird species and the record of the presence and abundance within the study area of other bird species of conservation importance, such as globally threatened species according to the International Union for the Conservation of Nature (IUCN) and in the Red Book of Uzbekistan.

BAT SURVEYS

The Agreement on the Conservation of Populations of European Bats (EUROBATS) under the Convention on Migratory Species (CMS) provides the special "Guidelines for consideration of bats in wind farm projects" (2014). The guidelines give recommendations about the methods to use for the assessment of potential impact from the wind farms construction/operation on the bat species found in the target area and its vicinity.

Project Site

Given that bat survey have been undertaken in the summer and autumn months of 2020, only spring surveys are proposed to be undertaken at the Project site. The Spring bat survey will be based on the guidelines provided by the EUROBAT Agreement and in accordance with the ongoing bat survey methodology.

OHTL

Bat surveys along the OHTL route will include roost search, activity transect and deployment of static bat detectors. This survey will be undertaken during the Spring-Summer seasons.

Roost Search

The roost search will be undertaken for two (2) days in April and two (2) days in June to identify and assess any potential bat roost sites along OHTL and determine the risks of roost site destruction during the construction phase and bat fatalities and disturbance during construction and operation. All structures along the OHTL route that are suitable for use by bats (trees/other structures) will be searched for evidence of roosting. Information of the bats species, their number and reproductive status (breeding / non-breeding individuals), the presence of breeding colonies will be recorded. In addition, mobile detectors will be used to make "reference" recordings of ultrasonic signals for the species identified manually. These "reference" signals will be used for further decoding of audio recordings of static and mobile detectors from stationary sites and transects, since some species of bats of Uzbekistan are absent in Europe and the parameters of ultrasonic signals are not known for them.

Transect Survey

Transect Survey will also be undertaken for two(2) in April and two(2) days in June to identify the potential ecological function of the OHTL area for foraging/commuting/migrating bats and highlight any important habitats types (such as typical linear landscape features, areas with more vegetation, wet areas and streams/ditches). Walkover or driveover transects will be conducted with two (2) mobile detectors that will allow the assessment of bat activity along the planned power lines. The mobile detectors will consist of 21 recordings points along the transect route. The duration of recording at each point will be 5 minutes. Walking Survey Transects (2km each, recordings points every 100m) will be conducted in places where it is difficult to move by car. Driven Transects (20km, recordings points every ~1km) - records on road sections that pass as close as possible to the planned power line lane. Transects will cover

the most important areas for bats (either near potential feeding areas (near aquatic biotopes), or near potential shelters (rock outcrops, etc.).

Static Detector Surveys

Two Wildlife Acoustics Song Meter SM4 bat static bat detectors will be used constantly from March to June 2021 to record bat activity along OHTL during the bat active season. Static Detectors will be first installed during a 2-days preliminary field survey in March; and then reinstalled according to a schedule. Installation will be in areas of potential activity of bats i.e. the potential feeding places, the vicinity of shelters, and areas between shelters and feeding places.

It is proposed that the detectors will work from mid-March to mid-June (approx. 3 months). Each detector will work alternately at 5 points (for 9 days each), including two sub seasons of 1.5 months ("migration" – from mid-March to May and "breeding" - from May to mid-June). Data obtained will be analysed by the bat specialist using Kaleidoscope Pro Auto Analysis (or similar software) and tabulated after cycle of deployments.

COLLISION RISK ASSESSMENT

A collision risk assessment will be conducted based on the Scottish Natural Heritage Guidelines. A Collision Risk Model (CRM) will be used to determine the potential for collision with target species. This model estimates number of bird collisions over a period of time and determines number of birds colliding per annum as a function of number of birds flying through rotor (Stage 1) and probability of bird flying through rotor being hit (Stage 2).

Stage 1: Number of Birds through Rotors

Two methods exist to inform CRM of number of birds flying through rotors; the different methods are favourable for different bird species:

1. Bird populations taking regular flights through a windfarm; and
2. Or, birds using windfarm airspace.

The bird monitoring described above will inform the method based on species i.e., if migrating birds are prevalent then method 1 is preferred, but if raptors are common then method 2 is preferred. Both approaches yield number of bird transits (per combined migration seasons) through rotors. Data from surveys described above (on bird species, behaviour and flight height) will inform the CRM.

Stage 2: Probability of Bird Flying through Rotor being Hit

The probability of bird flying through rotor being hit will be determined. Probability depends on:

- Size of bird (length and wingspan);
- Speed at which the bird is flying;

- Breadth and pitch of the turbine blades; and
- Rotation speed of the turbine.

5.2 Noise & Vibration

5.2.1 Applicable Requirements & Standards

NATIONAL REGULATIONS

- SanPin No. 0267-09 relating to rules on acceptable levels for habitable areas in Uzbekistan.
- SanPinNo. 0120-01 relating to noise levels from industrial equipment.
- SanPiN No. 0339-16. "Sanitary rules and norms of planning and development of settlements of Uzbekistan.
- SanPiN No. 0325-16 relating to sanitary standards for permissible noise levels in the workplace

LENDER REQUIREMENTS

EBRD

- Directive 2002/49/EC relating to the assessment and management of environmental noise (the Environmental Noise Directive – END)
 - The Directive does not set limits or target values, nor does it prescribe the measures to be included in EU Member State (or Uzbekistan) action plans for noise, thus leaving such items at the discretion of the competent authorities.

ADB and EPFI's

- The World Bank Group General EHS Guidelines (2007) – Table 1.7.1.

5.2.2 Initial Observation and Baseline Conditions

NOISE

Based on review of satellite imagery there are very limited noise sources in the project area. The only anthropogenic noise source will be noise emanating from local roads that run through the project plots. At the time of writing, no baseline noise investigation have been undertaken and the traffic flow on this road has not been determined. Due to the remote nature of the Project area, It is however expected that only residents of the Kalaata village and Dzhankeldy village may be using this road. As such, any noise emanating from these roads will be from very few vehicles and are not expected to result in discernible noise levels.

VIBRATION

Due to the remote location of the site, vibration is not expected.

5.2.3 Potential Impacts

Table 5-4 Potential Noise & Vibration Impacts

ACTIVITY	ENVIRONMENTAL ASPECT	IMPACTS AND INFLUENCE	ZONE OF	POTENTIAL RECEPTORS
Construction Phase				
Construction activities on-site and at the OHTL (including temporary plant and use of mobile equipment)	Noise propagation	Increased noise influence at receptors expected up to 500m or to a maximum of 2km in very calm and quiet ambient conditions.		Human and ecological receptors within zone of influence including receptors (up to 2km)
	Vibration	Impacts within the site footprint (WTGs, substation, laydown, access road) and immediately adjacent to the site.		
Movement of vehicles to the site (Wind Farm and OHTL)	Noise propagation	Impacts along road corridors used by construction vehicles to the site. Particularly due to increased HGV movements		
Operational Phase				
Wind Turbine Noise (Aerodynamic and Mechanical Noise)	Noise propagation	Increased noise influence at receptors primarily expected up to 500m from the turbines or to a maximum of 2km		Human and ecological receptors within zone of influence.
Movement of vehicles to the site	Noise propagation	Impacts along road corridors used by operational vehicles to the site. Few operational vehicles are expected, so impacts are likely to be minimal.		
Crackling/Corona effect from OHTL and electrical facilities	Noise Propagation	Increased noise influence at receptors primarily expected up to 200m from OHTL.		

5.2.4 Proposed ToR for the ESIA

NOISE SURVEY

Two separate noise monitoring surveys are proposed below. Noise monitoring related to construction noise impacts assessment will be undertaken in all cases, however, more detailed noise monitoring for noise modelling purposes will only be undertaken where preliminary modelling has identified the need for a detailed noise model at sensitive receptors.

In the context of the Project, potentially sensitive receptors may only possibly relate to the seasonal used structures that are understood to be 4 in total within the defined project site boundary. It is likely that these will be within 2,000 m of final location when the turbines. It is known that during specific times of the year (typically spring and summer) animal herders are

present and occasionally stay in the structures; and therefore may be subject to noise related impacts.

Noise monitoring related to construction noise impacts assessment:

Noise monitoring will be measured by sound level meter Class 1 (Type 1), which will correspond to IEC 61672, as per requirements of ToR. Due to the lack of receptors locally and the limited noise sources, monitoring is expected to be undertaken at four location will be undertaken with the following parameters:

- Each location will be monitored for 24 hours continuously;
- The meter will be placed on a tripod so that the microphone is 1.2m to 1.6m above the local ground level (and no closer than 3m to any reflecting surface (e.g. wall) when measuring near a house, for example);
- Measurements will not be undertaken during periods of rain;
- There will be taken photo of the noise meter at each monitoring location and also at the nearest receptors (e.g. if near a house) at each location;
- The actual wind parameters will be conditions for each location at the time of monitoring will be noted in the report by providing wind speed and direction.

Raw data and graphical representations of the data will be included to the ESIA. Notes on noise influence (such as noise from any vehicle, human activity or from local infrastructure) will be reflected.

Noise monitoring for operational modelling assessment of noise impacts assessment:

Note: *If the preliminary noise model suggests that turbine noise at any sensitive receptor is likely to be above an LA90 of 35 decibels (dB) (A) at a wind speed of 10 meters/second (m/s) at 10 m height during day and nighttime, then more detailed modelling be carried out, which would include a background ambient noise measurement survey outlined below.*

Noise Measurements will be undertaken as a minimum at the nearest sensitive receptor to the wind turbines. This will follow the general monitoring process outlined above for the baseline monitoring (for construction phase impacts), but will also intend to capture noise measurements for 10-minute periods during varying speeds of wind up to 12m/s. Such measurements will be undertaken for 10-minutes in duration for each integer wind speed that is captured.

CONSTRUCTION PHASE IMPACT ASSESSMENT

Noise impacts during the construction phase will be assessed by using calculations established in BS 5228-1:2009 'Code of practice for noise and vibration control on construction and open sites – Noise'. This will be undertaken for construction works at a wind turbine pad & turbine erection location and an OHTL gantry footing & gantry erection location. The predicted noise levels will be based on the expected construction equipment and will incorporate reductions in noise due to distance propagation.

Due to the number of turbines and OHTL gantry footings with near identical required construction works, this will be undertaken for one location each and will generate expected noise levels at set distances from these works. It will then be possible to evaluate potential noise impacts at receptors, where these are located within the zone of influence from the works.

Potential impacts will be based upon the degree of change in decibels at the receptor location and predicted compliance with applicable noise standards.

Due to the remoteness of the Project site and works, vibration impacts are generally not expected and will not be assessed in the ESIA.

OPERATIONAL PHASE IMPACT ASSESSMENT

Given the presence of settlement in proximity to the Project boundary (Kalaata village and Dzhankeldy village) and in line with IFG EHS Guideline on Wind Energy, a preliminary modelling will be carried out for sensitive receptors within 2km of any of the turbines." *If the preliminary model suggests that turbine noise at all sensitive receptors is likely to be below an LA90 of 35 decibels (dB) (A) at a wind speed of 10 meters/second (m/s) at 10 m height during day and night times, then this preliminary modeling is likely to be sufficient to assess noise impact; otherwise it is recommended that more detailed modeling be carried out, which may include background ambient noise measurements"* (IFC, 2015).

In the event, a detailed assessment is deemed necessary based on IFC guidelines, appropriate noise modelling will be carried out as outlined below in order to assess any impact from the proposed wind project on the receptors within 2km from any turbine.

Noise Modelling

If the preliminary noise model predicts that turbine noise impacts at any sensitive receptor is likely to be above an LA90 of 35 decibels (dB) (A) (at a wind speed of 10 meters/second (m/s) at 10 m height during day and nighttime), then more detailed modelling would be conducted.

If detailed noise modelling is required, this will be undertaken using predictive modelling software such as DECIBEL, IMMI or CADNA(A), which are 3D models incorporating terrain and would model the cumulative impacts of all project turbines. The software will also consider parameters which interferes with sound propagation, i.e. noise shielding, acoustic reflection, ground acoustic attenuation, meteorology, wind direction, wind speed, acoustic diffraction

and others. Input data for the model would include noise guarantee levels as provided by the turbine manufacturer.

Modelling plots would be prepared and calculations of predicted noise at sensitive receptor locations will be made incorporating measured baseline conditions.

Other Noise Sources

Electrical Crackling/Corona Noise

Where receptors are identified in proximity to OHTL lines and/or substations, a calculation of the expected noise level at the receptor will be made, accompanied with a qualitative description of the impacts.

Vehicle Noise

Noises emanating from maintenance vehicles will be assessed qualitatively, as these are expected to be few in number and potentially not discernible from existing traffic flows.

5.3 Air Quality

5.3.1 Applicable Requirements & Standards

NATIONAL REGULATIONS

- The Law of the Republic of Uzbekistan “On Atmospheric Air Protection” (1996, amended on 10.10.2006)
- SanPiN № 0293-11 “Hygienic regulations. List of maximum permissible concentrations (MPC) of contaminants in the atmospheric air of inhabitant areas in the territory of the Republic of Uzbekistan”
- SanPiN Ruz No.0179-04 – ‘Hygienic norms: List Maximum Allowable Concentrations (MACs) of pollutants in ambient air of communities in the Republic of Uzbekistan

LENDER REQUIREMENTS

Ambient Air Quality

EBRD

- Directive 2008/50/EC of the European Parliament and of the Council on ambient air quality and cleaner air for Europe.

Note: Not being a member State of the EU, it is noted that the Uzbekistan government does not manage ambient air quality in line with these standards, and as such the applicability of these standards in this ESIA assessment will only be for good practice benchmarking purposes, and not compliance assessment.

ADB and EPFI's

- WHO Ambient Air Quality Guidelines (as referenced by the World Bank Group General EHS Guidelines, 2007)

5.3.2 Initial Observation and Baseline Conditions

The Project site is located in a remote area and upon review of satellite imagery, there are no visible sources of air emissions (such as point sources) at the site or in the immediate surroundings.

The only source of emission will be mobile emissions from vehicles moving along the local roads that run through the Project site. Given the remote nature of the Project area and the expected low vehicle flows on the local roads, any mobile emissions are unlikely to be distinguishable from background concentrations in the airshed.

5.3.3 Potential Impacts

Table 5-5 Potential Air Quality Impacts

ACTIVITY	ENVIRONMENTAL ASPECT	IMPACTS AND ZONE OF INFLUENCE	POTENTIAL RECEPTORS
Construction Phase			
Site preparation and earthworks	Dust/Particulate generation	Increased suspended particles in air and dust deposition (350m from source – UK IAQM)	Human and ecological receptors in zone of influence
Vehicle movements on unpaved tracks			
Use of vehicles, mobile equipment and fuel driven plant	Emission of gases (e.g. NOx, SO2, CO2, BTEX, other VOCs etc.)	Increased concentration of gaseous pollutants (distinguishable from background within a of 200m from source - DMRB)	
	Emissions of Greenhouse Gases (GHGs)	Contribution to global warming on a global scale	
Use of temporary sanitation facilities and wastewater containment	Odour from sanitary wastewater (only if poorly managed)	Only expected a maximum of 100m from source for distributed and various temporary toilets/septic tanks.	
Storage of fuels, chemicals and other volatile substances	VOC emissions and odour (only if poorly managed)	Only expected a maximum of 100m from source for small quantity and distributed storage during construction.	
Operational Phase			
The proposed wind farm will not include any specific air emissions sources as a result of operations. Emissions sources will be minor in regard to vehicle emissions due to vehicular movements to and from and around the site for operations and maintenance. Considering the lack of permanent sensitive air quality receptors and the nature of the project, discernible impacts are not anticipated to be likely during operation phase.			

5.3.4 Proposed ToR for the ESIA

BASELINE STUDIES

Given the proximity of Kalaata village and Dzhankeldy village to the Project site, a precautionary approach will be undertaken to establish baseline air quality condition at the Project site and the villages.

Ambient air monitoring will be undertaken at three (3) monitoring locations within and outside the project site. The monitoring campaign at all locations will run for a total of 3 days (1 day at each monitoring location) and ambient air quality will be measured two(2) times during this period. The concentration of NO₂, SO₂, CO and total suspended particles (TSP) will be monitored.

Meteorological data for temperature, pressure, wind speed and wind direction will also be provided during these measurement periods.

Note: It is not possible to measure PM_{2.5} & PM₁₀ since there is no capacity in the local market for such equipment.

Figure 5-4 Proposed Ambient Air Quality Monitoring Locations



Note: Location of actual ambient air monitoring stations may vary dependant on suitability of locations for air monitoring.

Results of the ambient air quality monitoring surveys will be provided in µg/m³ and will be compared with applicable national, EU and WHO ambient air quality standards to determine the extent of existing impacts in the local project area and whether the airshed is classified as degraded or non-degraded.

This data will be used as the benchmark for assessing further air quality impacts from the Project in the ESIA.

CONSTRUCTION PHASE IMPACTS ASSESSMENT

Qualitative assessment will be made concerning the potential impacts of construction dust, pollutant emissions and odour. Where applicable, these will be made in combination with baseline concentrations to determine the significance of impacts. Where potentially significant impacts are determined, applicable mitigation measures will be proposed in the ESIA for further incorporation to the EPC Contractor's CESMP. Such measures are expected to align with typical construction good practices for emissions management.

An estimate regarding the consumption of fuel during the construction phase will be used to predict greenhouse gas emissions for the construction phase.

OPERATIONAL PHASE IMPACT ASSESSMENT

The proposed project is associated with the generation of renewable energy, hence there are no permanent (on-going) fuel combustion requirements or any other associated air emissions directly from the Project. An emergency diesel generator might be supplied to provide power in case of malfunctioning or disconnection from the grid, however this will not be used except for in emergency situations only (which feasibly may not occur). As such, no specific air pollution emissions sources other than those from the operation of vehicles are anticipated during the operational phase of the Project.

Therefore, the potential operational impacts relating to air quality have been scoped out of detailed assessment. The ESIA will however include best practice mitigation and management measures related to operations. The intention will be for these best practice measures to be included into the Operational Environmental Management Plan (OEMP) and operational phase Environmental Management System (EMS) for effective management and implementation on-site.

5.4 Soil, Geology and Groundwater

5.4.1 Applicable Requirements & Standards

NATIONAL REGULATIONS

The following regulations are applicable to the storage of both hazardous materials and waste on the site, which may have an influence soil and groundwater quality:

- SanPiN № 0157-04 "Sanitary requirements to the storage and neutralization of solid domestic waste on special grounds in Uzbekistan"
- SanPiN No 0127-02 – "Sanitary rules for inventory making, classification, storing and rendering harmless of industrial wastes"
- SanPiN of the Republic of Uzbekistan dated 29/7/2002 No 0128-02 – "Hygienic classifier of toxic industrial wastes in the Republic of Uzbekistan"
- SanPiN of the Republic of Uzbekistan dated 16/11/2011 No 0300-11 "Sanitary Rules and Standards for managing collection, inventory, classification, treatment, storage and disposal of industrial waste in the context of Uzbekistan"

Further research will be undertaken into the applicability of any domestic soil and groundwater quality standards.

LENDER REQUIREMENTS

EBRD

Performance Requirement 3 on Resource Efficiency and Pollution Prevention and Control establishes general requirements for pollution prevention as follows:

- The assessment process must identify technically and financially feasible pollution prevention and control techniques that are best suited to avoid or minimise adverse impacts on human health and the environment. Such techniques will be appropriate to the nature and scale of the project's adverse impacts and issues; and
- The Project must meet the relevant EU substantive environmental standards, where these can be applied at the project level. Where no EU substantive environmental standards at project level exist, the Project will identify, in agreement with the EBRD, other appropriate environmental standards in accordance with GIP.

As there may be no defined soil and groundwater standards for Uzbekistan, it is proposed to benchmark existing soil and groundwater against the Dutch standards.

ADB

ADB Safeguard Requirements for Environment includes specific requirements to prevent pollution and to minimise or control the intensity or loads of pollutant emissions and discharge. This includes effective management of hazardous materials and wastes, which can all have an influence on soil and/or groundwater quality.

EPFI's

IFC Performance Standard 3 on 'Resource Efficiency and Pollution Prevention' requires the client and/or the Project to:

- Avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities; and
- Prevent the release of pollutants to water and land due to routine, non-routine, and accidental circumstances, or when not feasible, minimize and/or control the intensity and mass flow of their release.

5.4.2 Initial Observation and Baseline Conditions

SOIL

The proposed Project site is primarily undeveloped with varying elevation. Based on the satellite imagery review and observations made during initial site visits, an access road runs through the western & eastern plots of the Project site and evidence of areas for runoff drainage are present across the Project site.

The presence of the access road within both plots provides the potential for the presence of vehicle residues (e.g. oils & greases, hydrocarbons and heavy metals) on the surface soils/topsoils causing soil contamination.

Review of historic satellite imagery of the Project site from 2006 – 2019 indicates that besides the presence of the access road which was evident from 2013 to present day, the site has not been developed as no previous land use was identified within the site.

GROUNDWATER

A groundwater tap was identified at Kalaata village during site visit indicating existing use of groundwater locally as a primary water source.

At the time of writing, no baseline soil & groundwater investigation have been undertaken as such, the characteristics of the soil & groundwater within the Project site is unknown at this stage.

5.4.3 Potential Impacts

Table 5-6 Potential Soil, Geology and Groundwater Impacts

ACTIVITY	ENVIRONMENTAL ASPECT	IMPACTS AND ZONE OF INFLUENCE	POTENTIAL RECEPTORS
Construction Phase			
Existing site soil condition	Minor spills & leaks from vehicle activity on access road within the site (e.g. oils & greases, hydrocarbons and heavy metals)	Areas for construction. Cross-contamination during site clearance or removal of any site soils.	Other soils from cross contamination.
Storage, handling and use of hazardous materials, chemicals, fuels and inadequate waste management	Potential spills & leaks associated with construction	Direct impacts to soil (and potentially groundwater) with potential for runoff to flow paths	Site soils and potentially groundwater.
Operational Phase			
Storage, handling and use of hazardous materials, chemicals, fuels, and inadequate waste management	Potential spills & leaks associated with operations	Direct impacts to soil surfaces with potential for runoff to flow paths	Site soils and potentially groundwater

5.4.4 Proposed ToR for the ESIA

BASELINE STUDIES

Geology

Reference will be made in the ESIA to available secondary data sources to identify the geological condition of the Project area.

Soil

Project Site

It is expected that an amount of information concerning the physical elements of the soil will be available from the geotechnical study that will be made available prior to conducting the ESIA. Relevant items will be referenced. The ESIA will include an Initial conceptual model to identify the risk of source-pathway-receptor linkage based on a Phase 1 land contamination walkover.

As a precautionary approach to assess existing soil quality, topsoil samples will be collected at representative locations within the project footprint. These samples will be taken from top 10cm of topsoil (after scraping off the upper most layer) and will be analysed for a suite of physical parameters, indicators, heavy metals such as Chloride, Nitrate, Sodium, Potassium, Arsenic, Cadmium, Chromium, Copper, Lead, Manganese, Mercury, Nickel, Iron, Zinc, etc.

OHTL

Visual inspection along the OHTL will be undertaken to determine the level of contamination along the alignment. The observations on any of the following will be recorded:

- Surface disturbance, subsidence and discoloration;
- Chemical pollution, if applicable;
- Topography and surface condition – open ground, hardstanding and other geotechnical or surface features;
- Polluted areas, etc.

Groundwater

It is expected that certain details, including depth of groundwater will be referenced in the ESIA from the site geotechnical survey.

Impacts that could be attributable to the construction phase are common for any construction project and considered to be manageable through the implementation of a robust CESMP. As such, appropriate controls relating to construction processes will be included to the mitigation and management section of the ESIA. The same will be applied in the ESIA for operations.

5.5 Solid Waste and Wastewater Management

Note: *this section considers the management of solid waste and wastewater and not its impacts to environmental receptors. Considerations of such impacts are made in the respective sections for Water Environment and Soil, Geology and Groundwater.*

5.5.1 Applicable Requirements & Standards

NATIONAL REGULATIONS

- The Law of the Republic of Uzbekistan "On Wastes" (2002)
- SanPiN № 0157-04 "Sanitary requirements to the storage and neutralization of solid domestic waste on special grounds in Uzbekistan"
- SanPiN No 0127-02 – "Sanitary rules for inventory making, classification, storing and rendering harmless of industrial wastes"
- SanPiN of the Republic of Uzbekistan dated 29/7/2002 No 0128-02 – "Hygienic classifier of toxic industrial wastes in the Republic of Uzbekistan"
- SanPiN of the Republic of Uzbekistan dated 16/11/2011 No 0300-11 "Sanitary Rules and Standards for managing collection, inventory, classification, treatment, storage and disposal of industrial waste in the context of Uzbekistan"
- Regulation "On the Procedure for the Disposal, Collection, Pay Settlement, Storage and Removal of Waste Industrial Oils" annexed to the Decree of the Cabinet of Ministers dated 04/09/2012 No.258

LENDER REQUIREMENTS

Solid Waste

EBRD

EBRD PR3 on Resource Efficiency and Pollution Prevention and Control establishes general requirements with regards to waste management as follows:

- The Project must strive to avoid the generation of hazardous and non-hazardous waste materials and reduce their harmfulness as far as practicable. Where waste generation cannot be avoided, the waste must be reused, recycled or recovered, or used it as a source of energy. Where waste cannot be recovered or reused, the waste must be treated and disposed of it in an environmentally sound manner;
- The Project must identify technically and financially feasible alternatives for the environmentally sound disposal of any hazardous waste considering the limitations applicable to trans boundary movement; and
- When waste disposal is transferred offsite and/or conducted by third parties, chain of custody documentation to the final destination must be obtained and only contractors that are reputable and legitimate enterprises licensed by the relevant regulatory agencies must be commissioned. The Project must ascertain whether licensed disposal sites are being operated to acceptable standards. Where this is not the case, alternative disposal options must be considered, including the possibility of the Project developing its own recovery and disposal facilities at the project site.

ADB

The Environmental Safeguard requires the borrower/client to avoid, or where avoidance is not possible, to minimise or control the generation of hazardous and non-hazardous wastes and the release of hazardous materials resulting from project activities. Where waste cannot be

recovered or reused, it will be treated, destroyed, and disposed of in an environmentally sound manner.

Where the waste disposal is conducted by third parties, the borrower/client is required to use reputable and legitimate enterprises licensed by the relevant regulatory agencies.

EPFIs

Section 1.6 of “the IFC General EHS Guidelines” is entitled Waste Management and is applicable to all projects that generate, store or handle any quantity of waste; whilst Section 1.5 of the IFC EHS Guidelines covers Hazardous Materials Management. The waste management guidelines state that facilities that generate and store wastes should practice the following:

- Establish waste management priorities at the outset of activities ;
- Identify EHS risks and impacts and consider waste generation and its consequences;
- Establish a waste management hierarchy that considers prevention, reduction, reuse, recovery, recycling, removal and finally disposal of wastes;
- Avoid or minimize the generation of waste materials, as far as practicable;
- Identify where waste generation cannot be avoided but can be minimized or where opportunities exist for, recovering and reusing waste; and
- Where waste cannot be recovered or reused, identify means of treating, destroying, and disposing of it in an environmentally sound manner.

Waste Water

EBRD

EBRD PR3 on Resource Efficiency and Pollution Prevention and Control establishes general requirements for wastewater management as follows:

- The Project must seek to minimise water usage in order to minimise wastewater generation; and
- The Project must identify technically and financially feasible techniques for reusing and recycling effluents in accordance with GIP, which should be implemented as part of the project design.

EPFIs

The World Bank General EHS Guidelines (2007) establish general requirements for direct or indirect discharge of wastewater from utility operations or storm water to the environment.

‘Projects with the potential to generate process wastewater, sanitary (domestic) sewage, or storm water should incorporate the necessary precautions to avoid, minimize, and control adverse impacts to human health, safety, or the environment’.

However, wastewater effluent pollutant limits are only established for sanitary wastewater for discharge to the sanitary sewer systems. World Bank General EHS Guidelines (2007) (ref. Table 1.3.1 of IFC EHS Guidelines), provides indicative values for treated sanitary wastewater effluent.

5.5.2 Potential Impacts

Table 5-7 Potential Waste & Wastewater Impacts

ACTIVITY	ENVIRONMENTAL ASPECT	IMPACTS AND ZONE OF INFLUENCE	POTENTIAL RECEPTORS
Construction Phase			
Project construction activities	Solid waste generation (hazardous and non-hazardous)	Suitable contractors and facilities for the handling and treatment of such waste and wastewater streams	Waste facilities and Environmental receptors
	Construction Wastewater		
Operational Phase			
Plant operations	Small amounts of solid waste generation (hazardous and non-hazardous) from the operation of the administration facilities and activities of the employees	Suitable contractors and facilities for the handling and treatment of such wastes	Waste facilities and Environmental receptors
	Sanitary and domestic wastewater generated from on-site administration areas		
		Stormwater	Potential runoff into any areas containing hazardous residues and eroded soil

5.5.3 Proposed ToR for the ESIA

BASELINE STUDIES

Availability of local waste/wastewater treatment/disposal sites and service providers will be outlined with respect to expected Project waste and wastewater streams..

CONSTRUCTION AND OPERATIONAL PHASES IMPACTS ASSESSMENT

The ESIA will inventories the types of waste and wastewater that is expected to be generated by the Project's construction and operations respectively. Where estimates of waste and wastewater volumes are available these will be provided and broken to specific streams (at least to outline non-hazardous and hazardous streams, or other streams requiring special handling.

Based upon the baseline details of available waste and waste water service providers and disposal/treatment sites, an assessment can be made as to the needs for the management of such waste and wastewater streams.

The ESIA will include good practice mitigation and management measures for such waste streams, which can then be implemented on-site via the CESMP, OESMP and wider ESMS management programmes.

5.6 Traffic and Transportation

5.6.1 Applicable Requirements & Standards

NATIONAL REGULATIONS

The Ministry of Transportation is responsible for all transport related activities and their requirements should be fully complied with in terms of routing of HGVs and site vehicles, licensing, road diversions, heavy/wide loads etc. Some of the relevant national requirements for the Project include:

- Law "About traffic safety" of the Republic of Uzbekistan August 19, 1999 No. 818-I (as amended on 29-12-2015): The main objective of this law is to ensure protection of life and health of citizens and their protection.
- Regulations on road safety during transportation of large and heavy loads by road transport (Annex No.2 to the Decree of Cabinet of Ministers No. 342 of December 26, 2011): This law determines the requirements of ensuring and coordinating traffic safety during the transportation of large size and heavy loads on public roads on the territory of the Uzbekistan. It also details the basic requirements for the technical condition equipment and furnishing of vehicles used for the transport of large and heavy loads as well as safety.
- Criteria and Procedure for Determining International Road Transportation of Loads (approved by the Decree of Ministry of Transport of the Republic of Uzbekistan and State Customs Committee of the Republic of Uzbekistan dated October 31, 2019, No. 6).

- Regulations on transport of loads by road in the Republic of Uzbekistan (Annex to Decree of Cabinet of Ministers No. 213 of 01.08.2014)

LENDER REQUIREMENTS

EBRD

The EBRD PR 4 on Health and Safety establishes management requirements with regards to traffic and road safety risks to workers and potentially affected communities. Relevant EU road and traffic safety management standards must therefore be taken into consideration.

"For Projects that operate moving equipment on public roads and other forms of infrastructure, the client will seek to prevent the occurrence of incidents and injuries to members of the public associated with operation of such equipment."

EPFIs

The assessment will be undertaken with due consideration of the recommendations set out within the IFC/World Bank General EHS Guidelines (2007) Section 3.4 Traffic Safety, within Section 3: Community Health and Safety.

Separate considerations regarding Community Health and Safety are also provided in the IFC EHS Guideline for Wind Energy (2015). This includes relevant items for 'Abnormal Load Transportation'.

5.6.2 Initial Observations and Baseline Conditions

The project site comprise of access roads that run through both the eastern & western plot. One(1) access road runs from the south east extent to the south west extent of the eastern plot. This same access roads connects to the western plots and runs from the eastern extent of this plot to the west;

Another access road runs from the west to the north east & northern extent of the eastern plot. Both access roads connect to A380 which is located approximately 47km south of the Project site. This road also connects Uzbekistan to Turkmenistan.

5.6.3 Traffic and Logistics for Transportation of WTGs

A transportation routing survey for the WTGs and equipment is currently being undertaken. The outcome of this survey will be included in the ESIA.

5.6.4 Potential Impacts

Table 5-8 Potential Traffic & Transportation Impacts

ACTIVITY	ASPECT	IMPACTS AND ZONE OF INFLUENCE	POTENTIAL RECEPTORS
Construction Phase			
Movement of vehicles and machinery/equipment/ staff	Transportation of equipment i.e., oversized wind turbines components (blades, turbine tower sections, trnasformers), cranes etc	Transportation of wide and heavy loads may present a challenge to other road users such as temporary lane closures or increased traffic.	Highway and local road users including local communities
	Increased vehicular flow (particularly HGVs)	Increase in number of vehicles transporting materials and workers may potentially increase the flow of traffic on local roads.	
		Increased potential for incidents and increased road safety risks to communities.	
Operational Phase			
Movement of operation phase vehicles	Increased vehicular flow	Transportation impacts are not expected to be significant but movement of maintenance materials, waste removal and staff may lead to minimal addition of vehicle flow on local roads.	Local road users and local communities

5.6.5 Proposed ToR for the ESIA

The ESIA will include the findings of the transportation/routing survey for the Project and the potential impacts upon the local transportation network and road users in particular.

As stated in the IFC EHS Guidelines for Wind Energy (2015), *'the logistics, traffic, and transportation study should assess impacts on existing offsite roadways, bridges, crossings over culverts, overpasses/underpasses, turning radii, and utilities, as well as whether surface replacements, upgrades, or resettlements will be required'*. Such requirements will be discussed with the client and their selected EPC Contractor to determine any specific mitigation requirements that will be provided as part of the Traffic Management Plan.

5.7 Cultural Heritage

5.7.1 Applicable Requirements & Standards

NATIONAL REGULATIONS

The Ministry of Culture of the Republic of Uzbekistan is responsible for preserving, developing and promoting the cultural wealth and the national tourism attractions of the nations, nationalities and peoples of Uzbekistan.

Relevant legislation in Uzbekistan relating to archaeology and cultural heritage include:

- The Law of the Republic of Uzbekistan № 269-II dated August 2001 “On the protection and use of the sites and objects of cultural heritage.”
- Resolution of the President of the Republic of Uzbekistan № RP-4068 dated December 19, 2018 “On measures for improving actions for protection of material cultural heritage objects.”
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan № 846 dated October 4 2019 “On approval of the national list of real state sites and objects of material cultural heritage.”

The above laws seek to protect and sites and objects of cultural heritage which are considered as part of the national heritage for all the people in Uzbekistan.

LENDER REQUIREMENTS

EBRD

EBRD Performance Requirement 8 recognises the importance of cultural heritage, both tangible and intangible for present and future generations. The aim is to protect cultural heritage and to guide clients in avoiding or mitigating adverse impacts on cultural heritage in the course of their business operations. The clients are expected to be precautionary in their approach to the management and sustainable use of cultural heritage.

ADB

ADB's Safeguard Policy Statement and related Safeguards, include various requirements for cultural resources, both physical (and assumed to include intangible resources) – of importance locally, provincially, nationally and internationally. Where such resources are identified the ADB safeguards highlight the importance of consulting with the communities who use such facilities, as well as the regulatory agencies entrusted with protecting such resources.

EPFI's

In accordance with the Equator Principles, the assessment will refer to applicable IFC Performance Standards on Social and Environmental Sustainability, specifically with due consideration of Performance Standard 8 – Cultural Heritage. PS8 aims to protect the adverse impacts of project activities and support its preservation and to promote equitable sharing of benefits from the use of cultural heritage. Cultural heritage in this standard refers to:

- Tangible forms of cultural heritage, such as tangible moveable or immovable objects, property, sites, structures, or groups of structures, having archaeological (prehistoric), paleontological, historical, cultural, artistic, and religious values;
- Unique natural features or tangible objects that embody cultural values, such as sacred groves, rocks, lakes, and waterfalls; and
- Certain instances of intangible forms of culture that are proposed to be used for commercial purposes, such as cultural knowledge, innovations, and practices of communities embodying traditional lifestyles.

5.7.2 Initial Observation and Baseline Conditions

Based on the desktop research conducted, there are no known cultural or archaeological sites in the immediate vicinity of the Project (5km radius). This includes no recorded UNESCO World Heritage sites and other publicly identified archaeological sites.

As identified by Juru Energy (desktop review), several objects of cultural heritage were identified within a 60km radius of the Project site in Peshku district, Shofirkan district and Konimeh district.

In addition, letters have been sent to the Ministry of Culture and Institute of Archaeological Research under the Science Academy of the Republic of Uzbekistan by Juru Energy seeking information on the presence of nationally important archeological site within the Project area. At the time of writing, a response to these letters had not been received. Where a response is provided, this will be included in the ESIA.

5.7.3 Potential Impacts.

Table 5-9 Potential Cultural Heritage Environment Impacts

ACTIVITY	ENVIRONMENTAL ASPECT	IMPACTS AND ZONE OF INFLUENCE	POTENTIAL RECEPTORS
Construction Phase			
Project Construction (Wind Farm & OHTL)	Construction activities and movement of vehicles and equipment	Potential damage of known and unknown features if construction activities located in close proximity to any	Known (if any) or unknown buried artefacts
Earthworks (Wind Farm & OHTL)	Excavations of soil	Potential damage or destruction of any unknown buried artefacts in footprint of all works	
Operational Phase			
Impacts to cultural heritage are not envisaged during the operational phase unless an intangible cultural receptor is used in this area or as part of a cultural landscape			

5.7.4 Proposed ToR for the ESIA

BASELINE STUDIES

Follow up on letters submitted to the Ministry of Culture and Institute of Archaeological Research under the Science Academy of the Republic of Uzbekistan in order to gain official confirmation regarding the absence/presence of archaeological and cultural heritage at the Project site and surrounding areas.

Where official confirmation is obtained from the Ministry of Culture and Institute of Archaeological Research on the presence of archaeological & cultural heritage items within the site, an archaeological walkover survey (ground reconnaissance) will be undertaken to identify and record evidence (photo, coordinates) of these existing sites.

The socio-economic surveys will also help establish if the land has any specific physical cultural resources or other intangible cultural value.

CONSTRUCTION PHASE IMPACTS ASSESSMENT

Unless further information is gathered to identify specific cultural features of importance in/or near to the footprint of works (including OHTL, associated and temporary facilities), there is not expected to be a need for a detailed assessment of impacts to cultural heritage in the ESIA.

The ESIA will rather establish the need for a 'Chance Finds Procedure' to be developed, so that any potential interactions with unknown buried archaeology can be managed in accordance with a defined process and the applicable regulatory stakeholders.

5.8 Landscape and Visual Amenity

5.8.1 Applicable Requirements & Standards

NATIONAL REGULATIONS

Landscape & Visual Impacts

There are no known regulations or standards in Uzbekistan that provide requirements for landscape character, visual impacts and shadow flicker from wind turbines.

LENDER REQUIREMENTS

EPFIs and ADB

- IFC EHS Guidelines for Wind Energy (2015)

Landscape & Visual Impacts

The above EHS Guidelines for Wind Energy outline that *'preparing zones of visual influence maps and preparing wire-frame images and photomontages from key viewpoints is recommended to inform both the assessment and the consultation processes.'*

'Consideration should also be given to the proximity of turbines to settlements, residential areas, and other visual receptors to minimize visual impacts and impacts on residential amenity, where possible. All relevant viewing angles should be considered when considering turbine locations, including viewpoints from nearby settlements.'

Shadow Flicker

The above EHS Guidelines for Wind Energy, outline requirements for the modelling of shadow flicker to determine the duration and timing of shadow flicker occurrence under real weather conditions at specific receptors located within the zone of potential shadow flicker impact.

The guidelines require the model to predict flicker based on an astronomical worst-case scenario, which is defined as follows:

- There is continual sunshine and permanently cloudless skies from sunrise to sunset.
- There is sufficient wind for continually rotating turbine blades.
- Rotor is perpendicular to the incident direction of the sunlight.
- Sun angles less than 3 degrees above the horizon level are disregarded (due to likelihood for vegetation and building screening).
- Distances between the rotor plane and the tower axis are negligible.
- Light refraction in the atmosphere is not considered.

The IFC criteria for acceptability of flicker is:

- Not more than a combined 30 hours of flicker per year, and no more than 30 minutes of flicker on the worst-case day of the year.

5.8.2 Initial Observation and Baseline Conditions

Based on initial site observations and review of satellite imagery, the general characteristics of the site is predominantly undeveloped open landscape with low lying shrub vegetation spread across the site.

The only significant anthropogenic contributions to the landscape are from the existing overhead power lines within the eastern plot, the access road, temporary project masts and the cliffs with pointed hill tops. Besides views of these anthropogenic features, views above the site is predominantly unobstructed.

There are no wind turbines in the existing Project area and as such, receptors are not subject to flicker impacts.

5.8.3 Potential Impacts

Table 5-10 Potential Landscape and Visual Impacts

ACTIVITY	ASPECT	IMPACTS AND ZONE OF INFLUENCE	POTENTIAL RECEPTORS
Construction Phase			
Project construction	Use of construction plant and equipment and temporary laydown areas structures (for offices and material storage)	Such features are not common in the Project area and will temporarily affect the landscape character for the period of construction.	Landscape character and visual impacts for residents of Kalaata Village, Dzhankeldy village, other land users and wider amenity
Operational Phase			
Project Operations	Installation of wind power project	The installation of the proposed wind power project will continue the progression of the landscape to one that is gradually becoming more developed.	Landscape character and visual impacts for residents of Kalaata Village, Dzhankeldy village, other land users and wider amenity
	Changes in Landscape Character		
	Visual impacts to receptors	Receptors with direct, or partial views of the turbines and OHTL. Potentially extensive under good visibility conditions and dependent on topography (due to height of the WTGs & OHTL, and due to the length of the OHTL).	
	Lighting aviation anti-collision warning lights	Disturbance from the lighting during the night, however expected to be minimal and will not result in illumination of surfaces as typically these lights are not spotlight type.	
	Shadow Flicker: repetitive sudden variation of light intensity caused by passing shadows of rotating wind turbine blades, particularly through constrained openings like windows. Shadow flicker can be a nuisance for people living near a wind farm	Queensland Wind Farm Planning Guidelines (Australia), provide screening guidelines for modelling assessment, which only consider sensitive receptors within a distance equivalent to 265 maximum blade chords (the thickest part of the blade).	Local residents who are within the specified distances

5.8.4 Proposed ToR for the ESIA

BASELINE STUDIES

Landscape Character & Visual Impacts

Full characterisation of the landscape will be made with reference to a good practice guideline, such as the UK's Landscape and Visual Impacts Assessment Guide. Further supporting photographs will be included to establish and present the baseline condition.

In terms of visual impacts, visual references for viewpoints at nearby receptors with direct views to the project site will be established via photographs.

CONSTRUCTION AND OPERATIONAL PHASE IMPACTS ASSESSMENT

The ESIA will apply a measure of value/sensitivity to identified receptors and determine the likely associated magnitude of impacts in order to quantify significance of effects and also identify opportunities for mitigation to reduce the magnitude of any identified impacts.

This will include consideration of the viewpoints from applicable receptors and both potential daytime and night time impacts outlined above.

Shadow Flicker Modelling

Assuming sensitive receptors are identified within the above screening area, the effects of shadow flicker will be assessed by predictive modelling software such as SHADOW (as part of Wind Pro software). The model will calculate how often and in which intervals a specific receptor will be affected by shadows generated by one or more wind turbines. These calculations are worst case scenarios (i.e. based on astronomical maximum shadow - calculations which are solely based on the positions of the sun relative to the wind turbine).

Shadow-flicker effects on receptors to be expressed in terms of predicted frequency (hours per year). Shadow isolines on a 'shadow map' (i.e., contours indicating total number of hours of shadowing per average year) will be calculated based on the data and assumptions outlined above.

Based on the outcomes of the study, the results may be required to feedback into the project design in order to reduce potential impacts and to highlight any necessary mitigation/management measures.

5.9 Socio-Economics

5.9.1 Applicable Requirements & Standards

NATIONAL REGULATIONS

The following laws are applicable concerning land rights, acquisition and resettlement:

- Civil Code of the Republic of Uzbekistan "Civil code"
- Land Code (1998 as amended 2010)
- Law of the Republic of Uzbekistan on State Land Cadastre No.666-I of 28.08.1998

- Presidential Decree "On Measures for The Efficient Use of Land and Water Resources in Agriculture"
- Resolution № 146 of the Cabinet of Ministers "On the Procedure for Compensation for Losses of Land Owners, Users, Tenants and Owners, As Well As Losses Of Agricultural And Forestry Production".

LENDER REQUIREMENTS

EBRD

Performance Requirement 1 outlines the needs to assessing social impacts as part of ESIA. This is interpreted to include socio-economic effects to individuals/groups/populations that may be impacted by a project.

Performance Requirement 5 on land acquisition, involuntary resettlement and economic displacement refers to Involuntary resettlement as both physical displacement (relocation or loss of shelter) and economic displacement (loss of assets or resources, and/or loss of access to assets or resources that leads to loss of income sources or means of livelihood) as a result of project-related land acquisition and/or restrictions on land use.

Where resettlement is government is led, PS5 requires, *'the client (to) collaborate with the responsible government agency, to the extent permitted by the agency, to achieve outcomes that are consistent with the objectives of this PR.'*

ADB

The ADB Environmental Safeguards include the need to assess socio-economic project impacts in ESIA (including impacts on livelihood through environmental media, health and safety, vulnerable groups, and gender issues).

Specifically, 'The borrower/client will identify and assess the risks to, and potential impacts on, the safety of affected communities during the design, construction, operation, and decommissioning of the project, and will establish preventive measures and plans to address them in a manner commensurate with the identified risks and impacts.'

ADB's involuntary resettlement safeguard also aims to avoid involuntary resettlement where possible; to minimise involuntary resettlement by exploring project and design alternatives; to enhance at least restore, the livelihoods of all displaced persons in real terms relative to pre-project levels; and to improve the standards of living of the displaced poor and other vulnerable groups.

The safeguard also requires adverse economic, social or environmental impacts from project activities other than land acquisition such as loss of access to assets or resources or restrictions on land use to be avoided, or at least minimized, mitigated or compensated for through the environmental assessment process. Where such impacts are found to be adverse, the borrower/client is required to develop and implement a management plan to restore the livelihood of affected persons to at least pre-project level or better

EPFI's

Several of the IFC Performance Standards have elements that relate to socio-economics. Key requirements for the assessment of socio-economic impacts are outlined in PS1, whilst PS5 on Land Acquisition and Involuntary Resettlement has important requirements relating to projects that acquire land or will necessitate physical or economic displacement to PAPs, including compensatory measures.

5.9.2 Initial Observation and Baseline Conditions

The project site is located in Peshku district which consists of three(3) small cities and 11 villages including Dzhankeldy and Kalaata village, which are closest to the Project site. The main source of living in this district are trade and livestock.

SOCIO-ECONOMIC STATUS

Specific observations and baseline details concerning socio-economic status are not available at this stage, however such information will be collected as part of the ESIA socio-economic baseline surveys, outlined in sub-section below.

LAND USE AND RESETTLEMENT

As the proposed land for development (both eastern & western plots) will be leased from the Government of The Republic of Uzbekistan, there is no requirement for land acquisition. Survey are currently being undertaken to determine if other land areas within the Project site are under lease agreements with other private users and whether any resettlement will be required. Once the OHTL alignment is confirmed, the same process will need to be undertaken and will form part of the ESIA.

Based on initial site visit and review of satellite imagery, some areas of the Project site are used for infrastructure such as access roads, OHTL corridor, temporary project related meteorological monitoring masts. Residents of the Dzhankeldy village in proximity to the Project site graze livestock at the eastern plot. Given the proximity of two villages to the Project site, residents of these village may use areas within the site for other purposes besides grazing however, this will be confirmed during the socio-economic surveys.

In addition, It is understood through early engagement on-site that approximately 600ha of land within the eastern plot is currently being leased by "Dzhankeldy" LLC. Additional details on the leasing agreement is unknown (or otherwise validated) at this stage and will be verified during consultation with the LLC.

5.9.3 Potential Impacts

Table 5-11 Potential Socio-Economic Impacts

ACTIVITY	ASPECT	IMPACTS AND ZONE OF INFLUENCE	POTENTIAL RECEPTORS
Construction Phase			

ACTIVITY	ASPECT	IMPACTS AND ZONE OF INFLUENCE	POTENTIAL RECEPTORS
Project construction	Project employment	Provision of temporary jobs during construction	Local populations
	Skills training to local communities and the Project workforce	Increase in skills sets of population	
	Use of local goods and services	Positive indirect benefits and uplift to local economy from increased local spending	Local businesses and populations
	Land use change	Local herders may not be able to use the site during the construction phase.	Herders
	Disruption of local customs	Influx of workers could potentially introduce new habits or practices that are not consistent with local beliefs	Local populations
Worker Influx	Increase of demand and purchasing locally may inflate process of basic commodities	Increased cost of living for local populations and benefits to local home owners	Local populations
Operational Phase			
Plant operations	Project employment	Provision of employment	Local populations
	Skills training to local communities and the Project workforce	Increase in skills sets of population	

5.9.4 Proposed ToR for the ESIA

LAND USE

As specified in the 'Land Use and Site Condition' section here in this scoping report (sub-section 2.3.2), The Khokimiyat of Bukhara region will issue land allotment order that will allow the Project Company and its contractors to use the site without restriction. Following issuance of the land allotment order, the Project Company will enter into a Land Lease Agreement with The Government of The Republic of Uzbekistan as represented by the Khokimiyat of Bukhara Region.

It is expected that the Land Lease Agreement would have been signed during the ESIA stage. Where this is the case, evidence of Land Lease Agreement will be provided.

SOCIO-ECONOMIC STATUS SURVEYS

A key task of the ESIA baseline surveys is to gather data to:

- Confirm use of land, including past uses (land registry, conditions of land agreements, land valuation, compensation procedures, resettlement issues and etc.).

- Identity socio-economic characteristics of the population in the project area – size, gender and age structure, ethnic composition (including minorities and their vulnerability assessment);
- Characterise the living standards of the population in the project area - size and structure of income, property/other assets and their use, poverty level, living conditions (housing type and amenity);
- Assess access to social (health care, education, social programs) and public (water pipe, sanitary facilities, heat, electricity and gas supply) services;
- Identify the availability of social and cultural facilities (roads, transport, retail outlets);
- Assess existing knowledge about the Project within the communities and land users.

The key informants during the assessment will be:

- Current land users within the project area (if any);
- Populations in the nearby communities and settlements;
- Representatives of responsible institutions;
- Local governments managers, representatives of public and non-governmental organizations; When required, other stakeholders (representatives of local Khokimiyats, labour authorities etc.) will be involved in the assessment.

CONSTRUCTION PHASE IMPACTS ASSESSMENT

Worker Influx

The ESIA will aim to establish the likely extent of worker influx as a result of the Project, and how these workers will be housed and catered for to assess impacts upon local populations, particularly in terms of commodity prices.

Project Construction Positive Impacts

The outcomes of the survey of socio-economic condition, are expected to highlight and target methods that can be implemented to enhance such benefits of local employment, training provisions and use of local business and services. Where applicable the ESIA will outline provisions that can be implemented during construction.

OPERATIONAL PHASE IMPACTS ASSESSMENT

The same context (as for construction, above) is applicable for the ESIA concerning the positive project impacts linked to local employment, training provision and use of local business and services.

5.10 Community Health, Safety and Security

5.10.1 Applicable Requirements & Standards

NATIONAL REGULATIONS

- Resolution of Cabinet of Ministers of Republic of Uzbekistan No.95 "On approval of general technical regulations of environmental safety" (2020).
 - Requires the implementation of environmental safety measures for the protection of flora and fauna. This includes the prevention of death of wildlife species due to magnetic fields of power transmission lines and sanitary protection zones.
 - Requires transformer substations in power transmission lines, their grids to have equipment (barriers, fences etc.) to prevent animals from entering the territory of the substation.
- Decree of the Cabinet of Ministers of the Republic of Uzbekistan No.1050 "On approval of Rules for Protection of Power Grid Facilities, 2018".
 - This determines the procedure for establishing protected zones for power grid facilities, as well as special conditions for using land located within the protected zones and ensure the functioning and operation of the said facilities.
 - Construction of power grid facilities with 110, 220 or 500kV in protected areas of state nature reserves, protected areas of nature parks and state biosphere reserves etc shall be allowed with the permission of the Cabinet of Ministers of the Republic of Uzbekistan.
 - Protected zones of power grid facilities shall be established on both sides of the power transmission line from the outermost wires and along the perimeter of substations at the following distances for voltages;
 - 110kV: 20 meters;
 - 220kV: 25 meters; and
 - 500kV: 30 meters.
- San Rules & Norms No. 0236-07 "Sanitary norms and rules to ensure safety for people living near high voltage power transmission lines, 2007".
 - This regulation sets the requirements for ensuring public safety when overhead power lines pass over populated, unpopulated or inaccessible territories.
 - It requires sanitary norms and rules to be followed in the design, construction and operation of overhead power lines.
 - The distances corresponding to the projection onto the ground of the outer phase wires in a direction perpendicular to the overhead line as follows:
 - Up to 110kV/m: 10 meters;
 - Up to 220kV/m: 15 meters;
 - Up to 330kV/m: 20 meters;
 - Up to 500kV/m: 30 meters; and
 - Up to 570kV/m: 40 meters.

LENDERS REQUIREMENT

EBRD

Performance Requirement 4 establishes the importance of avoiding or mitigating adverse health and safety impacts and issues associated with project activities on workers, project affected communities and consumers. The objectives of EBRD PR4 are:

- To protect and promote the safety & health of workers by ensuring safe and healthy working conditions and implementing a health and safety management system, appropriate to the relevant issues and risks associated with the Project.
- To anticipate, assess and prevent or minimise adverse impacts on the health and safety of project affected communities and consumers during the project lifecycle from both routine and non-routine circumstances.

ADB

Under ADB Safeguard Requirement 1: Environment, the assessment of community health and safety is required in ESIA.

Specifically, 'The borrower/client will identify and assess the risks to, and potential impacts on, the safety of affected communities during the design, construction, operation, and decommissioning of the project, and will establish preventive measures and plans to address them in a manner commensurate with the identified risks and impacts.'

This includes reasonably foreseeable incidents, accidents and natural impacts (due to the Project) and requires affected communities to be informed. Preparation are also required to be made to plan for such events.

EPFIs

IFC Performance Standard 4 establishes requirements to safeguard local communities from potential risks associated with the Project including impacts associated with introduction of communicable disease, site access and operation, material use etc. The key objectives of PS4 are:

- To anticipate and avoid adverse impacts on the health and safety of the Affected Community during the project life from both routine and non-routine circumstances.
- To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities.

5.10.2 Initial Observation and Baseline Conditions

Given the proximity of the Project to two(2) villages; the Kalaata village and the Dzhankeldy village. Project related activities might result in the increase of risks associated with those who live near the Project or may visit areas in and around active Project sites.

This chapter will outline and assess the impacts relating to the safety and security of the public who access the surrounding areas and may be subject to project related impacts.

Secondary impacts relating to public health in terms of air quality, noise, waste etc., have been addressed in specific chapters elsewhere in this report. This chapter therefore concentrates on the potential emergency impacts that could relate to the project and the security of the project to avoid instances of trespass, or other misdemeanours.

The alignment of the OHTL has not yet been confirmed by ACWA Power. It is possible that the ultimate alignment may coincide with areas used by humans, such as farms, or could run close to properties. This would only be confirmed at a later stage.

5.10.3 Potential Impacts

Table 5-12 Potential Community, Health, Safety and Security Impacts

ACTIVITY	ASPECT	IMPACTS AND ZONE OF INFLUENCE	POTENTIAL RECEPTORS
Construction Phase			
Influx of workers	Community disgruntlement with external staff (potentially including expatriate workers)	Conflict, disease spread, initially on a local basis (potentially wider)	Local communities (where this coincides with Project workers) and those herders that use the site.
	Community health risks		
	Gender Based Violence and Harassment/Sexual Exploitation & Abuse/ Sexual Harassment	Risk posed to local women, young boys and girls by migrant workers from other parts of Uzbekistan and overseas.	
Construction Works	Exposure of community to construction and commissioning hazards (including equipment, electrical hazards, hazardous materials, chemicals and fuels, hazardous wastes etc.)	In areas of the WTGs and substation or at associated facilities that may not be fully secure, or where there are poor security management practices.	Nearby residences and ecological receptors
	Emergency situations (e.g. fire, explosion etc.)	Project footprint and external to the Project areas (depending on type and magnitude of emergency)	
Movement of construction vehicles	Increased vehicles on local road (particularly HGVs)	Increased potential for incidents and increased road safety risks to communities.	Local communities and other road users
Operational Phase			
Public Access	Safety issues may arise with public access to wind turbines (e.g., unauthorized climbing of the turbine)	WTG's	Public
Blade/ Ice Throw	Failure of the rotor blade can result in the "throwing of a rotor blade or part and during certain cold weather conditions accretion of ice on the blades and risk of pieces of ice thrown	Public safety at areas close to the WTGs	Nearby land users (e.g. herders and farmers) and ecological receptors

ACTIVITY	ASPECT	IMPACTS AND ZONE OF INFLUENCE	POTENTIAL RECEPTORS
	from rotor during operation or dropped if turbine is idle (IFC EHS Guideline on Wind Energy, 2015)		
Plant operations	Emergency situations (e.g. structural damage and possible collapse, spills of any back up fuels (from operational buildings), un-warranted releases of wastewater etc.)	Project footprint (WTGs, access roads and substations) and external to the Project areas (depending on type and magnitude of emergency)	Nearby land users (e.g. herders and farmers) and ecological receptors

5.10.4 Proposed ToR for the ESIA

Reasonably foreseeable risks to community health, safety and security will be delineated in the ESIA and where appropriate, provisions for the management of such circumstances will be outlined, with applicable mitigation and management measures.

The ESIA will highlight the need for such preparedness and response mechanisms to be addressed in specific construction and operational phase 'Emergency Preparedness and Response Plans

5.11 Human Rights, Labour and Working Conditions

5.11.1 Applicable Requirements & Standards

NATIONAL REGULATIONS

Labour and Working Conditions

- Ordinance No. 30-31 of the Ministry of Labour and Social Security and the Ministry of Health of the Republic of Uzbekistan approving the list of hazardous jobs mentioned in Article 355, for which the employment of persons under the age of eighteen years is prohibited
- Joint Decree of the Ministry of Labour and Social Protection of the Population (No. 7) and the Ministry of Healthcare (No. 1) of Uzbekistan dated 30 May 2001 to approve the list of occupations with unfavourable working conditions to which it is forbidden to employ persons under 18 years of age.
- Decree No. 133 of 11 March 1997 to approve normative acts necessary for the realization of the Labour Code of the Republic of Uzbekistan
- Decree of the Cabinet of the Ministers No. 1011 of 22 December 2017 "On Perfection of the Methodology of Definition of Number of People in Need of Job Placement, including the Methodology for Observing Households with Regard to Employment Issues, also for the Development of Balance of Labour Resources, Employment and Job Placement of Population".

- Decree of the Cabinet of the Ministers No. 965 of 5 December 2017 "On the Measures of Further Perfection of the Procedure of Establishment and Reservation of Minimum Number of Job Places for the Job Placement of Persons who are in need of Social Protection and Face Difficulties in Searching Employment and Incapable of Competing in Labour Market with Equal Conditions".
- Decree No. 964 of 5 December 2017 "On the Measures for Perfection of the Activity of Self-Government Bodies Aimed at Ensuring Employment, Firstly for the Youth and Women".

Human Rights

- As a member of the United Nations, Uzbekistan supports and implements all the main international instruments of the United Nations relating to the protection of human rights and freedoms, including UN Universal Declaration of Human Rights, Human Rights Council Resolution No. 30/15 on human rights and preventing and countering violent extremism, Convention on the Elimination of all Forms of Discrimination against Women among others.
- Uzbekistan's State Policy on human rights is aimed at preventing violations or any restriction on human rights and freedoms and at establishing the necessary organizational, legal, social, economic, spiritual and moral foundations for the protection of human rights.

LENDERS REQUIREMENT

EBRD

PR2 is applicable to Labour and Working Conditions and has the following key objectives:

- *Respect and protect the fundamental principles and rights of workers;*
- *Promote the decent work agenda, including fair treatment, non-discrimination and equal opportunities of workers;*
- *Establish, maintain and improve a sound worker-management relationship;*
- *Promote compliance with any collective agreements to which the client is a party, national labour and employment laws;*
- *Protect and promote the safety and health of workers, especially by promoting safe and healthy working conditions; and*
- *Prevent the use of forced labour and child labour (as defined by the ILO) as it relates to project activities.*

Concerning dedicated accommodation, compliance is required with:

- IFC & EBRD Workers Accommodation: Processes and Standards (2009).

In regard to human rights:

- According to EBRD's Environmental and Social Policy, EBRD is committed to the respect of human rights in the Project they finance. EBRD is also guided by the International Bill of Human Rights and the eight core conventions of the International Labour Organization.

ADB

The Environmental Safeguard requirements necessitate The Borrower/client to, 'provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease. Establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of local communities.'

ADB have stated that compliance with the IFC & EBRD Worker Accommodation: Processes and Standards (2009) will also be required.

EPFIs

The following applicable IFC Performance Standards aim to identify and ensure that social and economic impacts of a project are addressed in the relevant areas, in particular:

- Performance Standard 2: Labour and Working Conditions;

In accordance with IFC Performance Standard 2 (Labor and Working Conditions) there is a requirement to align with the following conventions:

- ILO Convention 29 on Forced Labor;
- ILO Convention 87 on Freedom of Association and Protection of the Right to Organize;
- ILO Convention 98 on the Right to Organize and Collective Bargaining;
- ILO Convention 100 on Equal Remuneration;
- ILO Convention 105 on the Abolition of Forced Labor;
- ILO Convention 138 on Minimum Age (of Employment);
- ILO Convention 182 on the Worst Forms of Child Labor;
- ILO Convention 111 on Discrimination (Employment and Occupation);
- UN Convention on the Rights of the Child, Article 32.1; and
- UN Convention on the Protection of the Rights of all Migrant Workers and Members of their Families.

In regard to human rights:

- In line with EP IV requirements, the United Nations Human Rights Guiding Principles apply to the Project. HRGP II on "The corporate responsibility to respect human rights" recognises that it is the responsibility of businesses and corporations to respect human rights. It is a global standard of expected conduct for all business enterprises wherever they operate. It exists independently of a States' ability and/or willingness to fulfil their human rights obligations and does not diminish those obligations.

5.11.2 Initial Observation and Baseline Conditions

Uzbekistan operates on the basis of its national policies, the constitution and applicable regulations concerning both human rights and labour & working conditions on the basis. Uzbekistan is a signatory of the International Labour Organisation (ILO).

Human Rights Watch an international NGO states that, 'Since Uzbekistan's President Shavkat Mirziyoyev assumed the presidency in 2016, the government has taken some concrete steps to improve the country's human rights record.'

5.11.3 Potential Impacts

Table 5-13 Potential Labour & Working Conditions Impacts

ACTIVITY	ASPECT	IMPACTS AND ZONE OF INFLUENCE	POTENTIAL RECEPTORS
Construction Phase			
Employment of staff	Contracting	Discrimination and exploitation. Risk of poorly formed contracts (or no contracts), risks of non-compliance with labour law and lender requirements, employment of labour that is forced or child labour.	Project workforce (PC, EPC Contractor and Sub-Contractors)
Day-to-day and specific construction & commissioning activities	Risks to worker occupational health and safety	Injury or death to workers where key risks are not suitably managed.	Project workforce
	Working Conditions	Poor conditions provided to workers with lack of welfare facilities, first aid, or other typical working amenities.	Project workforce
	Gender Based Violence and Harassment/Sexual Exploitation & Abuse/ Sexual Harassment	Within the workforce and potentially applicable to both women and men.	Project workforce
Worker Accommodation	Camps	Poor quality housing without access to all (or some/inadequate) required amenities and/or other non-compliance with the EBRD and IFC Worker Accommodation Guidelines.	Applicable to Project workforce requiring dedicated accommodation
Operational Phase			
Employment of staff	Contracting	Discrimination and exploitation. Risk of poorly formed contracts (or no contracts), risks of non-compliance with labour law and lender requirements, employment of labour that is forced or child labour.	Project workforce (PC, O&M Company and Sub-Contractors)
Day-to-day and specific operational and	Risks to worker occupational health and safety	Injury or death to workers where key risks are not suitably managed.	Project workforce

ACTIVITY	ASPECT	IMPACTS AND ZONE OF INFLUENCE	POTENTIAL RECEPTORS
maintenance activities	Working Conditions	Poor conditions provided to workers with lack of welfare facilities, first aid, or other typical working amenities.	Project workforce

5.1.1.4 Proposed ToR for the ESIA

The ESIA will highlight applicable requirements and risks that the Project may encounter related to labour and working conditions, similar to those outlined above. This will also include necessary compliance requirements to meet lender guidelines.

It will aim to identify appropriate mitigation and management measures to ensure that such risks are minimised and/or appropriately managed throughout the entire project workforce and any key supply chains.

APPENDIX C – PRESIDENTIAL DECREE (JULY 2022)

**DECREE
OF PRESIDENT OF THE REPUBLIC OF UZBEKISTAN**

08/07/2022

PD-314

**On amendments and additions to some acts of the President of the Republic of
Uzbekistan in order to allocate the necessary land plots for the development of
renewable energy sources**

As a result of the formation of the legal framework over the past three years and the creation of favorable conditions for the development of renewable energy, work has begun to date on the construction of 10 solar and wind power plants with a total capacity of 2,897 MW at the expense of foreign direct investment in the amount of 2.9 billion US dollars.

At the same time, in order to ensure the stability of property and legal relations on land issues, land protection, guaranteeing the property rights of landowners, as well as introducing them into free circulation as an object of civil law relations by determining the economic value of land, a transparent, market-based and equal procedure for allocating land plots has been introduced.

In order to allocate land plots for the construction of newly built solar and wind power plants to expand the use of renewable energy sources on the basis of current legislation, as well as in accordance with the Decree of the President of the Republic of Uzbekistan dated June 8, 2021 No. UP-6243 "On measures to ensure equality and transparency in land relations, reliable protection of land rights and their transformation into a market asset":

1. Make amendments and additions to some acts of the President of the Republic of Uzbekistan according to the annex, providing:

allocation to the Ministry of Energy on the right of permanent use for state and public needs of land plots necessary for the construction of wind farms, substations and power lines in accordance with the conditions specified in the Investment Agreement and the Agreement on Electricity Purchase concluded with foreign investors;

provision by the Ministry of Energy of land plots for rent to investors for a period equal to the construction and operation of wind farms;

within the framework of the construction and operation of wind power plants, if the land plots allocated for state and public needs belong to the category of agricultural land, their transfer to the category of non-agricultural industrial land;

granting the Minister of Finance, the authority to sign on behalf of the Government of the Republic of Uzbekistan an agreement on reimbursement of expenses of the Asian Development Bank within the framework of the investment project "Construction of a 500 MW wind power plant in Navoi region".

1. Control over the implementation of this resolution shall be entrusted to the Prime Minister of the Republic of Uzbekistan A.N.Aripov.

**President
of the Republic of Uzbekistan**

Sh. Mirziyoyev

Amendments and additions to some acts of the President of the Republic of Uzbekistan

1. In the Decree of the President of the Republic of Uzbekistan dated December 22, 2020 No. PD-4933 "On measures for the implementation of the investment project "Construction of a 500 MW wind power plant in Navoi region":

- a) in paragraph 5, replace the words "khokimiyat of Navoi region" with the words "Ministry of Energy";

- b) add paragraph 7¹ as follows:

“7¹. To authorize the Minister of Finance to sign, on behalf of the Government of the Republic of Uzbekistan, an agreement with the Asian Development Bank on reimbursement of expenses of the Asian Development Bank in a form acceptable to the Government of the Republic of Uzbekistan, in case of fulfillment by JSC "National Electric Networks of Uzbekistan" of payment obligations to a foreign bank opening a letter of credit under the guarantee of the Asian Development Bank”;

- c) paragraph 8 should be worded as follows:

“8. The Khokimiyat of Navoi region, by July 30, 2022, to ensure the allocation to the Ministry of Energy of a land plot on the right of permanent use, as well as the land area necessary for the construction of a wind farm, substation, and overhead power lines based on the coordinates of the land occupied by supporting structures that meet the conditions specified in the Investment Agreement and the Agreement on purchase of electric energy”.

The Ministry of Energy in accordance with this paragraph for state and public needs to ensure the transfer of lease:

Project company - a land plot allocated for the construction of a wind power plant and substation for a period equal to the period of implementation of the Investment Project;

JSC "National Electric Networks of Uzbekistan" - a land plot allocated for the construction of overhead transmission lines.

Determine that the payment for the right to lease land at market value is expressed in the form of rent applicable to the land and paid by the Project Company.

At the same time, release the Project Company and JSC "National Electric Networks of Agricultural Uzbekistan" production from compensation (compensation losses of payments) when using agricultural land as part of the implementation of an investment project”;

- d) add paragraph 8¹ as follows:

“8¹. To agree with the proposal of the Ministry of Investment and Foreign Trade, the Ministry of Agriculture, the Ministry of Water Resources, the Khokimiyat of Navoi region on the transfer of land allocated for the placement of an investment project with an area of 293.35 hectares in the Tamdyn district of Navoi region from the category of agricultural land to the category of industrial land according to the annex to this resolution”.

The Khokimiyat of Navoi region should ensure the development of new agricultural lands equal to the area of land plots, the category of which is changing according to this resolution, by the end of 2022”;

- e) add the following appendix:

The list of land plots, the category of which is being transferred from agricultural to industrial and other purposes within the framework of the investment project "Construction of a 500 MW wind power plant in the Tamdy district of Navoi region"

Name of territory	Contour number	Land area (hectare)	Pastures	Ball bonitet
For a wind farm				
Tamdy district, Tomdibulok community	364к	12,97	12,97	Not valuated
	371к	33,99	33,99	Not valuated
	566к	9,25	9,25	Not valuated
	565к	1,35	1,35	Not valuated
	571к	18,56	18,56	Not valuated
	572к	35,04	35,04	Not valuated
	573к	8,0	8,0	Not valuated
	576к	4,2	4,2	Not valuated
	577к	24,26	24,26	Not valuated
	584к	28,34	28,34	Not valuated
	585к	48,75	48,75	Not valuated
Total by territory		224,71	224,71	

Name of territory	Contour number	Land area (hectare)	Pastures	Ball bonitet
Tamdy district Octav community	29к	13,56	13,56	Not valuated
	33к	14,96	14,96	Not valuated
	34к	4,58	4,58	Not valuated
Total by territory		33,1	33,1	
Total		257,81	257,81	
For the construction of a substation				
Tamdy district, Tomdibulok community	571к	11,25	11,25	Not valuated
Total		11,25	11,25	
For the construction of supporting structures of overhead transmission lines				
Tamdy district, Tomdibulok community	571к	0,05	0,05	Not valuated
Total		0,05	0,05	
For bird survey and wind survey system				
Tamdy district, Tomdibulok community	364к	2,59	2,59	Not valuated
	371к	3,01	3,01	Not valuated
	566к	0,33	0,33	Not valuated
	571к	2,51	2,51	Not valuated
	572к	2,76	2,76	Not valuated

Name of territory	Contour number	Land area (hectare)	Pastures	Ball bonitet
	573к	2,18	2,18	Not valuated
	576к	0,17	0,17	Not valuated
	577к	2,26	2,26	Not valuated
	584к	2,59	2,59	Not valuated
	585к	2,92	2,92	Not valuated
Total by territory		21,32	21,32	
Tamdy district Octav community	29к	0,5	0,5	Not valuated
	33к	2,34	2,34	Not valuated
	34к	0,08	0,08	Not valuated
Total by territory		2,92	2,92	
Total		24,24	24,24	
Total by territory		293,35	293,35	

1. In the Decree of the President of the Republic of Uzbekistan dated February 23, 2021 No. PD-5001 "On measures for the implementation of the investment project Construction of a wind power plant with a capacity of 300 - 500 MW in the Peshku district of Bukhara region":

a) in paragraph 5, replace the words "khokimiyat of Bukhara region" with the words "Ministry of Energy";

b) paragraph 8 should be worded as follows:

"8. The Khokimiyat of the Bukhara region, by July 30, 2022, to ensure that the Ministry of Energy is allocated a land plot on the right of permanent use, as well as the land area necessary for the construction of a wind power plant, substation, and overhead power lines based on the coordinates of the land occupied by supporting structures that meet the conditions specified in the Investment Agreement and the Agreement on purchase of electric energy.

The Ministry of Energy in accordance with this paragraph for state and public needs to ensure the transfer of lease:

The project company of the land plot allocated for the construction of the wind power plant and substation for a period equal to the period of implementation of the Investment Project;

JSC "National Electric Networks of Uzbekistan" - a land plot allocated for the construction of overhead power lines.

Determine that the payment for the right to lease land at market value is expressed in the form of rent applicable to the land and paid by the Project Company.

At the same time, to exempt the Project Company and JSC "National Electric Networks of Uzbekistan" from compensation for losses of agricultural production (compensation payments) when using agricultural land as part of the implementation of the Investment Project";

b) add paragraph 8¹ as follows:

"8¹. To agree with the proposal of the Ministry of Investment and Foreign Trade, the Ministry of Agriculture, the Ministry of Water Management, the khokimiyats of Bukhara and Navoi regions on the transfer of land allocated for the placement of an investment project with a total area of 154.2 hectares in the Peshkun and Gijduvan districts of Bukhara region and Kanimekh district of Navoi region from the category of agricultural land to the category of industrial land according to the annex to this resolution.

The khokimiyats of Bukhara and Navoi regions should ensure the development of new agricultural lands equal to the area of land plots, the category of which is changing according to this resolution, by the end of 2022";

d) add the following appendix:

Appendix
to the Decree of the President of the Republic of Uzbekistan
dated February 23, 2021 No. PP-5001

The list of land plots, the category of which is being transferred from agricultural to industrial and other purposes as part of the implementation of the Investment project "Construction of a wind power plant with a capacity of 300 - 500 MW in the Peshku district of the Bukhara region".

Name of territory	Contour number	Land area (hectare)	Pastures	Ball bonitet
For wind farm				
Peshku district, Dzhankeldy village	39к	4,63	4,63	Not valuated
	86к	11,65	11,65	Not valuated
	42к	0,5	0,5	Not valuated
	44к	32,84	32,84	Not valuated
	45к	26,04	26,04	Not valuated
	87к	41,84	41,84	Not valuated
Total		117,5	117,5	
For the construction of supporting structures of overhead transmission lines				
Peshku district, Dzhankeldy village	86к	0,1	0,1	Not valuated
	87к	1,25	1,25	Not valuated

Name of territory	Contour number	Land area (hectare)	Pastures	Ball bonitet
Total by territory		1,35	1,35	
Gijduvan district, Kukcha community	117к	0,73	0,73	Not valuated
	118к	0,35	0,35	Not valuated
	120к	0,32	0,32	Not valuated
	123к	0,59	0,59	Not valuated
	161к	0,38	0,38	Not valuated
	159к	0,14	0,14	Not valuated
	160к	0,29	0,29	Not valuated
	175к	0,33	0,33	Not valuated
	176к	0,32	0,32	Not valuated
	177к	0,61	0,61	Not valuated
Total by territory		4,06	4,06	
	125к	0,65	0,65	Not valuated
	126к	1,05	1,05	Not valuated
	127к	0,9	0,9	Not valuated
	128к	0,15	0,15	Not valuated
	129к	0,45	0,45	Not valuated

Name of territory	Contour number	Land area (hectare)	Pastures	Ball bonitet
Navoi region, Kanimekh district Aul "Karakata"	130κ	0,6	0,6	Not valuated
	131κ	0,1	0,1	Not valuated
	132κ	0,75	0,75	Not valuated
	142κ	0,2	0,2	Not valuated
	164κ	0,9	0,9	Not valuated
	166κ	0,85	0,85	Not valuated
	167κ	0,05	0,05	Not valuated
	168κ	1,65	1,65	Not valuated
	169κ	0,9	0,9	Not valuated
	176ακ	1,3	1,3	Not valuated
	183α κ	0,45	0,45	Not valuated
	182α κ	1,05	1,05	Not valuated
	180κ	0,3	0,3	Not valuated
	181κ	1,2	1,2	Not valuated
Total by territory		13,5	13,5	
Total		18,91	18,91	
For the construction of substation				

Name of territory	Contour number	Land area (hectare)	Pastures	Ball bonitet
Peshku district, Dzhankeldy village	87к	17,79	17,79	Not valuated
Total by territory		17,79	17,79	
Total for project		154,2	154,2	

1. In the Decree of the President of the Republic of Uzbekistan dated February 23, 2021 No. PP-5003 "On measures for the implementation of the investment project "Construction of a 500 MW wind power plant in Gijduvan district of Bukhara region":

a) in paragraph 5, replace the words "khokimiyat of Bukhara region" with the words "Ministry of Energy";

b) paragraph 8 should be worded as follows:

8. The Khokimiyat of the Bukhara region, by July 30, 2022, to ensure the allocation to the Ministry of Energy of a land plot on the right of permanent use, as well as the land area necessary for the construction of a wind power plant, substation, and overhead power lines based on the coordinates of the land occupied by the supporting structures corresponding to the conditions specified in the Investment Agreement and the Agreement about the purchase of electric energy.

The Ministry of Energy in accordance with this paragraph for state and public needs to ensure the transfer of lease:

The project company of the land plot allocated for the construction of the wind power plant and substation for a period equal to the period of implementation of the Investment Project;

JSC "National Electric Networks of Uzbekistan" - a land plot allocated for the construction of overhead power lines.

Determine that the payment for the right to lease land at market value is expressed in the form of rent applicable to the land and paid by the Project Company.

At the same time, release the Project Company and JSC "National Electric Networks of Uzbekistan" production from compensation (compensation losses of payments) when using agricultural land as part of the implementation of an investment project";

c) add the following paragraph 8¹:

"8¹ To agree with the proposal of the Ministry of Investments and Foreign Trade, the Ministry of Agriculture, the Ministry of Water Management, the Khokimiyat of Bukhara region on the transfer of land allocated for the placement of an investment project with an area of 172.55 hectares, 0.18 hectares of which are irrigated, in Gijduvan, Shafirkan, Peshkun, Ramitan, Jandar and Karakul districts of Bukhara region from the category of agricultural appointments to the category of industrial lands in accordance with the annex to this resolution.

The Khokimiyat of the Bukhara region, by the end of 2022, to ensure the development of new irrigated land plots in an amount equal to ten times the size of irrigated land plots, as well as new agricultural lands equal to the area of pasture lands¹ the category of lands of which is changing according to this resolution";

d) add the following appendix:

Appendix

to the Decree of the President of the Republic of
Uzbekistan dated February 23, 2021 No. PP-5003

The list of land plots, the category of which is being transferred from agricultural to industrial and other purposes within the framework of the Investment project "Construction of 500 MW wind power plant in Gijduvan district of Bukhara region"

Name of territory	Contour number	Land area (hectare)	From them		Ball bonitet
			irrigated croplands	Pastures	
For wind farm					
Gijduvan district, Kukcha community	193к	9,97		9,97	Not valuated
	194к	4,97		4,97	Not valuated
	178к	28,23		28,23	Not valuated
	183к	1,65		1,65	Not valuated
	171к	1,65		1,65	Not valuated
	176к	6,66		6,66	Not valuated
	163к	1,65		1,65	Not valuated
	256к	4,97		4,97	Not valuated
	257к	1,66		1,66	Not valuated
	254к	1,66		1,66	Not valuated
	244к	1,66		1,66	Not valuated
	258к	1,66		1,66	Not valuated

Name of territory	Counter number	Land area (hectare)	From them		Ball bonitet
			Irrigated croplands	Pastures	
Gijduvan district, Kukcha community	260к	1,66		1,66	Not valuated
	261к	1,66		1,66	Not valuated
	243к	1,65		1,65	Not valuated
	242к	3,35		3,35	Not valuated
	263к	1,65		1,65	Not valuated
	264к	1,65		1,65	Not valuated
	170к	36,54		36,54	Not valuated
	276к	3,32		3,32	Not valuated
	238к	3,32		3,32	Not valuated
	239к	3,32		3,32	Not valuated
	275к	1,66		1,66	Not valuated
	262к	4,97		4,97	Not valuated
Total		131,14		131,14	
For the construction of supporting structures of overhead transmission lines					
Gijduvan district, Kukcha community	178к	0,67		0,67	Not valuated
	240к	0,38		0,38	Not valuated
	239к	0,45		0,45	Not valuated
	237к	0,43		0,43	Not valuated
	176к	0,30		0,3	Not valuated

Name of territory	Counter number	Land area (hectare)	From them		Ball bonitet
			Irrigated croplands	Pastures	
Gijduvan district, Kukcha community	271κ	0,22		0,22	Not valuated
	265κ	0,17		0,17	Not valuated
	266κ	0,39		0,39	Not valuated
	273κ	0,42		0,42	Not valuated
	274κ	0,45		0,45	Not valuated
	275κ	0,24		0,24	Not valuated
	276κ	0,29		0,29	Not valuated
	277κ	0,39		0,39	Not valuated
Total		4,80		4,80	
Shofirkon district, Galaba community	10980κ	0,3		0,3	Not valuated
	10984κ	0,38		0,38	Not valuated
	10988κ	0,35		0,35	Not valuated
	10990κ	0,48		0,48	Not valuated
	10991κ	0,2		0,2	Not valuated
	10992κ	0,11		0,11	Not valuated
	12436κ	0,18		0,18	Not valuated
	12490κ	0,04		0,04	Not valuated
	12491κ	0,09		0,09	Not valuated
	12492κ	0,24		0,24	Not valuated
	12501κ	0,59		0,59	Not valuated

Name of territory	Counter number	Land area (hectare)	From them		Ball bonitet
			Irrigated croplands	Pastures	
Shifirkon district, Galaba community	12503к	0,54		0,54	Not valuated
	12504к	0,34		0,34	Not valuated
	12505к	0,2		0,2	Not valuated
	12506к	0,34		0,34	Not valuated
Total by territory		4,38		4,38	
Peshku district, Dzhankledy community	107к	1,1		1,1	Not valuated
	109к	0,47		0,47	Not valuated
	110к	1,32		1,32	Not valuated
Total by territory		2,89		2,89	
Romitan district, E.Khojaev and Yangiobod community	9к	0,23		0,23	Not valuated
	10к	0,2		0,2	Not valuated
	11к	0,59		0,59	Not valuated
	14к	0,51		0,51	Not valuated
	17к	0,2		0,2	Not valuated
	19к	0,13		0,13	Not valuated
	26к	0,25		0,25	Not valuated
	30к	0,1		0,1	Not valuated
	31к	0,04		0,04	Not valuated
	32к	0,1		0,1	Not valuated
	33к	0,22		0,22	Not valuated
Total by territory		2,57		2,57	

Name of territory	Counter number	Land area (hectare)	From them		Ball bonitet
			Irrigated croplands	Pastures	
Jandar district, A.Temur community	19071к	0,61		0,61	Not valuated
	19072к	0,25		0,25	Not valuated
	19077к	1,6		1,6	Not valuated
	19080к	0,67		0,67	Not valuated
	19087к	0,35		0,35	Not valuated
	19100к	0,25		0,25	Not valuated
	19101к	0,87		0,87	Not valuated
	19109к	0,44		0,44	Not valuated
	19136к	0,35		0,35	Not valuated
	19137к	0,91		0,91	Not valuated
	19138к	0,43		0,43	Not valuated
Total by territory		6,73		6,73	
Karakul district, Karakul community	2094к	0,07		0,07	Not valuated
	2092к	0,15		0,15	Not valuated
	2093к	0,06		0,06	Not valuated
	2135к	0,28		0,28	Not valuated
	2136к	0,09		0,09	Not valuated
	2137к	0,01		0,01	Not valuated
	2141к	0,03	0,03		49 ball
	2160к	0,02	0,02		40 ball

Name of territory	Counter number	Land area (hectare)	From them		Ball bonitet
			Irrigated croplands	Pastures	
Karakul district, Karakul community	2167к	0,14		0,14	Not valuated
	2173к	0,27		0,27	Not valuated
	2207к	0,02	0,02		49 ball
	2209к	0,02	0,02		55 ball
	2316к	0,03	0,03		55 ball
	2368к	0,03	0,03		55 ball
	2370к	0,03	0,03		44 ball
Total by territory		1,25	0,18	1,07	
Total		22,62	0,18	22,44	
For the construction of substation					
Gijduvan district, Kukcha community	172к	1,81		1,81	Not valuated
	178к	16,98		16,98	Not valuated
Total by territory		18,79		18,79	
Total for the project		172,55	0,18	172,37	

APPENDIX D – CONSENT LETTER FROM COMMITTEE FOR DEVELOPMENT OF SERICULTURE & KARAKUL FARMING

**O'ZBEKISTON RESPUBLIKASI
PILLACHILIK VA
QORAKO'LCHILIKNI
RIVOJLANTIRISH QO'MITASI**

100170, O'zbekiston Respublikasi,
Toshkent sh.,
Mirzo Ulug'bek tumani,
Ismoil ota ko'chasi, 1-a uy.
E-mail: info@uzbekipaksanoat.uz
Tel/faks: 268-23-63, Tel: 267-31-23, 267-31-56



**SERICULTURE AND KARAKUL
FARMING DEVELOPMENT
COMMITTEE OF THE REPUBLIC OF
UZBEKISTAN**

100170, Republic of Uzbekistan,
Tashkent city,
Mirzo Ulugbek district,
1-a Ismoil ota street.
E-mail: info@uzbekipaksanoat.uz
Tel/faks: 268-23-63, Tel: 267-31-23, 267-31-56

2020 yil « 31 » декабрь
№ 1-2/241

**Бухоро вилояти
хокимлигига**

2020 йил 29 декабрдаги
9/5385-сонли хатга

Ўзбекистон Республикаси Президентининг 2020 йил 2 сентябрдаги “Ўзбекистон Республикасида пиллачилик ва қоракўлчиликни янада ривожлантириш чора-тадбирлари тўғрисида”ги ПФ-6059-сонли Фармонига асосан республикада мавжуд 17,3 млн гектар, хусусан Бухоро вилояти бўйича 2 356 минг гектар яйлов ер майдонлари Пиллачилик ва қоракўлчиликни ривожлантириш қўмитаси доимий эгалигига ўтказилди.

Бухоро вилоятида жами 8 та, жумладан Пешку туманида 2 та ва Ғиждувон туманида 1 та қоракўлчилик кластерлари ташкил этилиб, уларга яйлов ер майдонлари 49 йил муддатга ижара асосида ажратиб берилди. Мазкур кластерлар ҳамда уларга кооперация асосида бириктирилган аъзоларида 150 дан ортиқ кўра-кўтанлар ва сув иншоотлари мавжуд бўлиб, 130 мингдан ортиқ майда шохли моллар парвариш қилинмоқда.

Ўзбекистон Республикаси Президентининг 2019 йил 22 августдаги ПҚ-4422-сонли қарорининг 4-банди ижросини таъминлаш ҳамда мамлакатимизда муқобил энергияни ривожлантириш мақсадида ишлаб чиқилган лойиҳани амалга ошириш мақсадида Пешку ва Ғиждувон туманларидан ажратиб берилиши сўралаётган 1 100 гектар яйлов ер майдонлари қоракўлчилик субъектлари фаолиятига таъсир этмаган тақдирда ажратиб берилишини маълум қиламиз.

Қўмита раисининг
биринчи ўринбосари


Б.Юсупов

Unofficial translation

31.12.2020

No.1-2/241

To Bukhara region municipality

Response to the letter No. 9/5385 dated 29.12.2020

According to the Presidential Decree No. 6059 dated 2.09.2021 "On Measures For The Further Development Of Sericulture And Karakul Breeding in The Republic Of Uzbekistan" overall, 17.3 mln ha of land, particularly 2356 thousand ha grazing lands in Bukhara region were allocated to Sericulture and Karakul farming development committee for permanent ownership.

In Peshku district 2, in Gijduvon district 1 and overall 8 karakul clusters were organized in Bukhara region and lands were allocated for 49 years lease agreement. These clusters and their members have more than 150 stables and water facilities, and more than 130 thousand small-horned cattle.

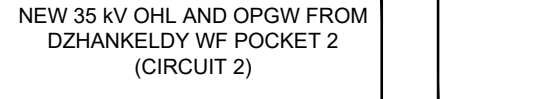
In order to implement the 4th part of Presidential Decree No. 4422 dated 22.08.2021 and development of alternative energy project in our country, we would like to inform you the requested 1100 ha of land for allocation in Peshku and Gijduvon districts will be allocated for the project only if it is not interrupting karakul farming activities.












first Deputy Chairman of the committee




signature

B.Yusupov

APPENDIX E - AIR INSULATED SUBSTATION (AIS)



LEGEND	
	CIRCUIT BREAKER
	CURRENT TRANSFORMER
	DISCONNECTER
	EARTHING DISCONNECTER
	FUSE
	GROUNDING DEVICE
	SURGE ARRESTER
	VOLTAGE DETECTOR
	THREE PHASE
	POWER TRANSFORMER
	VOLTAGE TRANSFORMER

00	23/07/2021	ACF	GDS	ABA	INITIAL VERSION
REV.	DATE	DRAFTED	CHECKED	APPROVED	DESCRIPTION
CLIENT			AUTHOR MS Enertech S.L. C/ San Roque 4, 09006 Burgos, España Tel. +(34) 947 041 052 Tel. +(34) 947 218 542 www.ms-enertech.com		
					
PROJECT					
DZHANKELDY WIND FARM (UZBEKISTAN)					
FILE NAME E-DZH-RMT-B-P-I-91-R00-Plant SLD.dwg			SCALE A1 N/A GRAPH 		DATE JULY 2021
DRAWING TITLE PLANT CONCEPT SLD WITH INTERCONNECTION TO GRID				REVISION 00	DRAWING NUMBER 91 SHEET 01 OF 01

APPENDIX F - CRITICAL HABITAT ASSESSMENT REPORTS AND PRESENTATIONS

Please Refer to Appendices: Part B

APPENDIX G- DETAILED TERRESTRIAL ECOLOGY SURVEY REPORT

Please Refer to Appendices: Part B

APPENDIX H - GECKO HABITAT ASSESSMENT – WIND FARM

Please Refer to Appendices: Part B

APPENDIX I - AIR QUALITY CALIBRATION CERTIFICATES

Annex 9. Certificate of instruments for measurements air pollution


СИСТЕМА ОБЕСПЕЧЕНИЯ ЕДИНСТВА ИЗМЕРЕНИЙ
РЕСПУБЛИКИ УЗБЕКИСТАН
Центр гидрометеорологической службы Республики Узбекистан
(УЗГИДРОМЕТ)

ОТДЕЛ ПОВЕРКИ СРЕДСТВ ИЗМЕРЕНИЙ
(наименование юридического лица, производящего поверку)

**СЕРТИФИКАТ ПОВЕРКИ
СРЕДСТВА ИЗМЕРЕНИЙ**
№ 100

 Действителен до
"16" 03 2022 г.

Настоящий сертификат удостоверяет, что средство измерений
Анемометр механический МС-13 №6847
(обозначение и обозначение средства измерений, заводской номер)
с метрологическими характеристиками 10-20 м/с
(наименование параметра)
 $\pm(0,3 + 0,05 \cdot V)$ м/с
(пределы измерений, погрешности, значение точности средства измерений)
изготовленное (импортированное) _____
(юридическое лицо – изготовитель)
Россия
(и страна – импортёр средства измерений)
принадлежащее АМЗ АВ
(юридическое лицо – владелец средства измерений)
поверенное ОПСИ Узгидромета
(наименование юридического лица, поверявшего средство измерений)
в соответствии с методикой поверки
(обозначение и наименование нормативного документа по поверке)
с использованием установки ПАТ №016, ЗА 70(0) №032
(обозначение и наименование эталонов (образцовых) средств измерений, дата их поверки)
соответствует требованиям технической документации завода изготовителя
(обозначение и наименование нормативного документа)
(описание типа, регламентирующего требования к средству измерений)
и допущено к применению в сфере распространения государственного
метрологического контроля и надзора.
Дата поверки "16" 03 2021 г.

Отдел поверки средств измерений
 Поверитель Алишиерова

Unofficial translate of Certificate of instruments for measurements air pollution

**STATE SYSTEM FOR ENSURING THE UNIFORMITY OF
MEASUREMENTS**

Hydrometeorological Service Center of the Republic of Uzbekistan (UZHYDROMET)

DEPARTMENT OF VERIFICATION OF MEASURING INSTRUMENTS

name of the legal entity that conducted the audit

CERTIFICATE OF VERIFICATION OF THE MEASURING INSTRUMENT

No.100

Valid to "16" 03/2022

This is to certify, that the measuring instrument **Anemometer MS-13 No. 6847** with
metrological characteristics of **1.0-20 m/s \pm (0.3+ 0.05* V) m/s**

manufactured (imported) Russia

owned by AAPL

Tested by UzHydromet's DVMi

in accordance with the verification methodology

using PAT unit No. 016, EA70(0) No.032

**meets the requirements of the technical documentation of the manufacturer's plant and
is approved for use in the field of distribution of state metrological control and
supervision.**

Verification date **"16" 03 2021**

Verifier

С/б Анникова

STATE SYSTEM FOR ENSURING THE UNIFORMITY OF
MEASUREMENTS

Hydrometeorological Service Center of the Republic of Uzbekistan (UZHIDROMET)

DEPARTMENT OF VERIFICATION OF MEASURING INSTRUMENTS

name of the legal entity that conducted the audit

CERTIFICATE OF VERIFICATION OF THE MEASURING INSTRUMENT

No.101

Valid to **"16" 03/2022**

This is to certify, that the measuring instrument Psychrometer MV-4M No. 12503 with
metrological characteristics of $-31^{\circ}\text{C} + 51^{\circ}\text{C} \Delta \pm 0.2^{\circ}\text{C}$

manufactured (imported) Russia

owned by AAPL

Tested by UzHydromet's DVMi

in accordance with the verification methodology

using P0 -30 No. 6699,

meets the requirements of the technical documentation of the manufacturer's plant and
is approved for use in the field of distribution of state metrological control and
supervision.

Verification date "16" 03 2021

Verifier

Annex 11. Certificate of instruments for measurements pressure

СИСТЕМА ОБЕСПЕЧЕНИЯ ЕДИНСТВА ИЗМЕРЕНИЙ
РЕСПУБЛИКИ УЗБЕКИСТАН
Центр гидрометеорологической службы Республики Узбекистан
(УЗГИДРОМЕТ)

ОТДЕЛ ПОВЕРКИ СРЕДСТВ ИЗМЕРЕНИЙ
(наименование юридического лица, производящего поверку)

**СЕРТИФИКАТ ПОВЕРКИ
СРЕДСТВА ИЗМЕРЕНИЙ**

№ 156

Действителен до 23.04.2021 г.

Настоящий сертификат удостоверяет, что средство измерений

Барометр-анероид M-67 № 3390
(наименование и обозначение средства измерений, заводской номер)

с метрологическими характеристиками 800-800 мм Нф
(наименование параметра,

$\Delta p \pm 0,8 \text{ мм Нф}$
погрешности измерений, погрешности, класс точности средства измерений)

изготовленное (импортированное) Россия
(юридическое лицо – изготовитель,

и страна – импортер средства измерений)

принадлежащее СеллЗ
(юридическое лицо – владелец средства измерений)

поверенное ОПСИ Узгидромета
(наименование юридического лица, поверившего средство измерений)

в соответствии с Методикой поверки
(обозначение и наименование нормативного документа по поверке)

с использованием Установки ПО-8 №103 БРС-1М-2 №0702500
(обозначение и наименование эталонов (образцовых) средств измерений, даты их поверки)

соответствует требованиям технической документации завода изготовителя
(обозначение и наименование нормативного документа,

описания типа, регламентирующего требования к средству измерений)

и допущено к применению в сфере распространения государственного
метрологического контроля и надзора.

Дата поверки 23.04.2020 г.

Поверитель А.И. Ахмедов

Оттиск поверительного
исходного

UZB
2
2 041 0
MS A

STATE SYSTEM FOR ENSURING THE UNIFORMITY OF
MEASUREMENTS

Hydrometeorological Service Center of the Republic of Uzbekistan (UZHIDROMET)

DEPARTMENT OF VERIFICATION OF MEASURING INSTRUMENTS

name of the legal entity that conducted the audit

CERTIFICATE OF VERIFICATION OF THE MEASURING INSTRUMENT

No.156

Valid to **"23" 04/2021**

This is to certify, that the measuring instrument

Aneroid barometer M-67 No. 3390

with metrological characteristics of 600-800 mmHg \pm 0.8 mmHg

manufactured (imported) Russia

owned by CM3

Tested by UzHydromet's DVMI

in accordance with the verification methodology

using P0 -30 No. 6699,

meets the requirements of the technical documentation of the manufacturer's plant and
is approved for use in the field of distribution of state metrological control and
supervision.

Verification date "16" 03 2021

Verifier

APPENDIX J - PARTICULATE MATTER CALIBRATION CERTIFICATE

Equipment used: Temptop 351

Certificate of Validation:

Temptop

Manufacturer's Certificate of Validation

Product Information

Product Name	Serial Number	Date of Calibration
PMD 351	TD5110322002	03/24/2021

STATEMENT OF CALIBRATION

The products mentioned on the following page have been thoroughly tested, validated and meet performance accuracy specifications over the stated ranges.

The certificate is valid for one year from the date of calibration.

REFERENCE EQUIPMENT

The calibration results on this report certify that this instrument complies with the product specification at the time of calibration.

Aerosol Mass Monitor PMB 200 Accuracy $\pm 10\%$

Environment Conditions

Temperature
25°C
Relative Humidity
60%

Validation Information

PSL Size(μm)	Test Results	Test Spec
PM1.0	Pass	$\pm 10\%$
PM2.5	Pass	$\pm 10\%$
PM4.0	Pass	$\pm 10\%$
PM10	Pass	$\pm 10\%$
TSP	Pass	$\pm 10\%$

This calibration certification shall not be reproduced except in full, without the written approval of Elitech Technology, Inc.

Approved by:

Jason Ma.

Elitech Technology, Inc.
Tel: (+1)408-898-2866

2528 Qume Dr, Ste 2
San Jose, CA 95131 USA

Sales: sales@temptopus.com
Website: www.temptopus.com

APPENDIX K - SOUND METER CALIBRATION CERTIFICATE

CERTIFICATE OF CALIBRATION

Model Name Integrating Sound Level Meter

Model Number ST-105

Serial Number LB0004

Microphone Serial No. 011272

Microphone Sensitivity -26.34 dB

Accuracy Class IEC61672 & IEC61760 Class 1

Date of Calibration 2021/03/12

Due Date 2022/03/11



Calibrated by:

Tim Lin

- I. This report certifies that all calibration equipment used in the test is traceable with the internal ISO9001 procedures and meets all specification given in the Manuals) or respectively purchase then, and applies only to the unit identified above.
- II. This certificate is produced with advanced equipment & procedures which permit comprehensive quality assurance verification of all data supplied herein.
- III. This certificate of calibration shall not be reproduced except in full, without written permission of the Scarlet Tech Co Ltd Taiwan.

Test Environment Air Temperature: 23°C Relative Humidity: 60% Air Pressure: 101.1 kPa.

Instrument Noise

Nominal	Actual Value	Upper Lim.
A Weighting	7.2 dB	18dB
C Weighting	7.6dB	23dB
Z Weighting	15.3dB	28dB

126-130 dB Deviation

Nominal	126	127	128	129	130
Actual Value	126.0	127.0	128.0	129.0	130.0

Peak C Noise (500Hz)

	Full Cycle	Half Cycle P+	Half Cycle P-
Nominal	3.5	2.4	2.4
Actual Value	3.5	2.2	2.3

Impulse (A Weight)

Single Impulse	LAFmax-LA	Lc10p-Lc	Lc5-Lc	Lc90-Lc
500 ms	-0.2	-4.4	-3.0	-7.0
10 ms	-11.8	-20.5	-20.0	-7.0

Frequency Response (A, C Electric Signals & Z Sound Signal)

Frequency	10	16	31.5	63	125	250	500	1k	2k	4k	8k	16k	20k
A Weight (dB)	-70.6	-56.8	-39.4	-26.3	-16.2	-8.7	-3.3	0.0	1.2	1.2	-0.5	-9.7	-21.0
C Weight (dB)	-5.0	-8.8	-3.2	-0.9	-0.2	-0.1	0.0	0.0	-0.1	-0.6	-2.3	-11.6	-23.0
Z Weight (dB)	-0.5	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.1

Function Check:

Appearance Check	OK
Accessories Check	OK
Button Key Check	OK
Low BAT Check	OK
Back Light Check	OK
Contrast Check	OK
USB Connector Check	OK
AC Output	OK
Flash Disk Transfer	OK
Clock	OK

Calibration & Test Certificate

To whom it may concern

We hereby certify that the instrument under mentioned has been certainly calibrated according to our calibration standard and the testing result in the calibration procedure has been good enough within the tolerance regulated in our specification.

Test conditions

Model name Class 1 Sound Level Calibrator
Model number ST-120
Serial number 210102612
Temperature 23° C
Humidity 60 %rh
Date of calibration 2021/03/12

Test data

Actual Value	Measured Value	Result
94 dB	94 dB	PASS
114 dB	114 dB	PASS

Calibrator

Model	Model Number	Serial Number	Due date
Standard SOUND LEVEL METER	B&K 2239	181001698	MAR/11/2022

The standard generators used for calibration procedure are proofed once a year and can be traceable to the standard authorized by public organization.

Approved by
Tim Lin, Head of Engineering Department



Tim Lin

CERTIFICATE OF CALIBRATION

Model Name Integrating Sound Level Meter
 Model Number ST-105
 Serial Number M70002
 Microphone Serial No. 011255
 Microphone Sensitivity..... -76.52 dB
 Accuracy Class..... IEC61672 & IEC61260 Class 1
 Date of Calibration 2021/03/12
 Due Date 2022/03/11



Calibrated by:

Lin Lin

- This report certifies that all calibration equipment used in the test is traceable with the internal ISO9001 procedures and meets all specifications given in the Manuals or respectively surpass them and applies only to the unit identified above.
- This certificate is produced with advanced equipment & procedures which permit comprehensive quality assurance verification of all data supplied herein.
- This certificate of calibration shall not be reproduced except in full without written permission of the Scarlet Tech Co., Ltd Taiwan.

Test Environment Air Temperature: 23°C, Relative Humidity: 60%, Air Pressure: 101.1 kPa.

Instrument Noise

Nominal	Actual Value	Upper Lim.
A Weighting	7.0 dB	10dB
C Weighting	9.6dB	23dB
Z Weighting	23.7dB	28dB

126-130 dB Deviation

Nominal	126	127	128	129	130
Actual Value	126.0	127.0	128.0	129.1	130.1

Peak C Noise (500Hz)

	Full Cycle	Half Cycle P+	Half Cycle P-
Nominal	3.5	2.4	2.4
Actual Value	3.5	2.2	2.2

Impulse (A Weight)

Single Impulse	Lower Ls	Lower Ls	Upper Ls	Upper Ls
500 ms	-0.1	-4.3	-2.9	-6.9
10 ms	-18.7	-20.0	-20.1	-21.0

Frequency Response (A, C Electric Signals & Z Sound Signal)

Frequency	10	16	31.5	63	125	250	500	1k	2k	4k	8k	16k	20k
A Weight (dB)	-70.5	-54.9	-39.4	-26.2	-16.2	-8.7	-3.2	0.0	1.3	1.2	-0.5	-9.8	-21.1
C Weight (dB)	-15.1	-0.7	-3.2	-0.8	-0.2	-0.2	0.0	0.0	-0.1	-0.6	-2.3	-11.5	23.0
Z Weight (dB)	-0.7	-0.5	-0.5	-0.4	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Function Check:

Appearance Check	OK
Accessories Check	OK
Button Key Check	OK
Low BAT Check	OK
Back Light Check	OK
Contrast Check	OK
USB Connector Check	OK
AC Output	OK
Fresh Disk Transfer	OK
Clock	OK

Calibration & Test Certificate

To whom it may concern

We hereby certify that the instrument under mentioned has been certainly calibrated according to our calibration standard and the testing result in the calibration procedure has been good enough within the tolerance regulated in our specification.

Test conditions

Model name Class 1 Sound Level Calibrator
 Model number SF-120
 Serial number 210102633
 Temperature 23° C
 Humidity 60 %rh
 Date of calibration 2021/03/12

Test data

Actual Value	Measure Value	Result
94 dB	94 dB	PASS
114 dB	114 dB	PASS

Calibrator

Model	Model Number	Serial Number	Due date
Standard SOUND LEVEL METER	BSK 2238	181001638	MAR/1/2022

The standard generators used for calibration procedure are proofed once a year and can be traceable to the standard authorized by public organization.

Approved by

Tim Lin, Head of Engineering Department





SCARLET TECH

Certificate of Conformity for ST-WL11 Wireless Anemometer

The ST-WL11 Wireless Anemometer was produced following precise factory standard procedure. The accuracy of wind speed sensor was tested and calibrated against internal standards following the methods below. This Certificate of Conformity is issued to certify that the device performed in compliance with the specification provided in ST-WL11 User Manual at the time of manufacture.

Manufacturer: Scarlet Tech Ltd
Address: 347, 4F-3 HePing E Rd, 2nd Sec, DaAn Dis, Taipei City, Taiwan
Description of EUT: Wireless Wind Logger
Model Name: ST-WL11

Electronics Technical Standard



Emission

EN 61326-1:2006 Class B
CISPR 11:2003/A1:2004/A2:2006 Group 1 Class B Specification for radio disturbance and immunity measuring apparatus and methods

Immunity

EN 61326-1:2006
EN 61000-3-2:2006 Electromagnetic compatibility (EMC)
EN 61000-3-3:2008

The EUT described above has been tested by us with listed standards and found in compliance with the council EMC directive 2004/108/EC. It is possible to use CE marking to demonstrate the compliance with this EMC Directive. These products have been independently tested and demonstrated to comply with the technical requirements concerning the applied section of the above test standards for electrical equipment for measurement, control and laboratory use.

Methods and Testing Environment

Methods Used in Calibration and Testing: Wind Speed / Air Flow. Every Scarlet anemometer is individually tested in a subsonic wind tunnel operating at approximately 1200 rpm (6.1 m/s) monitored by an ultrasonic hot-wire anemometer calibrated at low and high speeds to a minimum of $\pm 0.6\%$ and further verified on a regular schedule by Scarlet's internal measurement assurance program.

Approved by Ethan Lin
Ethan Lin, Head of Engineering Department

CE Certificate Passed in July 2020

Certificate of Calibration

WL-11 Wireless Anemometer

Scarlet Tech Ltd. hereby certifies that the WL-11 wireless anemometer listed below was thoroughly calibrated, tested and inspected following the standard calibration procedure (st-wl-11) and is within manufacturer's specification at the time when the calibration is done

Atmosphere Pressure: 1008.6 mmHg

Serial Number: SN1402XD

Calibration Date: 03/19/2021

Calibration Expiry Date: 03/18/2022

Calibration Details:

Measured Value (m/s)	Actual Value (m/s)	Deviation	Tolerance	Result
1.0	1.0	0.0	0.9 - 1.1	Pass
2.0	2.0	0.0	1.8 - 2.2	Pass
5.0	5.0	0.0	4.7 - 5.3	Pass
10.0	10.0	0.0	9.5 - 10.5	Pass
20.0	19.9	0.1	19.0 - 21.0	Pass

Performed by:



Jim Lin

Certified by
Head of Engineering department

This certificate may not be published or reproduced, except in full, unless obtaining permission in writing form from Scarlet Tech Ltd.
4F-3, No. 347, 2nd Sec., Heping E. Rd., Daan Dist, Taipei City 106, Taiwan



SCARLET | TECH

Certificate of Conformity for ST-WL11 Wireless Anemometer

The ST-WL11 Wireless Anemometer was produced following precise factory standard procedure. The accuracy of wind speed sensor was tested and calibrated against internal standards following the methods below. This Certificate of Conformity is issued to certify that the device performed in compliance with the specifications provided in ST-WL11 User Manual at the time of manufacture.

Manufacturer: Scarlet Tech Ltd.

Address: 347, 4F-3 HePing E Rd, 2nd Sec, DaAn Dis, Taipei City, Taiwan

Description of EUP: Wireless Wind Logger

Model Name: ST-WL11

Electronics Technical Standard



Emission

CISPR 12:2006 Class B

CISPR 11:2003/A1:2004/A2:2006 Group 1 Class B Specification for radio disturbance and immunity measuring apparatus and methods

Immunity

EN 61326-1:2006

EN 61000-3-2:2006 Electromagnetic compatibility (EMC)

EN 61000-3-3:2006

The EU1 described above has been tested by us with listed standards and found in compliance with the Council EMC directive 2004/108/EC. It is possible to use CE marking to demonstrate the compliance with this EMC Directive. These products have been independently tested and demonstrated to comply with the technical requirements concerning the applied sections of the above test standards for electrical equipment for measurement, control and laboratory use.

Methods and Testing Environment

Methods Used in Calibration and Testing: Wind Speed / Air Flow. Every Scarlet anemometer is individually tested in a subsonic wind tunnel operating at approximately 1200 rpm (6.1 m/s) monitored by an ultrasonic time-of-flight anemometer calibrated at low and high speeds to a minimum of $\pm 0.05\%$ and further verified on a regular schedule by Scarlet's internal measurement assurance program.

Approved by

Ethan Lin

Ethan Lin, Head of Engineering Department

CE Certificate Passed in July 2020

Certificate of Calibration

WL-11 Wireless Anemometer

Scarlet Tech Ltd. hereby certifies that the WL-11 wireless anemometer listed below was thoroughly calibrated, tested and inspected following the standard calibration procedure (sl-wl-11) and is within manufacturer's specification at the time when the calibration is done.

Atmosphere Pressure: 1008.6 mmHg

Serial Number: SN1401XD

Calibration Date: 03/19/2021

Calibration Expiry Date: 03/18/2022

Calibration Details:

Measured Value (m/s)	Actual Value (m/s)	Deviation	Tolerance	Result
1.0	1.0	0.0	0.9 - 1.1	Pass
2.0	2.0	0.0	1.8 - 2.2	Pass
5.0	5.1	0.1	4.7 - 5.3	Pass
10.0	10.0	0.0	9.5 - 10.5	Pass
20.0	20.1	0.1	19.0 - 21.0	Pass

Performed by:



Certified by
Head of Engineering Department

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APPENDIX L - NOISE MODELLING STUDY

Dzhankeldy Wind Farm, Uzbekistan Noise Assessment


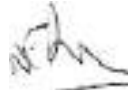
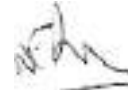
December 2021





Dzhankeldy Wind Farm, Uzbekistan

Noise Assessment

Revision	Date	Notes	Author	Checked	Approved
Ver. 6	06-12-21	Env - Noise	Sunil Patel	Nick Davey	Nick Davey
					

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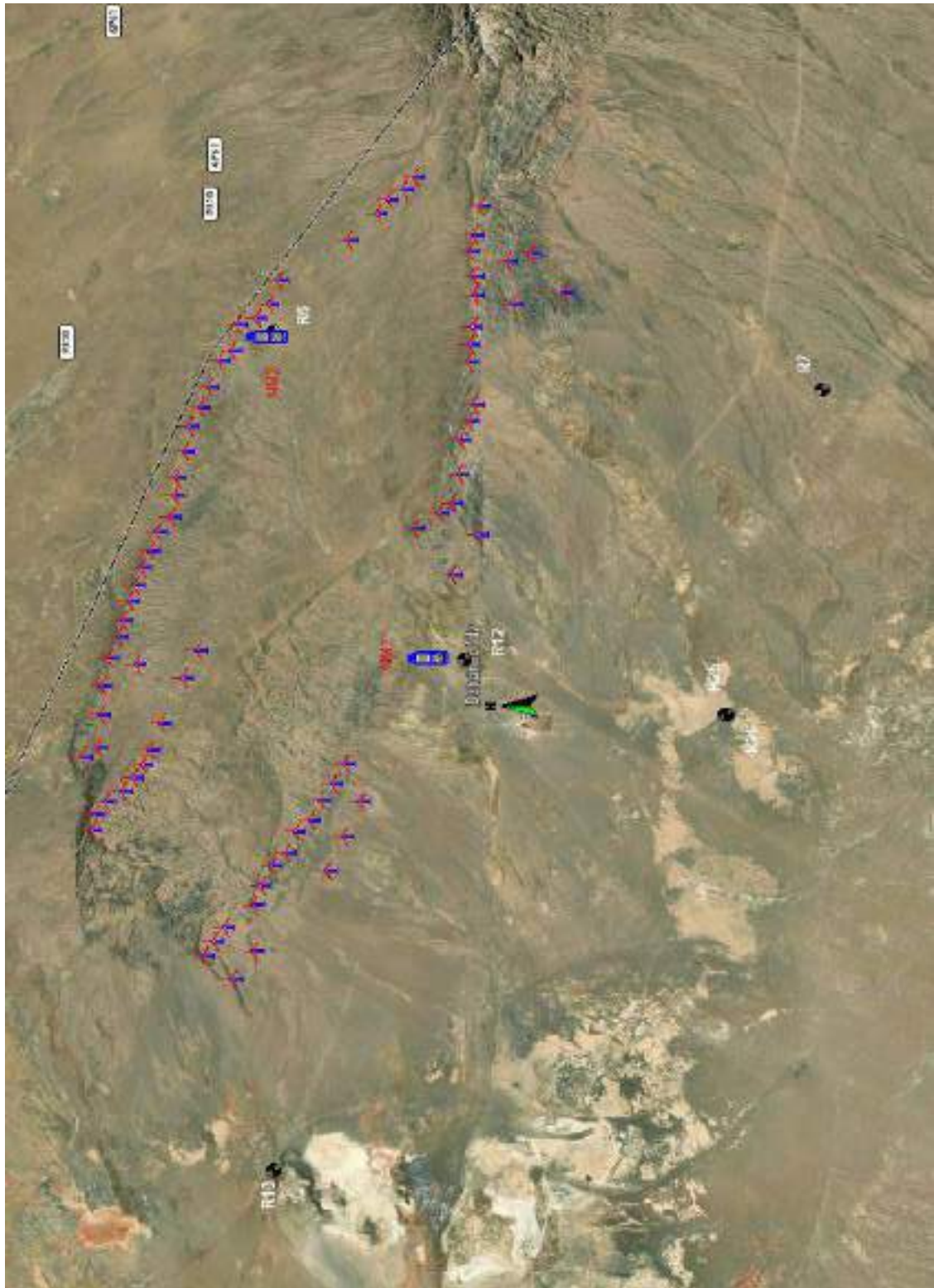
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1 INTRODUCTION

- 1.1 Entran Ltd have been commissioned to provide a noise assessment for the project known as the 'Dzhankeldy Wind Farm', Uzbekistan. The project site is in the Peshku district towards the south-west of Uzbekistan. This report presents the results of the noise model constructed to identify potential effects at nearby noise sensitive receptors.
- 1.2 This noise assessment has been undertaken in accordance with the World Bank Group/International Finance Corporation's (IFC) environmental guidelines on Wind Energy.
- 1.3 The 500MW wind farm will be made of 79 Envision (6.5MW) turbines (WTG) and ancillary equipment. The general site location is presented in Figure 1 and the receptors are presented in Table 1.1
- 1.4 This Report is necessarily technical in nature and contains terminology relating to acoustics and noise. Therefore, a glossary together with a brief introduction to the subject of noise has been provided in Appendix A.

Figure 1 Dzhankeledy Wind Farm Project, Turbine, Receptor & Survey Locations





1.5 For the purposes of this study all nearby human settlements and ecological sites are considered to be noise sensitive as shown in Table 1.1.

Table 1.1 Identification of Sensitive Receptors

Receptor	Location WGS84 (Zone41N) UTM	Nearest WTG	Distance to Nearest WTG, m	Ground height at receptor, m	Description
R6	537207, 4527104	DZH36	533	416	Active Settlement within site boundary (seasonal residential)
R7	535639.6, 4513782	DZH55	6784	241	Active Settlement within site boundary (seasonal residential)
R12	528463, 4522463	DZH70	2264	214	Dzhankeldy Village (Mixed use, residential/educational/agricultural)
R13	514748, 4527095	DZH83	5244	178	Kalaata Village (Mixed use, residential/commercial)
R25	526957.6, 4516079	DZH70	7657	175	Ecological use (temporary water body)
R26	526982.6, 4516053	DZH70	7668	175	Ecological use (temporary water body)



2 NOISE ASSESSMENT CRITERIA

World Bank Group/International Finance Corporation

- 2.1 The Environmental, Health and Safety' Guidelines for Wind Energy (2015) sets the following screening criteria for wind farms:

"Preliminary modelling should be carried out to determine whether more detailed investigation is warranted. The preliminary modelling can be as simple as assuming hemispherical propagation (i.e., the radiation of sound, in all directions, from a source point). Preliminary modelling should focus on sensitive receptors within 2,000 meters of any of the turbines in a wind energy facility."

*"If the preliminary model suggests that turbine noise at all sensitive receptors is likely to be below an **LA90 of 35 decibels (dB) (A) at a wind speed of 10 meters/second (m/s) at 10 m height** during day and night times, then this preliminary modelling is likely to be sufficient to assess noise impact; otherwise it is recommended that more detailed modelling be carried out, which may include background ambient noise measurements."*

- 2.2 The EHS Guidelines for Wind Energy (2015) do not provide a noise limit other than the screening limit and therefore the general IFC guidance has been applied in common with other such projects.
- 2.3 The IFC / World Bank Environmental, Health, and Safety General Guideline (1.7 Noise (2007) is therefore applied for the Dzhankeldy Wind Farm project and presented below in Table 2.1.



Table 2.1 IFC/World Bank Group Noise Level Guideline (adopted from WHO guidance)

Receptor	L _{Aeq,T} (dB)	
	Daytime 07:00 – 22:00	Night time 22:00 – 07:00
Residential, Institutional, Educational	55	45
Industrial, Commercial	70	70

- 2.4 The above guideline values are expressed in terms of L_{Aeq,T} and for the comparison with the L_{A90,T} parameter used for the preliminary assessment, a correction of -2 dB has to be applied (the limit for residential use is therefore 53 dB L_{A90,T} during the day and 43 dB L_{A90,T} during the night).
- 2.5 The above noise limits can be revised to allow for a 5 dB increase over ambient noise levels in the following manner:
- Daytime: The higher of 53 dB(A) or 5 dB(A) above the prevailing day-time background noise level;
 - Night-time: The higher of 43 dB(A) or 5 dB(A) above the prevailing night-time background noise level. Good practice is not to normally exceed the absolute noise criteria or the background noise level.

Uzbekistan National Standards

- 2.6 Given the proximity of the nearby communities, it is expected that the applicable residential standards will be applicable to the Project. SanPiN No. 0339-16 “Sanitary rules and norms of planning and development of settlements of Uzbekistan provides criteria for noise levels at residential areas.
- 2.7 The guideline criteria for residential areas are set out in Table 2.2 below.



Table 2.2 National Noise Standards

Receptor	Uzbekistan, SanPiN No. 0325-16.	
	Daytime (07:00 to 23:00) $L_{Aeq,T}$ dB	Night-time (23:00 to 07:00) $L_{Aeq,T}$ dB
Residential, institutional, educational	55	45
Industry, commercial	75	70

- 2.8 For sensitive locations (e.g., residential use buildings), the noise limits for the Uzbekistan's National guidance are the same as the IFC guidance.
- 2.9 The above guideline values are expressed in terms of $L_{Aeq,T}$ and for the comparison with the $L_{A90,T}$ parameter used for the preliminary assessment, a correction of -2 dB has to be applied.
- 2.10 The calculation methodology for assessment purposes is outlined in International Standard ISO 9613-2:1996 ('Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation'). The standard specifies an engineering method for calculating noise at a known distance from a variety of sources under meteorological conditions favourable to sound propagation. The standard defines favourable conditions for light downwind propagation where the wind blows from all the turbines to the receiver(s) within an angle of +/-45 degrees from a line connecting each turbine to each receiver, at wind speeds between approximately 1 m/s and 5 m/s, measured at a height of 3 m to 11 m above the ground. Equivalently, the method accounts for average propagation under a well-developed moderate ground based thermal inversion. In this respect, it is noted that at the wind speeds relevant to noise levels from wind turbines, atmospheric conditions do not favour the development of thermal inversions throughout the propagation path from the source to the receiver.
- 2.11 The general calculation method considers the following attenuation corrections:



- Geometric divergence
- Air absorption
- Reflecting obstacles
- Screening
- Vegetation
- Ground reflections

2.12 Attenuation due to the above factors is applied to the sound power levels of the noise sources to derive the resulting noise levels at the receptors.

2.13 Wind turbines are sound sources with special characteristics, such as wind speed dependent sound power levels, high source heights etc., which require special considerations. These parameter adjustments are chosen in combination (see Table 2.3) to give a more reliable calculation methodology.

Table 2.3 ISO9613 Parameters used in the Preliminary Noise Assessment.

Calculation Parameter ISO 9613	Observation
Agr = -3 (Geometrical divergence)	Normal correction for wind farms
Cmet = 0 (Metrological corrections)	Normal correction for wind farms (downwind propagation)
Terrain obstacles correction = 0 (site specific)	Normal correction for wind farms (site specific for a worst-case assessment)
Temperature = 10 ⁰ C; Relative Humidity = 70%	Normal correction for a worst-case assessment for sound propagation.
Correction of results from L _{Aeq,T} to L _{A90,T} by -2dB.	Normal correction in the UK and some other countries but not universally applied by all countries.
For propagation of turbine sound to a receptor across a valley with a concave profile, a correction of +3 dB must be applied.	Normal correction for wind farms.
Ground Absorption Factor, G=0.5	The normal correction for wind farms in the UK, Germany, NZ and Australia is G=0.5.



3 NOISE SURVEYS

- 3.1 As mentioned earlier in this report, criteria based upon the ambient noise levels at reference speeds (e.g. 10 m/s at 10m) are routinely applied with an allowance of 5 dB above the prevailing noise level or the criteria presented in Tables 2.1 and 2.2 (whichever is the highest).
- 3.2 Background noise monitoring was conducted by contractors employed by 5C Limited at two proxy locations (NM1 & NM2) in lieu of the human settlements/ecological sites shown in Figure 1. The monitoring survey duration was between 20th July 2021 and 9th August 2021. Survey details are published elsewhere. Ten-minute intervals were recorded, with the $L_{A90,10min}$ readings synchronised with the site's wind mast data to determine background noise levels.
- 3.3 It is understood that all acoustic measurement equipment used during the noise surveys conformed to Type 1 specification of British Standard 61672: 2013: *Electroacoustics. Sound level meters. Part 1 Specifications*. The noise measurement equipment used during the surveys were calibrated at the start and end of the measurement period. No significant drift in calibration was found to have occurred on the sound level meter.
- 3.4 The regression analysis of the monitored noise levels is presented below (for a reference wind speed at 10m/s and a height of 10m). As observed over the course of the monitoring survey, it was evident that there was, apart from wind noise, an absence of any other significant noise source(s). Therefore, to gather sufficient data for the regression analysis, daytime and evening periods were aggregated to the period 0700 to 2300 hrs (as per the adopted criteria). The night-time period remains between 2300 to 0700 hrs.
- 3.5 The regression analysis is presented below in Figures 3.1 to 3.4.



Figure 3.1 Daytime Noise Levels for Survey Location NM1

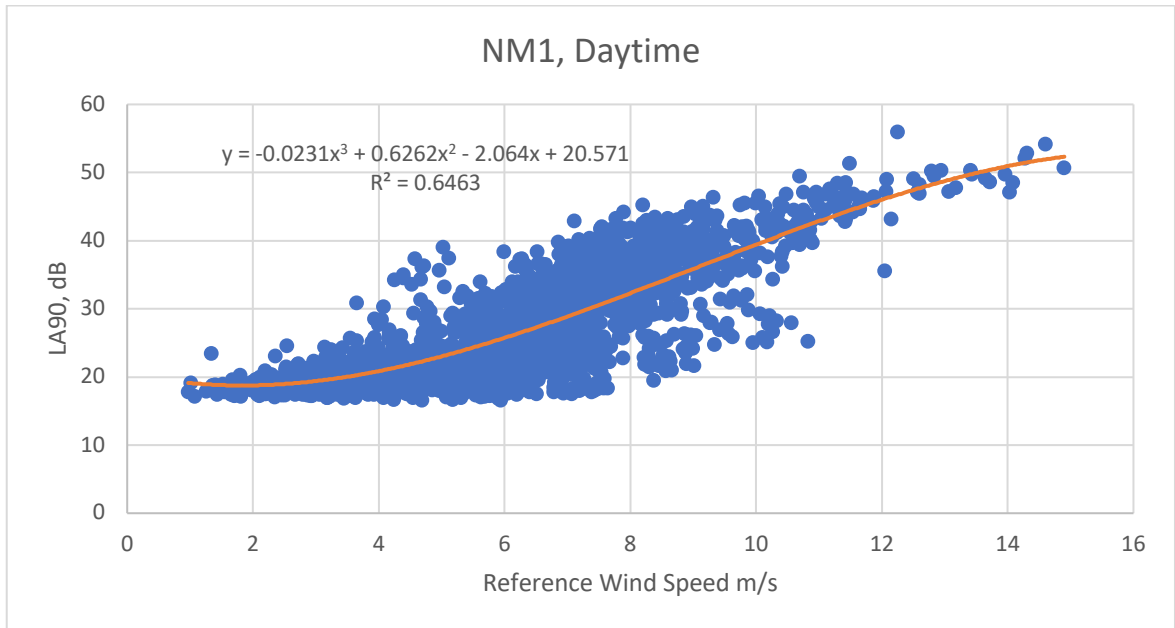


Figure 3.2 Night-time Noise Levels for Survey Location NM1

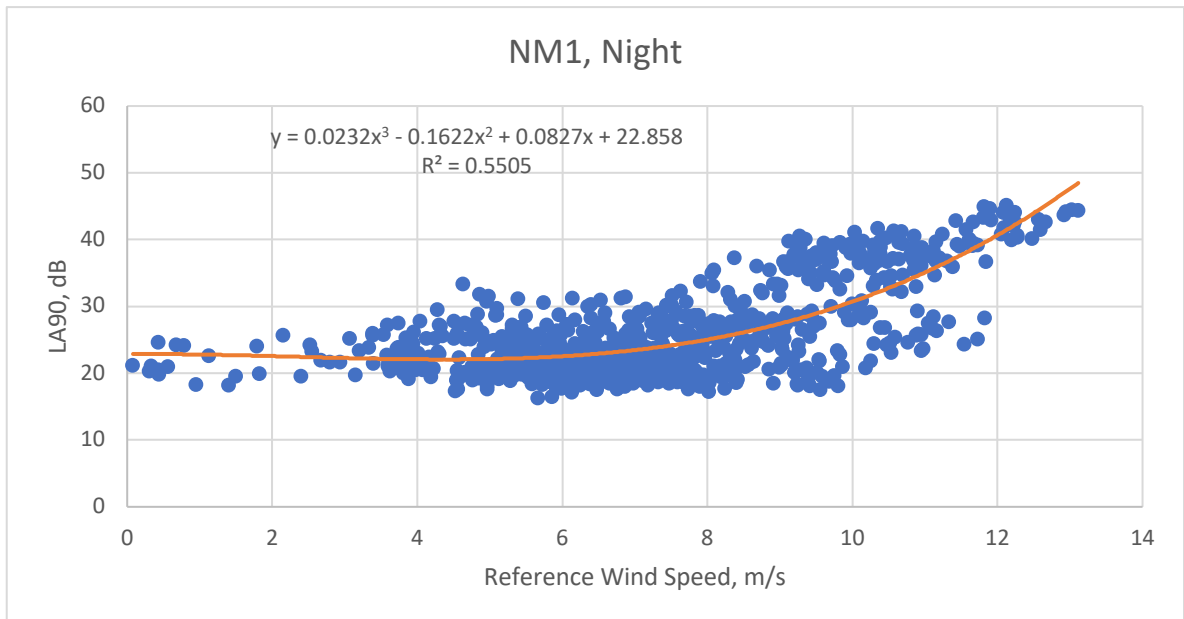


Figure 3.3 Daytime Noise Levels for Survey Location NM2

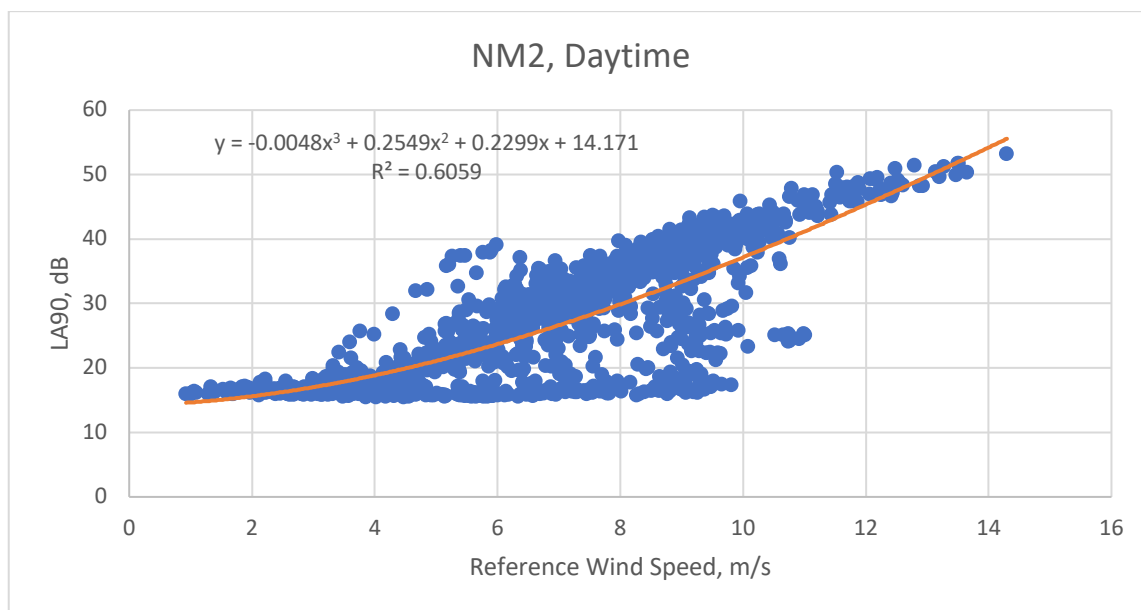
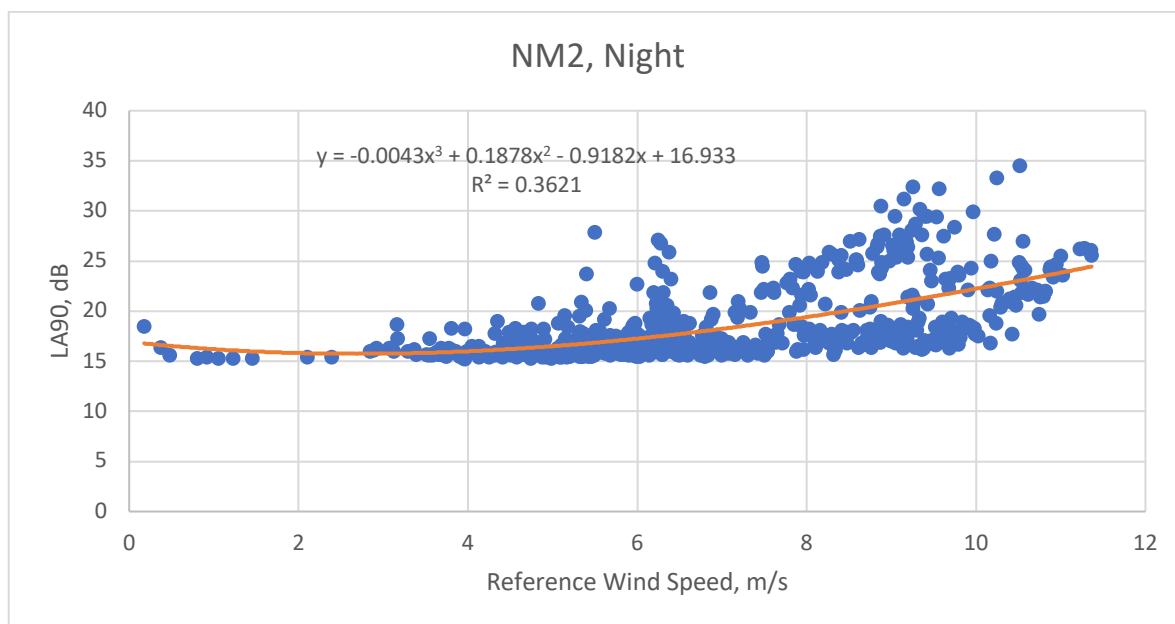


Figure 3.4 Night-time Noise Levels for Survey Location NM2



3.6 The derived background noise limits are shown below. NM1 is a proxy site for receptors R7, R12, R13 (all residential) and R25/26 (ecological). NM2 is a proxy site for receptor R6 (settlement).



Table 3.1 Derived Background Noise Limits

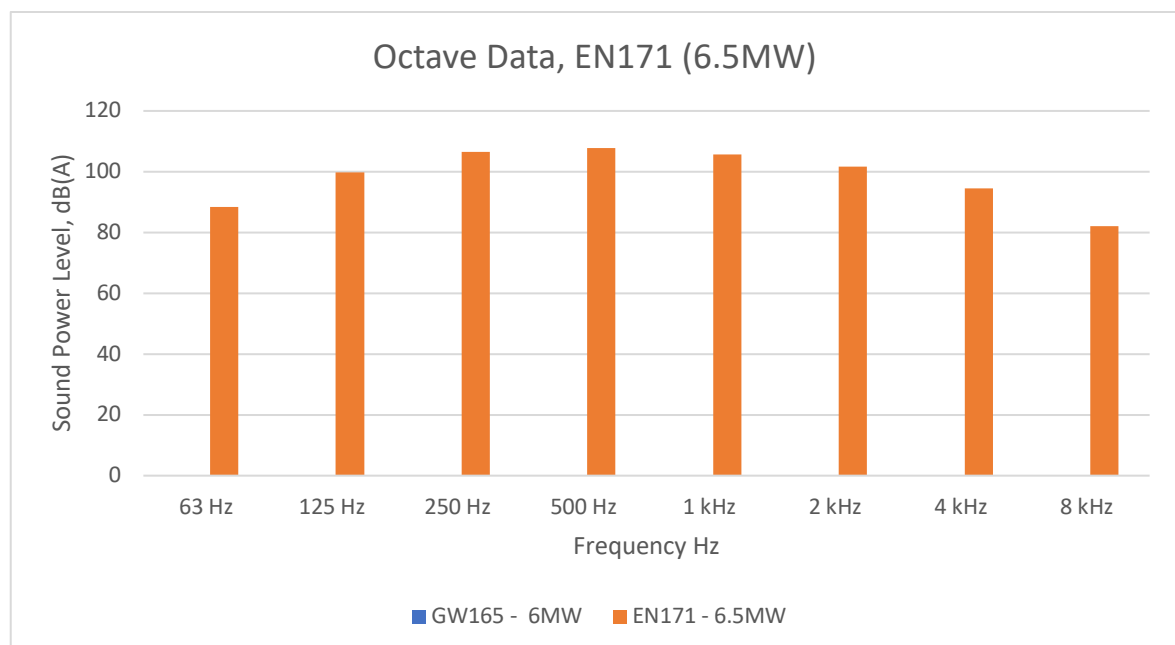
Location	Noise Level at Reference Wind Speed (10 m/s at 10m), $L_{A90,T}$ dB	Derived Criteria based on Background Noise levels, $L_{A90,T}$ dB (10 m/s). See Paragraph 2.5.
	Day/Night	Day/Night
R6	37/22	53/43
R7	40/31	53/43
R12	40/31	53/43
R13	40/31	53/43
R25	40/31	53/43
R26	40/31	53/43

4 NOISE ASSESSMENT

Turbine Data

- 4.1 The sound power levels of the turbines in octave bands are presented below in Figure 4.1 for the hub height wind speed of 10m/s. The hub heights of the EN171 turbine are at 100m relative to the ground. The layout details are presented in Appendix B.

Figure 4.1 Octave Data for the turbines (hub height, 10m/s, not adjusted for uncertainty)



- 4.2 All the above sound power levels are not guaranteed by the manufacturer and therefore, for the purposes of noise modelling, an uncertainty of +2 dB has been applied for a worst-case assessment. The +2 dB addition to the sound power levels is in accordance with good practice guidance and is routinely applied for wind farm projects where there is no manufacturer's warranty.

Other Acoustic Considerations

- 4.3 The WBG/IFC guidelines does not consider other factors such as tonality. It is understood from the turbine manufacturers' advice that tonality will not be an issue for receptors beyond 300m from the nearest turbine. For receptors within 300m of a turbine, a tonal penalty of 5 dB is applied as per normal international guidance.



Calculation of Noise Levels at Receptors

- 4.4 Noise levels at the receptors has been calculated using the noise-modelling suite IMMI2021 (recognised by the European Union and the UK Government), in accordance with the ISO 9613 prediction methodology (applied with the above-mentioned calculation modifications).
- 4.5 In addition to the uncertainty adjusted turbine sound power levels used in the calculations, the model also considers the effects of the topographical conditions throughout the area as well as applying a light downwind propagation correction to represent worst case. The model considers the noise 'emission' of each turbine and calculates the accumulative noise level at each receptor in accordance with the ISO9613 methodology discussed in Table 2.3.
- 4.6 The topography model was obtained from the (Space) 'Shuttle Radar Topography Mission', (SRTM), at 30m resolution. Turbine layout supplied by the client is presented in Appendix B. Noise levels have been calculated at the first-floor height (4m above ground). None of the receptors fit the 'concave' profile and therefore further corrections have not been added.
- 4.7 The results of the noise model (for Dzhankeldy Wind Farm) are shown below in Table 4.1. The difference in ground level to the first floor is not significant due to the high noise sources and therefore long slant distances as well as long horizontal distances and the limitations imposed on the ISO9613 methodology set out in Table 2.3. Noise contours centred at Receptors R6 and R12 at wind speeds 5 m/s and 10 m/s are presented in Appendix C.



Table 4.1 Noise Levels at Receptors (rounded) - First Floor (4m above ground)

Receptor	Location	Nearest Turbine	Distance to Nearest Turbine	5m/s	6m/s	7m/s	8m/s	9m/s	10m/s
			(m)	L _{A90,T} dB					
R6	537207, 4527104	DZH36	533	39.5	41.9	45.3	48.1	49.5	49.8
R7	535639.6, 4513782	DZH55	6784	15.7	18.2	21.5	24.4	25.8	26.1
R12	528463, 4522463	DZH70	2264	26.0	28.4	31.8	34.6	36.0	36.3
R13	514748, 4527095	DZH83	5244	17.3	19.8	23.1	26.0	27.4	27.7
R25	526957.6, 4516079	DZH70	7657	15.1	17.6	20.9	23.8	25.2	25.5
R26	526982.6, 4516053	DZH70	7668	15.1	17.6	20.9	23.8	25.2	25.5

4.8 For the Dzhankeldy Wind Farm project, compliance with the relevant criteria is set out in Table 4.2.

Table 4.2 Compliance with IFC/Uzbekistan Assessment Limits (10m/s)

Receptor	Compliant with the Initial IFC 35 dB L _{A90,T} criterion	Compliant with the IFC General / Uzbekistan Daytime 53 dB criteria?	Compliant with the IFC General / Uzbekistan Night-time 43 dB criteria?	Receptor Classification
R6	N	Y	N	Active Settlement within site boundary (seasonal residential)
R7	Y	Y	Y	Active Settlement within site boundary (seasonal residential)
R12	N	Y	Y	Dzhankeldy Village (Mixed use, residential/educational/agricultural)
R13	Y	Y	Y	Kalaata Village (Mixed use, residential/commercial)
R25	Y	Y	Y	Ecological use (Temporary water body)
R26	Y	Y	Y	Ecological use (Temporary water body)

4.9 As can be seen from Table 4.2, two receptors are above the WBG/IFC's initial 35 dB L_{A90,T} criterion and further detail studies including noise surveys have undertaken for these and other receptors. However, as shown in Section 2 of this report, the WBG/IFC General guidelines as well as the Uzbekistan National Standards limits still apply. Only receptor R6 (located within the project site) is above the night-time criteria set out by WBG/IFC General Guidelines/Uzbekistan national guidance and will therefore require mitigation measures if this receptor is considered to be noise sensitive.



Mitigation Measures

- 4.10 It is understood that receptor R6 is in a Health Protection Zone and due to the adverse Social Impact, this receptor will be relocated 500m or further away and therefore, be within the IFC/Uzbekistan Guidelines.
- 4.11 It should also be noted that the noise output of a turbine varies with the wind speed and therefore the noise climate attributable to the wind farm will not always be at a worst-case output at 10 m/s or greater.



5 CONCLUSIONS

- 5.1 A noise assessment has been undertaken for the proposed Dzhankeldy Wind Farm project in accordance with the World Bank Group/International Finance Corporation's guidelines for Wind Energy. The project will consist of 79 Envision EN171 turbines (6.5MW) at a hub-height of 100m.
- 5.2 Noise levels at a sample set of receptors was calculated using a modified version (for wind farms) of ISO 9613-2:1996, for each of the turbine options and assessed against the criteria outlined by World Bank Group/International Finance Corporation's environmental guidance on Wind Energy projects. The WBG/IFC guidelines are considered in two parts; part one is for the initial study to ascertain whether any of the receptors are above a threshold value of 35 dB $L_{A90,T}$ and part two is the assessment of receptor noise levels against the general guidance criteria of, for example, residential receptors, 55 dB $L_{Aeq,day}$ or 45 dB $L_{Aeq,night}$ (corrected to 53 dB $L_{A90,day}$ and 43 dB $L_{A90,night}$). Similarly, national Uzbekistan guidance also outlines the noise limits 55 dB $L_{Aeq,day}$ and 45 dB $L_{Aeq,nigh}$ for sensitive areas.
- 5.3 The assessment concludes that two receptors (R6 & R12) is above the initial WBG/IFC guideline value of 35 dB $L_{A90,T}$ and therefore further background noise surveys have been undertaken. However, as shown in Section 2 of this report, the WBG/IFC General Guidelines as well as the Uzbekistan limits still apply. Only receptor R6 (within the project site) is above the night-time criteria set out by WBG/IFC General Guidance/Uzbekistan national guidance. It is understood that receptor R6 is in a Health Protection Zone and due to the adverse Social Impact, this receptor will be relocated 500m or further away and therefore, be within the IFC/Uzbekistan Guidelines.



APPENDIX A – INTRODUCTION TO NOISE

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0 dB (the threshold of hearing) to over 120 dB.

The ear is less sensitive to some frequencies than to others. The A-weighting scale is used to approximate the frequency response of the ear. Levels weighted using this scale are commonly identified by the notation dB(A).

A noise impact on a community is deemed to occur when a new noise is introduced that is out of character with the area, or when a significant increase above the pre-existing ambient noise level occurs. For levels of noise that vary with time, it is necessary to employ a statistical index that allows for this variation. These statistical indices are expressed as the sound level that is exceeded for a percentage of the time period of interest.

The L_{A90} is the level exceeded for 90% of the time and has been adopted to represent the background noise level in the absence of discrete events. An alternative way of assessing the time varying noise levels is to use the equivalent continuous sound level, L_{Aeq} . This is a notional steady level that would, over a given period of time, deliver the same sound energy as the actual fluctuating sound.

To put these quantities into context, where a receiver is predominantly affected by continuous flows of road traffic, a doubling or halving of the flows would result in a just perceptible change of 3dB, while an increase of more than 25%, or a decrease of more than 20%, in traffic flows represent changes of 1dB in traffic noise levels (assuming no alteration in the mix of traffic or flow speeds).



Table A1: Glossary of Terms

Term	Definition
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s_1 and s_2 is given by $20 \log_{10} (s_1/s_2)$. The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is $20\mu\text{Pa}$.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
$L_{eq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level during the period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. L_{90} can be considered to be the "average minimum" noise level and is often used to describe the background noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near ($L_{Aeq,T}$).



APPENDIX B – WIND FARM LAYOUT



Turbine Layout

WTG ID	Easting (m)	Northing(m)	Absolute Hub Height, m
DZH01	523872	4531497	478.4
DZH02	524297	4531433	477.2
DZH03	524643	4531170	460.7
DZH04	524910	4530761	461.3
DZH05	525280	4530496	444.8
DZH06	525629	4530242	431.1
DZH07	526043	4530094	411.6
DZH08	526741	4529822	385.1
DZH09	527954	4529288	363
DZH10	528673	4528939	347.6
DZH11	525826	4531721	395.6
DZH12	526112	4531374	431.8
DZH13	526964	4531307	422.2
DZH14	527736	4531249	416.2
DZH15	528321	4530438	411.3
DZH16	528487	4531100	418.1
DZH17	529060	4530849	420.4
DZH18	529495	4530757	427.6
DZH19	529984	4530607	414.9
DZH20	530428	4530448	410.5
DZH21	530912	4530290	403
DZH22	531336	4530102	400.6
DZH23	531866	4529917	406.4
DZH24	532239	4529599	401.9
DZH26	532814	4529492	385.5
DZH27	533299	4529447	392.1
DZH28	534011	4529246	379
DZH30	534683	4529135	377
DZH31	535190	4528885	380.9
DZH32	535714	4528680	387
DZH33	536425	4528421	410.3
DZH34	536704	4528094	427.4
DZH35	537399	4527980	425.4
DZH36	537563	4527500	432.2
DZH37	537939	4527191	397.4
DZH38	538571	4526945	389.4
DZH39	539662	4525287	383.7



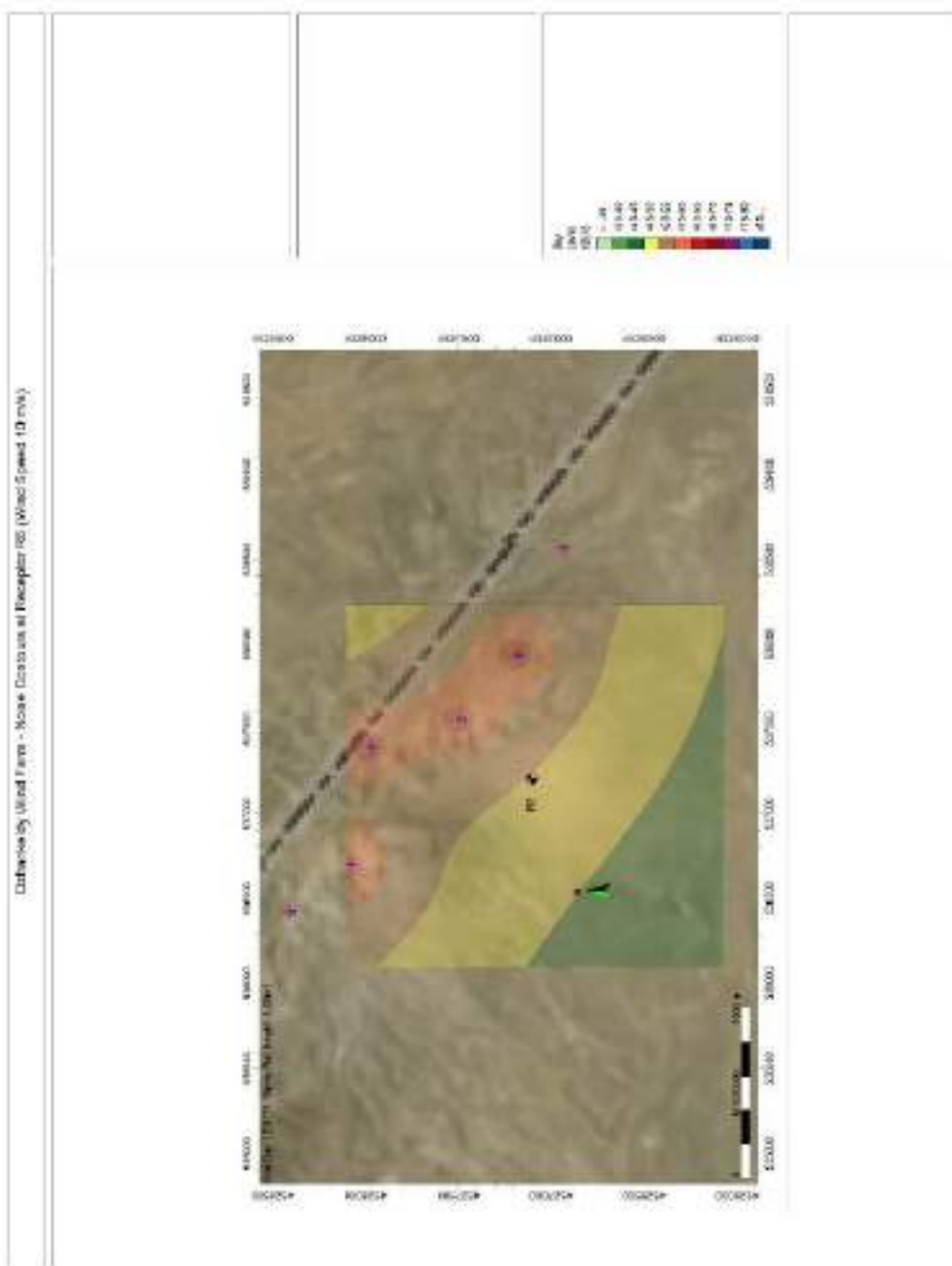
DZH41	540356	4524556	401.8
DZH42	540749	4524298	416.2
DZH43	541000	4523942	426.8
DZH44	541336	4523661	436.9
DZH49	540573	4522053	492.6
DZH50	539783	4522199	480
DZH51	539351	4522298	487.2
DZH52	538691	4522216	472.7
DZH53	539094	4521400	479.6
DZH54	539275	4520827	437.6
DZH55	538242	4520032	405.8
DZH56	537939	4521277	443.2
DZH57	538161	4522225	459.5
DZH58	537350	4522248	457.5
DZH59	536878	4522298	448.1
DZH60	536400	4522364	455.9
DZH61	535236	4522211	464.9
DZH62	534827	4522346	493.8
DZH63	534293	4522549	496.7
DZH64	533390	4522577	477.2
DZH65	532638	4522744	419.7
DZH66	532343	4523058	365.1
DZH67	531944	4523646	353.1
DZH68	531786	4522101	342.1
DZH70	530709	4522738	298.1
DZH71	525645	4525334	294.4
DZH72	525127	4525643	305.7
DZH73	524697	4525960	307.9
DZH74	524155	4526189	311.7
DZH75	523857	4526541	315.7
DZH76	523276	4526793	303.5
DZH77	522921	4527140	316.8
DZH78	522382	4527399	302.8
DZH79	521874	4527574	305.8
DZH80	521274	4528278	314.4
DZH81	520900	4528531	324.3
DZH82	520507	4528791	345.4
DZH83	519902	4528052	294.9
DZH84	520658	4527568	283.3
DZH86	522799	4525794	263
DZH87	523711	4525380	272.2
DZH88	524661	4524971	271.6



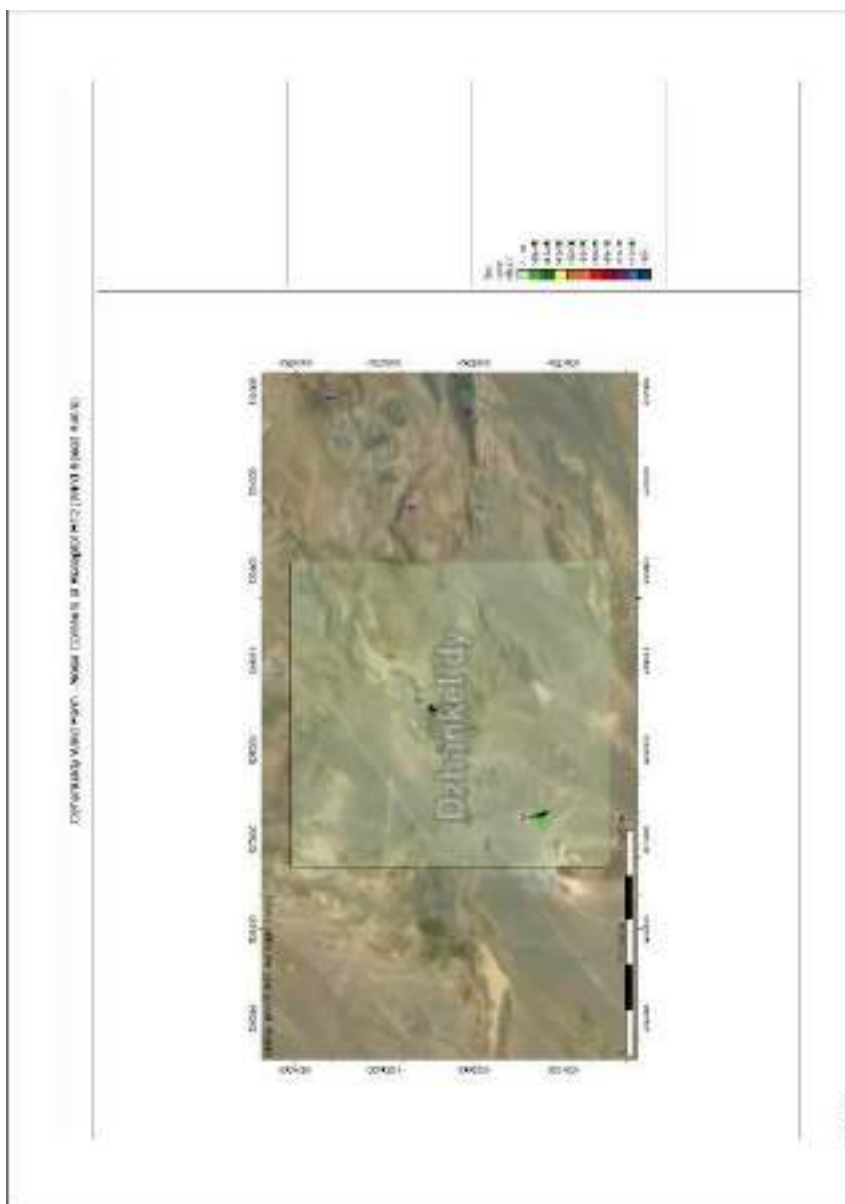
APPENDIX C – NOISE MAPS AT RECEPTORS R6 & R12



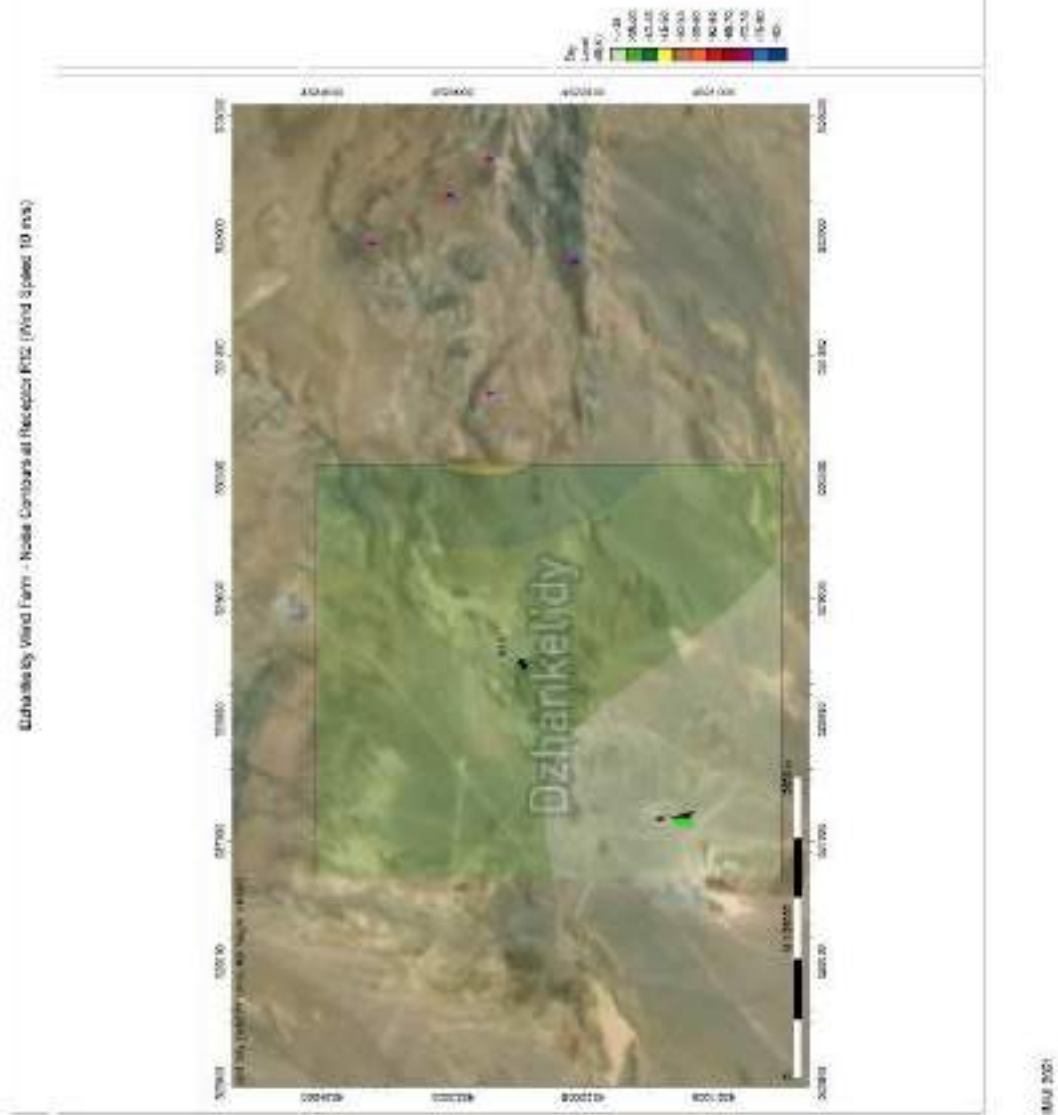
Noise Contours at Receptor R6 (10 m/s Wind Speed)



Noise Contours at Receptor R12 (5 m/s Wind Speed)



Noise Contours at Receptor R12 (10 m/s Wind Speed)



APPENDIX M - SOIL LABORATORY RESULTS – WIND FARM

Assessment of soil quality

UZBEKISTAN DZHANKELDY 500 MW WIND FARM PROJECT:

LOCAL SUPPORT IN THE DEVELOPMENT, SUBMISSION AND APPROVAL OF ESIA

CLIENT: 5CAPITALS

Date: May 2021

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May 2021

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Abbreviations/Acronyms

ICP-MS – Inductively coupled plasma mass spectrometry

ISE's - Ion-selective electrodes

JE – Juru Energy

MS – Mass spectrometry

SE - State Enterprise

WF – Wind Farm

INTRODUCTION

The project area of the planned Dzhankeldy 500 MW Wind Farm is located in Peshku district of Bukhara region. The site is divided into two plots: Eastern and Western located in the Kyzyl-Kum desert. The territory of WF comprises of an extensive plain with area placed on the southern ridge of the Palaeozoic hills- Kuldzhuktau.

The Project site particularly by sands and with a huge rocky soil. The landscape of the project area is steppe, rather homogeneous and arid. Accordingly, steppe and desert species of animals and plants live here. Especially the foothill areas serve as habitat for some mammals.

The road network is poorly developed and consists of separate unpaved roads, which can be used only by off-road transport equipment with significant detours, and partially only on foot.

The climate of the area is extreme continental with dry hot summer and cold winter. The maximum temperature in summer reaches +42°C, and the minimum in winter is -5.4°C. The average annual precipitation, which usually falls in the autumn and winter, and spring periods, is 100-150 mm.

Two nearest settlements are located close to the Project. There is Dzhankeldy village that is located between two plots of the Project, and Kalaata village is located right after the western plot. The village of Dzhankeldy and Kalaata has about 742 and 350 rural residents.

Almost all households own some cattle, such as cows, sheep and camel. Several villagers work at school as teachers, security, cleaning staff.

The Environmental Assessment of soil quality aims to providing information on qualitative and quantitative content of pollutants in the soil on the territory of planned Wind Farm.

1. Methodology

1.1 Organization of field research

As per the Terms of Reference, on 5th of April, 2021 on the territory of the planned Wind Plant in Bukhara region, the field works were carried out to take samples of soil at seven (7) observation points.

Sampling was carried out in accordance with the established State standard 17.4.4.02-2017 "Nature protection. Soils. Methods for sampling and preparation of soil for chemical, bacteriological, helminthological analysis".

The following steps were performed:

Step 1: Location for each soil sample was determined by using Garmin navigator. Then surface was cleaned from stones and other waste on the surface.

Step 2: By using small scapula the surface layer of ground was removed up to 10 cm. To define the depth for 10 cm was used meter measurer.

Step 3: Soil from top 10 cm was collected to special canvas bag. Stones and roots of weed grass were removed. Based on the demand of local labs, there were collected 200 grams of soil for each location.

Step 4: Each bag was labelled in accordance with soil sample location (e.g. SQ_1 SQ_2 and etc.) and signed with date of collection



Figure 1: Location of soil sampling points.

Table 1 – Coordinates of collected soil samples

No.	Sample number	Coordinates
Soil samples		
1.	Soil No.1 (SQ1)	40.813813° 63.425894°
2.	Soil No.2 (SQ2)	40.871759° 63.282831°
3.	Soil No.3 (SQ3)	40.881642° 63.455134°
4.	Soil No.4 (SQ4)	40.932494° 63.330276°
5.	Soil No.5 (SQ5)	40.889645° 63.282222°
6.	Soil No.6 (SQ6)	40.909721° 63.226733°
7.	Soil No.7 (SQ7)	40.899651° 63.183279°

The coordinates of sample locations were determined by the personal navigation device ETREX 32x «GARMIN» (Figure 2).



Figure 2. Hand-held navigation ETREX 32x «GARMIN»

The territory is represented by light sandy soils. Some areas were easily sampled with soft and moist soil, such as 3 and 4 location. Others were dry and had a large amount of rock.



Figure 3. Sampling of soil from Dzhankeldy No.1



Figure 4. Sampling of soil from Dzhankeldy No.2



Figure 5. Sampling of soil from Dzhankeldy No.3



Figure 6. Sampling of soil from Dzhankeldy No.4



Figure 7 Sampling of soil from Dzhankeldy No.5



Figure 8. Sampling of soil from Dzhankeldy No.6



Figure 9. Sampling of soil from Dzhankeldy No.7

1.2. Description of methods for measuring quality indicators of soil.

The samples were sent to the certified “Central laboratory” for analysis of the parameters in the Table 2. Basic chemical methods were used to analyze components:

- **Photometric** – based on chemical conversion of harmful substances (nitrates, aluminum, chromium (+6),) in color-intensive compounds when interacting with corresponding reagents, with subsequent measurements of the density of the colored compounds at a certain wavelength and allowing to make quick measurements with a sufficiently high accuracy;

- **Inductively coupled plasma mass spectrometry (ICP-MS)** – an analytical method that is used to detect metals and several non-metals in liquid samples at very low concentrations. MS analysis is the most sensitive of all modern multi-element analysis methods. The basic principle of mass spectrometry (MS) is to generate ions from inorganic or organic compounds, to distribute these ions by mass-to-charge ratio and to detect their qualitative and quantitative characteristics.

- **Potentiometry** – one of the electroanalytical methods. Potentiometry based on measures the difference in electrode potentials. One electrode is called the reference electrode and has a constant potential, while the other one is an indicator electrode whose potential changes with the composition of the sample. Therefore, the difference of potential between the two electrodes gives an assessment of the composition of the sample. Ion-selective electrodes (ISE's) possess a high degree of selectivity. In the laboratory, the electrode used is specific for chloride ion.

- **Titrimetric** – a method of quantitative/mass analysis (chlorides), based on the measurement of the reagent solution volume of a precisely known concentration consumed for the reaction with the substance being determined;

Table 2. The list of determined substances in soil and methods of its determination

Method of determination	Parameters
Potentiometry	pH
Titrimetric	Chlorides (Cl ⁻) Nitrates (NO ₃ ⁻)
ICP-MS	Sodium (Na) Potassium (K) Arsenic (As) Cadmium (Cd) Chromium (Cr) Copper (Cu) Lead (Pb) Manganese (Mn) Mercury (Hg) Nickel (Ni) Ferrum (Fe) Zinc (Zn)

2. Results of soils analysis

In accordance with the Terms of Reference there were collected 7 soil samples at different points.

The MPC in the soil is determined for 35 substances that are considered typical for anthropogenic impact, as well as for 109 pesticides. The samples do not fully comply with the standards and sanitary standards and exceed the maximum permissible values for four components (Ni, Cr, Zn, Cu).

The results of laboratory analysis of the soil are presented in Table 3.

The studied soil samples have a slightly alkaline reaction from 7.14 to 7.82. Samples No. 4,5,6 (mountainous area) are characterized by a high content of nitrates, unlike the others.

The results showed that the content of heavy metals in sample 5 is lower than in almost all other samples. The Lead content in soil samples ranges from 13 mg / kg to 16 mg / kg, which is higher than the sample №5 (6.40mg / kg).

Table 3¹. Results of chemical analysis of soils

Name of parameters	Sample number							Detectable limits in mg/l	MPC in mg/kg	Compliance with national MPC
	№1	№2	№3	№4	№5	№6	№7			
pH	7,75	7,80	7,82	7,63	7,14	7,80	7,74	1-14	N/A	N/A
Chloride (as Cl), %	0,014	0,014	0,014	0,014	0,021	0,042	0.035	N/A	N/A	N/A
Chloride (as Cl) mg/l	7	7	7	7	11	21	18			
Nitrate (NO ₃), mg/dm ³	1	1	1	2	48	6	1	10 ⁻⁶ -100* mg/kg	130.0 (gross content)	Comply
Sodium (Na), mg/kg	8600	11000	11000	12000	3600	11000	11000	40-110000 mg/kg	N/A	N/A
Magnesium (Mg), mg/kg	10000	9400	10000	7700	9100	11000	11000	40-110000 mg/kg	N/A	N/A
Potassium, mg/kg	18000	16000	18000	17000	5500	16000	17000	80-300000 mg/kg	N/A	N/A
Lead (Pb), mg/kg	16.0	14.0	15.0	13.0	6.40	16	16	0.1-4000 mg/kg	32.0	Comply
Manganese (Mn), mg/kg	300	380	350	310	160	520	420	20-100000 mg/kg	1500.0 (gross content)	Comply
Copper (Cu), mg/kg	29.0	24,0	25,0	23,0	17,0	26,0	26,0	1,0-4000 mg/kg	3.0	Does not comply

¹ This table shows results for chemical parameters that were proposed to 5 C with in initial TP. The lab, in turn, conducted full mass spectrometry analysis for more parameters (only metals). Please refer to Annex 5-6 for more information.

Name of parameters	Sample number							Detectable limits in mg/l	MPC in mg/kg	Compliance with national MPC
	№1	№2	№3	№4	№5	№6	№7			
Zinc (Zn), mg/kg	50.0	44.0	44.0	40.0	26.0	51	50	1,0-4000 mg/kg	23,0	Does not comply
Chromium (Cr), mg/kg	63.0	51.0	57.0	49.0	40.0	54.0	52.0	1,0-4000 mg/kg	6.0	Does not comply
Iron (Fe), mg/kg	24000	17000	18000	15000	8800	23000	17000	60-300000 mg/kg	N/A	N/A
Mercury (Hg), mg/kg	0.26	0.07	0.06	<0,01	0.16	0.07	0.02	Not determined	2.1	Comply
Nickel (Ni), mg/kg	51.0	46.0	46.0	48.0	19.0	40,0	42,0	1,0-4000	4.0	Does not Comply
Cadmium (Cd), mg/kg	0.073	0.059	0.046	0.046	0.028	0.055	0.059	0.005-4000 mg/kg	N/A	N/A
Aluminum (Al), mg/kg	61000	61000	66000	57000	24000	63000	64000	20-200000 mg/kg	N/A	N/A
Arsenicum (As) mg/kg	65.0	18.0	34.0	28.0	45.0	43.0	21.0	0.1-4000 mg/kg	N/A	N/A

Annex 1. Brief profile of the “Central laboratory”

The state enterprise "Central Laboratory" of the State Committee of the Republic of Uzbekistan on Geology and Mineral Resources began its activity in 1868.

Main activities:

- Development of regulatory documents regulating the procedure for performing analytical work.
- Analysis of soils, rocks, ores, minerals, natural waters.
- Development of measurement techniques.
- Development of standard samples of the composition of rocks, ores, products of technological processing and aqueous solutions of heavy metals.
- Production of acid and alkaline electrolytes.

The main methods of analysis: spectral, assay, chemical, neutron activation, mass spectrometry, mineralogical and all types of preparation of rocks for analysis.

SE "Central Laboratory" in 2015-2020 was accredited by the agency "Uzstandart" for technical competence and independence for compliance with the requirements of the standards O'ZDST ISO/IEC 17025, O'ZDST 16.5 and O'ZDST 16.3 and registered in the State Register of the National Accreditation System of the Republic of Uzbekistan. № UZ.AMT.07.MAI.672

- for the right to conduct tests according to O'z DSt ISO/IEC 17025,
- for the right to conduct the certification of MVI according to O'z DSt 16.5
- for the right to conduct the certification of CO according to O'z DSt 16.3

Annex 2. National standards and regulations for soil

In accordance with the SanPiN No. 0272-09 "Sanitary rules and norms for compiling hygienic justifications for soil protection schemes from pollution in Uzbekistan" indicators of sanitary status of soils for enterprises and industrial zones are as follows:

- Ammonium nitrogen
- Nitrate nitrogen
- Chlorides
- pH
- Pesticides
- Heavy metals
- Oil and oil products
- Phenols are volatile
- Sulfur compounds
- Carcinogenic substances
- Radioactive substances
- Thermophilic bacteria
- Escherichia coli bacteria
- Clostridium perfringens
- Helminth eggs and larvae
- Larvae and pupae of synanthropic flies

In accordance with SanPiN № 0191-05 "Maximum allowable concentrations (MPC) and Approximate permissible concentrations of exogenous harmful substances in soil", the MPC of exogenous chemicals in the soils (in mg/kg) is as follows:

According to the general sanitary limiting indicator of harmfulness in mg/kg:	
1. BENZAPIRENE (gross content)	0.02
2.VANADIUM (gross content)	150.0
3. Manganese + VANADIUM (gross content)	1000.0
4. TUNGSTEN (moving forms)	10.0
5. CELTAN	1.0
6 COBALT (mobile forms)	5.0
7. COPPER (mobile forms)	3.0
8. Molybdenum (mobile forms)	10.0
9. NICKEL (mobile forms)	4.0
10. COAL FLOTATION WASTE (OFU) (gross content)	3000.0
11. LEAD (gross content)	32.0
12. SULFUR ELEMENTARY (gross content)	160.0
13. SULFURIC ACID (gross content)	160.0
14. PHOSPHATES	27.2
15. FURFUROL	3.0

16. CHROME (moving forms)	6.0
by air-migration limiting hazard indicator:	
17. ALFAMETHYLSTYROL	0.5
18. BENZENE	0.3
19. ISOPROTTILBENZENE	0.5
20. HYDROGEN SULFUR (gross content)	0.4
21. STYROL	0.1
22. FORMALDEHYDE	0.7
by water-migration limiting hazard indicator:	
23. LIQUID COMPLEX FERTILIZERS (gross content)	80.0
24. INTEGRATED GRANULATED FERTILIZERS (gross content)	120.0
25. Manganese: (gross content) (mobile forms)	1500.0 60.0
26. NITRATES (gross content)	130.0
27. POTASSIUM CHLORIDE (gross content)	560.0
by trans locational limiting hazard indicator:	
28. ACIDS (ortho, -meta, -pa)	0.3
29. ARROW (gross maintenance)	2.0
30. Mercury (gross content)	2.1
31. LEAD + MERCURY (gross content)	20.0+1.0
32. ANTIMONY (gross content)	4.5
33. TOLUOL	0.3
34. FLUORINE (water soluble forms)	10.0
35. ZINC	23.0

Annex 3. Photos of sample collection

Collected soil samples



Collection process

Soil № 1



Soil sample № 2



Soil sample № 3



Soil sample № 4



Soil sample № 5



Soil sample № 6



Soil sample № 7



000592



СВИДЕТЕЛЬСТВО

О государственной регистрации юридического лица
(субъекта предпринимательства)

Настоящим подтверждается, что в Единый государственный реестр субъектов предпринимательства внесена запись о создании:

Государственное унитарное предприятие "MARKAZIY LABORATORIYA"

(Полное наименование юридического лица – субъекта предпринимательства с указанием организационно-правовой формы)

ГУП "MARKAZIY LABORATORIYA"

(Сокращенное наименование юридического лица)

23.03.2007

За регистрационным номером:

000592-04

(Число, месяц, год), под:

Идентификационный номер налогоплательщика (ИНН):

205174241

Организационно-правовая
форма:

Государственное унитарное предприятие

Местонахождение:

Ташкентская область, Зангиатинский район, Зашангузар,
A.TEMUR MFY, MUSTAQILLIK KO'CHASI, 21-UY.

Свидетельство выдано:

Ташкентская область, Зангиатинский район, ЦЕНТР
ГОСУДАРСТВЕННЫХ УСЛУГ

(Полное наименование регистрирующей органа)



Translation of the Original copy of Accreditation Certificate of Central Laboratory

THE CERTIFICATE

State registration of a legal entity (business entity)

It is hereby confirmed that the Unified State Register of Business Entities contains an entry on the creation of:

State unitary enterprise "MARKAZIY LABORATORIYA"

(Full name of legal entity - business entity, indicating the organizational and legal form)

SUE "MARKAZIY LABORATORIYA"

(Abbreviated name of legal person)

23.03.2007

registration number:

000592-04

(Number, month (cursive), year)

Tax Identification Number (TIN):

205174241

Organizational-legal forms:

State unitary enterprise

Location:

Tashkent region, Zangiatinsk district,
Eshanguzar, A.TEMUR MFY, MUSTAQILLIK
STREET, 21-house

Issued by:

Tashkent region, Zangiata district, STATE
SERVICES CENTER

(Full name of registering authority):

Annex 5. Original copy of Protocol of mass spectrometric (ICP-MS) analysis of natural waters and solutions

ПСН-05-10

Государственный комитет по геологии и минеральным ресурсам Республики Узбекистан ГП «Центральная лаборатория»

111800, Ташкентская обл., Зангиотдинский р-н, п. Энгингузар, ул. Мустақиллик, 21, тел.: 933805415

Протокол № *ЛМСА 381*

Протокол испытания масс-спектрометрического (ICP-MS) анализа природных вод и растворов

1. Заказчик – ООО JURU ENERGY CONSULTING
 2. Лабораторный номер заказа – 286-15-21
 3. Количество проб – 15
 4. Место взятия
 5. Вид анализа – масс-спектральный
 6. Дата поступления проб – 12.04.2021
 7. Дата проведения анализа –
 8. Дата выдачи протокола – 14.04.2021
 9. Средства измерения:
 - 10.1 Термометры типа НТС-2 №№/м – сертификат поверки №0901141
 - 10.2 Масс-спектрометр ИСП Agilent 7500 CX №JPS1202496- сертификат поверки №0910705
 10. НД на методы испытаний и средства измерений – МММ С/з С/У 0677:2015
 12. Условия окружающей среды –
 11. Результаты анализа в $\mu\text{g/cm}^3$
- Приложение – 1 стр.

Директор ГП «Центральная лаборатория»

Начальник ЛМСА



С.В. Михайлов

В.А. Баннов

Unofficial translate of Protocol of mass spectrometric (ICP-MS) analysis of natural waters and solutions

ПСК-05-10

The state committee of the Republic of Uzbekistan for Geology and Mineral resources SE "Central Laboratory"

111800, Tashkent region, Zangiatinsk district, Eshanguzar, Mustakillik street, 21-house tel.933805415

Protocol No. ЛМСА 361

Protocol of mass spectrometric (ICP-MS) analysis of natural waters and solutions

1. Customer - ООО JURU ENERGY CONSULTING
2. Laboratory order number – 286-15-21
3. Number of samples – 15
4. Place of sampling:
5. Type of analysis - mass spectral
6. Date of receipt of samples – 12.04.2021
7. Date of analysis -
8. Date of issue of the report - 14.04.21
9. Used equipment:
 - 10.1 Thermohygrometers HTC-2 No. n/n - test certificate No. 0901141
 - 10.2 Mass spectrometer ISP Agilent 7500 CX No. JP51202494 - test certificate No. 0910705
- 10.(ND) Normative documents for test methods and measuring instruments – MVI O'zDSt 0677:2015
- 11.Environmental conditions –
- 12.Results of the analysis in $\mu\text{g}/\text{dm}^3$

Appendix 1 page

Director of SE "Central Laboratory"

S.V. Mihaylov

Head of LMSSA

V.A.Bannov

Содержание в (mg/t)

№	Лаб №	Геол №	Li	Be	B *	Na *	Mg *	Al *	P	K *	Ca *	Sc	Ti *	V	Cr	Mn	Fe *	Co
Диапазон значений погр. элементов			0,05-4000	0,00-0000	1,4-0000	0,004-1100	0,004-1100	0,000-1100	1,0-0000	0,000-0000	0,000-1000	0,000-0000	0,000-0000	0,000-0000	0,000-0000	0,000-0000	0,000-0000	0,000-0000
1	285-1	SQ 7	21,0	1,20	22,8	11000	11000	64000	480	17000	50000	7,70	2100	54,0	50,0	400	17000	8,40
2	285-2	SQ 6	22,0	1,10	21,8	11000	11000	60000	520	16000	50000	5,50	2000	51,0	54,0	380	16000	7,70
3	285-3	SQ 5	11,0	3,810	21,8	3800	9100	24000	430	3800	90000	4,70	700	30,0	40,0	160	8800	4,30
4	285-4	SQ 4	16,0	1,10	21,8	12000	11000	37000	370	17000	60000	5,70	1800	41,0	49,0	210	16000	9,90
5	285-5	SQ 3	20,0	1,30	20,4	11000	10000	80000	340	18000	60000	7,90	1800	58,0	67,0	360	16000	7,60
6	285-6	SQ 2	17,0	1,10	16,0	11000	9400	81000	440	16000	70000	7,40	1800	58,0	57,0	360	17000	7,70
7	285-7	SQ 1	27,0	1,60	20,4	8000	10000	41000	370	18000	50000	7,70	2100	75,0	60,0	300	24000	9,90

№	Лаб №	Геол №	Ni	Cu	Zn	Ga	As	Se	Rb	Sr	Y	Zr *	Nb	Mo	Ag	Cd	In *
Диапазон значений погр. элементов			0,0-0000	0,0-0000	0,0-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000
1	285-1	SQ 7	40,0	28,0	80,0	18,0	21,0	4,40	80,0	280	16,0	54,0	7,80	2,80	0,670	0,080	0,007
2	285-2	SQ 6	40,0	28,0	87,0	11,0	43,0	5,30	83,0	300	19,0	60,0	9,10	2,30	0,640	0,060	0,004
3	285-3	SQ 5	16,0	17,0	20,0	8,00	45,0	4,80	30,0	2700	7,20	18,0	2,20	0,360	0,400	0,000	0,010
4	285-4	SQ 4	46,0	23,0	40,0	10,0	28,0	9,90	68,0	290	14,0	48,0	6,90	1,90	0,380	0,040	0,003
5	285-5	SQ 3	46,0	25,0	44,0	11,0	34,0	4,70	98,0	330	16,0	54,0	6,90	1,60	0,200	0,040	0,007
6	285-6	SQ 2	46,0	24,0	44,0	10,0	16,0	4,70	64,0	300	16,0	55,0	7,40	1,90	0,340	0,060	0,001
7	285-7	SQ 1	51,0	28,0	60,0	12,0	66,0	4,30	98,0	280	16,0	64,0	7,30	1,70	0,230	0,070	0,041

№	Лаб №	Геол №	Sn	Sb	Te	Cs	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho
Диапазон значений погр. элементов			0,00-00	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000
1	285-1	SQ 7	1,80	0,820	0,077	4,90	680	20,0	80,0	8,70	25,0	4,80	1,00	4,10	1,900	3,80	0,640
2	285-2	SQ 6	1,70	0,790	0,060	4,30	710	20,0	82,0	7,80	26,0	5,10	1,10	4,70	1,900	3,90	0,600
3	285-3	SQ 5	0,900	0,360	0,077	2,20	180	7,40	15,0	1,70	6,30	1,40	0,270	1,20	1,700	1,20	0,200
4	285-4	SQ 4	1,40	0,820	0,051	3,80	710	22,0	49,0	5,50	19,0	4,00	0,920	3,30	1,900	3,00	0,910
5	285-5	SQ 3	1,80	0,890	0,051	8,10	740	28,0	64,0	8,30	29,0	4,80	1,00	4,10	1,900	3,40	0,600
6	285-6	SQ 2	1,80	0,890	0,064	4,90	720	27,0	64,0	8,20	29,0	4,80	1,00	4,30	1,900	3,60	0,600
7	285-7	SQ 1	1,70	0,870	0,025	8,30	690	24,0	61,0	8,70	21,0	4,90	0,940	3,90	1,900	3,30	0,600

№	Лаб №	Геол №	Er	Tm	Yb	Lu	Hf	Ta	W *	Ru	Pt *	Au *	Hg *	Tl	Pb	Bi	Th	U
Диапазон значений погр. элементов			0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000	0,00-0000
1	285-1	SQ 7	1,80	0,270	1,40	0,270	1,70	0,640	1,80	+0,01	+0,00	+0,04	0,000	0,270	18,0	0,760	9,40	0,70
2	285-2	SQ 6	2,00	0,280	1,60	0,270	1,80	0,660	1,80	+0,01	+0,00	+0,05	0,000	0,280	19,0	0,290	11,0	0,70
3	285-3	SQ 5	0,600	0,080	0,600	0,190	0,510	0,180	1,30	+0,01	+0,00	+0,04	0,180	0,180	6,40	0,370	3,70	1,30
4	285-4	SQ 4	1,80	0,210	1,40	0,270	1,80	0,660	1,80	+0,01	+0,00	+0,04	0,000	0,280	19,0	0,760	7,80	1,80
5	285-5	SQ 3	1,80	0,240	1,70	0,270	1,80	0,660	1,80	+0,01	+0,00	+0,04	0,000	0,280	19,0	0,760	8,40	0,80
6	285-6	SQ 2	1,80	0,270	1,80	0,270	1,80	0,660	1,80	+0,01	+0,00	+0,04	0,000	0,280	19,0	0,760	8,80	0,80
7	285-7	SQ 1	1,80	0,250	1,80	0,270	2,00	0,630	1,40	+0,01	+0,00	+0,04	0,280	0,270	18,0	0,290	9,40	0,70

№	Lab №	Sample	Li	Be	B *	Na *	Mg *	Al *	P	K *	Ca *	Sc	Ti *	V	Cr	Mn
	Detectable limits		0,05-4000	0,05-4000	1,0-4000	0,004-11%	0,004-11%	0,002-20%	1,0-4000	0,008-30%	0,005-28%	0,10-4000	0,0006-9%	0,10-4000	1,0-4000	0,002-10%
1	285-1	SQ 7	21,0	1,20	22.8	11000	11000	64000	450	17000	50000	7,70	2100	54,0	52,0	420
2	285-2	SQ 6	22,0	1,10	21.6	11000	11000	63000	520	16000	79000	8,30	2300	57,0	54,0	520
3	285-3	SQ 5	11,0	0,610	21.6	3600	9100	24000	430	5500	300000	4,10	700	30,0	40,0	160
4	285-4	SQ 4	16,0	1,10	21.6	12000	7700	57000	370	17000	44000	5,70	1800	47,0	49,0	310
5	285-5	SQ 3	20,0	1,30	20.4	11000	10000	66000	340	18000	59000	7,90	1800	58,0	57,0	350
6	285-6	SQ 2	17,0	1,10	18.0	11000	9400	61000	440	16000	70000	7,40	1900	50,0	51,0	380
7	285-7	SQ 1	27,0	1,60	20.4	8600	10000	61000	370	18000	53000	7,70	2100	75,0	63,0	300

№	Lab №	Sample	Ni	Cu	Zn	Ga	As	Se	Rb	Sr	Y	Zr *	Nb	Mo	Ag	Cd
	Detectable limits		1,0-4000	1,0-4000	1,0-4000	0,10-4000	0,10-4000	0,50-4000	0,10-4000	0,10-4000	0,10-4000		0,005-4000	0,10-4000	0,05-10,0	0,005-4000
1	285-1	SQ 7	42,0	26,0	50,0	10,0	21,0	4,40	90,0	280	18,0	54,0	7,80	2,80	0,670	0,059
2	285-2	SQ 6	40,0	26,0	51,0	11,0	43,0	5,00	83,0	300	19,0	60,0	9,10	2,20	0,540	0,055
3	285-3	SQ 5	19,0	17,0	26,0	3,60	45,0	4,80	30,0	2700	7,20	16,0	2,20	0,980	0,460	0,028
4	285-4	SQ 4	48,0	23,0	40,0	10,0	28,0	5,00	86,0	250	14,0	48,0	6,90	1,90	0,350	0,046
5	285-5	SQ 3	46,0	25,0	44,0	11,0	34,0	4,70	96,0	300	16,0	56,0	6,90	1,80	0,320	0,046
6	285-6	SQ 2	46,0	24,0	44,0	10,0	18,0	4,70	84,0	300	18,0	50,0	7,40	1,90	0,240	0,059
7	285-7	SQ 1	51,0	29,0	50,0	12,0	65,0	4,30	96,0	260	16,0	64,0	7,30	1,70	0,230	0,073

Nº	Lab Nº	Sample	Sn	Sb	Te	Cs	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho
	Detectable limits		0,10-10	0,10-4000	0,30-4000	0,02-4000	0,10-4000	0,50-4000	0,04-4000	0,01-4000	0,01-4000	0,01-4000	0,01-4000	0,01-4000	0,01-4000	0,01-4000	0,01-4000
1	285-1	SQ 7	1,50	0,920	0,077	4,90	690	28,0	60,0	6,70	25,0	4,60	1,00	4,10	0,560	3,80	0,650
2	285-2	SQ 6	1,70	0,790	0,089	4,30	710	29,0	62,0	7,00	26,0	5,10	1,10	4,70	0,630	3,90	0,690
3	285-3	SQ 5	0,590	0,360	0,077	2,20	190	7,40	15,0	1,70	6,30	1,40	0,270	1,20	0,190	1,20	0,200
4	285-4	SQ 4	1,40	0,520	0,051	3,80	710	23,0	49,0	5,50	19,0	4,00	0,920	3,30	0,500	3,00	0,510
5	285-5	SQ 3	1,50	0,650	0,051	5,10	740	28,0	56,0	6,30	23,0	4,60	1,00	4,10	0,530	3,40	0,600
6	285-6	SQ 2	1,50	0,530	0,064	4,30	720	27,0	55,0	6,20	23,0	4,80	1,00	4,20	0,600	3,80	0,620
7	285-7	SQ 1	1,70	0,610	0,025	6,30	630	24,0	51,0	5,70	21,0	4,30	0,940	3,80	0,520	3,30	0,600

Nº	Lab Nº	Sample	Er	Tm	Yb	Lu	Hf	Ta	W*	Re	Pt*	Au*	Hg*	Tl	Pb	Bi	Th	U
	Detectable limits		0,01-4000	0,01-4000	0,01-4000	0,01-4000	0,05-4000	0,04-4000	0,08-4000	0,01-4000	0,05-4000	0,05-4000		0,01-4000	0,1-4000	0,01-4000	0,01-4000	0,01-4000
1	285-1	SQ 7	1,80	0,270	1,80	0,270	1,70	0,640	1,50	<0,01	<0,05	<0,05	0,020	0,370	16,0	0,180	9,40	2,30
2	285-2	SQ 6	2,00	0,280	1,90	0,270	1,80	0,850	1,60	<0,01	<0,05	<0,05	0,070	0,350	16,0	0,230	11,0	2,50
3	285-3	SQ 5	0,630	0,089	0,620	0,100	0,510	0,190	1,30	<0,01	<0,05	<0,05	0,160	0,140	6,40	0,078	3,10	1,30
4	285-4	SQ 4	1,60	0,210	1,40	0,210	1,50	0,600	1,00	<0,01	<0,05	<0,05	<0,01	0,350	13,0	0,130	7,80	1,80
5	285-5	SQ 3	1,80	0,240	1,70	0,250	1,90	0,600	1,20	<0,01	<0,05	<0,05	0,060	0,380	15,0	0,190	9,50	2,00
6	285-6	SQ 2	1,90	0,270	1,80	0,250	1,50	0,690	1,90	<0,01	<0,05	<0,05	0,070	0,360	14,0	0,170	8,80	2,00
7	285-7	SQ 1	1,80	0,250	1,80	0,260	2,00	0,630	1,40	<0,01	<0,05	<0,05	0,260	0,370	16,0	0,260	9,40	2,20

Annex 6. Original copy of Protocol of chemistry analysis No 20

Государственный комитет по геологии и минеральным
ресурсам Республики Узбекистан
ГУП «Центральная лаборатория»
Ташкентская область, п. Энгингузар, ул. Мустакиллик, 21
тел. 933805415, 702027142



ПРОТОКОЛ ИСПЫТАНИЯ № 20

на исследование согласно письма № JEC 21/42 от 12/04/2021г о проведении испытаний пробы воды согласно O'z DS 950:2011.

Заказчик: ООО «JURU ENERGY CONSULTING»

Обозначение и данные маркировки объекта испытания:

№1 по № 7 - (05/04/2021) почва – sq dzhankeldi;

№8 по №15 - (06/04/2021) почва – bash sq;

дата получения: 12-04-2021г в количестве 15 проб;

Цель, задачи испытаний – анализ почвы по заданию заказчика;

НД на объекты испытаний – ГОСТ 26423-85, ГОСТ 26425-85.

Условия проведения испытаний: температура окружающей среды 21,0°, влажность 40%.

Средства измерений: весы AS 220/C Radwag, номер И-160МН, электронный гигрометр НТС-2.

Испытания проведены: 12-04-2021г – 23-04-2021г.

Результаты испытаний.

Заказ № 287 от 12-04-2021г.

№	Наименование показателей	НД на методы испытаний	Фактическое значение														
			Sq dzhankeldi							Bash sq							
			№7	№6	№5	№4	№3	№2	№1	№8	№9	№10	№11	№12	№13	№14	№15
1	Водородный показатель, pH	26429-85	7,74	7,80	7,14	7,63	7,82	7,80	7,75	7,70	7,80	7,80	7,60	7,80	7,80	7,70	7,75
2	Хлориды, %	26425-85	0,035	0,042	0,021	0,014	0,014	0,014	0,014	0,014	0,032	0,021	0,014	0,040	0,016	0,010	0,014

№	Наименование показателей	ИД по методу испытаний	Фактическое значение														
			Sq dzhankeldi							Bash sq							
			№7	№6	№5	№4	№3	№2	№1	№8	№9	№10	№11	№12	№13	№14	№15
3	Нитраты, мг/дм³	Измеряется колориметром	1	6	48	2	1	1	1	1	1	2	2	2	1	2	12

Право тиражирования и копирования без разрешения
ГУП «ИД» не допускается.

И.о. начальника ХАЛ



Гусанова И.Е.

The state committee of the Republic of Uzbekistan for Geology and Mineral resources
SE "Central Laboratory"
111800, Tashkent region, Zangiatinsk district, Eshanguzar, Mustakillik street, 21
tel.933805415, 702027142

"Approved"
Director of the
SE "Central Laboratory"
Mihaylov S.V.
"26" April 2021

Protocol of measurements No. 20

for measuring according to letter No. JEC 21/41 of 12/04/21 on testing of water samples according to the State standard 950:2011.

Customer - OOO JURU ENERGY CONSULTING

Marking and labeling data of the test object:

No.1 to No.7 – (05/04/2021) soil – sq dzhankeldi;

No.8 to No.15 – (06/04/2021) soil – bash sq

1. Date of receipt – 12.04.2021; of samples 15
2. Date of analysis -

3. Laboratory order number – 286-15-21
4. Number of samples – 15
5. Place of sampling:
6. Type of analysis - mass spectral
7. Date of issue of the report - 14.04.21
8. Used equipment:

10.1 Thermohygrometers HTC-2 No. n/n - test certificate No. 0901141

10.2 Mass spectrometer ISP Agilent 7500 CX No. JP51202494 - test certificate No. 0910705

10.(ND) Normative documents for test methods and measuring instruments – MVI O'zDSt 0677:2015

11.Environmental conditions –

12.Results of the analysis in $\mu\text{g}/\text{dm}^3$

Appendix 1 page

Director of SE "Central Laboratory"

S.V. Mihaylov

Head of LMSSA

V.A.Bannov

No.	Parameters	ND for measurments	Actual value														
			Sq Dzhankeldi							Bash sq							
			No.7	No.6	No.5	No.4	No.3	No.2	No.1	No.8	No.9	No.10	No.11	No.12	No.13	No.14	No.15
	pH	26429-85	7.74	7.80	7.14	7.63	7.82	7.80	7.75	7.70	7.80	7.80	7.60	7.80	7.82	7.70	7.75
	Chlorides %	26425-85	0.035	0.042	0.021	0.014	0.014	0.014	0.014	0.014	0.032	0.021	0.014	0.040	0.010	0.010	0.014
	Nitrates mg/dm ³	Measurements with ionometers	1	6	48	2	1	1	1	1	1	2	2	2	1	2	12

APPENDIX N - CONSULTATION WITH MINISTRY OF TRANSPORTATION

ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ

JURU ENERGY CONSULTING

100077, Tashkent, M.Ulugbek region, Chust Street, house # 10.
TIN: 303454532, BIC: 00974 Bank: «Kapitalbank» A/N: 20208000600502375001

JEC-OUT-21-123

04.05.2021

**To Ministry of transportation
of the Republic of Uzbekistan**

Under Presidential Decree of the Republic of Uzbekistan No.5001 dated 23.02.2021 "On measures to implement the investment of the Project on construction of a 300-500MW wind power plant in Peshku district in Bukhara region", FE 'ACWA Power Dzhankeldy Wind' LLC (Tashkent)' has entered into a 25-year Power Purchase Agreement with JSC National Electric Networks of Uzbekistan. This agreement was entered on force 24th January 2021 for the development, financing, construction and operation of a 500MW Wind Farm in Peshku district of Bukhara region (See Annex 1).

The project also includes the development of an Overhead Transmission Line (OHTL) approximately 250km in length with a rating of 500kV single circuit. This OHTL will be shared between ACWA Power's Dzhankeldy 500MW Wind Farm and the ACWA Power Bash 500MW Wind Farm which is approximately 94km north east of the Dzhankeldy Wind Farm site. The alignment of the OHTL is being finalised by JSC National Electric Networks of Uzbekistan and will connect to an existing substation in Qurako'l from the Bash Wind Farm site (See Annex 2).

As a part of the Environmental & Social Impact Assessment (ESIA), Juru Energy is consulting with Ministry of transportation to request any data or comments that will be relevant to the preparation of the Project ESIA, including any requirements relating to the transportation of the following:

- Transportation of project equipment i.e., wind turbines components such as blades, transformers etc.
- Transportation of hazardous material and waste; and
- Transportation of workers who are expected to be approximately 700 to 1000 during the project construction phase.

We welcome your feedback and comments on the above to be addressed to Gulchekhra Nematullayeva (email: g.nematullayeva@juruenergy.com, tel +998 97 4459504).

Thank you very much for your assistance and we look forward to your response.

Yours Sincerely,

Director

J.Yakubov

For the further information please contact:
Gulchekhra Nematullayeva
Mob.: +998 97 4459504



Project is located in Peshku district of Bukhara region

Project Coordinates (based on preliminary co-ordinates)

NORTHING	EASTING
ACWA Power 500MW Project Site	
Eastern Plot	
523619.75	4534733.22
543599.97	4529733.76
536496.75	4510432.45
526924.81	4516485.66
532348.42	4525452.64
523032.36	4532093.13
Western Plot	
525738.34	4525288.58
515437.34	4532201.45
514980.93	4524099.13
522031.61	4519603.11

Annex 2 To the letter JEC-OUT-21-123
On 04.05.2021
Preferred OHTL allotment



O'zbekiston Respublikasi
Transport vazirligi huzuridagi
Avtomobil yo'llari qo'mitasi

«YOL LOYIHA EXPERTIZA»
UNITAR KORXONASI



Комитет по автомобильным дорогам
при Министерстве транспорта
Республики Узбекистан

УНИТАРНОЕ ПРЕДПРИЯТИЕ
«ЙУЛ ЛОЙИХА ЭКСПЕРТИЗА»

100052 Toshkent sh., Mirzo Ulug'bek tumani, Katta Darxon - 2 tur ko'cha, 5 uy, Tel: 286-19-01, 286-19-02, 286-19-03, 286-19-10, Faks: 286-19-10
«DAVR BANK» XATB, Mirzo Ulug'bek tumani filiali, X/R 2021 0000 9024 6196 4001, STIR 202 330 936, XXTUT 71120, MFO 01072, www.ekspertiza.uz.

№ 467/05

« 27 » май 2021 г.

Автомобиль йўллари
қўмитасига

06.05.2021 йилдаги №02/49-2863 сонли топширик бўйича

“JURU ENERGY CONSULTING” МЧЖ томонидан Ўзбекистон Республикаси Транспорт Вазирлигига 2021 йил 04 майдаги №JEC-OUT-21-123-сонли мурожаати тегишлилиги юзасидан ўрганиб чикиб, қуйидагиларни маълум қиламиз:

Ўзбекистон Республикаси Вазирлар Маҳкамасининг 2011 йил 26 декабрдаги 342-сонли қарори билан тасдиқланган “Катта ҳажмли ва оғир вазнли юкларни автомобиль транспортида ташишда ҳаракат хавфсизлигини таъминлаш” Қоидаларига мувофиқ катта ҳажмли ва оғир вазнли юкларни автомобиль транспортида ташишда махсус рухсатнома талаб этилишини маълум қиламиз.

Маълумот учун: махсус рухсатнома талаб этилган ҳолларда <http://oktv.ekspertiza.uz> ахборот тизими орқали мурожаат юбориши мумкин.

Директор

Ф. Салаев

Committee on Highways under the Ministry of Transport of the Republic of Uzbekistan

UNITARY ENTERPRISE "YO'L LOYIHA EKSPERTIZA»

No. 467/05

27.05.2021

To the Committee on highways

According to the task No.02/49-2863

We would like to inform you based on the letter No. JEC-OUT-21-123 sent by JURU Energy on 04.05.2021 to the Ministry of Transport of the Republic of Uzbekistan on followings:

In accordance with the regulations "Ensuring traffic safety during the transportation of bulky and heavy cargo", approved by the Cabinet of Ministers of the Republic of Uzbekistan No.342 dated December 26, 2011, we declare that a special permit is required for the transportation of bulky and heavy cargo.

FYI: in cases where a special permit is required, you can send an application through the information system <http://okn.elcspertiza.uz>

Director

signature

F.Salayev

APPENDIX O - ACWA POWER ROUTE SURVEY & EPC PRELIMINARY TRANSPORTATION REPORT



中远海运物流
COSCO SHIPPING Logistics

Survey and construction works overview

Project: 1,100 MW Wind Power Projects in Uzbekistan

Doc. No: CEEC 202205

Date: 12.05.2022

**PLANED CIVIL WORKS FOR TRANSPORTATION OF WTG EQUIPMENT
FROM MANUFACTURER IN CHINA TO SITES IN UZBEKISTAN
KAZAKHSTAN & UZBEKISTAN
(PRELIMINARY REPORT)**



ОБЩЕЕ / GENERAL

Таблица строительных работ предоставляет обзор запланированных дорожно-строительных работ на пути от порта (точка погрузки) к стройплощадке (точка разгрузки) и может включать:

- Разрешение на использование земельных участков (государственных/частных)
- укрепление дорог/причала,
- проверка грузоподъемности моста и кульвертов и любые связанные с прохождением необходимые изменения,
- все работы по уширению дорог и поворотов,
- удаление препятствий,
- удаление или поднятие линий электропередачи и связи,
- удаление дорожных знаков,
- изменение дорожных знаков

и все другие работы, как того требует правительство, клиент или транспортная компания надобные для безопасной доставки оборудования.

The Construction activities table get overview for the planed road construction works on the way from port (point of loading) to the site (point of unloading):

- Permission to use land (public/private)
- strengthening of roads/embankments,
- bridge and culvert load bearing capacity checks & any required modifications to it.
- all widening works on roads and curves,
- obstacle removal,
- removal or raising of power and communication lines / poles,
- removal of road signs,
- modification of road layouts

and all other works as required by government, the client or the transportation company for safe and secure delivery of the equipment.

Информация о маршруте / Route information: Khorgos – Yallama

Препятствия	Obstacles	Количество /Quantity
Общее количество обследованных препятствий	Total number of obstacles surveyed	497
Из них на основном маршруте	Of which on the main route	283
Мосты на основном маршруте	Bridges on the main route	97
Ограничения по высоте (арки, ЛЭП, путепровод, пешеходные переходники и тд.) на основном маршруте	Height restrictions (arches, power lines, overpass, pedestrian crossings, etc.) on the main route	96
Дорожные работы на основном маршруте	Road under construction on the main route	5
Подъемы /спуски на основном маршруте	gradients on the main route	19
Повороты	Turns	15

КАТЕГОРИЗАЦИИ СЛОЖНОСТИ ИСПОЛНЯЕМЫХ ДОРОЖНЫХ РАБОТ / STRUCTURAL MEASURES CATEGORIZATION:

Индикатор / Indication	Категория /Category	Описание	Description
1	Средняя / normal	Необходимы изменения. Например: удаление дорожных знаков	Modifications necessary. For example: remove traffic signs
2	Высокая / high	Необходимы изменения. Например, удаление дорожных барьеров, использование мобильных дорожных пластин, удаление дорожных знаков и т.д.	Modifications necessary e.g. strengthening traffic island, use of mobile track panels, remove traffic signs etc..
3	Комплексное / complex	Необходимы изменения (например, устранение дорожных ограждений, реконструкция кругового перекрестка, строительство поворотных зон, расширение дорог, вырубка деревьев, удаление светофоров, длительные периоды дорожно-строительных работ на маршруте и т.д.).	Modifications are necessary (e.g. remove traffic barriers, roundabout reconstruction with drive through lanes, construction of turning areas, widening roads, tree cutting, remove traffic lights, long period road construction sites etc.).
4	Трудно / difficult	необходимы дополнительные расчеты (например, сертификаты, изучение грузоподъемности /экспертиза моста), уточнение прав на использование частной собственности, взрывы камней и удаление электрической инфраструктуры.	Transit not clarified, additional calculations necessary (e.g. Certificates, load capacity study at bridges), rights of use for private properties, rock blasting and removal of electrical infrastructure.

ССЫЛКИ НА ДОКУМЕНТЫ/ DOCUMENT REFERENCES

- ACWA Waypoints 202205_main route KZ.kmz

ОТВЕТСТВЕННОСТЬ / RESPONSIBILITY

Работы должны выполняться профессиональной командой в соответствии с инструкциями по безопасной транспортировке груза и требованиями производителя оборудования.	The work will must be carried out by professional team in accordance with the instructions of the safety cargo transportation the requirements of the equipment manufacturer.
Вся техника, оборудование и вспомогательное оборудование должна соответствовать цели выполняемых работ.	All cars, equipment must correspond to the purpose of the work performed.
Ответственность за проведение дорожных мероприятий и подготовку маршрута для реализации перевозки лежит на: Endion	The responsibility for carrying out road activities and preparing the route for the transportation lies with: Endion

РАБОТЫ ПО МОДЕРНИЗАЦИИ МАРШРУТА / ROAD MODIFICATION WORKS

Part 1 - Kazakhstan

(PRELIMINARY REPORT)

Для беспрепятственного проезда колонны с комплектами ВТГ по маршруту необходимо произвести работы по модернизации дорожного полотна, обустройства объездов и демонтажа знаков. Общий объем работ приведен в таблице №1.	For the passing of the cargo along the route, it is necessary to carry out the modernization works of the roadway, the arrangement of bypasses and the dismantling of signs. Total scope of work is included in Table 1.
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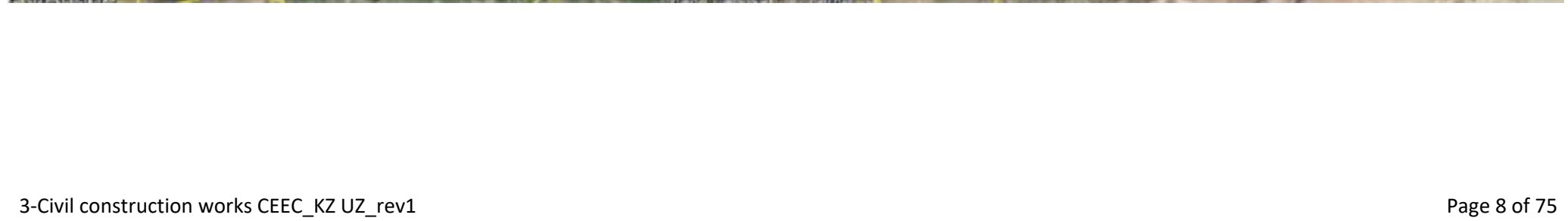
Nr	Type	Description	Coordinates L	Coordinates B
202204109	Border crossing Khorgos	H= 5.7 slim pipe, width 7m, main pipe 6m, slim pipe dismantling	80.31157399999999	44.174748
202204123	highway-over crossing	Высота путепровода 5.6m слева – 5.7m справа При общей высоте с грузом более 5.75m демонтаж дорожных ограждений, обустройство съезда, расширение поворотов на имеющейся второстепенной дороге. / Overpass height 5.6m on the left – 5.7m on the right. With a total load height more than 5.75m, the dismantling of road barriers, the arrangement of the exit, the expansion of turns on the existing secondary road.	79.982511	44.045386
202204137	highway-over crossing	Высота путепровода 5.5m слева – 5.6m справа При общей высоте с грузом более 5.55m, демонтаж дорожных ограждений на разделительной полосе до путепровода / Overpass height 5.5m on the left – 5.6m on the right. With a total load height more than 5.55m, dismantling of road barriers on the dividing strip to the overpass	79.908736	44.029714
202204143	highway-over crossing	Высота путепровода 5.5m При общей высоте с грузом более 5.45m строительство площадки для разворота / Overpass height 5.5m With a total load height more than 5.45m, the construction of a turning platform	79.674921	44.0142

111	Border crossing Kalzhat / КАЛЖАТ –	Получение разрешения и строительство площадок хранения, погрузки и подъезда на стороне КНР и на нейтральной зоне / Obtaining permission and construction of storage, loading and access sites on the prc side and in the neutral zone	, 80.624622	43.672415
202204151	Highway exit	Демонтаж фонарного столба, дорожных ограждений на въезде и разделительных ограждений на выезде из поворота при движении по встречной полосе / Dismantling of the lamppost, road barriers at the entrance and separation fences at the exit of the turn when driving in the oncoming lane	, 80.624622	43.672415
202204087	pedestrian crossing	Высота пешеходного перехода 5,75 При высоте автопоезда выше 5.65 движение по существующей грунтовой дороге. Необходимо расширение заезда/выезда, спланировать съезд / Pedestrian crossing height 5,75 When the height of the road train is above 5.65, traffic on the existing dirt road. It is necessary to expand the arrival / exit, plan the exit	78.25957099999999	43.582657
202204083	pedestrian crossing	Высота пешеходного перехода 5,5m При высоте автопоезда выше 5.45m необходимо строительство байпаса справа / Pedestrian crossing height 5,5m When the height of the road train is above 5.45m, it is necessary to build a bypass on the right	78.20041999999999	43.578068
202204073	highway-over crossing	Высота путепровода справа - 5,5m слева – 5.6m При высоте автопоезда выше 5.45m – укрепление обочин в месте разворота / The height of the overpass on the right - 5,5m on the left - 5.6m When the height of the road train is above 5.45 m - strengthening of the shoulders at the turning point	77.70740600000001	43.542526
202204069	highway-over crossing	Высота путепровода справа - 5,6m слева – 5.5m При высоте автопоезда выше 5.5m – укрепление обочин в месте разворота / The height of the overpass on the right - 5.6m on the left - 5.5m When the height of the road train is above 5.5m – strengthening of the shoulders at the turning point /	77.475853	43.510724
202204043	Checkpoint	Высота арки - 5,7m При высоте автопоезда выше 5.65m – демонтаж нижней трубы (не является несущей конструкцией), демонтаж блоков для движения по встречной полосе / Arch height - 5,7m When the height of the road train is above 5.65m - dismantling of the lower pipe (not a supporting structure), dismantling of blocks for traffic in the oncoming lane	76.99973900000001	43.447121



202204180	Turn	Демонтаж всех фонарных столбов по правую сторону / Dismantling of all lampposts on the right side	76.994201	43.443844
202204181	Archway	Высота антенны 5.7m. При высоте автопоезда выше 5,65 или демонтаж антенны или строительство байпаса справа / Antenna height 5.7m. When the height of the road train is above 5.65 or dismantling the antenna or building a bypass on the right	76.989035	43.453668
202204019		Демонтаж фонарных столбов и движение задним ходом на развязке с лопастями / Removal of lampposts and reversing at the junction with the blades	77.04087952	43.8465828,
002	Turn	Расширение проезжей части / road widening	76.342049	43.894800,
202204396	Turn	Расширение проезжей части / road widening	76.299913	43.901553
202204398	Turn	Расширение проезжей части / road widening	76.315247	43.886476
202204404	Archway	Арка 5.6m. При высоте автопоезда выше 5.55m - подъем / Arch 5.6m. When the height of the road train is above 5.55m - lifting	76.278926	43.32613
202204406	Turn	Поворот направо – подрезка деревьев справа / Turn right – trim trees on the right	76.287622	43.277396
202204441	Archway	Арка – 5.6m по вывеске. Подъем указателя / Arch – 5.6m by sign. Lift up of the sign	73.24767	42.928162
202204449	highway-over crossing	Путепровод – 5.75m справа, 5.65 слева. При высоте автопоезда свыше 5.7m демонтаж ограждений на разделительной полосе и движение по полосе встречного движения / Overpass – 5.75m on the right, 5.65m on the left. When the height of the road train is more than 5.7 m, the dismantling of fences on the dividing strip and traffic on the lane of oncoming traffic	73.137828	42.875577
202204492	pedestrian crossing	Пешеходный переход высота – справа 5.65m справа, 5.55 слева. При высоте автопоезда свыше 5.6m строительство байпаса справа или подъем конструкции/ Pedestrian crossing height – right 5.65m on the right, 5.55m on the left. When the height of the road train is over 5.6m, the construction of the bypass on the right or the lifting of the structure/	70.755465	42.637568
202204528	pedestrian crossing	Пешеходный переход высота – справа 5.65m справа, 5.59 слева. При высоте автопоезда свыше 5.6m подъем конструкции/ Pedestrian crossing height – right 5.65m right, 5.59 left. When the height of the road train is over 5.6m, the lifting of the structure	69.75695	42.457006
202204542		Демонтаж фонарного столба и дорожного указателя/ Dismantling of the lamppost and road sign	69.344042	42.529372



COSCO SHIPPING LOGISTICS (XIAMEN)




202204545		Демонтаж фонарного столба и ограждения на въезде. Перенос ограждения на выезде/ Dismantling of the lamppost and fence at the entrance. Relocation of the fence at the exit	69.454722	42.403867
202204554	Pipeline	Газовая труба высота – 5.5m. Подъем./ Gas pipe height – 5.5m. lifting	69.269775	42.383261
202204557	Pipeline	Газовая труба высота – 5.65m. Подъем при высоте автопоезда свыше 5.6m./ Gas pipe height – 5.65m. Lifting at a height of the road train above 5.6m	69.259404	42.381028
202204569	PTL	ВЛ 220кВ высота 7.7m – построить байпас так как высота может уменьшиться/ 220kV overhead line height 7.7m – build a bypass as the height may decrease	69.212914	42.290257
202204578	Turn	Поворот демонтаж фонарного столба и снять грунт слева от входа в поворот/ Turn dismantle the lamppost and remove the ground to the left of the entrance to the turn	69.47513499999999	42.046398
202204634	Border crossing Yallama	Пункт пропуска. Для прохождения на территории Республики Казахстан требуется строительство площадки для поворота лопастевого на 90 град. Для этого необходимо получить соответствующие разрешения, произвести демонтаж забора, фонарного столба и флагштоков по левую сторону. / Checkpoint. To pass on the territory of the Republic of Kazakhstan, it is required to build a platform for turning the blade truck by 90 degrees. To do this, it is necessary to obtain the appropriate permits, dismantle the fence, lamppost and flagpoles on the left side.	68.728697	40.972832



Ситуационный план / Situation plan:	Идентификационный номер / ID	202204109
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	44.17474784, 80.31157412
	Объем работ / Scope of works: Демонтаж трубы (не является частью несущей конструкции) / H= 5.7 slim pipe, width 7m, main pipe 6m, slim pipe dismantling	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
	Утверждено клиентом / Approved by the client:	
	-	



Ситуационный план / Situation plan:	Идентификационный номер / ID	202204123-130
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	44.045347, 79.982409
	Объем работ / Scope of works:	
	<p>Высота путепровода 5.6m слева – 5.7m справа При общей высоте с грузом более 5.75m демонтаж дорожных ограждений, обустройство съезда, расширение поворотов на имеющейся второстепенной дороге. / Overpass height 5.6m on the left – 5.7m on the right. With a total load height more than 5.75m, the dismantling of road barriers, the arrangement of the exit, the expansion of turns on the existing secondary road.</p>	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204137
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	44.0297145, 79.90873638
	Объем работ / Scope of works:	
	<p>Высота путепровода 5.5m слева – 5.6m справа При общей высоте с грузом более 5.55m, демонтаж дорожных ограждений на разделительной полосе до путепровода / Overpass height 5.5m on the left – 5.6m on the right. With a total load height more than 5.55m, dismantling of road barriers on the dividing strip to the overpass</p>	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-



Ситуационный план / Situation plan:	Идентификационный номер / ID	202204143-144
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	44.01420037, 79.67492142
	Объем работ / Scope of works:	
	<p>Высота путепровода 5.5m При общей высоте с грузом более 5.45m строительство площадки для разворота / Overpass height 5.5m With a total load height more than 5.45m, the construction of a turning platform</p>	
Состояние на сегодняшний день / Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-


KALZHAT / КАЛЖАТ



Ситуационный план / Situation plan:		Идентификационный номер / ID	111
		Категоризации меры / Structural measures categorization::	
		Координаты / Coordinates:	43.672415, 80.624622
		Объем работ / Scope of works:	Получение разрешения и строительство площадок хранения, погрузки и подъезда на стороне КНР и на нейтральной зоне / Obtaining permission and construction of storage, loading and access sites on the prc side and in the neutral zone
Состояние на сегодняшний день /Actual status:		Замечания/Remarks:	Расходы / Costs:
			-
			Утверждено клиентом / Approved by the client:
			-

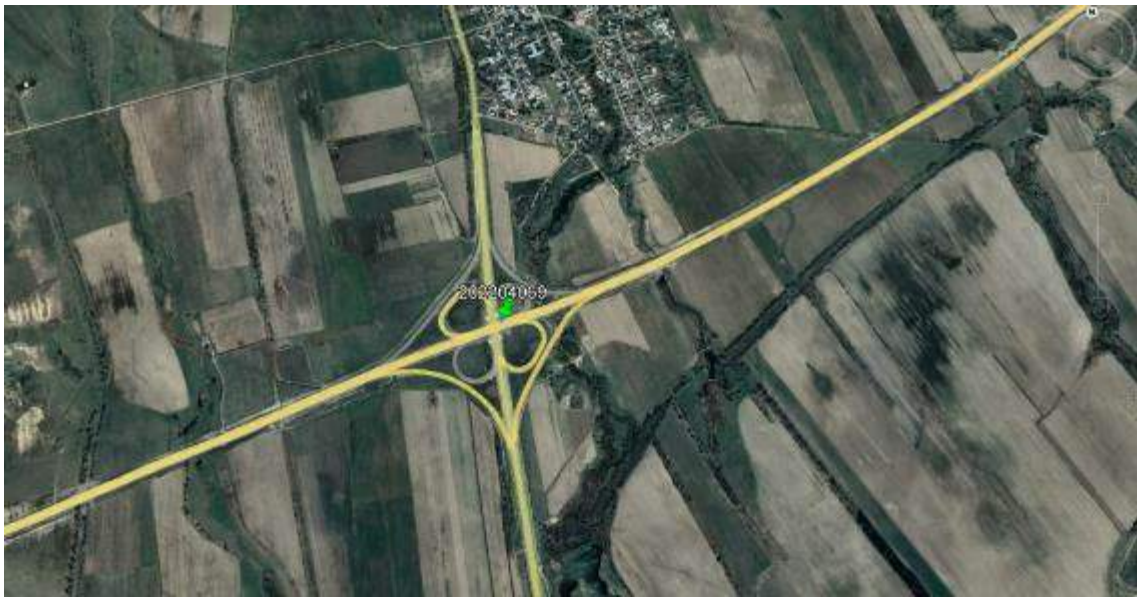

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204151
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	43.672415, 80.624622
	Объем работ / Scope of works:	
	Демонтаж фонарного столба, дорожных ограждений на въезде и разделительных ограждений на выезде из поворота при движении по встречной полосе / Dismantling of the lamppost, road barriers at the entrance and separation fences at the exit of the turn when driving in the oncoming lane	
Состояние на сегодняшний день / Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-




ОБЩИЙ МАРШРУТ



Ситуационный план / Situation plan:	Идентификационный номер / ID	202204087
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	43.58265701, 78.25957149
	Объем работ / Scope of works:	
	<p>Высота пешеходного перехода 5,75 При высоте автопоезда выше 5.65 движение по существующей грунтовой дороге. Необходимо расширение заезда/выезда, спланировать съезд / Pedestrian crossing height 5,75 When the height of the road train is above 5.65, traffic on the existing dirt road. It is necessary to expand the arrival / exit, plan the exit</p>	
Состояние на сегодняшний день / Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-



Ситуационный план / Situation plan:	Идентификационный номер / ID	202204083
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	43.57806842, 78.20042019
	Объем работ / Scope of works: Высота пешеходного перехода 5,5m При высоте автопоезда выше 5.45m необходимо строительство байпаса справа / Pedestrian crossing height 5,5m When the height of the road train is above 5.45m, it is necessary to build a bypass on the right	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-



Ситуационный план / Situation plan:	Идентификационный номер / ID	202204073
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	43.54252583, 77.70740625
	Объем работ / Scope of works: Высота путепровода справа - 5,5m слева – 5.6m При высоте автопоезда выше 5.45m – укрепление обочин в месте разворота / The height of the overpass on the right - 5,5m on the left - 5.6m When the height of the road train is above 5.45 m - strengthening of the shoulders at the turning point	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204069
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	43.51072363, 77.47585329
	Объем работ / Scope of works:	
	<p>Высота путепровода справа - 5,6m слева – 5.5m При высоте автопоезда выше 5.5m – укрепление обочин в месте разворота /</p> <p>The height of the overpass on the right - 5.6m on the left - 5.5m When the height of the road train is above 5.5m – strengthening of the shoulders at the turning point /</p>	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204043
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	43.44712089, 76.99973911
	Объем работ / Scope of works: Высота арки - 5,7m При высоте автопоезда выше 5.65m – демонтаж нижней трубы (не является несущей конструкцией), демонтаж блоков для движения по встречной полосе / Arch height - 5,7m When the height of the road train is above 5.65m - dismantling of the lower pipe (not a supporting structure), dismantling of blocks for traffic in the oncoming lane	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client: -

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204180
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	43.44384373, 76.99420149
	Объем работ / Scope of works:	
	Демонтаж всех фонарных столбов по правую сторону / Dismantling of all lampposts on the right side	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204181
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	43.45366849, 76.98903491
	Объем работ / Scope of works:	<p>Высота антенны 5.7m. При высоте автопоезда выше 5,65 или демонтаж антенны или строительство байпаса справа / Antenna height 5.7m. When the height of the road train is above 5.65 or dismantling the antenna or building a bypass on the right</p>
Состояние на сегодняшний день / Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

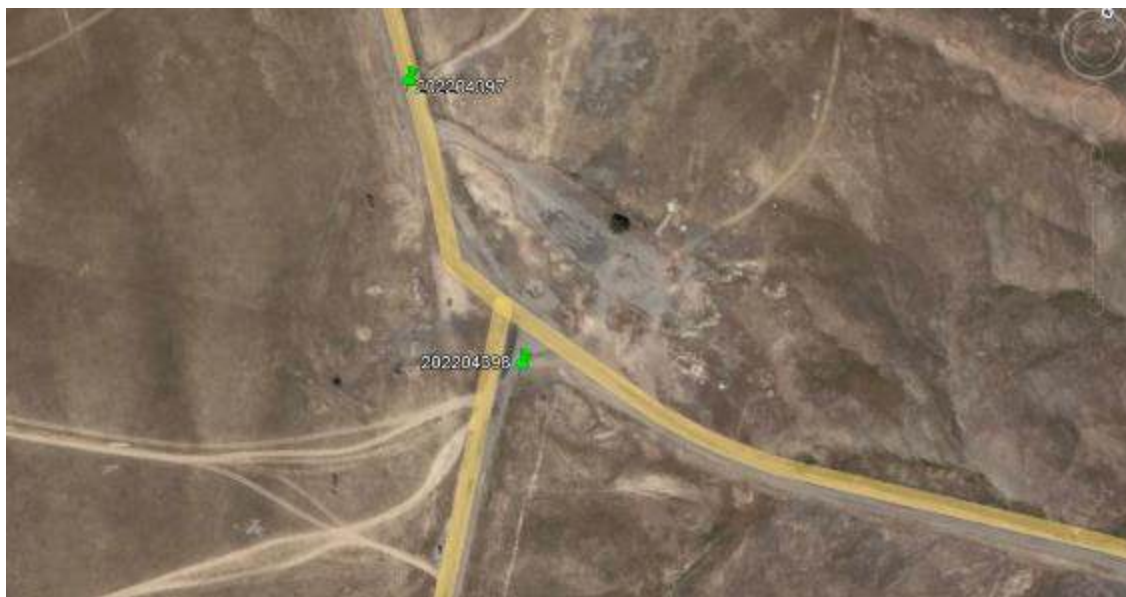
Ситуационный план / Situation plan:	Идентификационный номер / ID	002
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	43.894800, 76.342049
	Объем работ / Scope of works:	
	Расширение проезжей части / road widening	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204396
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	43.90155344, 76.29991258
	Объем работ / Scope of works:	
	Расширение проезжей части / , road widening	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:



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Ситуационный план / Situation plan:



Идентификационный номер / ID

202204398

Категоризации меры / Structural measures categorization::

Координаты / Coordinates:

43.88647554, 76.31524726

Объем работ / Scope of works:

Расширение проезжей части /
road widening

Состояние на сегодняшний день /Actual status:

Замечания/Remarks:

Расходы / Costs:



-

Утверждено клиентом /
Approved by the client:

-

Ситуационный план / Situation plan:



Идентификационный номер / ID

202204404

Категоризации меры / Structural
measures categorization::

Координаты / Coordinates:

43.32613003, 76.27892635

Объем работ / Scope of works:

Арка 5.6m. При высоте автопоезда выше 5.55m - подъем /
Arch 5.6m. When the height of the road train is above 5.55m - lifting

Состояние на сегодняшний день /Actual status:

Замечания/Remarks:

Расходы / Costs:



-

Утверждено клиентом /
Approved by the client:

-

Ситуационный план / Situation plan:



Идентификационный номер / ID

202204406


Категоризации меры / Structural
measures categorization::

Координаты / Coordinates:

43.27739578, 76.28762167

Объем работ / Scope of works:

Поворот направо – подрезка деревьев справа /
Turn right – trim trees on the right

Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204441
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	42.92816248, 73.24767029
	Объем работ / Scope of works:	



Арка – 5.6m по вывеске. Подъем указателя /
Arch – 5.6m by sign. Lift up of the sign

Состояние на сегодняшний день /Actual status:

Замечания/Remarks:



Расходы / Costs:

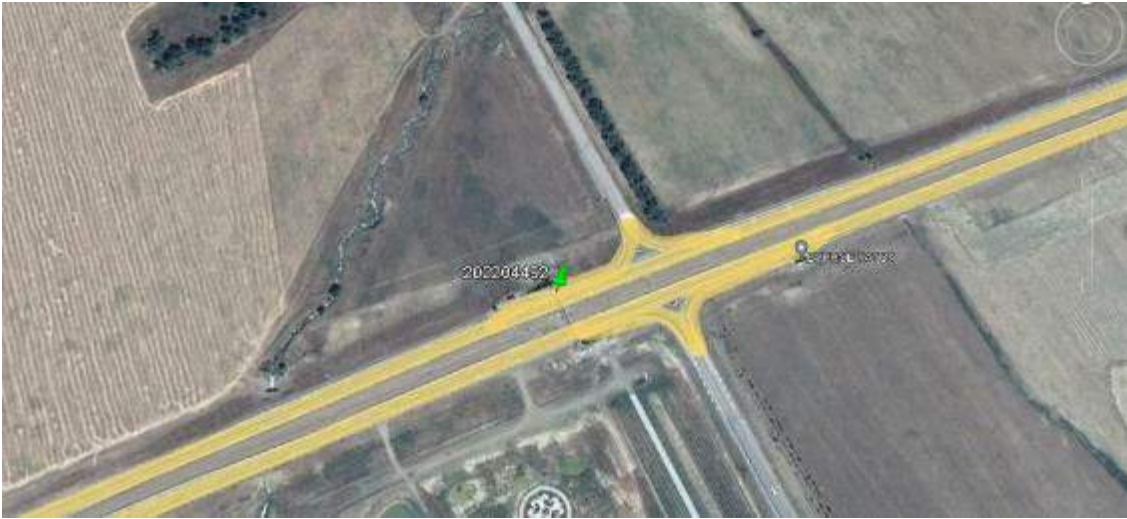





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Утверждено клиентом /
Approved by the client:

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Ситуационный план / Situation plan:	Идентификационный номер / ID	202204449-455
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	42.87557659, 73.1378279
	Объем работ / Scope of works: Путепровод – 5.75m справа, 5.65 слева. При высоте автопоезда свыше 5.7m демонтаж ограждений на разделительной полосе и движение по полосе встречного движения / Overpass – 5.75m on the right, 5.65m on the left. When the height of the road train is more than 5.7 m, the dismantling of fences on the dividing strip and traffic on the lane of oncoming traffic	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-



Ситуационный план / Situation plan:	Идентификационный номер / ID	202204492
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	42.63756781, 70.75546546
	Объем работ / Scope of works:	<p>Пешеходный переход высота – справа 5.65m справа, 5.55 слева. При высоте автопоезда свыше 5.6m строительство байпаса справа или подъем конструкции/ Pedestrian crossing height – right 5.65m on the right, 5.55m on the left. When the height of the road train is over 5.6m, the construction of the bypass on the right or the lifting of the structure/</p>
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-



Ситуационный план / Situation plan:	Идентификационный номер / ID	202204528
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	42.45700569, 69.75694999
	Объем работ / Scope of works:	
Состояние на сегодняшний день / Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
	Утверждено клиентом / Approved by the client:	
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204542
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	42.5303921, 69.34499848
	Объем работ / Scope of works:	
	Демонтаж фонарного столба и дорожного указателя/ Dismantling of the lamppost and road sign	
Состояние на сегодняшний день / Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-


Ситуационный план / Situation plan:	Идентификационный номер / ID	202204545
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	42.40317083, 69.45464167
	Объем работ / Scope of works:	
	Демонтаж фонарного столба и ограждения на въезде. Перенос ограждения на выезде/ Dismantling of the lamppost and fence at the entrance. Relocation of the fence at the exit	
Состояние на сегодняшний день / Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204554
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	42.38326084, 69.26977525
	Объем работ / Scope of works:	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204557
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	42.38102818, 69.25940448
	Объем работ / Scope of works:	
	Газовая труба высота – 5.65m. Подъем при высоте автопоезда выше 5.6m./ Gas pipe height – 5.65m. Lifting at a height of the road train above 5.6m	
Состояние на сегодняшний день / Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204569
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	42.29025741, 69.21291416
	Объем работ / Scope of works:	
	ВЛ 220кВ высота 7.7m – построить байпас так как высота может уменьшиться/ 220kV overhead line height 7.7m – build a bypass as the height may decrease	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204578
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	42.04639768, 69.47513521
	Объем работ / Scope of works:	
	Поворот демонтаж фонарного столба и снять грунт слева от входа в поворот/ Turn dismantle the lamppost and remove the ground to the left of the entrance to the turn	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204634
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	40.97283222, 68.7286969
	Объем работ / Scope of works: Пункт пропуска. Для прохождения на территории Республики Казахстан требуется строительство площадки для поворота лопастевого на 90 град. Для этого необходимо получить соответствующие разрешения, произвести демонтаж забора, фонарного столба и флагштоков по левую сторону. / Checkpoint. To pass on the territory of the Republic of Kazakhstan, it is required to build a platform for turning the blade truck by 90 degrees. To do this, it is necessary to obtain the appropriate permits, dismantle the fence, lamppost and flagpoles on the left side.	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

РАБОТЫ ПРИ КАЖДОМ РЕЙСЕ КОЛОННЫ / WORKS FOR EACH TOUR

Так же необходимо осуществлять работы при каждом рейсе колонны, такие как отключение проводов ЛЭП, демонтаж\монтаж знаков и тд. Расходы сведены в таблицу №2

It is also necessary to carry out work at each toure of the convoi, such as disconnecting power lines, dismantling / installing signs, etc. The costs are summarized in table number 2

Nr	Type	Description RU	CW	CW Remark
202204014	highway-over crossing	H= 5.5м везде,	x	from asphalt to wall 14m, bypass on the right side possible, now here 6.1
202204024	Road condition	Road under construction	x	new check bevor transportation
202204026	Road condition	Road under construction	x	new check bevor transportation
202204027	Road condition	Road under construction	x	new check bevor transportation
202204084	Archway	right 5.55, left 5.88, center 5.76.	x	on the oncoming traffic lane 6.0
202204088	highway-over crossing	H= left 5.6 right 5.9, center 5.8, oncoming lane 6 м	x	movement on oncoming lane
202204089	highway-over crossing	H= right 5.75, left 5.6. oncoming lane 5.6 right и 6 left и 5.9 в center	x	movement on oncoming lane
202204092	Route	A place to turn around	x	dismantling of the road signs
202204150	highway-over crossing	H= 5.9 right, left 5.8,	x	movement on the right side
202204384	PTL	PTL 35, H= 5.9	x	lift up and switch out
202204390	Road condition	high spots on the road	x	leveling
202204391	gradient	gradient down and up, for blades leveling necessary	x	leveling
202204392	Road condition	high spots on the road	x	leveling
202204393	Road condition	Road under construction	x	new check bevor transportation
202204394	Road condition	hill leveling	x	hill leveling
202204395	Turn	turn	x	road widening inside and outside
202204400	PTL	PTL 10kv, H=5.8m.	x	lift up and switch out
202204415	Road condition	Road under construction	x	new check bevor transportation
202204420	highway-over crossing	H= right 5.98, left 5.8,	x	movement on the right side
202204432	highway-over crossing	H= right 5.93, left 5.83	x	movement on the right side
202204454	Archway	H= 7.1, metal in the center 5.8	x	movement on the left side
202204458	pedestrian crossing	H= 5.87 right 5.74 left,	x	movement on the right side
202204459	Archway	H= right 6м, left 5.9	x	movement on the right side
202204462	Archway	H= 5.9 right, 5.8 left	x	movement on the right side

202204467	Archway	H= 6.0 right, 5.8 left,	x	movement on the right side
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РАБОТЫ ПО МОДЕРНИЗАЦИИ МАРШРУТА / ROAD MODIFICATION WORKS

Part 2 - Uzbekistan

(PRELIMINARY REPORT)

Для беспрепятственного проезда колонны с комплектами ВТГ по маршруту необходимо произвести работы по модернизации дорожного полотна, обустройства объездов и демонтажа знаков. Общий объем работ приведен в таблице №3.	For the passing of the cargo along the route, it is necessary to carry out the modernization works of the roadway, the arrangement of bypasses and the dismantling of signs. Total scope of work is included in Table 3.
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Nr	Type	Description	Coordinates L	Coordinates B
202204635		Проверка размеров арки для проезда!!! / Checking the dimensions of the driveway arch, permit from customs authorities needed	68.727868	40.966898
202204638	Turn	На время проезда засыпать ливневки ПГС или проложить металлические листы. / During the project time, fillin the rain strom drains or laying with metal sheets.	68.73178	40.956591
202204639	Turn	На время проезда засыпать ливневку ПГС или проложить металлические листы, убрать блоки, демонтировать дорожный знак, подрезать деревья / During the project time, fillin the rain strom drains or laying with metal sheets, remove blocks, dismantle road sign, cutting trees	68.73304899999999	40.950113
202204641	Turn	Требуется расширение дороги справа, убрать блоки, перенос ЛЭП, демонтаж дорожного знака. На выезде М-39 убрать островок с грунтом, демонтаж маленького бордюра. / road widening on the right, removing blocks, moving power lines, dismantling the road sign. At the M-39 exit, remove the island with soil, dismantle the curb.	68.741314	40.946989

202204644	Bridge	Демонтаж забора на заправке (только для лопастей). Демонтаж блоков и знака, подсыпка ПГС (по ситуации) / Dismantling of the fence at the gas station (only for blades). Dismantling of blocks and sign, filling of soil (according to the situation)	68.69909800000001	40.907972
202204646	Bridge	Вскрытие арматуры на последнем пролете 9 м, трещины на опоре Обследование и ремонт. / Opening of fittings on the last span of 9 m, cracks on the support Inspection and repair.	68.675989	40.893156
202204663		Объезд по встречной полосе. Демонтаж бордюра. / Detour on the oncoming lane. Dismantling of the curb.	68.483895	40.138259
202204675		Заезд на на трассу М-39. Демонтаж дорожных знаков и расширение проезжей части на развороте / Exit to the M-39. Dismantling of road signs and widening of the roadway at the turn	67.93197600000001	40.095364
202204702	highway-over crossing	Объезд по встречной полосе, необходим демонтаж блоков до и после. Для каждого проезда необходимо подготовка байпаса, раскапывать/закапывать дорогу ведущую в населенный пункт / Detour on the oncoming lane, it is necessary to dismantle the blocks before and after movement. For each passage, it is necessary to prepare a bypass, dig / dig in the road leading to the village	67.90760400000001	40.075135
202204707	Archway	Движение по существующему байпасу (удлинить/расширить) или подъем балки / Driving on an existing bypass (extend/widen) or lifting a beam	67.454885	39.844771
202204708		Справа 5.7 и 6.0 Поднять / Right 5.7 and 6.0 Lift up	67.091604	39.71094
202204718		Для заезда на пункт разворота. Расширение разрыва с переносом блоков и знаков с двух сторон, расширение существующей отсыпки / To arrive at the U-turn point. Expansion of the gap with the transfer of blocks and signs on both sides, expansion of the existing area.	66.88706999999999	39.758521
202204768		Арка, высота 5.6 Поднять /	64.900049	40.066999



		Archway H=5.6 Lift up		
202204778		Выезд на встречную полосу. Существующий разрыв длина 35м Расширить расстояние между ограждениями на выезде / Exit to the oncoming lane. Existing gap 35 m. Extend the distance between fences at the exit	64.765947	40.061614
202204782		Обследование мостового сооружения / Bridge expertise	64.47929499999999	39.91541
202204790 - 202204801	Bridge	90 км строительство бетонки. Практически все мосты в ремонте (7-9 шт) с U-образными объездами. Проверка перед проездом, возможны работы по отсыпке и расчистки объездов/ 90 km road under construction. Almost all bridges are under reconstruction (7-9 pcs) with U-shaped detours. Status check before project start, work like soil fill and clearing of detour ways are possible	64.321433	39.877409
202204807		Демонтаж дорожных знаков на повороте, укрепление и выравнивание существующей отсыпки на углу 20 м / Dismantling of road signs at the turn, strengthening and leveling of the existing road widening for the turn area 20m	63.089775	40.403376
202204835	Road condition	24 км дороги плохого качества (микс асфальта и щебеночной дороги с гребенчатым профилем), необходим ямочный ремонт и планирование неровностей. / 24 km of poor quality road (mix of asphalt and gravel road with comb profile), need pothole repair and leveling	63.090087	40.404094
202205_0001	Turn	Необходимо расширить и укрепить обочину на углах справа и слева (довольно много), демонтаж фонарного столба, всех столбиков, знаков и указателей. / It is necessary to expand and strengthen the shoulder at the turns on the right and left (large area), dismantling the light pillars, all posts, road signs.	63.332453	40.844249,
202204840	exit to site	Dzhangel'dy Локальный ремонт дороги для съезда к площадкам ветропарка вправо/влево / Local road repair for the right/left exit to the wind farm sites	63.378647	40.815081
202205_0002	turn	Демонтаж, 3-х фонарных столбов (справа/слева), бетонных ограждений слева и дорожных знаков справа. / Dismantling of 3 lampposts (right/left), concrete fences on the left and road signs on the right side	60.769352	41.674665,



COSCO SHIPPING LOGISTICS (XIAMEN)



202204830	Turn	Демонтаж столбиков, дорожного знака, бетонных блоков. Расширение проезжей части на углу / Dismantling of pillars, road sign, concrete blocks. Widening the roadway at the turn	60.317342	42.181468
202205_0003	road condition	Строительство дороги 21 км/ Road construction 21 km	60.43745	42.18893,
202204740		Демонтаж знака и укрепление островка для проезда / Dismantling of the sign and strengthening of the islet for passage	65.352827	40.147711
202204756		Расширение проезжей части по 40м с каждой стороны, демонтаж столбиков, дорожных знаков, блоков. / Expansion of the roadway by 40 m on each side, dismantling of pillars, road signs, blocks.	65.020145	40.190735
202205_0004		Расширение проезжей части / Road widening	64.74415	40.53281,
202204854	Turn	Демонтаж столбиков и бетонных блоков слева. Небольшая отсыпка угла / Dismantling of pillars and concrete blocks on the left. filling turn area	64.60527399999999	41.061038
202204851	PTL	Вл 220 7.6м, отключение и поднятие / 220 7.6m, switch of and lifting	64.56343	41.058364
202204850	Turn	Отсыпать угол. Демонтаж знаков / Turn widening and dismantling of the road signs	64.38145799999999	41.016566

ФОТО-ОТЧЕТ/ VISUALISATION







Ситуационный план / Situation plan:	Идентификационный номер / ID	202204635
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	40.966938, 68.727834
	Объем работ / Scope of works:	
	Проверка размеров арки для проезда!!! / Checking the dimensions of the driveway arch, permit from customs authorities needed	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204638
	Категоризации меры / Structural measures categorization:	
	Координаты / Coordinates:	40.95659058, 68.73178025
	Объем работ / Scope of works:	
	<p>На время проезда засыпать ливневки ПГС или проложить металлические листы. / During the project time, fillin the rain strom drains or laying with metal sheets.</p>	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204639
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	40.950055, 68.733089
	Объем работ / Scope of works: На время проезда засыпать ливневку ПГС или проложить металлические листы, убрать блоки, демонтировать дорожный знак, подрезать деревья / During the project time, fillin the rain strom drains or laying with metal sheets, remove blocks, dismantle road sign, cutting trees	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-



Ситуационный план / Situation plan:	Идентификационный номер / ID	202204641
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	40.94698921, 68.74131435
	Объем работ / Scope of works: Требуется расширение дороги справа, убрать блоки, перенос ЛЭП, демонтаж дорожного знака. На выезде М-39 убрать островок с груном, демонтаж маленького бордюра. / road widening on the right, removing blocks, moving power lines, dismantling the road sign. At the M-39 exit, remove the island with soil, dismantle the curb.	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-



Ситуационный план / Situation plan:	Идентификационный номер / ID	202204644
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	40.90797246, 68.69909847
	Объем работ / Scope of works:	
	Демонтаж забора на заправке (только для лопастей). Демонтаж блоков и знака, подсыпка ПГС (по ситуации) / Демantling of the fence at the gas station (only for blades). Dismantling of blocks and sign, filling of soil (according to the situation)	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-



Ситуационный план / Situation plan:	Идентификационный номер / ID	202204646
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	40.893277, 68.676327
	Объем работ / Scope of works: Вскрытие арматуры на последнем пролете 9 м, трещины на опоре Обследование и ремонт. / Opening of fittings on the last span of 9 m, cracks on the support Inspection and repair.	
Состояние на сегодняшний день / Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-



Ситуационный план / Situation plan:	Идентификационный номер / ID	202204663
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	40.138267, 68.484304
	Объем работ / Scope of works: Объезд по встречной полосе. Демонтаж бордюра. / Detour on the oncoming lane. Dismantling of the curb.	
Состояние на сегодняшний день / Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-



Ситуационный план / Situation plan:	Идентификационный номер / ID	202204675
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	40.09536421, 67.93197632
	Объем работ / Scope of works: Заезд на на трассу М-39. Демонтаж дорожных знаков и расширение проезжей части на развороте / Exit to the M-39. Dismantling of road signs and widening of the roadway at the turn	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-



Ситуационный план / Situation plan:	Идентификационный номер / ID	202204702
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	40.074996, 67.907703
	Объем работ / Scope of works: Объезд по встречной полосе, необходим демонтаж блоков до и после. Для каждого проезда необходимо подготовка байпаса, раскапывать/закапывать дорогу ведущую в населенный пункт / Detour on the oncoming lane, it is necessary to dismantle the blocks before and after movement. For each passage, it is necessary to prepare a bypass, dig / dig in the road leading to the village	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204707
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	39.84477094, 67.45488537
	Объем работ / Scope of works: Движение по существующему байпасу (удлинить/расширить) или подъем балки / Driving on an existing bypass (extend/widen) or lifting a beam	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204708
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	39.71073, 67.091678
	Объем работ / Scope of works: Справа 5.7 и 6.0 Поднять / Right 5.7 and 6.0 Lift up	
Состояние на сегодняшний день / Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-



Ситуационный план / Situation plan:	Идентификационный номер / ID	202204718
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	39.7585208, 66.88706955
	Объем работ / Scope of works: Для заезда на пункт разворота. Расширение разрыва с переносом блоков и знаков с двух сторон, расширение существующей отсыпки / To arrive at the U-turn point. Expansion of the gap with the transfer of blocks and signs on both sides, expansion of the existing area.	
Состояние на сегодняшний день / Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-



Ситуационный план / Situation plan:	Идентификационный номер / ID	202204768
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	40.066931, 64.900172
	Объем работ / Scope of works: Арка, высота 5.6 Поднять / Archway H=5.6 Lift up	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-


Ситуационный план / Situation plan:	Идентификационный номер / ID	202204778
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	40.06161448, 64.76594703
	Объем работ / Scope of works: Выезд на встречную полосу. Существующий разрыв длина 35м Расширить расстояние между ограждениями на выезде / Exit to the oncoming lane. Existing gap 35 m. Extend the distance between fences at the exit	
Состояние на сегодняшний день / Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204782
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	39.91558, 64.47937
	Объем работ / Scope of works:	
	Обследование мостового сооружения / Bridge expertise	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID		202204790 202204801
	Категоризации меры / Structural measures categorization::		
	Координаты / Coordinates:		
		Объем работ / Scope of works:	90 км строительство бетонки. Практически все мосты в ремонте (7-9 шт) с U-образными объездами. Проверка перед проездом, возможны работы по отсыпке и расчистки объездов/ 90 km road under construction. Almost all bridges are under reconstruction (7-9 pcs) with U-shaped detours. Status check before project start, work like soil fill and clearing of detour ways are possible
Состояние на сегодняшний день / Actual status:	Замечания/Remarks:	Расходы / Costs:	
		-	
		Утверждено клиентом / Approved by the client:	
		-	

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204807
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	40.402806, 63.089521
	Объем работ / Scope of works: Демонтаж дорожных знаков на повороте, укрепление и выравнивание существующей отсыпки на углу / Dismantling of road signs at the turn, strengthening and leveling of the existing road widening for the turn area	
Состояние на сегодняшний день / Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204835
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	40.40409431, 63.09008736
	Объем работ / Scope of works: 24 км дороги плохого качества (микс асфальта и щебеночной дороги с гребенчатым профилем), необходим ямочный ремонт и планирование неровностей. / 24 km of poor quality road (mix of asphalt and gravel road with comb profile), need pothole repair and leveling	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202205_0001
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	40.844249, 63.332453
	Объем работ / Scope of works: Необходимо расширить и укрепить обочину на углах справа и слева (довольно много), демонтаж фонарного столба, всех столбиков, знаков и указателей. / It is necessary to expand and strengthen the shoulder at the turns on the right and left (large area), dismantling the light pillars, all posts, road signs.	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs: - Утверждено клиентом / Approved by the client:



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Ситуационный план / Situation plan:



Идентификационный номер / ID

202204840

Категоризации меры / Structural measures categorization::

Координаты / Coordinates:

40.820563, 63.369925

Объем работ / Scope of works:

Dzhangeldy
 Локальный ремонт дороги для съезда к площадкам ветропарка вправо/влево
 /
 Local road repair for the right/left exit to the wind farm sites

Состояние на сегодняшний день /Actual status:

Замечания/Remarks:

Расходы / Costs:



-

Утверждено клиентом /
Approved by the client:

-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202205_0002
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	41.674665, 60.769352
	<p>Объем работ / Scope of works:</p> <p>Демонтаж, 3-х фонарных столбов (справа/слева), бетонных ограждений слева и дорожных знаков справа. / Dismantling of 3 lampposts (right/left), concrete fences on the left and road signs on the right side</p>	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:



-

Утверждено клиентом /
Approved by the client:

-

Ситуационный план / Situation plan:



Идентификационный номер / ID

202204830

Категоризации меры / Structural
measures categorization::

Координаты / Coordinates:

42.18146815, 60.31734159

Объем работ / Scope of works:

Демонтаж столбиков, дорожного знака, бетонных блоков.
Расширение проезжей части на углу
/
Dismantling of pillars, road sign, concrete blocks. Widening the roadway
at the turn

Состояние на сегодняшний день / Actual status:

Замечания/Remarks:

Расходы / Costs:

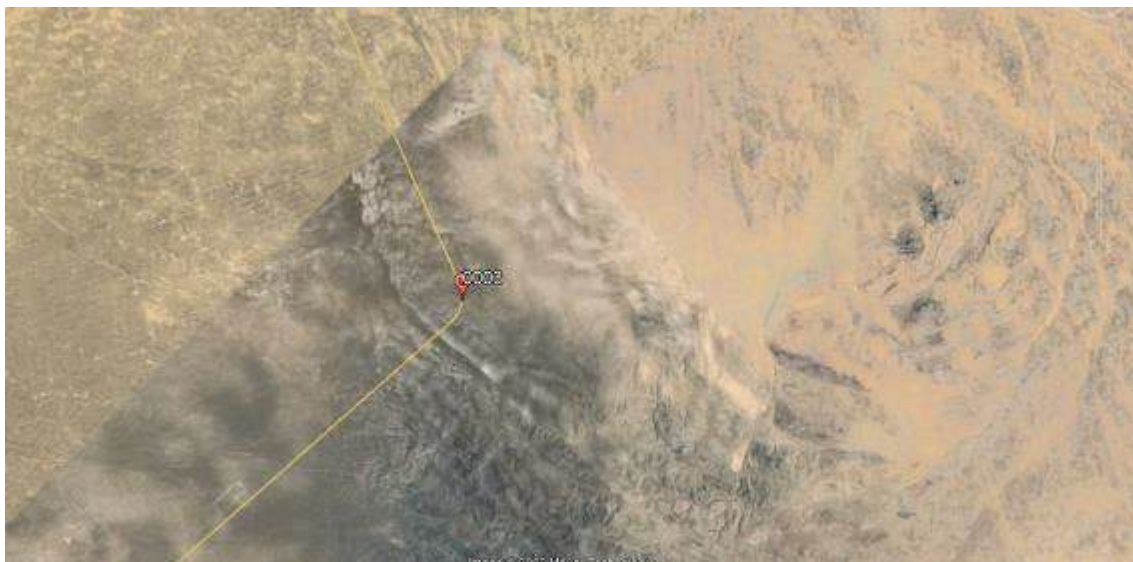


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Утверждено клиентом /
Approved by the client:

-

Ситуационный план / Situation plan:



Идентификационный номер / ID

202205_0003

Категоризации меры / Structural
measures categorization::

Координаты / Coordinates:

42.18893, 60.43745

Объем работ / Scope of works:

Строительство дороги 21 км/
Road construction 21 km

Состояние на сегодняшний день / Actual status:

Замечания/Remarks:

Расходы / Costs:



-

Утверждено клиентом /
Approved by the client:

-

Ситуационный план / Situation plan:



Идентификационный номер / ID

202204740

Категоризации меры / Structural
measures categorization::

Координаты / Coordinates:

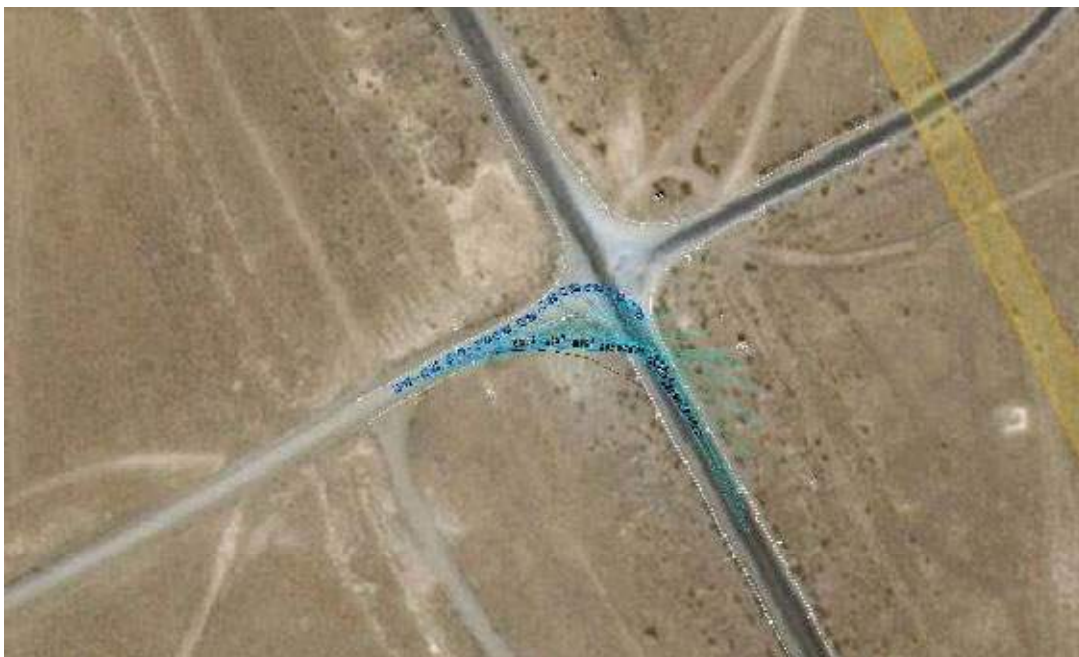
40.14756, 65.35363

Объем работ / Scope of works:

Демонтаж знака и укрепление островка для проезда
/
Dismantling of the sign and strengthening of the islet for passage

Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204856
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	40.69683, 64.88518
	Объем работ / Scope of works:	



Расширение проезжей части по 40м с каждой стороны, демонтаж столбиков, дорожных знаков, блоков.

/ Expansion of the roadway by 40 m on each side, dismantling of pillars, road signs, blocks.

Состояние на сегодняшний день /Actual status:

Замечания/Remarks:

Расходы / Costs:



Утверждено клиентом /
Approved by the client:

Ситуационный план / Situation plan:

Идентификационный номер / ID

202205_0004



Категоризации меры / Structural measures categorization::

Координаты / Coordinates:

40.53281, 64.74415

Объем работ / Scope of works:

Расширение проезжей части
/
Road widening

Состояние на сегодняшний день /Actual status:

Замечания/Remarks:



Расходы / Costs:





-

Утверждено клиентом /
Approved by the client:

-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204854
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	41.06104, 64.60421
	Объем работ / Scope of works: Демонтаж столбиков и бетонных блоков слева. Небольшая отсыпка угла / Dismantling of pillars and concrete blocks on the left. filling turn area	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204851
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	41.05836408, 64.5634303
	Объем работ / Scope of works: Вл 220 7.6м, отключение и поднятие / 220 7.6m, switch of and lifting	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

Ситуационный план / Situation plan:	Идентификационный номер / ID	202204850
	Категоризации меры / Structural measures categorization::	
	Координаты / Coordinates:	41.01656571, 64.38145845
	Объем работ / Scope of works: Отсыпать угол. Демонтаж знаков / Turn widening and dismantling of the road signs	
Состояние на сегодняшний день /Actual status:	Замечания/Remarks:	Расходы / Costs:
		-
		Утверждено клиентом / Approved by the client:
		-

APPENDIX P - CONSULTATION LETTERS MINUTES OF MEETINGS AND POWER POINT PRESENTATION WITH INSTITUTE OF ARCHAEOLOGY

ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ
JURU ENERGY CONSULTING

100077, Tashkent, M.Ulugbek region, Chust Street, house # 10.
TIN: 303454532, BIC: 00974 Bank: «Kapitalbank» A/N: 20208000600502375001

JEC-OUT-21-35
29.03.2021

**Institute of Archaeology under the Academy
of Sciences of the Republic of Uzbekistan**

Under Presidential Decree of the Republic of Uzbekistan No.5001 dated 23.02.2021 "On measures to implement the investment of the Project on construction of a 300-500MW wind power plant in Peshku district in Bukhara region", FE 'ACWA Power Dzhankeldy Wind' LLC (Tashkent)' has entered into a 25-year Power Purchase Agreement with JSC National Electric Networks of Uzbekistan. This agreement was entered on force 24th January 2021 for the development, financing, construction and operation of a 500MW Wind Farm in Peshku district of Bukhara region (See Annex 1).

The project also includes the development of an Overhead Transmission Line (OHTL) with a rating of 500kV single circuit. This OHTL will be shared between ACWA Power's Bash 500MW Wind Farm and the ACWA Power Dzhankeldy 500MW Wind Farm. The alignment of the OHTL is being finalised by JSC National Electric Networks of Uzbekistan and will connect to an existing substation in Qurako'l.

As a part of the ESIA, Juru Energy is consulting with the Institute of Archaeology to request any data or comments that will be relevant to the preparation of the Project ESIA. This includes locations of archaeological and cultural sites/objects near the project site (and within 5km radius of the site).

We would also like to request your clarifications on the following:

1. Are there any ongoing archaeological/cultural surveys being conducted on or near the project site?
2. If yes, would you please share the survey locations, timelines and any relevant information about the archaeological/cultural surveys?

Thank you very much for your assistance and we look forward to your response.

Yours Sincerely,

Director

For the further information please contact:
Gulchekhra Nematullaeva

Phone: +99871 202 04 40
Mob.: +99897 445 95 04



Project is located in Peshku district of Bukhara region

Project Coordinates (based on preliminary co-ordinates)

NORTHING	EASTING
ACWA Power 500MW Project Site	
Eastern Plot	
523619.75	4534733.22
543599.97	4529733.76
536496.75	4510432.45
526924.81	4516485.66
532348.42	4525452.64
523032.36	4532093.13
Western Plot	
525738.34	4525288.58
515437.34	4532201.45
514980.93	4524099.13
522031.61	4519603.11



100170, O'zbekiston Respublikasi, Toshkent sh., Mirzo Ulug'bek ko'chasi, 81. Tel.: (+998) 712629531; (+998) 712626462;
140151, O'zbekiston Respublikasi, Samarqand sh., Vohid Abdullayev ko'chasi, 3. Tel.: (+998) 662321513; uzarchae@academy.uz

№ 95

06 / 04 / 2021 yil

JURU ENERGY CONSULTING
МЧЖ директори Ж. Якубовга

ЎзР ФА Миллий археология маркази Сизнинг 2021 йил 29 мартдаги №21-35 сонли хатингизга жавобан қўйидагиларни маълум қилади.

Белгиланган ҳудуд Ўзбекистон Республикаси Фанлар академияси Миллий археология маркази ва Франция илмий тадқиқотлар миллий маркази (CNRS, UMR 7041. Ўрта Осиё бўлими)нинг қадимги тош даврини ўрганувчи Ўзбекистон-Француз қўшма экспедицияси томонидан бирламчи тадқиқ этилиб, кузатув давомида ҳудуд ва унинг атрофида қадимги ва ўрта асрларга оид сопол намуналари аниқланган.

Шу боис кўрсатилган ҳудудда қадимги тош асрига оид манзилгоҳлар, тошга ишлов бериш устахоналари ва топилмажойлар ёки қадимги кўчманчи чорвадорларнинг мазоркўрғонлари мавжудлиги эҳтимолидан келиб чиққан ҳолда қурилиш режалаштирилаётган ҳудудларда дастлаб археологик кидирув ва назорат ишлари ўтказилиши мақсадга мувофиқдир.

Директор

Ф.А.Мақсудов

Unofficial translation

**National center of Archaeology
Academy of Sciences Republic of Uzbekistan**

No.95 06/04/2021

**To the director of JURU ENERGY CONSULTING LLC
J.Yakubov**

The centre of national archaeology of the Republic of Uzbekistan informs you in response to your letter dated March 29, 2021 №21-35.

The indicated area was studied by Uzbek-French joint expedition of the National Archaeological Centre of the Academy of Sciences of the Republic of Uzbekistan and the National Centre for Scientific Research of France (CNRS, UMR 7041. Central Asia department) which studies the Ancient Stone Age, conducted a primary study, during which samples of ceramics from the ancient and medieval periods were identified in and around the Project territory.

Taking into account the presence of ancient Stone Age settlements, stone-working workshops and cemeteries of ancient nomads and herders, it is advisable to conduct preliminary archaeological search and control work on the planned project site.

Director

signature

F.A.Maksudov

ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ
JURU ENERGY CONSULTING

100077, Tashkent, M.Ulugbek region, Chust Street, house # 10.
TIN: 303454532, BIC: 00974 Bank: «Kapitalbank» A/N: 20208000600502375001

JEC-OUT-21-94
12.04.2021

**Institute of Archaeology under the Academy
of Sciences of the Republic of Uzbekistan**

We would like to thank you for your response on 6th April 2021 No.95 regarding the presence of archaeological sites within the proposed Dzhankeldy Wind Farm project boundaries. Based on your response, we would like to request for further information on the following:

1. Would you please provide us with the coordinates of the Neolithic site in Dzhankeldy including the details and the measurements of the required buffer zone around the site?
2. Would you please confirm whether the Uzbek-French expedition has any active research work currently ongoing on site or the within 5km radius?
3. Please provide us with information of the experts who would be involved in the preliminary archaeological survey:
 - a. Would it be possible to arrange a call with them to understand the requirements for conducting a preliminary archaeological survey and the timeline?
 - b. If yes, would you please propose the most suitable date and time for a call with your team? The call would be between your team, project representatives from ACWA Power, 5 Capitals and Juru Energy.
4. Where a call with your team is not possible at this moment, please provide us with information and details on the following:
 - a. Protocols and requirements for conducting the preliminary archaeological survey on site?
 - b. Number of experts who will be involved in conducting the surveys including their contact details.
 - c. Timeline for conducting the preliminary survey.

Thank you very much for your assistance and we look forward to your response.

Yours Sincerely,

Director

For the further information please contact:
Gulchekhra Nematullaeva

Phone: +99871 202 04 40
Mob.: +99897 445 95 04

MINUTES OF MEETING

Zoom Meeting with representatives of Institute of Archaeology under the Academy of Science of the Republic of Uzbekistan

In a framework of stakeholder engagement and conducting consultations for Bash 500 MW WF and Dzahnkeldy 500 MW WF, Juru Energy issued a request to Institute of Archaeology dated on 12.04.2021 (ref.num – JEC-OUT-21-93) to determine the followings:

- Exact coordinates of archaeological findings on Project sites (both for Dzhankeldy and Bash wind farms);
- Background information about conducted research at the Project sites (both for Bash and Dzhankeldy);
- Preliminary timeline and budget for conducting survey on the Project sites.

The meeting agenda included discussion of abovementioned issues. Thus, on April 19, 2021 at 15.30pm (Tashkent time) a Zoom call was arranged.

A summary of the meeting is provided below.

Stakeholder group:	Interest based
Institute of Archaeology	Mr Muminkhon Saidov – deputy director of Samarkand brach of Institute of Archaeology Bakhtiyor Sayfullayev – Senior researcher
5 Capitals Environmental and Management Consultancy	Ms.Eva Kimonye – Senor Environmental Consultant
Juru Energy	Ms Umida Rozumbetova – acting head of E&S practice group
Meeting language:	Uzbek
Date:	19.04.2021
Start time:	15:30
End time:	16:30
Method of engagement:	Formal letter to the Institute of Archaeology under Academy of Science on 12.04.2021 (JEC-OUT-21-93)
Venue:	Zoom call
Used materials and visual aids	Power point presentation from Institute of Archaeology

Agenda for meeting

1. Background information regarding previous conducted reserch at the Project sites both at Bash and Dzhankeldy;
2. Coordinates/location of places where research has been conducted
3. Discussion of possibilities to arrange an archaeological survey at Bash and Dzhankeldy Project sites.
4. Q&A

Meeting has started with the introduction of parties to each other. Umida Rozumbetova introduced representatives of Institute to 5 Capitals and visa version.

Bakhtoyor Sayfullayev prepared presentation to make an introduction for conducted survey/research for each site.

Starting the presentation Mr. Sayfullayev highlighted that Kyzilkum desert has significant importance for archaeological research. So far around 1600 of archaeological monuments that belong to Neolithic period were found. Institute of Archaeology used to arrange joint research with foreign experts starting from 1996.

The last research was conducted in 2015 along the northern shore of Ayakagitma lake as well as near cliff, that is located on the Project site. Uzbek-French expedition conducted this research.



Figure 1: Locations of researched places at Bash Project site (red spots)



Figure 2: Findings

The Project site of Dzhankeldy WF was less researched comparing to the Bash. The last conducted expedition at Dzhankeldy was in 1980 by archaeologist A. Vinogradov. Since the surveys were not renewed and existing information was not updated, Mr. Sayfullayev told that it was difficult to determine the coordinates of surveyed places.

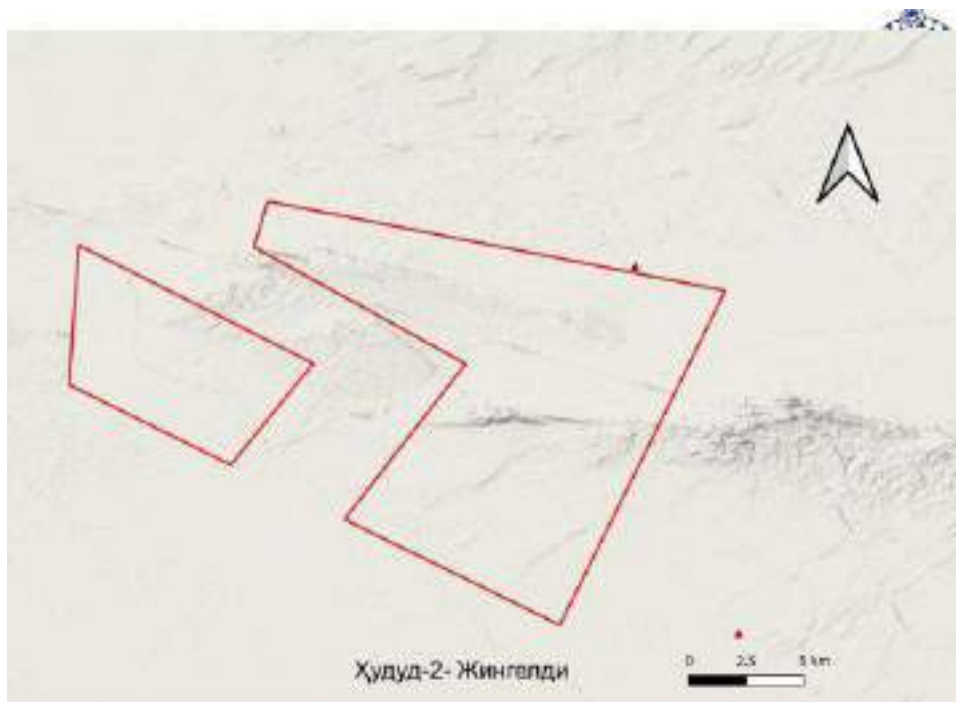


Figure 3: preliminary location of the last conducted research (red point on the eastern plot)

Main finding of these research is attached as ppt file both in Uzbek and in English languages.

Based on the request form 5 Capitals Institute representatives prepared preliminary budget timeline and budget. According to the Institute, overall it will take 2 months to conduct research and prepare report, i.e., 1 month for field works and 1 work for lab works and report preparation. Thus, for one Project site timeframe is 2 months. Consequently, 4 months for Bash and Dzhankeldy.

Regarding the budget, Institute suggested 75 mln UZS for each Project site. Costs breakdown are as follows:

- Travel expenses-20 mln UZS;
- Necessary equipment -25 mln UZS;
- Transportation costs *- 42 mln UZS (2 means of transport for 1 month, approx. 70+70 USD per day);
- Discount for the institute-20 mln UZS.

* The customer can alternately solve the transportation issue and discount this cost.

Q&A session followed after main discussion.

Question	Answer
Umida rozumbetova: Can please share the information regarding foreign researchers that participated in previous conducted surveys?	Bakhtiyor Sayfullayev: Yes, we will need some time to find this information.
Umida Rozumbetova: We would appreciate if you can give us locations (coordinates) of places at project sites and surrounding area.	Bakhtiyor Sayfullayev: Yes, we will search in archives. However, we would like to notify one more time that for Dzhankeldy site existing information might not be accurate, as the last investigations were conducted in 1980.
Umida Rozumbetova: Are there specific timeline (seasons) when archaeological surveys should be conducted?	Bakhtiyor Sayfullayev: The common recognized period is starting from March and ending in October.

Virtual Attendance List

Participants (4)

Eun Kwakanya (16)

Julu Chinyi (16)

Mahmoud Sedky

Sonali Chakrabarti

Invite

Generate QR

Save Hand

Merge Window

Zoom Meeting

Talking Jun. Energy

Meeting Topic: Meeting with Institute of Archaeology
Host: Jun Chinyi
Invite Link: <https://us02w.zoom.us/j/99473886448>
[Copy Link](#)
Participant ID: 487756

Join Audio

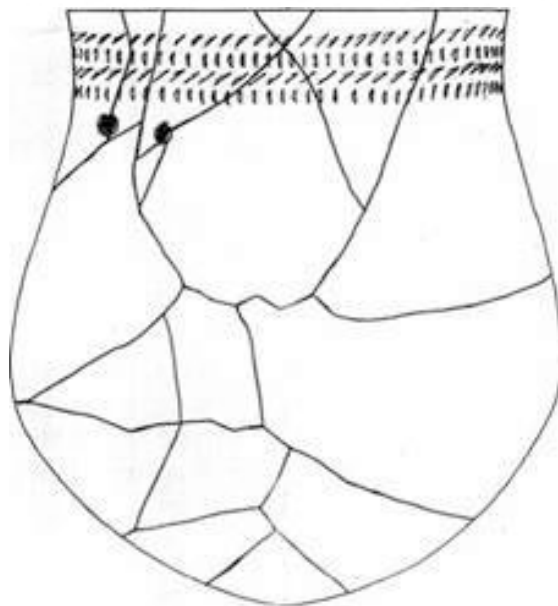
Computer Audio

Share Screen

Invite Others



OUTLINED PLAN FOR ARCHAEOLOGICAL RESEARCH IN THE AGYTMA DEPRESSION AND THE DZHANKELDY OASIS



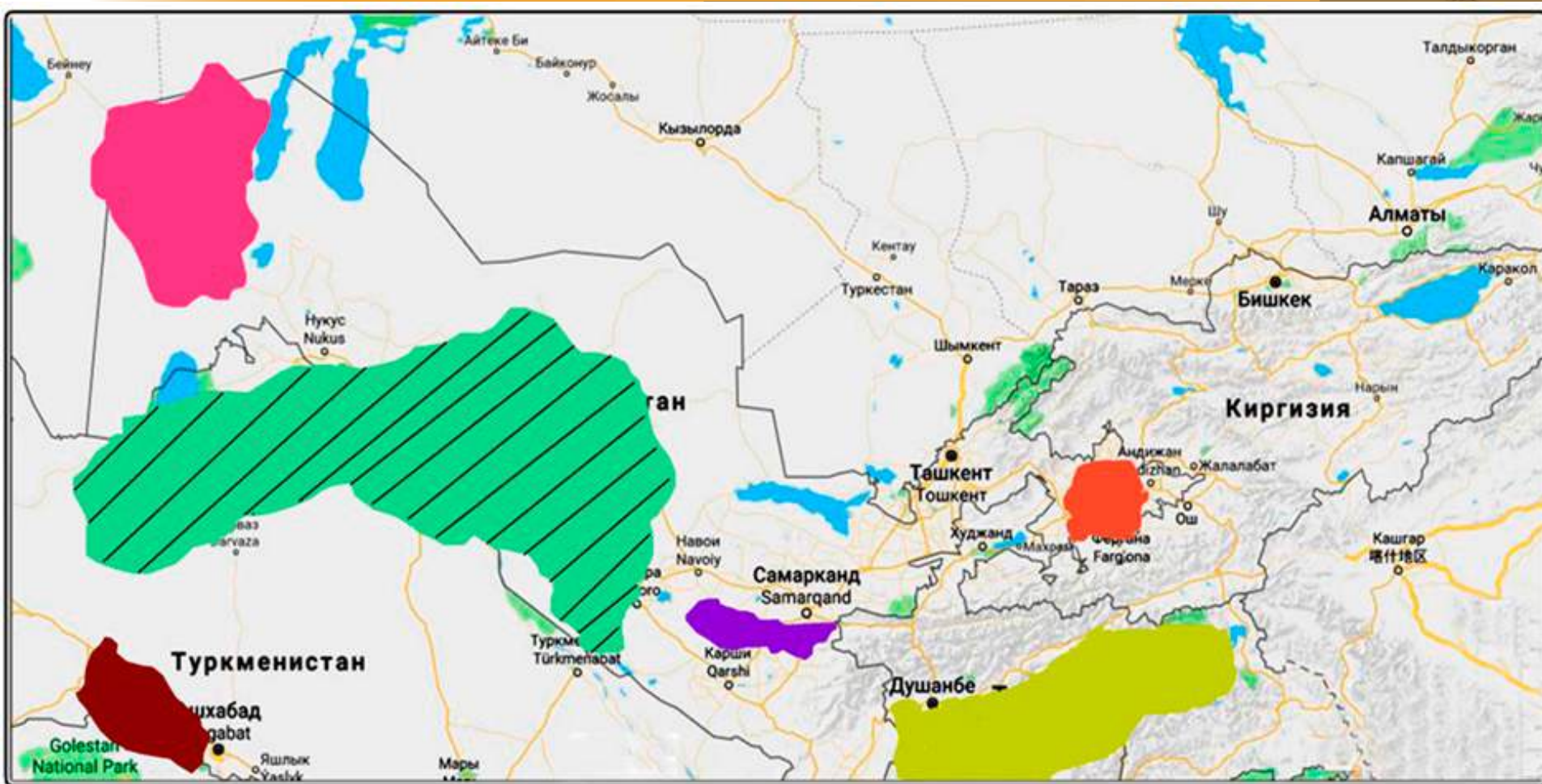
Compiled by: Kh. B. Khoshimov, B.Kh. Sayfullayev




Kyzylkum desert (300 sq.km) is one of the regions of Central Asia rich in colorful archaeological monuments. The most common of the monuments are the finds of the Neolithic period (in total, about 1,600 finds of this period were found). They are united in a single Kaltaminor culture and the study of this culture was conducted in the 40s of the last century by the KhAE (Khorezm Archaeological Expedition) led by S.P. Tolstov. Since the 60-ies and until the 80-ies of the last century, the territory studies were conducted by A.V. Vinogradov.




CULTURES OF THE NEOLITHIC PERIOD OF CENTRAL ASIA




 Kaltaminor culture

 Ustyurt culture

 Central Fergana culture

 Dzhaytun culture

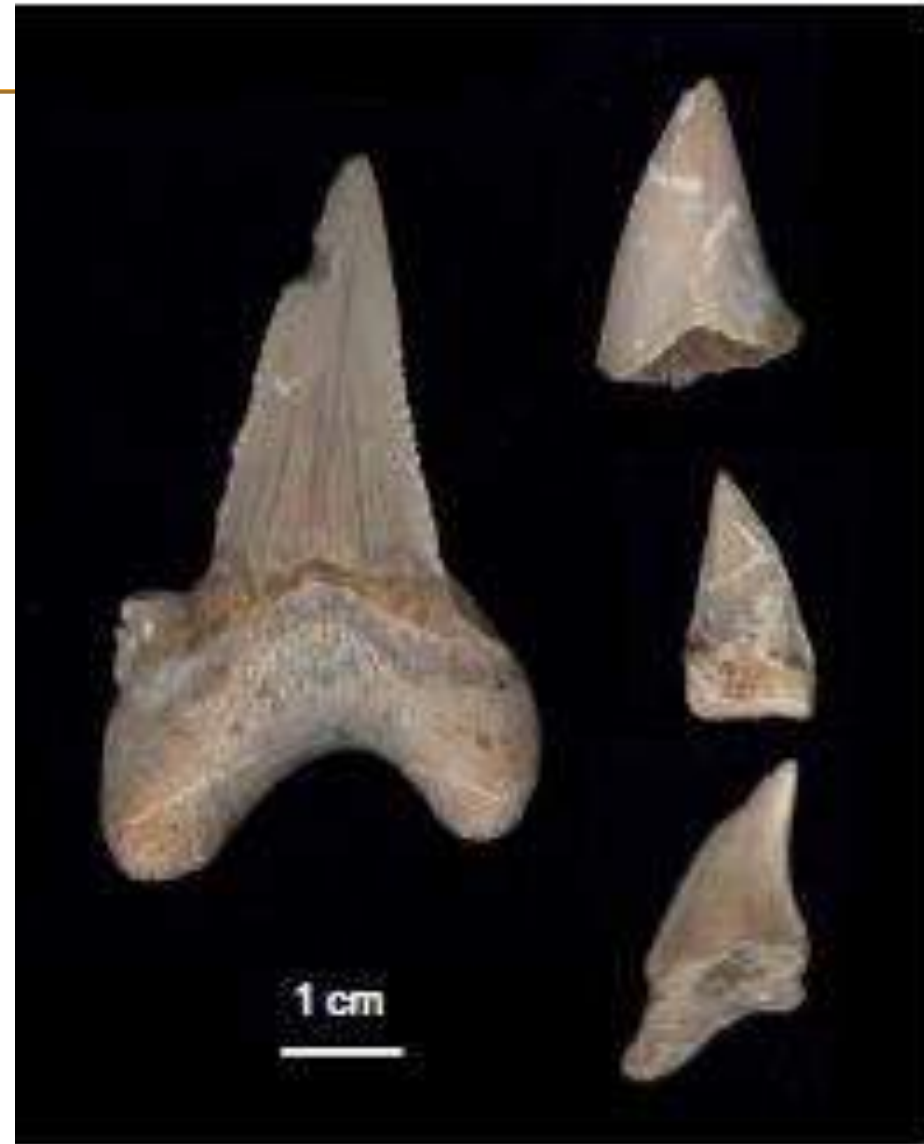
 Sagazan culture

 Khisor culture



As a result of studies conducted in the Kyzylkum territory, the teeth of sharks that lived in the water 30 million years ago also indicate that this territory was once under water.

At the beginning of the Pleistocene and Holocene, the territory of Kyzylkum was a place similar to a Valley. The Neolithic period of Kyzylkum is called "The Country of a Thousand Lakes". There were hundreds of lakes, the Amu Darya and Syr Darya, the ancient Zarafshan rivers flowing into the lower reaches of the Amu Darya. With the warming of the climate, these rivers began to dry up, blocking their ridges with sand dunes and turning into lakes. At that time, Poplars were growing in Central Kyzylkum and the wind was blowing from the opposite direction, relative to the current one. There were plenty of fish in the fertile rivers and lakes. Primitive communities settled around these water sources.

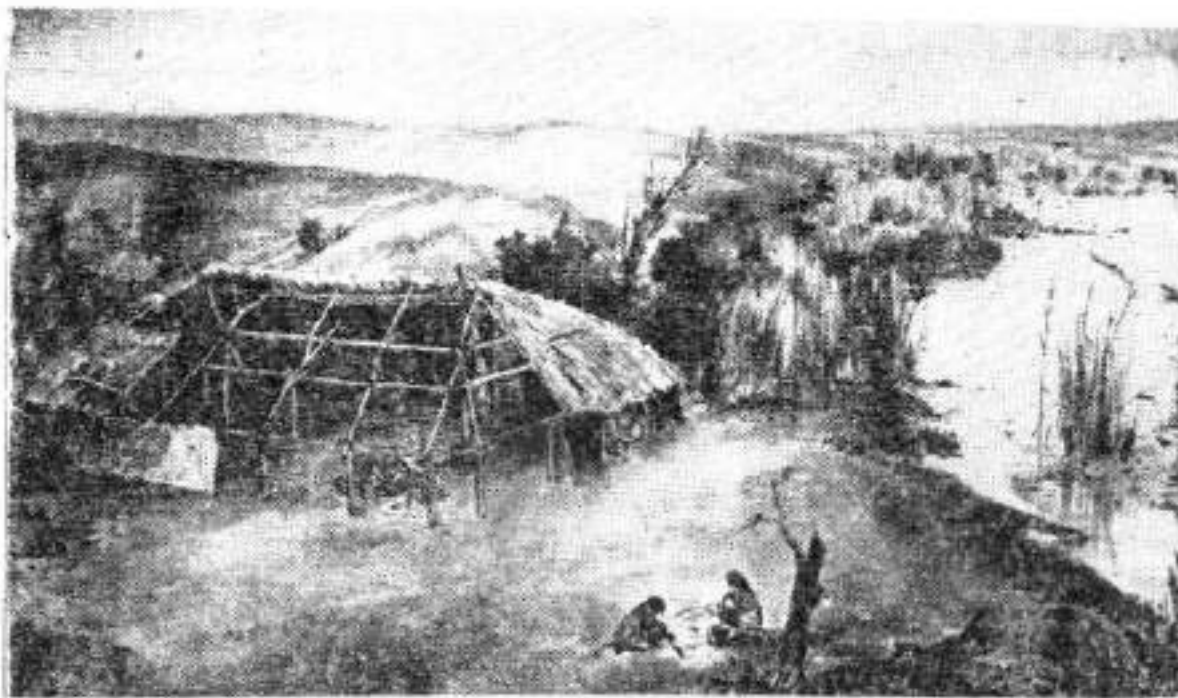




Currently, 3 different types of Stone Age monuments have been identified in the Kyzylkum region:

1. Cultural layers of untouched spaces (basic sites);
2. Destroyed cultural layers that have damaged as a result of natural impacts or (scattered sites);
3. Workshops for processing stones or semi-precious stones.

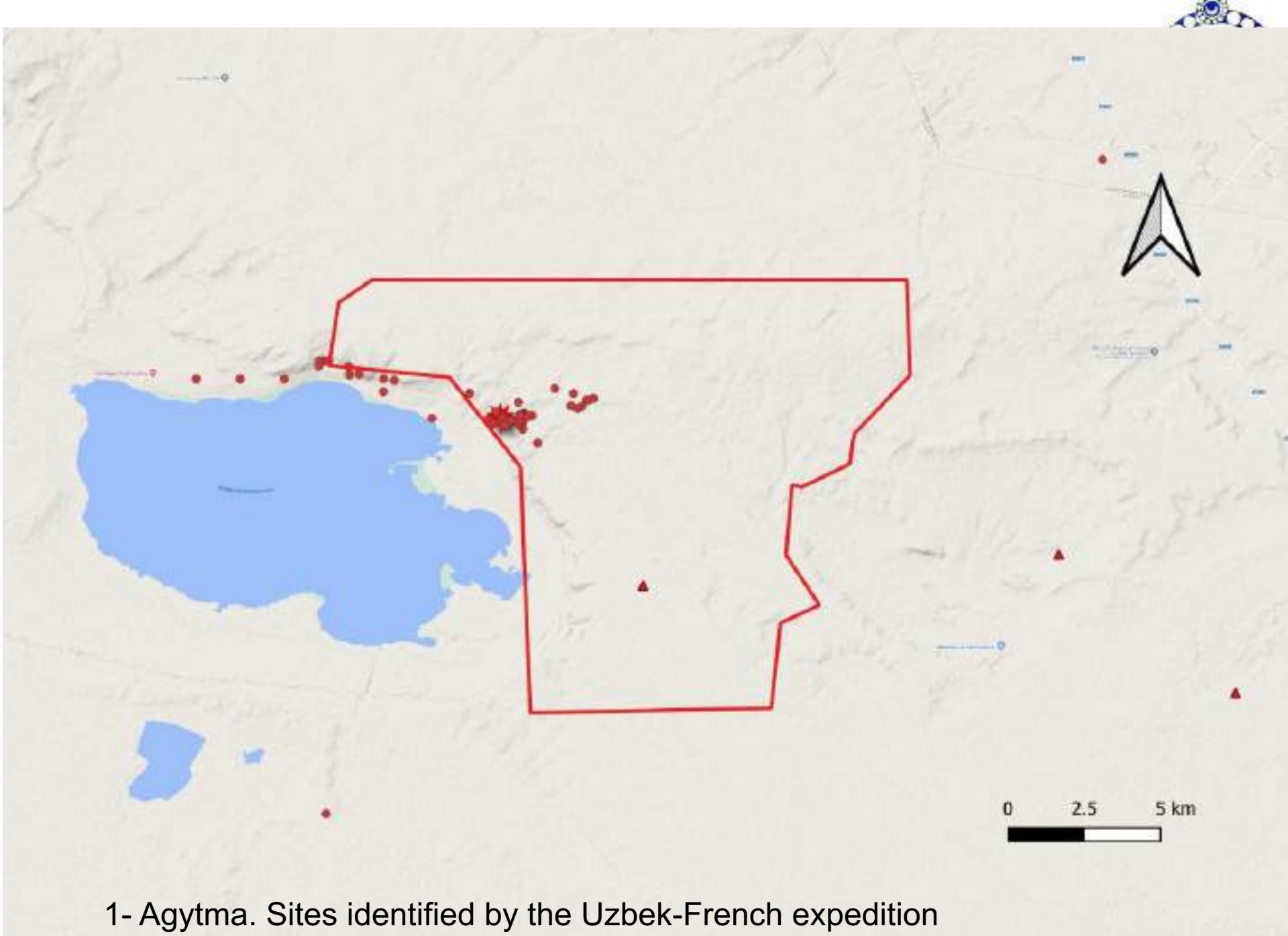
Usually the settlements were built between two mountain ranges, which now turned into dunes, and this protected them from the wind. Monuments of the Kaltaminor culture were found in the remains of the oldest dwelling in Central Asia. These are the monuments of Jonbos-4, Kavat-7 and Dorbozakir-2.



JONBOS-4 RECONSTRUCTION OF THE SETTLEMENT REMAINS)

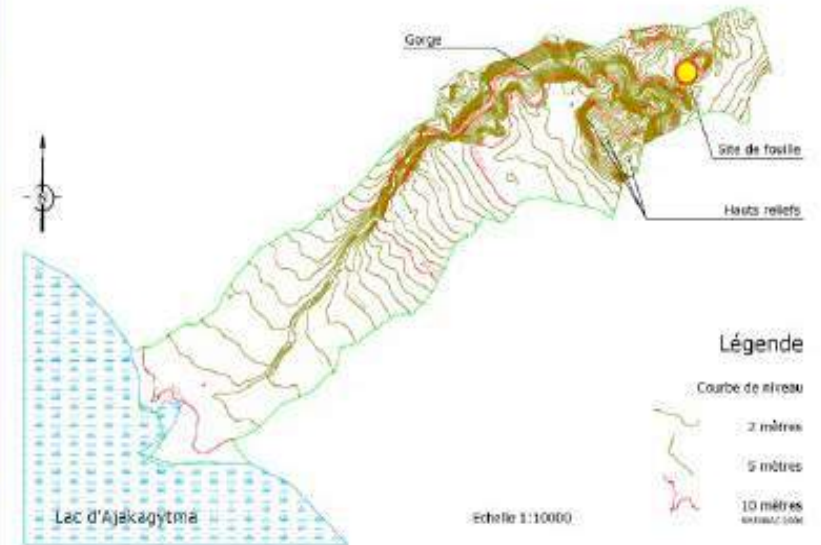


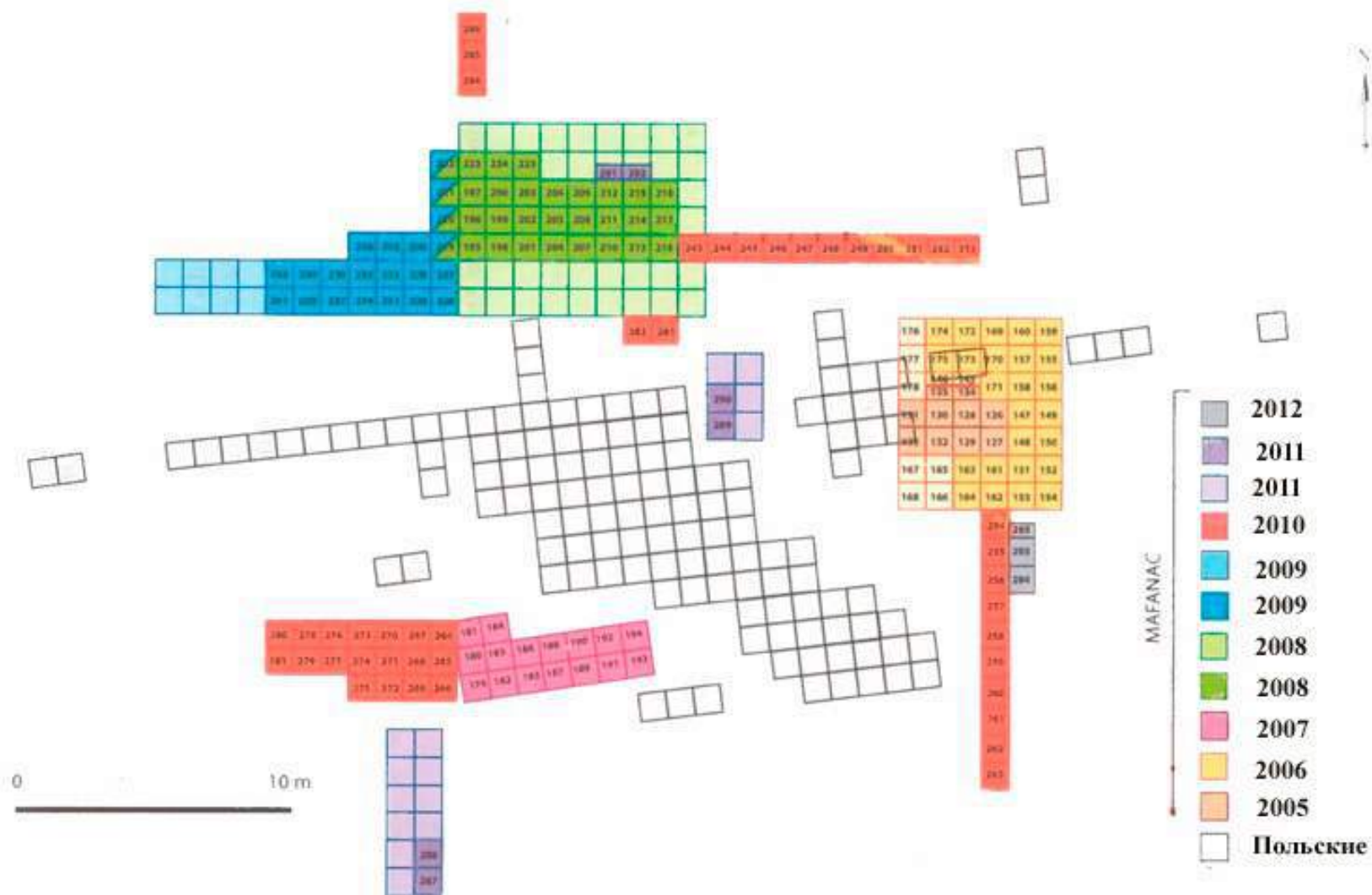
The area marked in Agytma :
length 17 – width 18 км.





CANYON PRINCIPAL : DU LAC D'AJAKAGYTMA AU SITE ARCHÉOLOGIQUE





HISTORY OF EXCAVATIONS AT AGYTMA 1995-2012

FAUNAL REMAINS FOUND IN AGYTMA

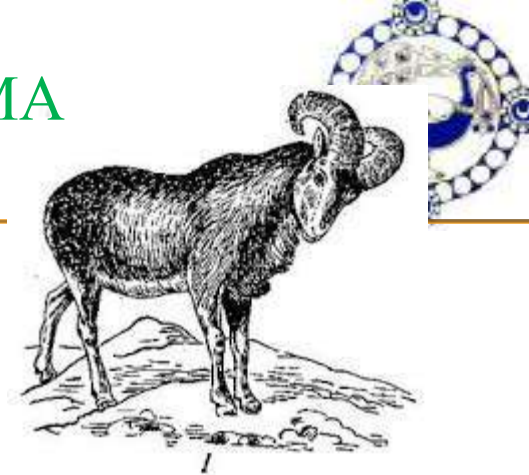
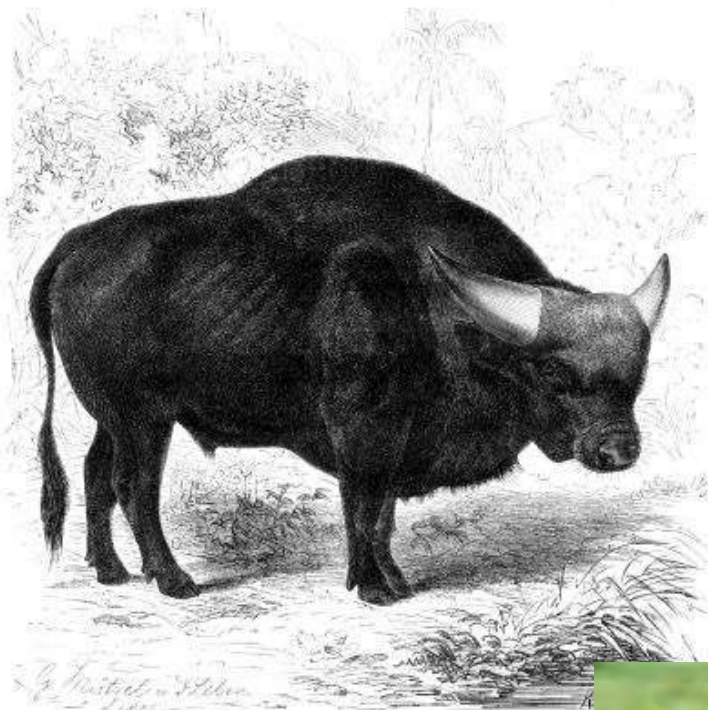


Рис. 10. Дичьи предки овец:
I — муфлон; II — архар



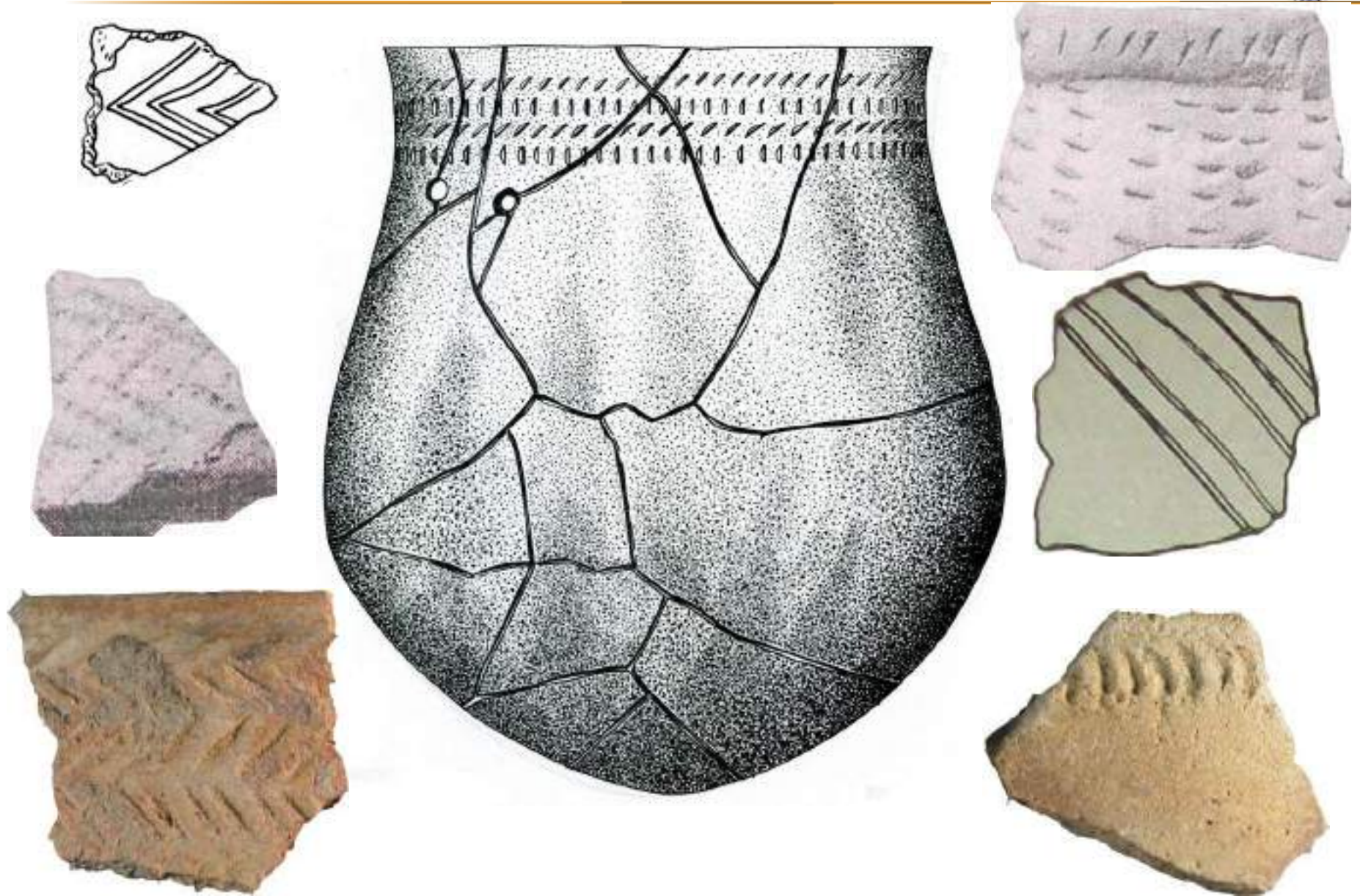


THE FIRST STAGE OF THE
KALTAMINAR CULTURE
FINDS AT AGYTMA



Credits: F. Brunet

CERAMIC PRODUCTS OF AGYTMA



List of specialists who conducted research at the Agytma in 1996-2005-2015 (Uzbekistan-Poland-France expeditions)



1	Mukhiddin Khujanazarov	Uzbekistan
2	Sayfullaev Bakhtiyor	Uzbekistan
3	Hoshimov Hikmatulla	Uzbekistan
4	Xalmatov Normuxammad	Uzbekistan
5	Christina Tondrich	Uzbekistan
6	Rakhimov Komiljon	Uzbekistan
7	Shumchak Karl	Poland
8	Malagajotta Kot	Poland
9	Anna Dluzewski	Poland
10	Elisabetta Michelska	Poland
11	Frédérique BRUNET	France
12	Gourgen Davtyan	France
13	Jon Denis Berger	France
14	Solen Davies	France



Working plan regarding Agytma site:

Working time is 2 months, from this :

1 month for field works

1 month for data processing, preparation of a scientific report

Primary sum of the study

Payment-75 mln UZS (25 % together with a olump-sum social payment)

Travel expenses-20 mln UZS.

Necessary equipment -25 mln UZS.

Transportation costs *- 42 mln UZS (2 means of transport for 1 month, approx. 70+70 USD per day)

Discount for the institute-20 mln UZS.

*** The customer can alternately solve the transportation issue and discount this cost.**



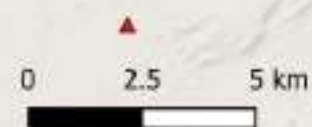


The area marked at Dzhankeldy:
length 30 км – width 27 км.

In the 80-ies of the last century from the territory of the Dzhankeldy Oasis - Tasqazgan monument was identified by A.V. Vinogradov.



Area-2- Dzhankeldy





Working plan regarding Dzhankeldy site

Working time is 2 months, from this :

1 month for field works

1 month for data processing, preparation of a scientific report

Primary sum of the study

Payment-75 mln UZS (25 % together with a lump-sum social payment)

Travel expenses-20 mln UZS.

Necessary equipment -25 mln UZS.

Transportation costs *- 42 mln UZS (2 means of transport for 1 month, approx. 70+70 USD per day)

Discount for the institute-20 mln UZS.

***The customer can alternately solve the transportation issue and discount this cost.**





Employees who plan to participate in the project

		Position
	Hoshimov Hikmatulla	Project manager
	Sayfullaev Bakhtiyor	Scientific consultant
	Kholmatov Azbiddin	Senior research fellow
	Alisher Razhabov	Junior research fellow
	Elmuratov Bahodir	Junior research fellow
	Imomov Aziz	Intern
	Berdikulov Mirolim	Intern

MINUTES OF MEETING

Second Zoom Meeting with representatives of Institute of Archaeology under the Academy of Science of the Republic of Uzbekistan

ACWA Power requested to arrange the second-round meeting with Institute of Archaeology to clarify key issues regarding archaeological findings and proposed research timeline at Bash 500 MW WF and Dzahnkeldy 500 MW WF project sites.

The meeting agenda included Q&A discussion. Thus, on April 27, 2021 at 18.30pm (Tashkent time) a Zoom call was arranged.

A summary of the meeting is provided below.

Stakeholder group:	Interest based
Institute of Archaeology	Mr Muminkhon Saidov – deputy director of Samarkand brach of Institute of Archaeology Bakhtiyor Sayfullayev – Senior researcher
ACWA Power	Mr.Sherzod Onarkulov – Senior Manager
Juru Energy	Ms Umida Rozumbetova – acting head of E&S practice group
Meeting language:	Uzbek
Date:	27.04.2021
Start time:	18:30
End time:	19:00
Method of engagement:	Call to Institute of Archaeology
Venue:	Zoom call
Used materials and visual aids	N/A

Agenda for meeting

1. Q&A regarding the proposed archaeological research timeline

Starting the meeting Sherzod Onarkulov greeted participants and explained the aim of arranging a call. He stated that ACWA Power looked through presentation prepared by Institute and has no comments so far. However, it is necessary to clarify some issues/questions regarding the methodology and timeline of conducting additional research.

Q&A session started after the speech of Sherzod Onarkulov

Question	Answer
Sherzod Onarkulov: It was written in presentation that conducting research at Project site would take 2 months. How this research is going to be conducted? By using special technique?	Muminkhon Saidov: The first stage of every archaeological research is observation field work. At this stage we observe and indicate potential places on map by using GPS tools. This is mostly long drives at the project site.
Sherzod Onarkulov: Do you have exact coordinates of previously researched places at Bash and Dzhankeldy Project sites?	Muminkhon Saidov: Yes, we have. We have indicated these places with red spots in presentation. These indicated places have been studied. However, we need to observe surrounding areas of previously researched places. It is difficult to make any conclusions or assumptions that remaining project site might not have any archaeological importance
Sherzod Onarkulov: When you indicated time as 2 months did you mean that you are going to spend 2 months for each site, i.e., 2 months for Bash and 2	Muminkhon Saidov: We can start field works at first project site and then move to the second project site. If you remember we will need one month for

months for Dzhankeldy? Is it possible to start research at both project site in parallel?	laboratory works. Thus, first 2 months we can devote to the field works and the remaining 2 months for lab analysis. Bakhtiyor Sayfullayev: At the end of field works we can prepare a map, showing observed places
Sherzod Onarkulov: According to existing legislations, are there specific requirements for keeping distance or buffer zone from archaeologically important areas/monuments etc?	Muminkhon Saidov: Yes, local legislation assumes keeping buffer zone from archaeological finding. Depending on size, type of archaeological finding the Inspection on protection of archaeological findings issues a conclusion by establishing the length of buffer zone.
Sherzod Onarkulov: As I understood, for each archaeological finding should be established individual buffer zone, right?	Muminkhon Saidov: Yes, that is right.
Sherzod Onarkulov: Let us come back to timeline. As we discussed earlier, it is possible to spend 2 months for field works and at the end of each month we will be able to get preliminary results as well as map. So, I want to clarify if it is possible to get final results within one month once field works are completed?	Bakhtiyor Sayfullayev: To prepare final scientific conclusion we need one month for each site. However, it also depends on the findings from Project sites. Based on our findings we can tell you how much time we need for analysis.
Sherzod Onarkulov: I would like to clarify the issue with payment as well. In the presentation you indicated that it is 75 million of UZS per project site, which means that for 2 project site it is going to be 150 million UZS?	Bakhtiyor Sayfullayev: 75 million UZS is for experts' remuneration. And for two project sites it is going to be 150 mln. UZS. However, we also indicated other expenses too. For field works we will need to cover transportation costs, supply expedition with necessary equipment.
Sherzod Onarkulov: All right, then per site total cost is 162 mln UZS?	Bakhtiyor Sayfullayev: That's right. Alternatively, your company can supply expedition with inland transport (by providing car and driver) thus deducting a cost.
Sherzod Onarkulov: From your previous experience, what organization is responsible for ordering or sponsoring archaeological surveys?	Muminkhon Saidov: To be honest, for us it does not matter at all. In our case we always have a Client. And Client can be state body or private sector.
Sherzod Onarkulov: Since ACWA Power was not informed by government about archaeological issues, do we obliged to conduct additional research and get a conclusion?	Muminkhon Saidov: Based on general legal requirements, before construction of any large-scale facility it is necessary to conduct preliminary archaeological research. After discovering any archaeological finding they automatically goes under state protection. And according to the Constitution of Republic of Uzbekistan, each citizen should protect discovered findings. Your company now knows that there were found places of archaeological importance. Even if you skip additional research and get conclusion from Institute of Archaeology at this stage, you will be required to do it later too, maybe for increased costs as well.
Sherzod Onarkulov: If all archaeological findings are under protection of state, should government allocate funds for the further researches?	Muminkhon Saidov: Government allocates funds, but it is not enough to cover all archaeological researches. Since you are going to construct wind farm on the territory of Uzbekistan, especially at site where already were found some objects of

	Neolithic period, you should get a conclusion from us.
Umida Rozumbetova: Bakhtiyor, can we go back to the presentation, i.e., slide 7. Here at Bash Project site, you told that main archaeological findings were discovered around the shore of Ayakagitma lake, whereas at Bash project site you conducted only research without findings. Could you please confirm this information one more time?	Bakhtiyor Sayfullayev: Many objects were found around lake of course, but we also found some objects at the project site as well.
Umida Rozumbetova: So, red spots at the project site means that these are places with archaeological findings?	Bakhtiyor Sayfullayev: Yes, that's right.
Umida Rozumbetova: Could you confirm that there are no more artefacts or objects of archaeological importance at places where you conducted research and these places are free for use?	Bakhtiyor Sayfullayev: At the moment I am not able to confirm, as at some places we found one or two objects. There were places where we found many objects and we had to No, it is not possible to take all the artefacts or findings at once. After the research we collect some objects. It is not possible to take away all findings, we have to bury back such places.
Sherzod Onarkulov: As results, it means that we have to establish buffer zone from each red spot you have indicated in map?	Bakhtiyor Sayfullayev: Yes, this is right

Sherzod Onarkulov explained to meeting participants that ACWA Power has concern about Project timeline. Since Ministry of Energy or Ministry of Foreign trade and investments did not informed ACWA Power about archaeological importance as well as about archaeological findings, Project timeline does not involve conducting long archaeological research. In case of inclusion additional research to project timeline, ACWA Power can be late for general agreed timeline with Government of Uzbekistan.

At the end of the meeting it was agreed on followings:

- Institute of Archaeology will send letter to Juru Energy by justifying need of additional research at the project sites. Moreover, Institute will give detailed information on timing and cost breakdown;
- Juru Energy will keep in touch with Institute and ensure the delivery of required letters;
- ACWA power will negotiate with relevant Ministries.

Annex 1 List of participants



MINUTES OF MEETING

Meeting with representatives of Institute of Archaeology under the Academy of Science of the Republic of Uzbekistan

Based on previous consultations with Institute of Archaeology in a framework of ESIA for Bash 500 MW WF and Dzhankeldy 500 MW WF regarding the archaeological findings and getting relevant conclusion from the Institute ACWA Power requested face to face meeting with the representative of Institute of Archaeology. The aim of meeting was to accelerate the process of signing the agreement with Institute and start archaeological surveys at Bash and Dzhankeldy projects.

FYI: The main office of the Institute of Archaeology is based in Samarkand city. All previous consultations were conducted with Muminkhon Saidov – deputy director of the Institute. All previous research at Bash Project site as well as main other survey and field works all around the Uzbekistan are carried out by the Institute of Archaeology. National Centre of Archaeology (main authorized organization for archaeological issues) is located in Uzbekistan. As ACWA Power preferred to meet in person, the meeting has been arranged in Tashkent, i.e., at the national Centre.

Thus, the meeting was arranged on April 30, 2021 at 11.00 am at the building of National Centre of Archaeology.

The meeting agenda included terms and conditions of preparing agreement for conducting field surveys at Bash and Dzhankeldy project sites as well as discussion of possibilities to shorten proposed 4 months timeline up to 3 months.

A summary of the meeting is provided below.

Stakeholder group:	Interest based
National centre of Archaeology	Mr Farkhod Maksudov – director of National centre of Archaeology Two members of national Centre
ACWA Power	Mr. Sherzod Onarkulov – Senior Manager Mr. Akbar - business manager
Juru Energy	Ms Umida Rozumbetova – acting head of E&S practice group Mrs Gulchekhra Nematullayeva – social consultant
Meeting language:	Uzbek
Date:	30.04.2021
Start time:	11:00
End time:	11:40
Method of engagement:	Through call to Institute of Archaeology
Venue:	National centre of Archaeology
Used materials and visual aids	N/A

Agenda for meeting

1. Signing agreement between Institute of Archaeology and ACWA Power;
2. Timeline for conducting additional research at Bash and Dzhankeldy Project sites.

Starting the meeting Farkhod Maksudov briefly described the development history of archaeology in Uzbekistan. He stated that main centre that coordinates archaeological activities in Uzbekistan is located in Tashkent, meantime the Institute of Archaeology that carries out surveys/field works is located in Samarkand city. Furthermore, Farkhod explained that due to the increase of works National centre plans to establish branches in Bukhara and Khorezm regions as well.

In turn, Sherzod Onarkulov greeted participants and expressed his gratitude for arranging a meeting in short time. He briefly introduced representatives of National centre with activity of ACWA Power as well as with its projects in Uzbekistan. Furthermore, Sherzod Onarkulov highlighted that Ministry of Energy of the Republic of Uzbekistan has chosen sites for Bash and

Dzhankeldy based on wind intensity. The issue of large archaeological finding came up while conducting consultations with relevant stakeholders which is an integral part of ESIA. Thus, ACWA Power was previously not unaware of archaeological sites at Bash and Dzhankeldy projects sites.

Considering this fact, Sherzod Onarkulov asked Farkhod Maksudov to assist in getting relevant conclusion from National Centre of Archaeology by conducting required surveys.

Q&A session started after the speech of Sherzod Onarkulov

Question	Answer
Sherzod Onarkulov: We have received from institute of Archaeology proposed timeline and budget for conducting survey at project sites. Is it possible to prepare an agreement and sign it between ACWA Power and national centre as soon as possible?	Farkhod Maksudov: We will be able to prepare an agreement by next Monday (May 3 rd) and send it to you. As soon as you sign and transfer money, I can deploy the teams for field surveys.
Sherzod Onarkulov: From collected information we aware that there are still some archaeological sites at Bash. What are the requirements for buffer/safety zone according to local legislation? And do these requirements comply with international requirements?	Farkhod Maksudov: Based on local legislation the requirements are as follows: <ul style="list-style-type: none"> - 50 meters from large sites such as ancient settlements, cities and etc; - 25 meters from small sites such as buildings, artefacts As for the international requirements, I would say that local legislation was amended based on international standards. Therefore, abovementioned buffer zone can match to international standards as well.
Sherzod Onarkulov: At the moment, timing is extremely important for us. Thus, is it possible to start archaeological surveys at Bash and Dzhankeldy in parallel?	Farkhod Maksudov: To be honest, nowadays we have pretty much work to do, i.e., we are surveying proposed direction for extension of railway. However, we will be able to deploy full team to one project site and half team for another site. It will be hard, but we will do our best.
Farkhod Maksudov: If your company can provide cars for transportation of teams, I can deduct inland transportation costs from budget.	Sherzod Onarkulov: No, at the moment, we are not able to provide cars. So please go ahead with including inland transportation costs to the agreement.
Umida Rozumbetova: During our last talk, Muminkhon Saidov said that team can provide overall summary and map with findings as soon as survey will be completed. Could you please confirm that?	Farkhod Maksudov: Yes, I confirm.
Umida Rozumbetova: Can you prepare the final report as well as conclusion in English language?	Farkhod Maksudov: We can prepare in the most preferable language for you. If you would like to have it in English, we will do that.
Umida Rozumbetova: Before you deploy teams to survey, is it possible to get a list of team members and contact details of head of team? We will need to stay in touch with them in order to be informed about the progress and receive photos from them.	Farkhod Maksudov: Of course, I will introduce you to the team leaders and make sure that you will exchange a contact detail with them.
Umida Rozumbetova: Could you also assist us with getting coordinates and get an access to information regarding the finding at Bash project site?	Farkhod Maksudov: All right, we will renew our negotiation on previous finding early next week.
Sherzod Onarkulov: It is extremely important for us to get requirements on buffer zone as we need to	Farkhod Maksudov: It is understandable. Let us start working on it from Monday.

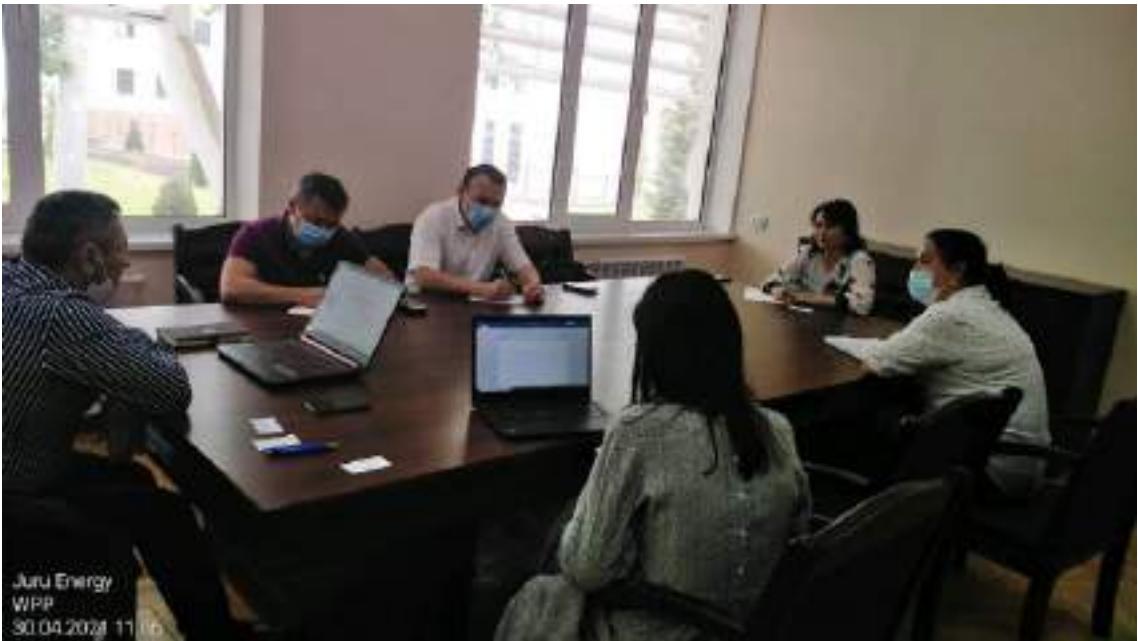
finalize the wind turbines layout. Furthermore, we need to be aware if lenders have any specific requirements for buffer zone.	
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At the end of the meeting it was agreed on followings:

- Farkhod Maksudov will keep in touch with ACWA Power regarding the signing agreement and receiving payment;
- All other works related to monitoring of field surveys should be carried out by Juru Energy;
- Juru Energy will be responsible for timely informing 5 Capitals on progress;

In addition, ACWA Power asked to check for lenders requirements regarding the buffers zone for archaeological findings. It was agreed that Juru Energy will refer to 5 Capitals to find out this.

Annex 1. Photo from meeting



MINUTES OF MEETING

As per request of ACWA Power and completion of archaeological surveys at Bash project site, Zoom meeting with director of National Centre of Archaeology was arranged on July 9 at 3 pm of Tashkent time.

A summary of the meeting is provided below.

Stakeholder group:	Interest based
National centre of Archaeology	Mr Farkhod Maksudov – director of National centre of Archaeology
ACWA Power	Mr. Sherzod Onarkulov – Senior Manager Mr. Akbar Mavlonov - business manager
Juru Energy	Ms Umida Rozumbetova – head of E&S practice group Mrs Gulchekhra Nematullayeva – social consultant
Meeting language:	Uzbek
Date:	09.07.2021
Start time:	15:00
End time:	16:00
Method of engagement:	Via Zoom call invitation
Venue:	
Used materials and visual aids	N/A

Agenda for meeting

Discussion of summary as per completion of survey at Bash Project site

Question	Answer
Sherzod Onarkulov: We received the summary of main findings at the Bash Project site from institute of Archaeology and we would like to clarify some issues related to this summary	Farkhod Maksudov: Yes sure
Akbar Mavlonov: From the summary we noticed that there are three suggestions for the buffer zone, depending on the type of finding, i.e., 25 meters, 50 meters and 200 meters. Could you please provide clarification why the buffer zone is different and how it is going to affect the Project?	Farkhod Maksudov: First of all, I would like to note that our Institute suggests the size of preliminary buffer zone that might be applicable to findings. You should refer to the Agency of Conservation of Cultural heritage. This Agency might find our suggestions for buffer zone as not applicable and set up another one. However, we are obliged to send them a copy of report that we are going to provide to ACWA Power. This Centre has a register of archaeological findings and our survey results will be included to it too. Buffer zone should be established based on the importance of the finding
Akbar Mavlonov: From the summary and provided photos we see that these findings are the parts of dishes, small scale smithers	Farkhod Maksudov: All our findings so far as well as suggested buffer zones are preliminary only. We need to wait until expedition team completes the survey at the second project site and makes final conclusions. At the moment we only determined places which can be identified as a source of archaeological excavations. We are not sure if there are more artefacts or even human settlement present.

	<p>The aim of our agreement was to determine if there are archaeological findings at the surface level. If we find number of findings that might be a part of one settlement or village, we will confirm it with you before sharing any report with third parties.</p> <p>More often than not, this Agency accepts our suggestions.</p> <p>When it comes to the affect to the construction, for findings under I Category you will need to conduct any types of works under archaeologist supervision, as places with such findings may have another artefacts as well. For the rest (II and III Category) archaeological supervision is not required.</p>
<p>Akbar Mavlonov: As you mentioned you are going to consult with us before passing report to the relevant organizations</p>	<p>Farkhod Maksudov:</p> <p>Yes, we will do it, as a Client and as funder of these surveys, you have a privilege to get all information first. The same applies to the publishing information in mass media.</p> <p>Nevertheless, we are obliged by our in-country regulations to share at least with technical details of conducted survey with Agency and notify them about findings.</p>
<p>Akbar Mavlonov: Clear. Does it mean that you also consult with us regarding buffer zone, right?</p>	<p>Farkhod Maksudov: No, unfortunately we are not able to do it. Indeed, the Agency should propose the size of buffer zone. Alternatively, they can agree with our suggestions regarding the size of buffer zone. But, if the Agency is not in agreement with proposed buffer zone, they can establish other buffer zones.</p>
<p>Sherzod Onarkulov: So far as we informed, you are working in accordance with Resolution of the Cabinet of Ministries No265. Does the Agency also work in accordance with the same regulation?</p>	<p>Farkhod Maksudov: Please note that our organisation has a status of public organisation. We do not always work as per regulations like state organisations. We work based on the scientific approach and methods.</p>
<p>Sherzod Onarkulov: Clear, now my question is should ACWA Power refer to the Agency with results and findings of the survey or you can do it?</p>	<p>Farkhod Maksudov: We are obliged to give to Agency only technical characteristics as well as list of findings. You can also present the full report with all detailed description if you wish</p>
<p>Sherzod Onarkulov: As I understand, the main conclusion stating that constructional works can be carried out at the places free from archaeological findings, right?</p>	<p>Farkhod Maksudov: Yes, Agency is empowered to issue such conclusions. However, to do so, they need to get results of archaeological survey.</p>
<p>Sherzod Onarkulov: In summary provided by your team, there are 3 Categories of findings and suggested buffer zones for them. Also in your report it is stated that any constructional works at these places should be conducted in coordination with the representative of National Centre. When you say "at these places" you mean in buffer zone?</p>	<p>Farkhod Maksudov: Archaeological supervision will be necessary during the constructional works. Because if during any drilling or other type of works new findings will be determined, archaeologists must carefully examine it and then proceed with required procedures, i.e., approve continuation of constructional works or stop it, if finding has high importance.</p>
<p>Sherzod Onarkulov:</p>	<p>Farkhod Maksudov:</p>

When we can expect the final reports from National centre?	Short summary for both Projects surveys will be given to you by the end of July (as soon as survey at Dzhankeldy will be completed). Full analytical report is not necessary for you, of course we are going to share with you all type of document we issue. However, for constructional works, our summary will be enough to proceed with agency.
Akbar Mavlonov: I would like to ask if the buffer zone should be fenced?	Farkhod Maksudov: At this moment, the places located at irrigation areas to prevent any agricultural interruption. But, considering that Project site is located in non-irrigated lands, no fencing is required. We only need to indicate finding place and buffer zone in the map.
Akbar Mavlonov: Can any of these findings be considered as finding of international importance and might be included to the UNESCO list?	Farkhod Maksudov: No, none of these findings can be considered as international importance findings.
Akbar Mavlonov: Who should refer with request to the Agency – ACWA power or Juru Energy and request to issue permission?	Sherzod Onarkulov: I believe, ACWA Power should do it, since the report from national Centre will be addressed to ACWA Power, and indeed permission should be given to us for any constructional activities.
Gulchekhra Nematullayeva Farkhod, could you please share with us the description of methodology, according which the survey was conducted. Since it will be necessary for us show it in the reports as well.	Farkhod Maksudov: Noted, I will ask survey team to include the methodology in the report as well.
Sherzod Onarkulov: If we look at the map, one of your findings were determined at the road in Project site. In future this road might be used for transportation. Furthermore, this road is being used today as well by other cars as well. What actions can be taken regarding this issue? Another place with finding was identified near railways as well.	Farkhod Maksudov: This finding place can be considered as modified place. If the finding is considered as I Category then it will be necessary to reroute the road and avoid crosses with this place. If this is III Category no rerouting is required. Please note, that we need to protect finding with high importance.
Sherzod Onarkulov: Is it possible to collect finding at determined location and give it local relevant organizations or museums, thus to reduce the number of places with findings?	Farkhod Maksudov: No unfortunately it is not possible. Since we conducted only field survey and surface excavations, it is possible that in all identified places we may find more artefacts.

Техническое задание

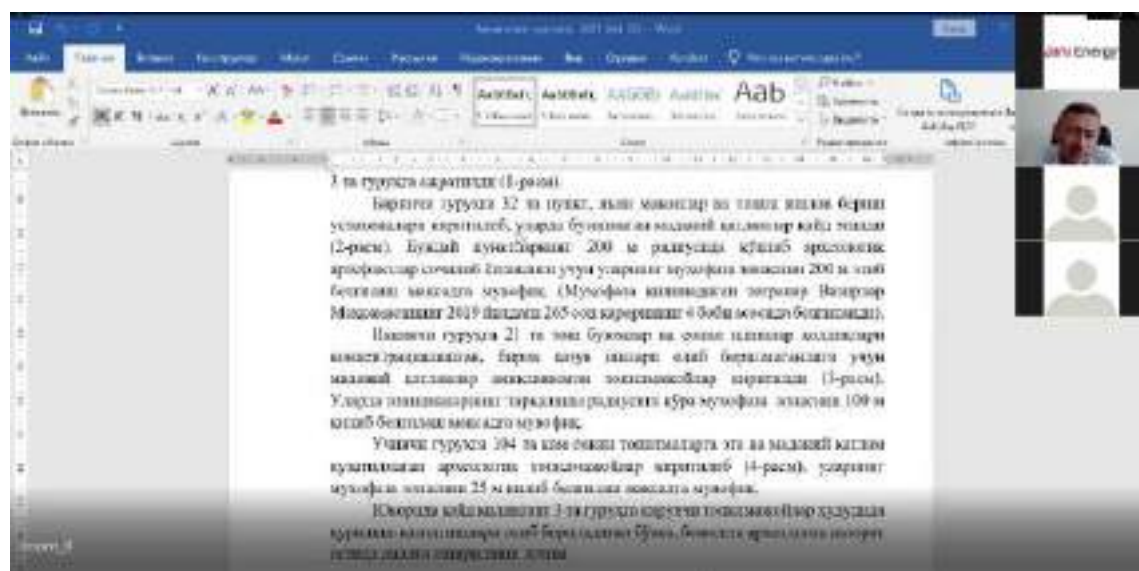
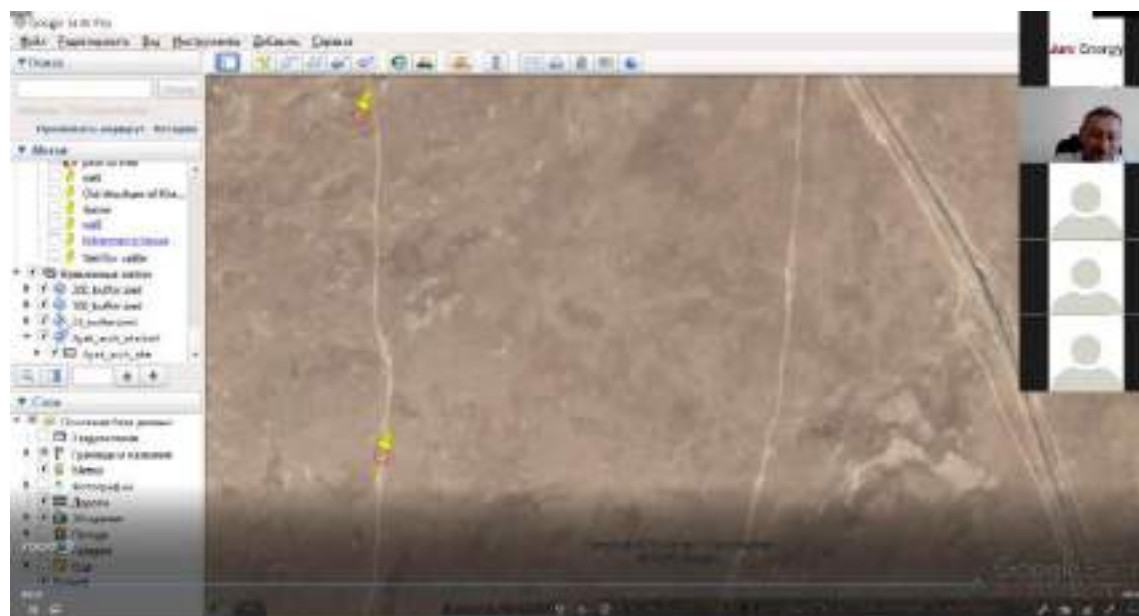
3. на фундаменте (1-расс.)

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APPENDIX Q – TRANSLATED SUMMARY OF DETAILED ARCHAEOLOGICAL SURVEY REPORT (MARCH, 2022)

REPORT

Brief summary of archeological excavations carried out in Dzhankeldy, Peshku district of Bukhara region

According to the contract No-09 dated May 4, 2021, between National Archaeological Center of the Academy of Sciences of the Republic of Uzbekistan (NACAS) and "Acwa Power Dzhankeldy Wind" LLC, an expedition consisting of employees of the (NACAS) is conducted from June 25 to July 25, 2021, in Peshku district of Bukhara region. All expedition works are implemented in Jonkeldi (2 areas: 23,500 ha and 6,700 ha). Conducted initial field research aimed to identify and map archaeological sites.

As we know, Tashbulak and Tashkazgan findings, about 20-25 km South-East of the village of Jonkeldi, were reported to science by A. Vinogradov.

A Neolithic stone workshop was found on the north side of the unnamed basin (size: 10x3 km), 10 km northeast of the center of Jankeldi village. The workshop is located at an altitude of 383 m above sea level, above the currently depleted silicon mines. The area is 70x30 m and cut by cliffs on both sides. During the investigation of the nameless basin in which the workshop was found, a group of 8 round tombstones was discovered, extending from its south-western pier in a line in the direction of northwest - northeast, structurally related to the Middle Ages.

As a result of archeological field research, 23 archaeological objects were found and there were divided into 2 groups depending on their quantity (protected areas were determined according to Chapter 4 of the Resolution of the Cabinet of Ministers No. 265 of 2019).

If construction and excavation works are implemented on the territory of the above-mentioned 2 groups, it is advisable to carry out them under direct archaeological supervision.

The first group includes 2 points, namely, a Neolithic stone workshop and medieval tombstones, in which intact cultural layers are recorded. Since many archeological artifacts are scattered within a radius of 200 m of such points, it is advisable to set their protection zone at 200 m.

The second group includes 21 low-numbered finds and archaeological finds, the cultural layer of which is not observed, it is desirable to designate their protection zone at 25 m

It is also important to remember, it was identified some findings in Ayakagitma 2 that belonging Neolith and other findings near the Bashagitma 1-7, which is belongs to middle Palaeolith. Moreover, stone processing workshop and dozens of other finds have been identified in Dzhankeldy 1-8 that belonging to Neolithic. These above-mentioned objects are an invaluable part of ancient history of Uzbekistan.

Table 2. Database of archaeological objects around Dzhankeldy village

№	X	Y	Z	stone	ceramic	bone	buffer zone
1	533076	4523216	405	10	0		25
2	534225	4528548	389	6	0		25
3	532824.66	4523453.57	252	1	0		25
4	528558	4529984	383	453	0		200
5	537360	4521637	382	0	1		25
6	534098.00	4528456.00	387	5	0		25
7	535143.61	4531727.13	302	1	0		25
8	527287	45300626	399	4	0		25
9	527144	4530296	391	0	9		25
10	529777	4530688	432	0	66		200
11	529762	4527571	320	4	7		25
12	532418	4523790	319	0	1		25
13	532796	4523619	347	0	1		25
14	528806	4527929	344	0	23		25
15	533371.98	4531624.53	312	0	7		25
16	537208	4528769	372	4	0		25
17	535513.42	4522820.32	378	1	5		25
18	535754.94	4527765.13	333	2	0		25
19	535737.87	4531284.10	284	1	0		25
20	530200	4511602	254	1	0		25
21	532994	4523434	357	1	0		25
22	533096	4523336	361	9	0		25
23	518211	4526501	260	0	7		25

APPENDIX R - SHADOW FLICKER ASSESSMENT REPORT

Dzhankeldy Wind Farm, Uzbekistan
Shadow Flicker Assessment




December 2021





Dzhankeldy Wind Farm, Uzbekistan

Shadow Flicker Assessment

Revision	Date	Notes	Author	Checked	Approved
Ver. 7	06-12-21	Env - Shadow Flicker	Sunil Patel	Nick Davey	Nick Davey
					

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3 Shadow Flicker Modelling	3
4 Shadow Flicker Results	6
5 Conclusions	7
 APPENDIX A – Wind Farm Layout	 10



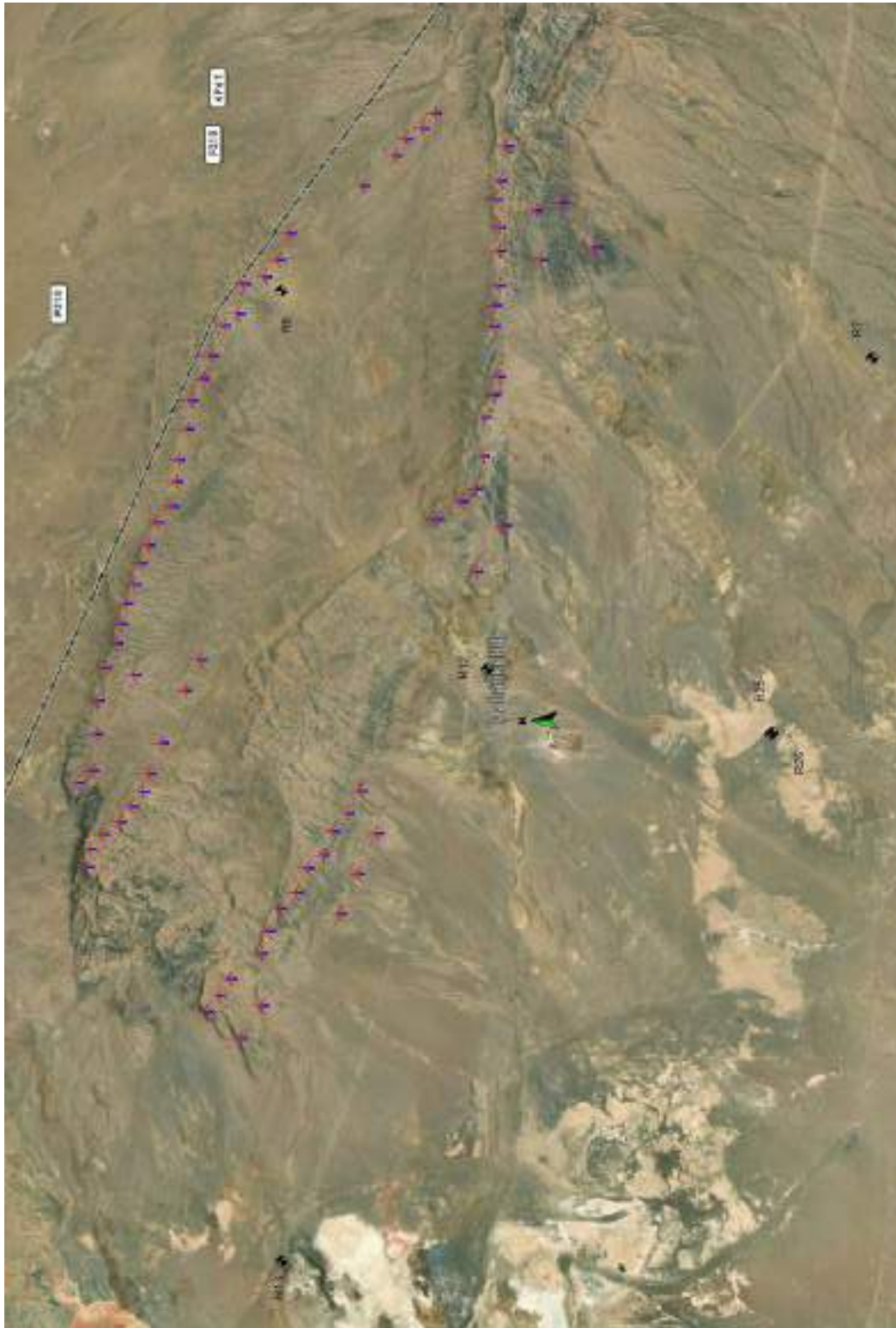
1 INTRODUCTION

- 1.1 Entran Ltd have been commissioned to provide a 'Shadow Flicker' assessment for the project known as the 'Dzhankeldy Wind Farm', Uzbekistan. The project site is in the Peshku district towards the south-west of Uzbekistan. This report presents the results of the shadow flicker model constructed to identify potential effects at nearby receptors.
- 1.2 This 'Shadow Flicker' assessment has been undertaken in accordance with the World Bank Group/International Finance Corporation's guidelines for Wind Energy.
- 1.3 The 500MW wind farm will be made of 79 Envision (6.5MW) turbines (WTG) and ancillary equipment. The general site location is presented in Figure 1 and the receptors are presented in Table 1.1.
- 1.4 Wind turbines can cause 'Shadow Flicker' when the sun passes behind a moving blade and casts a shadow on the window of nearby premises. Shadow flicker for the purposes of assessment is described as:

the flickering effect caused when rotating wind turbine blades periodically cast a shadow over neighbouring properties as they turn, through constrained openings such as windows. The magnitude of the shadow flicker effect varies both spatially and temporally and depends on a number of environmental conditions coinciding at any particular point in time, including, the position and height of the sun, wind speed and direction, cloudiness, and proximity of the turbine to a sensitive receptor.

- 1.5 Shadow flicker will depend on the following variables:
 - The turbine hub height and rotor diameter;
 - The distance from the turbines;
 - The direction of the residence relative to the turbines;
 - The time of year and wind direction;
 - The proportion of daylight hours in which the turbines operate; and
 - The frequency of bright sunshine and cloudless skies (particularly at low elevations above the horizon).
- 1.6 This report considers the shadow flicker of all turbines at a specific receptor(s) at any given time and therefore considers the potential increase of the shadow flicker intensity or frequency.

Figure 1 Dzhankeldy Wind Farm Project, Turbine and Receptor Locations





- 1.7 The assessment of receptors potentially susceptible to shadow flicker (e.g. human settlements) within a distance of ten rotor diameters from proposed turbine locations is internationally considered to be an acceptable distance limit for the shadow flicker studies. However, for a robust approach, all human settlements within a 2,500m radius of any given turbine location have been included for analysis.

Table 1.1 Identification of Nearby Receptor Sites

Receptor	Location WGS84 (Zone41N) UTM	Nearest WTG	Distance to Nearest WTG, m	Ground height at receptor, m	Description
R6	537207, 4527104	DZH36	533	416	Active Settlement within site boundary (seasonal residential)
R12	528463, 4522463	DZH70	2264	214	Dzhankeldy Village ((Mixed use, residential/educational/agricultural)



2 SHADOW FLICKER ASSESSMENT CRITERIA

World Bank Group/International Finance Cooperation Guidelines

- 2.1 The Environmental, Health and Safety' Guidelines for Wind Energy (2015) sets the following screening criteria for wind farms:

If it is not possible to locate the wind energy facility/turbines such that neighbouring receptors experience no shadow flicker effects, it is recommended that the predicted duration of shadow flicker effects experienced at a sensitive receptor not exceed 30 hours per year and 30 minutes per day on the worst affected day, based on a worst-case scenario.

In order to assess compliance with the recommended limits, shadow flicker should be modelled and predicted based on an astronomical worst-case scenario, which is defined as follows:

- *There is continual sunshine and permanently cloudless skies from sunrise to sunset.*
- *There is sufficient wind for continually rotating turbine blades.*
- *Rotor is perpendicular to the incident direction of the sunlight.*
- *Sun angles less than 3 degrees above the horizon level are disregarded (due to likelihood for vegetation and building screening).*
- *Distances between the rotor plane and the tower axis are negligible.*
- *Light refraction in the atmosphere is not considered.*

- 2.2 In addition to the above recommended scenario, an assessment has also been made to consider actual site conditions based upon long-term sunshine statistics at the nearest metrological station (Tashkant) which also considers cloud/wind data.



3 SHADOW FLICKER MODELLING

3.1 Turbine shadow flicker was modelled using 'WindPRO' (v3.5), an industry-leading software package for the design and planning of wind energy projects. The model software considers the sun's path with respect to every turbine location during every minute over a complete year. Any shadow flicker caused by each turbine is then aggregated for each receptor for the entire year.

3.2 The input parameters for the model include:

- the turbine locations and dimensions;
- the receptors location;
- the size of windows on each receptor and the direction that the windows face; and
- the topography model obtained from the (Space) 'Shuttle Radar Topography Mission', (SRTM), at 30m resolution.

3.3 The turbine locations are presented in Appendix A.

3.4 The relevant turbine data is presented in Table 3.1.

Table 3.1 Turbine Details

Turbine Model	Rotor Diameter, m	Hub Height, m	Rotor tip height, m	Rotor Swept Area, m ²	Rotor Speed Range, rpm
EN171 (6.5MW)	171	100	-	22964	7.1 – 9.94



3.5 The following scenarios are considered:

- As per IFC's worst-case; and
- A realistic scenario based upon site data (e.g., long term average sunshine hours rather than the worst-case IFC scenario of constant sunshine).

3.6 For the IFC worst-case scenario, the following is considered:

- there is a clear sky 365 days per year;
- the turbine blades were assumed to be rotating for 365 days per year;
- The effect of shadow flicker was not calculated where the sun lies less than 3 degrees above the horizon;
- the receptor is occupied at all times;
- no screening (from either trees or man-made obstacles) is taken into account; and
- all receptors have a 2 m x 2 m window facing directly towards the turbine. The WindPro model utilises the concept of 'Green House' mode which allows for shadow flicker effects to be evaluated for each receptor in every direction for the nearest group of WTGs.

3.7 These assumptions result in a robust but conservative estimation, due to:

- unlikely to have clear skies all year around;
- screening (structures, trees or any other obstacle that may obstruct sight lines between the turbines and the receptor) can mask shadows from the turbines;
- all the turbines may not be operational all year (calm conditions/maintenance etc);
- turbine blades will not face the shadow receptor all year (as blades will face the direction of wind to be fully efficient);
- receptors may not be occupied during a shadow flicker event; and
- the intensity of any shadow flicker event will be diminished by the intervening distance.

3.8 For a more realistic consideration, long term weather conditions were obtained from the Tashkant meteorological dataset (391km distant) and the sunshine probability used for the model is set out in Table 3.2. Other meteorological sites in the immediate vicinity do not have a complete set of the required data.



Table 3.2 Sunshine Hours for Realistic Scenario

Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
3.43 Hrs	4.40 Hrs	5.12 Hrs	7.24 Hrs	9.40 Hrs	11.89 Hrs	12.23 Hrs	11.73 Hrs	10.01 Hrs	7.16 Hrs	4.87 Hrs	3.07 Hrs

- 3.9 However, as the geographical extent of the study is large, screening (trees or man-made obstacles) has not been considered for the realistic scenario.



4 SHADOW FLICKER RESULTS

4.1 The following shadow flicker effects will result for the receptors under consideration (a graphical representation of the results is presented in Figures 2 to 3):

Table 4.1 Shadow Flicker Occurrence at Each Receptor

Receptor	Location	IFC Worst-case Shadow hours per year	Realistic Shadow hours per year	IFC Max Shadow hours per day
		(h/year)	(h/year)	(h/day)
R6	537207, 4527104	66:16	45:19	00:54
R12	528463, 4522463	05:06	03:29	00:18

4.2 As can be seen from Table 4.1, receptor R6 exceeds the IFC criteria (30 hours per year or less than 30 mins per day) for the IFC worst-case scenario (this receptor is within the project site). The realistic scenario also shows an exceedance of the IFC criterion for receptor R6.

Potential Mitigation

4.3 It is understood that receptor R6 is in a Health Protection Zone and due to the adverse Social Impact, this receptor will be relocated 500m or further away and therefore, be within the IFC Guidelines.



5 CONCLUSIONS

- 5.1 A shadow flicker assessment has been undertaken for the proposed Dzhankeldy Wind Farm project in accordance with the World Bank Group/International Finance Corporation's guidelines for Wind Energy. The Shadow flicker effects have been considered by using by the software suite 'WindPRO' (v3.5). The project will consist of 79 Envision EN171 turbines (6.5MW).
- 5.2 The following modelled receptor is likely to exceed the recommended shadow flicker duration stated within the WBG/IFC EHS Guidelines for Wind Energy:
- Receptor R6: exceeds the IFC criteria (of 30 hours per year or less than 30 mins per day) for the IFC worst-case scenario (this receptor is within the project site).
- 5.3 It is understood that receptor R6 is in a Health Protection Zone and due to the adverse Social Impact, this receptor will be relocated 500m or further away and therefore, be within the IFC Guidelines.

Figure 2 WBG/IFC Worst Case Maximum Minutes per Shadow Day

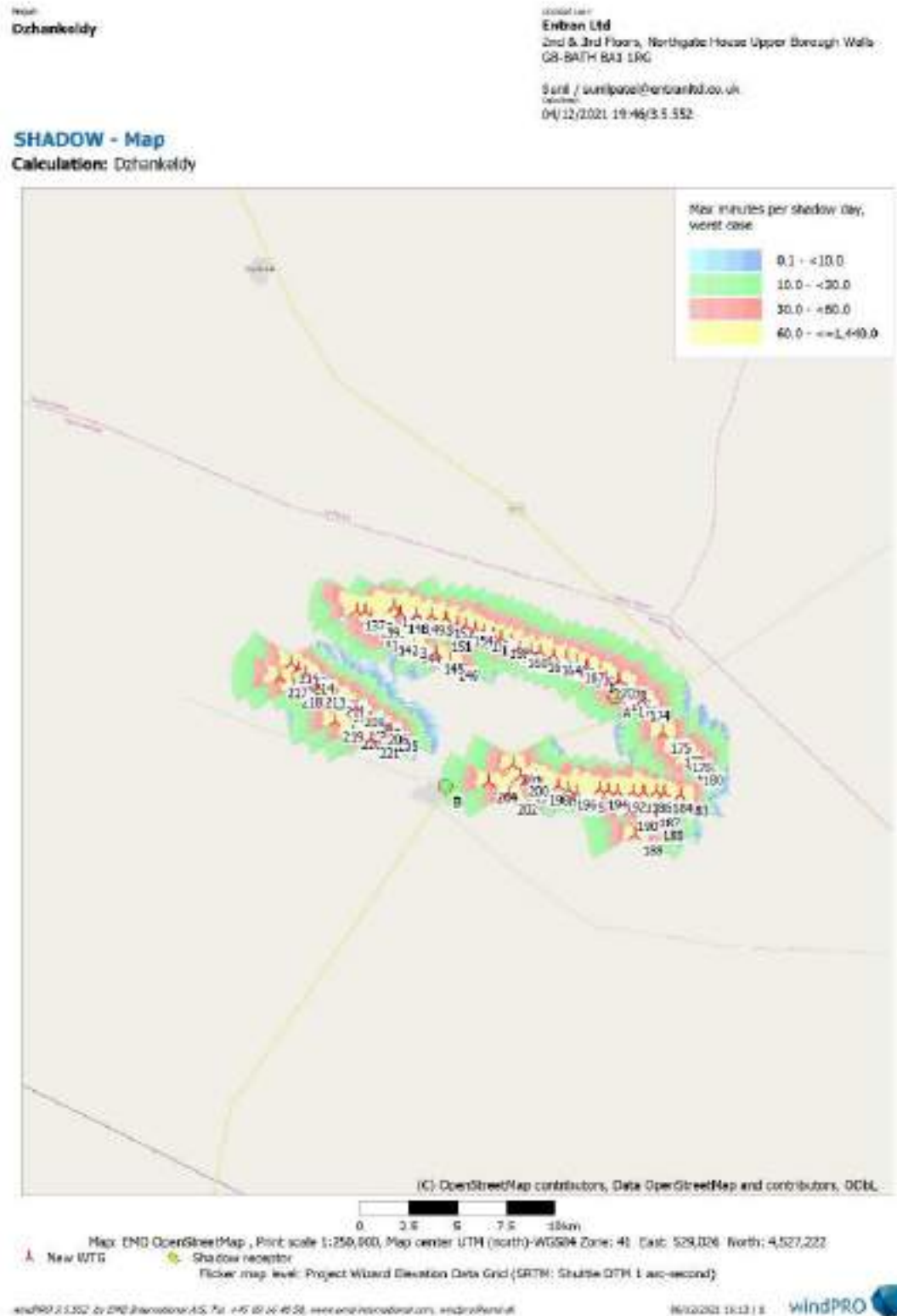
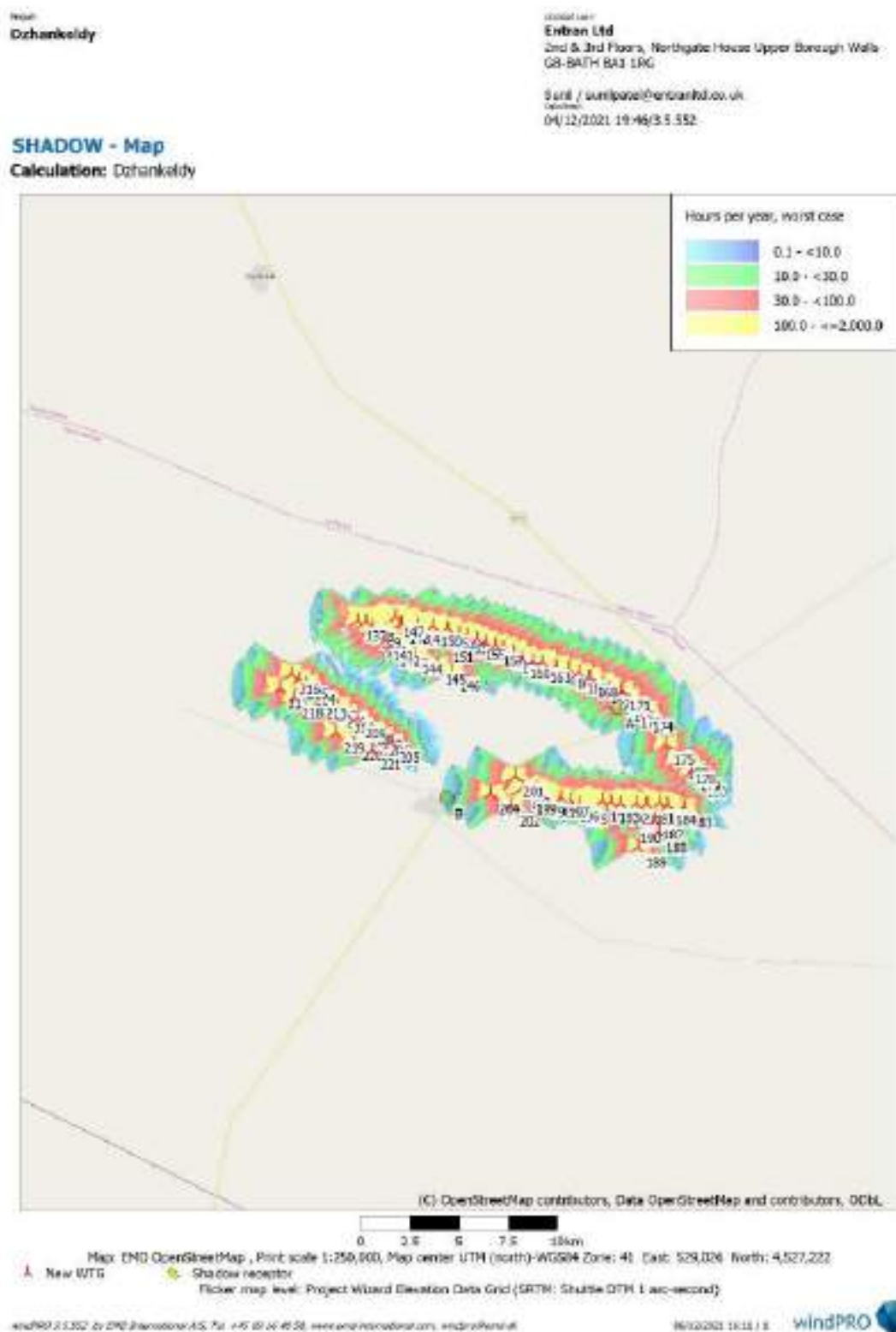


Figure 3 WBG/IFC Worst Case Shadow Hours Per Year





APPENDIX A – WIND FARM LAYOUT



Turbine Layout

WTG ID	Easting (m)	Northing(m)	Absolute Hub Height, m
DZH01	523872	4531497	478.4
DZH02	524297	4531433	477.2
DZH03	524643	4531170	460.7
DZH04	524910	4530761	461.3
DZH05	525280	4530496	444.8
DZH06	525629	4530242	431.1
DZH07	526043	4530094	411.6
DZH08	526741	4529822	385.1
DZH09	527954	4529288	363
DZH10	528673	4528939	347.6
DZH11	525826	4531721	395.6
DZH12	526112	4531374	431.8
DZH13	526964	4531307	422.2
DZH14	527736	4531249	416.2
DZH15	528321	4530438	411.3
DZH16	528487	4531100	418.1
DZH17	529060	4530849	420.4
DZH18	529495	4530757	427.6
DZH19	529984	4530607	414.9
DZH20	530428	4530448	410.5
DZH21	530912	4530290	403
DZH22	531336	4530102	400.6
DZH23	531866	4529917	406.4
DZH24	532239	4529599	401.9
DZH26	532814	4529492	385.5
DZH27	533299	4529447	392.1
DZH28	534011	4529246	379
DZH30	534683	4529135	377
DZH31	535190	4528885	380.9
DZH32	535714	4528680	387
DZH33	536425	4528421	410.3
DZH34	536704	4528094	427.4
DZH35	537399	4527980	425.4
DZH36	537563	4527500	432.2
DZH37	537939	4527191	397.4
DZH38	538571	4526945	389.4
DZH39	539662	4525287	383.7



DZH41	540356	4524556	401.8
DZH42	540749	4524298	416.2
DZH43	541000	4523942	426.8
DZH44	541336	4523661	436.9
DZH49	540573	4522053	492.6
DZH50	539783	4522199	480
DZH51	539351	4522298	487.2
DZH52	538691	4522216	472.7
DZH53	539094	4521400	479.6
DZH54	539275	4520827	437.6
DZH55	538242	4520032	405.8
DZH56	537939	4521277	443.2
DZH57	538161	4522225	459.5
DZH58	537350	4522248	457.5
DZH59	536878	4522298	448.1
DZH60	536400	4522364	455.9
DZH61	535236	4522211	464.9
DZH62	534827	4522346	493.8
DZH63	534293	4522549	496.7
DZH64	533390	4522577	477.2
DZH65	532638	4522744	419.7
DZH66	532343	4523058	365.1
DZH67	531944	4523646	353.1
DZH68	531786	4522101	342.1
DZH70	530709	4522738	298.1
DZH71	525645	4525334	294.4
DZH72	525127	4525643	305.7
DZH73	524697	4525960	307.9
DZH74	524155	4526189	311.7
DZH75	523857	4526541	315.7
DZH76	523276	4526793	303.5
DZH77	522921	4527140	316.8
DZH78	522382	4527399	302.8
DZH79	521874	4527574	305.8
DZH80	521274	4528278	314.4
DZH81	520900	4528531	324.3
DZH82	520507	4528791	345.4
DZH83	519902	4528052	294.9
DZH84	520658	4527568	283.3
DZH86	522799	4525794	263
DZH87	523711	4525380	272.2
DZH88	524661	4524971	271.6

APPENDIX S – SUPPLY CHAIN LABOUR & WORKING CONDITION ASSESSMENT REPORT

APPENDIX T - GECKO HABITAT ASSESSMENT – OHTL

Please Refer to Appendices: Part C

APPENDIX U - SOIL LABORATORY RESULTS – OHTL

Assessment of soil quality along Dzhankeldy-Bash OHTL

UZBEKISTAN DZHANKELDY - BASH OHTL PROJECT:

LOCAL SUPPORT IN THE DEVELOPMENT, SUBMISSION AND APPROVAL OF ESIA

CLIENT: 5CAPITALS

Date: September 2021

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September 2021

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Abbreviations/Acronyms

ICP-MS – Inductively coupled plasma mass spectrometry

ISE's - Ion-selective electrodes

JE – Juru Energy

MS – Mass spectrometry

SE - State Enterprise

WF – Wind Farm

OHTL – Overhead transmission line

INTRODUCTION

The project site of the planned OHTL belongs to the Kyzyl-Kum desert. Sandy deserts are ancient alluvial plains subjected to aeolian transformation. The most common aeolian landforms of Kyzyl-Kum are dunes and dune chains, hills, ridgy and trough sands, and sandy plains. (R.D. Mel'nikova, 1973)

Landscape area of the territory along the OHTL consists mainly of plain landscape complexes.

It is represented by the Turan desert type on gray-brown soils (there are light gray soils in some locations). The gray-brown soils of Kyzyl-Kum are characterized by low humus content - 0.2-0.6%. Layers of crystalline gypsum in gypsiferous soils of Kyzyl-Kum occur at a depth of 25 to 60 cm. The content of gypsum varies from hundredths to 8-30 (70) %. (F.Shomurodov and F.O. Khasanov, 2014).

Soil contamination assessment of proposed OHTL was conducted on August 20, 2021 by soil expert. Overall assessment resulted the absence of critical soil contamination. Along the proposed OHTL alignment surrounding areas were mainly represented by mainly "desert gray-brown soil", "sandy gray soil", "loamy sand" and "sandy loam". T

The environmental assessment of soil quality aims to provide information on the qualitative and quantitative content of contaminants in the soil in the territory of the planned OHTL from Dzhankeldy to Bash.

1. Methodology

1.1 Soil contamination survey

Soil contamination survey was based on walkover along the proposed alignment. Visual observation approach was applied to determine the current state of soil.

Walkover survey was conducted on August 20, 2021 by local soil expert Inomjon Bakhromov.

1.2. Collection of soil samples

Soils were sampled on 20th of August, 2021 along OHTL route and overall 7 soil samples were collected at agreed locations with 5 Capitals. (Fig.1)

In order to assess and study the state of soil contamination, samples from the selected sites were subjected to chemical and mass spectral analysis in a certified laboratory.

Sampling was carried out in accordance with the established State standard 17.4.4.02-2017 "Nature protection. Soils. Methods for sampling and preparation of soil for chemical, bacteriological, helminthological analysis".



Figure 1: Location of soil observation points.

Table 1 Coordinates of collected soil samples

No.	Sample number	Coordinates
Soil samples		
1.	Soil No.1 (SQ1)	40°59'45.46"N 63°40'26.54"E
2.	Soil No.2 (Q7)	40°59'15.98"N 63°50'17.51"E
3.	Soil No.3 (SQ2)	40°59'7.06"N 63°56'3.74"E
4.	Soil No.4 (Q6)	40°58'38.31"N 64° 1'19.83"E
5.	Soil No.5 (SQ3)	40°55'17.47"N 64°21'52.33"E
6.	Soil No.6 (SQ4)	40°49'2.61"N 64°28'14.48"E
7.	Soil No.7 (Q8)	40°45'58.68"N 64°32'37.73"E

2. Observation results

Site observations resulted that soil along 128 km of proposed OHTL mainly consists of sandy desert soil. Soil layers are represented by sand. Due to the constant presence of wind, the surface of soil is constantly covered by new layers of sandy barkhans. Concentration humus and fertilisers are dramatically low, which can be explained by absence of human activities. As a result, vegetation is represented mainly by desert flora. Nevertheless, after heavy rain season, which is highly likely for spring, surrounding areas are covered by ephemerid flora species.

Along the proposed OHTL route, soil structure and view doesn't change significantly. Main conclusions of visual inspection are as follows:

Parameters	Observation results
Current use	Mainly unmodified area with low presence of human activity. It was observed that land along proposed route is used for grazing activities and tracks of domestic animals' waste were observed. Intensity at highway road that goes along the proposed OHTL route was relatively low during observation time.
Topography/visual conditions	Surrounding areas are open with low concentration of social infrastructure. The nearest infrastructure is highway road. The nearest village Chontabay is located approximately at 150-200 meters to the observation route
Surface appearance	No surface disturbance, discoloration has been observed
Chemical pollution	Not observed
Polluted areas	Not observed

Detailed description of soil at samples collection locations as well as surrounding areas is provided below.

Point 1 (SQ1) observation and sample collection point

The first observation point along the planned OHTL was SQ1. (Figure 1) At this location the upper layer of soil was covered with unfixed sands and is frequently renewed by new layers of sand due to the wind. Soil at collection point as well as at surrounding areas, due to the sandy nature, has relatively low ability to keep humidity. Nevertheless, as SQ1 area is located between low hills, it is worth to make an assumption close proximity of groundwater, which in turn, affects to the growth of different flora species such as *Haloxylon persicum* Regel, *Artemisia diffusa*, *Kochia prostrata* (L.) Schrad., *Alhagi pseudalhagi* (Bieb) Devs, *Carex pachystylis*, *Poa bulbosa*.

Despite this collection point located near the village Chontabay, no soil contamination or household waste was observed at surrounding areas. Anthropogenic impacts have been observed only as a result of seasonal livestock grazing (livestock waste was observed).





Figure 2: Sampling point 1 and surrounding areas

Point 2 (SQ 7) observation and sample collection point

The SQ7 location surface consists of sandy desert soil with loose soil structure. The general appearance of the soil within a radius of 19 km around Q7, remained unchanged. This means that no differences in soil type, structure, and vegetation cover were observed. This point is located close to the highway, which is not particularly affecting the condition of the soil. Anthropogenic impacts have been observed as a result of seasonal livestock grazing (livestock waste was observed). The plants are very sparse, mainly *Ferula foetida*_ds, *Artemisia diffusa*, *Kochia prostrata* (L.) Schrad., *Alhagi pseudalhagi* (Bieb) Devs, *Carex pachystylis*, *Poa bulbosa* and *Peganum harmala* L.



Figure 3: Sampling point 2 and surrounding areas

Point 3 (SQ 2) observation and sample collection point

At SQ2 point was the same situation and conditions as it was determined at SQ7.



Figure 4: Sampling point 3 and surrounding areas

Point 4 (SQ 6) observation and sample collection point

Observation point SQ6 is also represented by sandy soil. However, the structure of the soil consists more of medium sand. The general appearance and structure of the soil within a radius of 15 km around the SQ6-point, is also unchanged. The plants are very sparse, mainly *Artemisia diffusa*, *Kochia prostrata* (L.) Schrad., *Alhagi pseudalhagi* (Bieb) Devs, *Carex pachystylis*, *Poa bulbosa*.





Figure 5: Sampling point 4 and surrounding areas

Point 5 (SQ 3) observation and sample collection point

Composition of soil at SQ3 mainly consists of sandy soil. Overall surface and structure at collection point and within a radius of 8 km remains unchanged. There are no visible tracks of human activities, as well as significant sources of soil pollution, except of grazing activities (livestock waste was observed). Moreover, some the gypsum layer was observed at the surface of sample collection point. The plants are very sparse, mainly *Artemisia diffusa*, *Kochia prostrata* (L.) Schrad., *Alhagi pseudalhagi* (Bieb) Devs, *Carex pachystylis*, *Poa bulbosa*.



Figure 6: Sampling point 5 and surrounding areas

Point 6 (SQ 4) observation and sample collection point

No significant differences were observed at point SQ4, almost the same as at SQ3. It consists of sandy soil. The soil surface forms weak thin layers during the rainy season. Livestock waste was observed. The plant composition is mainly *Haloxylon persicum* Regel, *Artemisia diffusa*, *Kochia prostrata* (L.) Schrad., *Alhagi pseudalhagi* (Bieb) Devs, *Carex pachystylis*, *Poa bulbosa*, *Peganum harmala* L.



Figure 7: Sampling point 6 and surrounding areas

Point 7 (SQ 8) observation and sample collection point

The point of SQ8 also is represented by sandy soil. Fine grains of sand were observed. As in other points, traces of animal wastes were present. The soil surface forms weak thin layers during the rainy season, the amount of humus is very low. The plant composition is mainly *Haloxylon persicum* Regel, *Artemisia diffusa*, *Kochia prostrata* (L.) Schrad., *Alhagi pseudalhagi* (Bieb) Devs, *Carex pachystylis*, *Poa bulbosa*, *Peganum harmala* L., and *Iris songarica* Schrenk. such species are common.



Figure 8: Sampling point 7

3. Laboratory analysis of collected samples and results

3.1. Description of methods for measuring quality indicators of soil.

The samples were sent to the certified “Central laboratory” for analysis of the parameters in the Table 2.

Basic chemical methods were used to analyze components:

- **Photometric** – based on chemical conversion of harmful substances (nitrates, aluminum, chromium (+6),) in color-intensive compounds when interacting with corresponding reagents, with subsequent measurements of the density of the colored compounds at a certain wavelength and allowing to make quick measurements with a sufficiently high accuracy;

- **Inductively coupled plasma mass spectrometry (ICP-MS)** – an analytical method that is used to detect metals and several non-metals in liquid samples at very low concentrations. MS analysis is the most sensitive of all modern multi-element analysis methods. The basic principle of mass spectrometry (MS) is to generate ions from inorganic or organic compounds, to distribute these ions by mass-to-charge ratio and to detect their qualitative and quantitative characteristics.

- **Potentiometry** –one of the electroanalytical methods. Potentiometry based on measures the difference in electrode potentials. One electrode is called the reference electrode and has a constant potential, while the other one is an indicator electrode whose potential changes with the composition of the sample. Therefore, the difference of potential between the two electrodes gives an assessment of the composition of the sample. Ion-selective electrodes (ISE's) possess a high degree of selectivity. In the laboratory, the electrode used is specific for chloride ion.

- **Titrimetric** – a method of quantitative/mass analysis (chlorides), based on the measurement of the reagent solution volume of a precisely known concentration consumed for the reaction with the substance being determined;

Table 2. The list of determined substances in soil and methods of its determination

Method of determination	Parameters
Potentiometry	pH
Titrimetric	Chlorides (Cl ⁻) Nitrates (NO ₃ ⁻)
ICP-MS	Sodium (Na) Potassium (K) Arsenic (As) Cadmium (Cd) Chromium (Cr) Copper (Cu) Lead (Pb) Manganese (Mn) Mercury (Hg) Nickel (Ni) Ferrum (Fe) Zinc (Zn)

3.2. Results of laboratory analysis

In accordance with the Terms of Reference there were collected 7 soil samples at different points.

The MPC in the soil is determined for 35 substances that are considered typical for anthropogenic impact, as well as for 109 pesticides. The samples do not fully comply with the standards and sanitary standards and exceed the maximum permissible values for four components (Ni, Cr, Zn, Cu).

The results of laboratory analysis of the soil are presented in Table 3.

The pH results showed that the pH of the samples was greater than 8.0. This lowers the presence of nutrients such as P, Cu, Zn, N. However, the pH did not exceed 8.35 and the amount of sodium is small, which may indicate that the soil is not that salty. Samples No.SQ1 (location near Chontabay village) are characterized by a high content of nitrates, unlike the others.

The results illustrated that the content of heavy metals in sample SQ2 and SQ3 is higher than in almost all other samples.

Table 3¹. Results of chemical analysis of soils

Name of parameters	Sample number							Detectable limits in mg/l	MPC in mg/kg	Compliance with national MPC
	SQ1	SQ2	SQ3	SQ4	Q6	Q7	Q8			
pH	8.35	8.00	8.10	8.25	8.30	8.30	8.26	1-14	N/A	N/A
Chloride (as Cl), %	535	7.00	6.00	11.00	11.00	11.00	7.00	N/A	N/A	N/A
Nitrate (NO ₃), mg/dm ³	249	10.00	17.00	11.00	15.00	9.40	8.00			
Sodium (Na), mg/kg	12000	20000	14000	14000	12000	13000	11000	40-110000 mg/kg	N/A	N/A
Magnesium (Mg), mg/kg	12000	10000	12000	9100	9700	6900	9100	40-110000mg/kg	N/A	N/A
Potassium (K), mg/kg	19000	35000	23000	22000	23000	24000	18000	80-300000 mg/kg	N/A	N/A
Lead (Pb), mg/kg	17.0	20.0	17.0	13.0	15.00	13.0	13.0	0.1-4000 mg/kg	32.0	Comply
Manganese (Mn), mg/kg	560	530	520	410	430	290	390	20-100000 mg/kg	1500.0 (gross content)	Comply
Copper (Cu), mg/kg	46.0	79.0	61.0	54.0	56.0	40.0	45.0	1,0-4000 mg/kg	3.0	Does not comply
Zinc (Zn), mg/kg	57.0	81.0	67.0	50.0	57.0	46.0	43.0	1,0-4000 mg/kg	23,0	Does not comply
Chromium (Cr), mg/kg	54.0	110	81.0	68.0	65.0	59.0	47.0	1,0-4000 mg/kg	6.0	Does not comply
Iron (Fe), mg/kg	26000	28000	28000	20000	22000	17000	19000	60-3000000 mg/kg	N/A	N/A
Mercury (Hg), mg/kg	0.056	0.016	<0,01	0.024	0.032	0.024	0.016	Not determined	2.1	Comply
Nickel (Ni), mg/kg	39.0	57.0	48.0	43.0	40.0	44.0	29.0	1,0-4000	4.0	Does not Comply
Cadmium (Cd), mg/kg	0.082	0.170	0.100	0.100	0.066	0.066	0.066	0.005-4000 mg/kg	N/A	N/A

¹ This table shows results for chemical parameters that were proposed to 5 C with in initial TP. The lab, in turn, conducted full mass spectrometry analysis for more parameters (only metals). Please refer to Annex 5-6 for more information.

Aluminum (Al), mg/kg	61000	74000	59000	57000	48000	56000	62000	20-200000 mg/kg	N/A	N/A
Arsenicum (As) mg/kg	24.0	49.0	38.0	27.0	27.0	21.0	20.0	0.1-4000 mg/kg	N/A	N/A

Annex 1. Brief profile of the “Central laboratory”

The state enterprise "Central Laboratory" of the State Committee of the Republic of Uzbekistan on Geology and Mineral Resources began its activity in 1868.

Main activities:

- Development of regulatory documents regulating the procedure for performing analytical work.
- Analysis of soils, rocks, ores, minerals, natural waters.
- Development of measurement techniques.
- Development of standard samples of the composition of rocks, ores, products of technological processing and aqueous solutions of heavy metals.
- Production of acid and alkaline electrolytes.

The main methods of analysis: spectral, assay, chemical, neutron activation, mass spectrometry, mineralogical and all types of preparation of rocks for analysis.

SE "Central Laboratory" in 2015-2020 was accredited by the agency "Uzstandart" for technical competence and independence for compliance with the requirements of the standards O'ZDST ISO/IEC 17025, O'ZDST 16.5 and O'ZDST 16.3 and registered in the State Register of the National Accreditation System of the Republic of Uzbekistan. № UZ.AMT.07.MAI.672

- for the right to conduct tests according to O'z DSt ISO/IEC 17025,
- for the right to conduct the certification of MVI according to O'z DSt 16.5
- for the right to conduct the certification of CO according to O'z DSt 16.3

Annex 2. National standards and regulations for soil

In accordance with the SanPiN No. 0272-09 "Sanitary rules and norms for compiling hygienic justifications for soil protection schemes from pollution in Uzbekistan" indicators of sanitary status of soils for enterprises and industrial zones are as follows:

- Ammonium nitrogen
- Nitrate nitrogen
- Chlorides
- pH
- Pesticides
- Heavy metals
- Oil and oil products
- Phenols are volatile
- Sulfur compounds
- Carcinogenic substances
- Radioactive substances
- Thermophilic bacteria
- Escherichia coli bacteria
- Clostridium perfringens
- Helminth eggs and larvae
- Larvae and pupae of synanthropic flies

In accordance with SanPiN № 0191-05 "Maximum allowable concentrations (MPC) and Approximate permissible concentrations of exogenous harmful substances in soil", the MPC of exogenous chemicals in the soils (in mg/kg) is as follows:

According to the general sanitary limiting indicator of harmfulness in mg/kg:

1. BENZAPIRENE (gross content)	0.02
2.VANADIUM (gross content)	150.0
3. Manganese + VANADIUM (gross content)	1000.0
4. TUNGSTEN (moving forms)	10.0
5. CELTAN	1.0
6 COBALT (mobile forms)	5.0
7. COPPER (mobile forms)	3.0
8. Molybdenum (mobile forms)	10.0
9. NICKEL (mobile forms)	4.0
10. COAL FLOTATION WASTE (OFU) (gross content)	3000.0
11. LEAD (gross content)	32.0
12. SULFUR ELEMENTARY (gross content)	160.0
13. SULFURIC ACID (gross content)	160.0
14. PHOSPHATES	27.2
15. FURFUROL	3.0
16. CHROME (moving forms)	6.0
by air-migration limiting hazard indicator:	
17. ALFAMETHYLSTYROL	0.5

18. BENZENE	0.3
19. ISOPROTTILBENZENE	0.5
20. HYDROGEN SULFUR (gross content)	0.4
21. STYROL	0.1
22. FORMALDEHYDE	0.7
by water-migration limiting hazard indicator:	
23. LIQUID COMPLEX FERTILIZERS (gross content)	80.0
24. INTEGRATED GRANULATED FERTILIZERS (gross content)	120.0
25. Manganese: (gross content) (mobile forms)	1500.0 60.0
26. NITRATES (gross content)	130.0
27. POTASSIUM CHLORIDE (gross content)	560.0
by trans locational limiting hazard indicator:	
28. ACIDS (ortho, -meta, -pa)	0.3
29. ARROW (gross maintenance)	2.0
30. Mercury (gross content)	2.1
31. LEAD + MERCURY (gross content)	20.0+1.0
32. ANTIMONY (gross content)	4.5
33. TOLUOL	0.3
34. FLUORINE (water soluble forms)	10.0
35. ZINC	23.0

Annex 3. Photos of sample collection

Landscape of the sample points

Soil № 1





Soil sample № 2





Soil sample № 3





Soil sample № 4





Soil sample № 5





Soil sample № 6





Soil sample № 7



Annex 4 Original copy of Accreditation Certificate Of Central Laboratory

000592



СВИДЕТЕЛЬСТВО
О государственной регистрации юридического лица
(субъекта предпринимательства)

Настоящим подтверждается, что в Единый государственный реестр субъектов предпринимательства внесена запись о создании:

Государственное унитарное предприятия "MARKAZIY LABORATORIYA"
(Полное наименование юридического лица – субъекта предпринимательства с указанием организационно-правовой формы)
ГУП "MARKAZIY LABORATORIYA"
(Сокращенное наименование юридического лица)

23.03.2007 <small>(Число, месяц (прямое), год)</small>	За регистрационным номером:	000592-04
Идентификационный номер налогоплательщика (ИНН):		205174241

Организационно-правовая форма:	Государственное унитарное предприятие
Местонахождение:	Ташкентская область, Зангиатинский район, Эшангузар, A.TEMUR MEY, MUSTAQILLIK KO'CHASI, 21-UY.
Свидетельство выдано:	Ташкентская область, Зангиатинский район, ЦЕНТР ГОСУДАРСТВЕННЫХ УСЛУГ <small>(Полное наименование регистрирующего органа)</small>



Translation of the Original copy of Accreditation Certificate of Central Laboratory

THE CERTIFICATE

State registration of a legal entity (business entity)

It is hereby confirmed that the Unified State Register of Business Entities contains an entry on the creation of:

State unitary enterprise "MARKAZIY LABORATORIYA"

(Full name of legal entity - business entity, indicating the organizational and legal form)

SUE "MARKAZIY LABORATORIYA"

(Abbreviated name of legal person)

23.03.2007	registration number:	000592-04
(Number, month (cursive), year)		

Tax Identification Number (TIN):	205174241
----------------------------------	-----------

Organizational-legal forms:	State unitary enterprise
Location:	Tashkent region, Zangiatinsk district, Eshanguzar, A.TEMUR MFY, MUSTAQILLIK STREET, 21-house
Issued by:	Tashkent region, Zangiata district, STATE SERVICES CENTER
(Full name of registering authority):	

Annex 4. Original copy of Protocol of chemistry analysis of soil

АО «Узбекгеологоразведка» Центральная лаборатория
Ташкентская область, и. Энгельса, ул. Мустафолев 21
тел. 933805415; 762627142

УТВЕРЖДАЮ
Начальник «Центральной
лаборатории»
Мухомов С.В.
2021 г.

ПРОТОКОЛ ИСПЫТАНИЯ № 65

на исследование согласно письма № JEC-OUT-21-218 от 18/08/2021г о проведении испытаний пробы воды согласно О'з DSt 950:2011.

Заказчик: ООО «JURU ENERGY CONSULTING»

Обозначение и данные маркировки объекта испытания:
№1 по №3 – почва – sg 2(ДВ), sg 3(ДВ), sg 4(ДВ); с№7 по №16 – почва – sg 7, sg 1, sg 2, sg 3, sg 4, sg 5 sg 6, sg 7, sg 8, sg 9;
№4 по №6 – почва – g6, g7, g8;
дата получения: 24-08-2021г в количестве 16 проб.

Цель, задачи испытаний – анализ почвы по заданию заказчика;
НД на объекты испытаний – ГОСТ 26423-85 ГОСТ 26425-85.

Условия проведения испытаний: температура окружающей среды 20,0°, влажность 40%.

Средства измерений: весы AS 220C Radwag, номер И-160МИ, электронный гигрометр НТС-2.

Испытания проведены: 24-08-2021г – 08-09-2021г.

Результаты испытаний.
Заказ № 769 от 24-08-2021г.

№	Наименование показателей	НД на методы испытаний	Фактическое значение															
			sg 2(ДВ) №1	sg 3(ДВ) №2	sg 4(ДВ) №3	g 6 №4	g 7 №5	g 8 №6	sg 7 №7	sg 1 №8	sg 2 №9	sg 3 №10	sg 4 №11	sg 5 №12	sg 6 №13	sg 7 №14	sg 8 №15	sg 9 №16
1	Водородный показатель pH	26429-85	8,00	8,10	8,25	8,30	8,30	8,26	8,35	8,10	8,28	8,00	8,10	8,20	8,20	8,30	8,20	8,30
2	Хлориды, %	26425-85	7,00	6,00	11,00	11,00	11,00	7,0	535,00	67,00	11,0	3,00	3,00	14,00	11,00	11,00	3,00	9,00

№	Наименование показателей	НД на методы испытаний	Фактическое значение															
			sg 2(ДВ) №1	sg 3(ДВ) №2	sg 4(ДВ) №3	g 6 №4	g 7 №5	g 8 №6	sg 7 №7	sg 1 №8	sg 2 №9	sg 3 №10	sg 4 №11	sg 5 №12	sg 6 №13	sg 7 №14	sg 8 №15	sg 9 №16
3	Нитраты, мг/дм³	Измеряется номером	10,00	17,00	11,00	15,00	9,40	8,00	294,00	49,00	6,00	9,00	101,00	21,00	38,00	15,00	9,33	10,00

Право тиражирования и копирования без разрешения
«ЦЛ» не допускается.

И.о. начальника ХАЛ *Гусанова* Гусанова И.Е.

Unofficial translate of of Protocol of chemistry analysis of soil

Uzbekgeologorazvedka JSC "Central Laboratory"

111800, Tashkent region, Zangiatinsk district, Eshanguzar, Mustakillik street, 21

tel.933805415, 702027142

"Approved"

Director of the

SE "Central Laboratory"

Mihaylov S.V.

"8" September 2021

Protocol of measurements No. 65

for measuring according to letter No. JEC-OUT-21-218 of 18/09/21 on testing of water samples according to the State standard 950:2011.

Customer - OOO JURU ENERGY CONSULTING

Marking and labeling data of the test object:

No.1 to No.3 –Soil

No.1 to No.6 –Soil

Date of receipt – 24.08.2021; of samples 6

Purpose, objectives of the tests - analysis of water according to the customer's assignment;

(ND) Normative documents for test methods and measuring instruments –GOST 26423-85; GOST 26425-85

Environmental conditions: temperature 20,0°C, humidity 40%

Used equipment: Lab scale AS 220/C Radwag, Ionomer И-160ММ, КФК-36, Thermohygrometers HTC-2

The tests were carried out: 24-08-2021 - 08-09-2021

Results of the analysis
Order No. 769 of-24-08-2021

Head of CAL (Chemical and Analytical Laboratory)

Gusanova I.E

APPENDIX V - CONSULTATION LETTER TO & FROM AGENCY OF SANITARY & EPIDEMIOLOGICAL WELLBEING

ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ

JURU ENERGY CONSULTING

100077, Tashkent, M.Ulugbek region, Chust Street, house # 10
TIN: 303454532, BIC: 00974 Bank «Kapitalbank» A/N. 20208000500502375001

JEC-OUT-21-51
03.04.2021

**Начальнику Службы
санитарно-эпидемиологического
благополучия и общественного
здоровья Б. К. Юсупалиеву**

Уважаемый Баходир Кахраманович!

В соответствии с Указом Президента Республики Узбекистан от 23.02.2021 года № ПП-5001 "О мерах по реализации инвестиционного проекта "Строительства ветряной электростанции мощностью 300-500 МВт в Пышкунском районе Бухарской области", ИП ООО "ACWA Power Dzhankeldy Wind" (г.Ташкент) заключила с АО "Национальные электрические сети Узбекистана" 25-летний договор купли-продажи электроэнергии. Данное соглашение было заключено 24 января 2021 года для разработки, финансирования, строительства и эксплуатации ветропарка мощностью 300-500 МВт Пышкунском районе Бухарской области (см. Приложение 1)

Проект также включает в себя строительство воздушной линии электропередач (ЛЭП) с напряжением 500 кВ в одном контуре. Эта ЛЭП будет проложена между ветропарком ACWA Power Bash мощностью 500 МВт и ветропарком ACWA Power Dzhankeldy мощностью 500 МВт. На данном этапе, согласование ЛЭП находится в стадии завершения АО "Национальные электрические сети Узбекистана" и будет подключено к существующей подстанции в Коракуле

В рамках оценки воздействия на окружающую среду и социальную сферу (ОВОСС) корпоративные консультанты по экологической и социальной оценке "5 Capital Environmental & Management Consulting" (Дубай, ОАЭ) компании ACWA Power назначили Juru Energy (г.Ташкент, Узбекистан) для проведения определенных фоновых экологических и социальных исследований, сбора данных, проведения консультаций с общественностью, а также процедуру составления и сдачи необходимых отчетов и представления национальной Оценки Воздействия на Окружающую Среду в Государственный комитет Республики Узбекистан по экологии и охране окружающей среды.

Согласно первичным исследованиям местности, проведенным на территории Проекта и прилегающих территориях в марте 2021 года, установлено что ближайшими населенными пунктами к Проектной территории являются два села, а именно, село Джанкельды и село Калаата. Село Джанкельды находится приблизительно в 14 км к западу от Восточного участка Проекта и село Калаата расположено в непосредственной близости от Западного участка (Приложение 1)

Данный проект по использованию возобновляемых источников энергии, не предусматривает применение технологий, которые будут выделять выбросы в атмосферный воздух. В связи с отсутствием конкретных источников выбросов загрязняющих веществ в атмосферу в рамках Проекта, отсутствует возможность определения или расчета величины санитарно защитной зоны до ближайших населенных пунктов, согласно СанПиН № 0350-17 «Санитарные нормы и правила по охране атмосферного воздуха населенных мест Республики Узбекистан».

В связи с вышеизложенным, просим Вас рассмотреть вопрос о необходимости установления санитарно защитной зоны для данного Проекта, принимая во внимание, что действующим законодательством не предусмотрены требования для ветровых электростанций.

Заранее благодарим за сотрудничество!

С уважением,

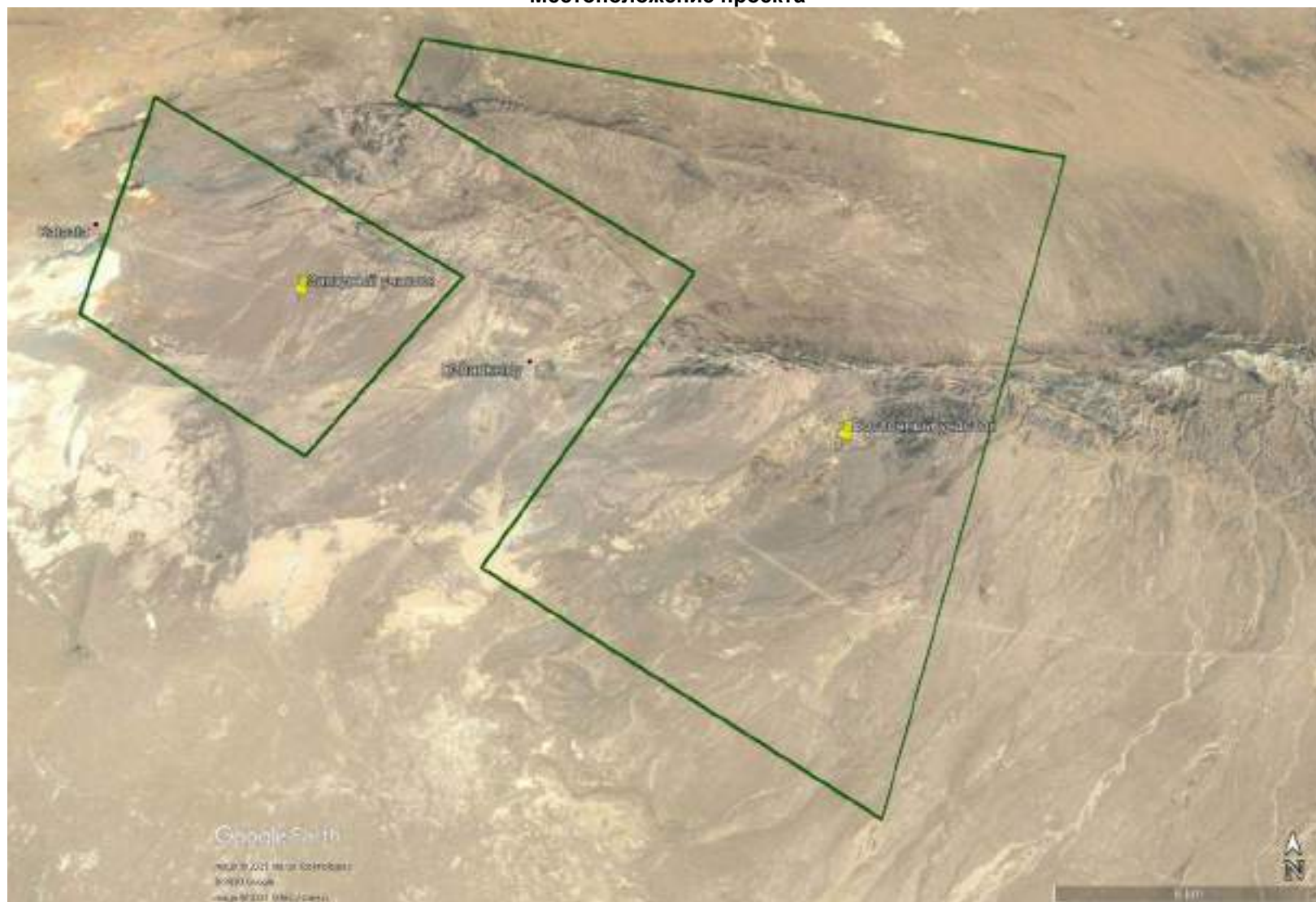
Директор



Якубов Жахонгир

Исполнитель,
Инобат Аллоберганова
Тел. +99871 202 04 40
Моб. +99890 131 70 17

Местоположение проекта



Координаты Проекта (на основе предварительных координат)

№	UTM Зона 41T	
	Долгота (В)	Широта (С)
Восточный участок		
1	523619.75	4534733.22
2	543599.97	4529733.76
3	536496.75	4510432.45
4	526924.81	4516485.66
5	532348.42	4525452.64
6	523032.36	4532093.13
Западный участок		
7	525738.34	4525288.58
8	515437.34	4532201.45
9	514980.93	4524099.13
10	522031.61	4519603.11

**SANITARY AND EPIDEMIOLOGICAL WELFARE AND PUBLIC HEALTH SERVICE OF THE
REPUBLIC OF UZBEKISTAN**

46 Bunyodkor str. Tashkent 100097 Phone: 71 276-59-28. Fax: 71 276-59-28 e-mail: sanepidxizmat@minzdrav.uz

**To director of «JURU ENERGY
CONSULTING» Yakubov J.**

Sanitary-Epidemiological Welfare and Public Health Service based on your requested dated April 3, 2021, No. JEC-OUT-21-51, regarding to establishment of health protection zone for "Construction of wind power station with a capacity of 500 MW in Gijduvan district of Bukhara region" Project has reviewed a number of existing regulations and conducted a literature review of available scientific researches related to this issue.

As a result, based on national legislation in force, namely sanitary norms, rules and hygienic standards: SanPiN № 0236- 07 "On ensuring the safety of the population living near high-voltage overhead power transmission lines" and SanPiN № 0350-17 "Sanitary norms and rules on atmospheric air protection in populated areas of the Republic of Uzbekistan" for single circuit OHTL with rated voltage of 500 kV and **should be not less than 30 meters from both sides of OHTL tower** and when producing electric power of 600 MW and above (in your case 500 MW) the size of sanitary protection zone should be "at least 500 meters".

Scientific studies related to the construction of wind power plants (WPPs) of several scientists in Ukraine, Russia and Belarus demonstrated locations, risks of environmental pollution (atmospheric air, soil, groundwater) as a result of transportation, welding, ground works, machinery and vehicles activities. Moreover, increased levels acoustic and electromagnetic pollution levels on surrounding areas as well as emergency situation, such as collapse of WPP during bad weather conditions, may occur while commissioning stage. Based on calculations presented in the projects and analysis of data on the environmental impact of foreign WPPs, it is established that the limiting factor of WPPs is acoustic pollution in the sound frequency range, which extends beyond the territory of wind farms.

As a result, a health protection zone for modern wind power plants is justified as 700 m from the outermost wind turbines in terms of noise criteria, and it is recommended to maintain a distance of 200 m from wind turbines to limit any activities and stay of people during possible emergencies periods under adverse weather conditions.

Considering above mentioned, it can be concluded that wind power plants (WPPs) should be classified as Class I with a health protection zone of at least 1000 m.

Signed by Deputy director

N.S.Otabekov

APPENDIX W - PROOF OF CONSULTATION WITH CIVIL AVIATION AGENCY AND MINISTRY OF ICT

O'ZBEKISTON RESPUBLIKASI
TRANSPORT VAZIRLIGI HUZURIDAGI
FUQARO AVIATSIYASI AGENTLIGI



CIVIL AVIATION AGENCY
UNDER THE MINISTRY OF TRANSPORT
OF THE REPUBLIC OF UZBEKISTAN

"O'ZAVIATSIYA" AGENTLIGI

CAA OF UZBEKISTAN

O'zbekiston Respublikasi, 100015, Toshkent shahri, Nukus ko'chasi, 73"b"- uy / 73 "b" Nukus street, Tashkent, 100015, Republic of Uzbekistan
Tel.: (+998 78) 120-00-60, Fax: (+998 71) 254-14-82, www.uzcaa.uz, E-mail: caa@uzcaa.uz, E-xat: uzcaa@exat.uz

2020 y. « ____ » _____

№ 01-39/11-1270

« 19 » 07

2021г.

Генеральному директору
ИП ООО «ACWA POWER BASH WIND»
и ИП ООО «ACWA POWER DZHANKELDY WIND»
Онаркулову Ш.К.

На исх. № 36 и 37
от 13.07.2021г.

Агентство «Узавиация» рассмотрело материалы, представленные Вами на выдачу разрешения по размещению объектов в районах аэродромов гражданской и экспериментальной авиации, которые могут угрожать безопасности полетов воздушных судов.

По итогам рассмотрения представленной информации о предварительное месте установке ветряных электростанций сообщаем следующее:

- предварительное места установки объектов находится в пределах поверхности круга учета препятствий и не превышает ограничивающие поверхности;

- объекты может быть рассмотрен в установленном порядке при поступлении заявления в соответствие с приложением №3, постановлением Кабинета Министров от 11.08.2014 года №226.

Также информируем что, указанные объекты высотой более чем 50 метров согласно постановлению выдача разрешения дополнительно согласовывается с Министерством обороны Республики Узбекистан.

Исходя из вышеизложенного, указанные объекты в вашем письме подлежат согласованию в Агентстве «Узавиация» и будет в установленном порядке рассмотрены после получение все необходимые документы.

И.о. директор

Ульжаев Т.Э.

Unofficial translation

CAA of Uzbekistan

No. 01-39/11-1270 dated 19.07.2021

To the director of FE "ACWA POWER BASH WIND" LLC and FE "ACWA POWER DZHANKELDY WIND" LLC Sh. Onarkulov

The agency "Uzaviation" has reviewed the materials submitted by you for the issuance of a permit for the placement of objects in the areas of civil and experimental aviation airfields that may threaten the safety of aircraft flights.

Based on the results of the review of the information provided on the preliminary location of the installation of wind power plants, we inform you of the following:

- the preliminary location of the installation of objects is located within the surface of the obstacle accounting circle and does not exceed the limiting surfaces;
- objects can be reviewed in accordance with the established procedure upon acceptance of an application in accordance with Annex No.3, Resolution of the Cabinet of Ministers No. 226 dated 11.08.2014.

We also inform you that these objects with a height of more than 50 meters, according to the resolution, the issuance of a permit is additionally coordinated with the Ministry of Defense of the Republic of Uzbekistan.

Based on the above, the specified objects in your letter are subject to approval by the Agency "Uzaviation" and will be considered in accordance with the established procedure after receiving all the necessary documents.

Acting director

signature

Uljayev T.E.

Электрон рақамнинг имзо орқали тасдиқланган, Хужжат коди: ВВ27501822

**O'ZBEKISTON RESPUBLIKASI
AXBOROT TEXNOLOGIYALARI
VA KOMMUNIKATSIYALARINI
RIVOJLANTIRISH
VAZIRLIGI**



**МИНИСТЕРСТВО ПО
РАЗВИТИЮ
ИНФОРМАЦИОННЫХ
ТЕХНОЛОГИЙ
И КОММУНИКАЦИЙ
РЕСПУБЛИКИ УЗБЕКИСТАН**

100047, Toshkent shahri, Amir Temur shoh ko'chasi, 4-uy
Tel.: (+998) 71-238-41-07, 71-233-65-03, Faks: (+998) 71-239-87-82
E-mail: info@mitc.uz, mitc@exat.uz

100047, город Ташкент, улица Амира Темура 4,
Тел.: (+998) 71-238-41-07, 71-233-65-03, Факс: (+998) 71-239-87-82
E-mail: info@mitc.uz, mitc@exat.uz

2021 y. "11" avgust

№ 17-8/5679

**"ACWA POWER DZHANKELDY
WIND" va "ACWA POWER BASH
WIND" MЧЖ шаклидаги хорижий
корхоналари**

*Сизнинг 2021 йил 28 июлдаги
40 ва 41- сон хатларингизга жавоб*

"ACWA POWER DZHANKELDY WIND" MЧЖ va "ACWA POWER BASH WIND" MЧЖ шаклидаги хорижий корхоналари томонидан Бухоро вилоятининг Пешкў va Гиждувон туманларида қурилиши режалаштирилган шамол электростанциялари учун ажратилган ер майдонларида телекоммуникация тармоқлари va алоқа иншоотлари мавжуд эмаслигини маълум қиламиз.

Вазир ўринбосари



Ж.Махсудов

Unofficial translation

Ministry for Information & Communications Technology Development

No. 17-8/5679 dated 11.08.2021

To FE "ACWA POWER DZHANKELDY WIND" LLC and FE "ACWA POWER BASH WIND" LLC

Response to the letters No. 40 and 41 dated 28.07.2021

We would like to inform you that on the Project sites allocated for the construction of Wind Farms by FE "ACWA POWER BASH WIND" LLC and FE "ACWA POWER DZHANKELDY WIND" LLC in Gijduvon and Peshku districts there are not any telecommunications networks and communication facilities.

Deputy minister

J.Makhsudov

APPENDIX X - CONSULTATION LETTER TO & FROM MINISTRY OF EMPLOYMENT

ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ

JURU ENERGY CONSULTING

100077, Tashkent, M.Ulugbek region, Chust Street, house # 10.
TIN: 303454532, BIC: 00974 Bank: «Kapitalbank» A/N: 20208000600502375001

JEC-OUT-21-125

04.05.2021

To Ministry of Employment and Labour Relations of the Republic of Uzbekistan

Under Presidential Decree of the Republic of Uzbekistan No.5001 dated 23.02.2021 "On measures to implement the investment of the Project on construction of a 300-500MW wind power plant in Peshku district in Bukhara region", FE 'ACWA Power Dzhankeldy Wind' LLC (Tashkent)' has entered into a 25-year Power Purchase Agreement with JSC National Electric Networks of Uzbekistan. This agreement was entered on force 24th January 2021 for the development, financing, construction and operation of a 500MW Wind Farm in Peshku district of Bukhara region (See Annex 1).

The project also includes the development of an Overhead Transmission Line (OHTL) approximately 250km in length with a rating of 500kV single circuit. This OHTL will be shared between ACWA Power's Dzhankeldy 500MW Wind Farm and the ACWA Power Bash 500MW Wind Farm which is approximately 94km north east of the Dzhankeldy Wind Farm site. The alignment of the OHTL is being finalised by JSC National Electric Networks of Uzbekistan and will connect to an existing substation in Qurako'l from the Bash Wind Farm site (See Annex 2).

As a part of the Environmental & Social Impact Assessment (ESIA), Juru Energy is consulting with Ministry of employment and labour relations to establish whether you have any specific employment and labour requirements for the project. The project is expected to employ approximately 700 to 1000 workers during the construction phase and a much smaller workforce during the operational phase even though the number has not been determined at this point.

It is noted that the project will adhere to the relevant Uzbekistan labour regulations and standards.

We welcome your feedback and comments on the above to be addressed to Gulchekhra Nematullayeva (email: g.nematullayeva@juruenergy.com, tel +998 97 4459504).

Thank you very much for your assistance and we look forward to your response.

Yours Sincerely,

Director

J.Yakubov

For the further information please contact:
Gulchekhra Nematullayeva
Mob.: +998 97 4459504



Project is located in Peshku district of Bukhara region

Project Coordinates (based on preliminary co-ordinates)

NORTHING	EASTING
ACWA Power 500MW Project Site	
Eastern Plot	
523619.75	4534733.22
543599.97	4529733.76
536496.75	4510432.45
526924.81	4516485.66
532348.42	4525452.64
523032.36	4532093.13
Western Plot	
525738.34	4525288.58
515437.34	4532201.45
514980.93	4524099.13
522031.61	4519603.11

Annex 2 To the letter JEC-OUT-21-125
On 04.05.2021
Preferred OHTL allotment





O'ZBEKISTON RESPUBLIKASI
BANDLIK VA MEHNAT
MUNOSABATLARI VAZIRLIGI
DAVLAT MEHNAT INSPEKSIYASI

100031, Toshkent shahar, Mirobod ko'chasi, 15-uy.
Telefon: (+998 71) 239-41-21, (+998 71) 239-12-72

Директору
ООО "JURU ENERGY CONSULTING"
Г-ну Ж. Якубову

www.mehnat.uz e-mail: info@mehnat.uz, mehnat@exat.uz

“18” 06 2021 yil № 0100-00/17-5928

На Ваши исх. №№ JEC-OUT-21-124 и JEC-OUT-21-125 от 04.05.2021г.

Министерство занятости и трудовых отношений Республики Узбекистан рассмотрев Ваше обращение, сообщает что для ведения строительно-монтажных работ на территории Республики Узбекистан необходимо соблюдать необходимые требования в области охраны труда и техники безопасности следующих нормативных документов:

- Закон “Об охране труда” (в новой редакции) №410-ЗРУ от 22.09.2016г.;
- Постановление КМ РУз “О дальнейшем совершенствовании мер по охране труда работников” № 263 от 15.09.2014г.;
- Постановление КМ РУз “О дальнейшем развитии рынка услуг в области охраны труда” № 246 от 27.04.2017г.;
- Постановление КМ РУз “О мерах по совершенствованию деятельности Министерства занятости и трудовых отношений Республики Узбекистан” № 1066 от 31.12.2018г.;
- Типовое положение Министра труда РУз “Об организации работ по охране труда” №273 от 29.06.1996г.;
- Типовое положение Министра труда РУз “Об организации обучения и проверки знаний по охране труда” №272 от 14.08.1996г.;
- Положение Министра труда РУз “О разработке инструкций по охране труда” №870 от 07.01.2000г.;
- Приказ Министра труда и социальной защиты населения РУз “Об утверждении типовых норм бесплатной выдачи специальной одежды, специальной обуви и других средств индивидуальной защиты для работников строительных, строительно-монтажных и ремонтно-строительных предприятий” №2224 от 10.05.2011г.;
- Строительные нормы и правила (СНиП) 3.01.02-00 “Техника безопасности в строительстве”, 2000г., разработаны Госархитектуром РУз.

Существует множество других рекомендуемых нормативных документов, которые также послужат к улучшению условий в области охраны труда и техники безопасности, а также достойного отдыха работников на строительном объекте.

С уважением,

Заместитель начальника
Государственной инспекции труда

Исп. А. Гулямов
Тел: (71) 239-41-21 (306)

А. Шаронов

**Ministry of Employment and
Labour Relations of the Republic of Uzbekistan**

18.05.2021 No. 01/00-00/17-5928

Response to your letters No. JEC-OUT-21-124 u JEC-OUT-21-125 dated 04.05.2021

The Ministry of Employment and Labour Relations of the Republic of Uzbekistan, having considered your application, informs that in order to conduct construction and installation work on the territory of the Republic of Uzbekistan, it is necessary to comply with the necessary requirements in the field of labour protection and safety of the following normative documents:

- The Law "On labour protection" (new edition) M410-ZRU dated 22.09.2016;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan "On further improvement of measures for labour protection of employees " No. 263 dated 15.09.2014;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan "On further development of the market of services in the field of labour protection" No. 246 dated 27.04.2017;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan "On measures to improve the activities of the Ministry of Employment and Labour Relations of the Republic of Uzbekistan " No. 1066 dated 31.12.2018;
- Standard Regulation of the Ministry of Labour of the Republic of Uzbekistan "On the organization of work on labour protection" No.273 dated 29.06.1996;
- Standard Regulation of the Ministry of Labour of the Republic of Uzbekistan "On the organization of training and testing of knowledge on labour Protection" No.272 dated 14.08.1996;
- Regulation of the Ministry of Labour of the Republic of Uzbekistan "On the development of Instructions on labour Protection " No.870 dated 07.01.2000;
- Order of the Minister of Labour and Social Protection of the population of the Republic of Uzbekistan "On approval of standard norms for the free issuance of special clothing, special shoes and other personal protective equipment for employees of construction, construction and installation and repair and construction enterprises" No. 2224 dated 10.05.2011;
- Building standards and regulations (SNiP) 3.01.02-00 "Safety in construction" dated 2000, developed by Gosarchitekstroy (State committee on architecture and construction) of the Republic of Uzbekistan.

There are many other recommended regulatory documents that will also serve to improve the conditions in the field of labour protection and safety, as well as decent rest for employees at the construction site.

Yours sincerely,

deputy Head of the State Labour Inspectorate

signature

A.Sharapov

For further information please contact:

A. Gulyamov

(71) 239-41-21 (306)