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ARAB ENGINEERING BUREAU

23 CONSTRUCTION DEWATERING

23.1 GENERAL

23.1.1 Scope

- 1 This Part specifies the general procedures and requirements for construction dewatering.
- 2 It shall be noted that legislative requirements, standards and requirements detailed in this Part are minimum standards, and methods shall be employed with the intent to continually improve on these standards.
- 3 Related Parts and Sections are as follows:
Section 8 Earthworks

23.2 REQUIREMENTS

23.2.1 Current Procedure Requirements

- 1 There are four types of construction dewatering disposal options that require licensing in Qatar, as follows:
 - (a) Discharge to the Sea via surface and groundwater network; the licensing authority shall be Kahramaa, Ashghal and Ministry of Municipality (MM).
 - (b) Direct discharge to the Sea; if the discharge is pumped directly to the sea, then the MOECC shall be the licensing authority.
 - (i) Discharge to Lagoon totally covered with geotextile from all sides. This method of disposal requires a license from MM and Kahramaa .
 - (ii) Discharge to Lagoon not covered. This method of disposal requires a license from MM and Kahramaa.
 - (c) Discharge through Deep Well Injection. This method of disposal requires a license from Kahramaa and MM.

23.2.2 Relevant Qatari Laws and Regulations

- 1 The list of parameters required by MM for dewatering permit is included in Appendix A together with Annex 4 of Law 30 of 2002 which specifies the limits for the discharged water into the marine environment (refer to Appendix A). The annex controls the parameters of pollutants in the water disposed to the marine environment whether via the Surface and Groundwater Network, or direct discharge to the sea.
- 2 If the construction dewatering effluent is discharged to foul network, the discharging party is liable to having committed a criminal offence.
- 3 If the construction dewatering effluent is discharged in shallow or deep aquifer, the discharging party is liable for having committed a criminal offense.
- 4 In the case of illegal discharge to Surface and Groundwater Network, the discharging party will be subjected to legal actions taken by the licensing authorities.

23.2.3 Environmental Impact Assessment (EIA) Requirements

- 1 Environmental approvals from the MOECC as per Article 7 of the Law No. 30 of 2002.

23.2.4 Air Quality Standards

- 1 The air quality standards are controlled by the Law No. 30 of 2002 under Annex (3/First).The standards applicable to dewatering activities may include the following:
 - 2 Maximum limits (of air pollutants) allowed for emissions from the movable sources; and Ambient air quality standards.

23.2.5 Noise Standards

- 1 The noise levels are also controlled by the Qatari Legislation under Law No. 30 of 2002 Annex (2/Fifth).

23.2.6 Discharge to Surface and Groundwater Network Standards

- 1 Executive Bylaws of Environment Protection Law Issued under Ordinance Law No. (30) Of 2002. Annex No. (4) Criteria and Specifications of the Hazardous Materials when disposed of in the Water Environments (MOECC regulations).

23.2.7 Environmental Impact Assessment (EIA)

- 1 For projects requiring an EIA at the design stage, the EIA shall be carefully reviewed by the Design Consultant / Contractor. The EIA shall be forwarded to MOECC for their approval and for issuing the relevant Environmental Permit.
- 2 Where available, the EIA will contain details of geotechnical surveys including groundwater, adopted from the previously mentioned report.
- 3 Although the EIA may not directly contribute to the construction dewatering design, it will document possible contamination in the area and environmental constraints and shall therefore be considered when preparing construction dewatering application papers. Existing contamination, or potential for contamination, shall be carefully considered and must be taken into account when dewatered groundwater is tested for compliance.
- 4 To ensure that dewatering systems are designed to maximise environmental protection and to assist in expediting license approval processes, the above investigations shall be taken into consideration as early in the project as possible and included when applying for the discharge permit.

23.2.8 Geotechnical and Geo-Environmental Study Requirements

- 1 After the awarding of the Contract to the Contractor and prior to obtaining the discharge permit, if required by the Contract or requested by the Engineer, the Contractor shall carry out a geotechnical and geo-environmental investigation in order to confirm the geotechnical and environmental conditions on site and groundwater levels.

- 2 The geotechnical and geo-environmental study must as a minimum identify soil types, permeability, groundwater hydrology, and the required drawdown for the construction activities. This study is required if the area is suspected for contamination or if the EIA at the design stage has indicated the existence of contamination.
- 3 The output of the geotechnical and geo-environmental study shall include as a minimum the following items:
 - (a) Time required for construction dewatering.
 - (b) Flow rate of the dewatering discharge.
 - (c) Required drawdown.
 - (d) Method of construction dewatering based on all of the above findings.
- 4 To assist in the approval process all of the above information must be provided in the application for discharge.
- 5 It is important to note that the requirements of the Geotechnical and Geo-environmental study are completely subject to project settings, type of contamination, and MOECC specific requirements of each project.

23.2.9 Existing Groundwater Monitoring Documents

- 1 It is the Contractor's responsibility to ensure he has been providing the latest existing groundwater level information from Ashghal and the MOECC. This information shall be used by the Contractor to assist in determining the current site conditions.
- 2 All groundwater information gathered during studies by the Contractor, are to be submitted to Ashghal for reference and inclusion in the country database. The collection of this information is paramount to the continuous improvement of government information databases.

23.2.10 Risk Assessment of Construction Dewatering

- 1 It is important to note that risks are site specific and depend on the intent of the Contractor. The Contractor is responsible for developing, implementing and managing a Risk Management System and conducting a Risk Assessment in terms of dewatering activities and otherwise onsite.
- 2 This Risk Management System and Risk Assessment shall be submitted to the Engineer for the approval within the 30 days of the contract award.
- 3 Risk assessment in this instance can be defined as the identification and characterisation of the nature of existing and potential adverse effects to humans and the environment resulting from dewatering activities employed on site.
- 4 Risk is a function of the probability of an event occurring and the degree of damage that would result shall it happen.
- 5 Details and information gathered during the concept design and associated site studies (geotechnical, groundwater & environmental) are needed to assess the risks associated with the proposed activities. The assessment allows significant risks to be identified so that they can be targeted for action.

- 6 The initial risk assessment needs to also be regularly reviewed and will become an integral part of the Construction Environmental Management Plan. This includes a review of existing risks and the identification of new risks detected through the surveillance or the monitoring program.
- 7 To conduct the Risk Assessment the Contractor shall undertake the following key steps:
- (a) Information gathering:
A risk assessment requires information about site conditions.
 - (b) Risk identification:
Hazard identification involves the identification of risks/hazards that could lead to an adverse effect on the receiving environment and/or health & safety.
 - (c) Risk analysis:
Risk analysis considers the likelihood of the risk being realised.
 - (d) Consequence analysis:
Consequence analysis determines the effect on the environment and health & safety shall a risk be realised.
- 8 The overall risk is a function of the likelihood of the activity or event causing environmental harm or impacting on health & safety and the consequence shall that risk be realised.
- 9 The risks are then ranked according to their magnitude and mitigation strategies developed.
- 10 The objective of this process is to identify and rank all potential risks that may arise from the dewatering of the construction site and then reduce risks to acceptable levels by implementing a suitable method of dewatering and/or action plan.
- 11 Risks generally associated with dewatering activities onsite include but not limited to the following:
- (a) Soil and slope stability and soil erosion due to dewatering activities.
 - (b) Soil contamination. Whether contamination exists in the project area prior to commencement of construction or is caused by dewatering activities.
 - (c) Change of groundwater properties due to dewatering practices.
 - (d) Excessive abstraction (dewatering) of groundwater which affects nearby groundwater related activities.
 - (e) Health and safety related issues.
 - (f) Risks associated with impacts of dewatering activities on surrounding environment and sensitive receptors.
 - (g) Risks associated with failure of dewatering system and/or disposal methods.

23.2.11 Dewatering Monitoring Plan

- 1 When dewatering activities are included within the project site, the Contractor shall prepare a Dewatering Monitoring Plan as detailed below.

- 2 The Dewatering Monitoring Plan shall be submitted to the Engineer for approval within 30 days of contract award.
- 3 The monitoring plan will assist the licensing authority, as well as the Contractor, in keeping track of dewatering activities onsite, and identify corrective actions to be carried out.
- 4 The monitoring plan can also assist in identifying liability issues concerned with reported dewatering problems and accidents.
- 5 Outline and components of monitoring plan are as follow:
 - (a) Identification of opportunities to reuse the dewatering effluent onsite in order to reduce the amount of disposed effluent.
 - (b) Dewatering techniques being employed on site
 - (c) Disposal methods employed on-site and relevant monitoring plan to ensure compliance with discharge limits.
 - (d) Copy of discharge limits.
 - (e) Roles and responsibilities of the Environmental Advisor on site.
- 6 Roles and responsibilities have to be clearly defined when designing a dewatering system. These roles and responsibilities are to be submitted as an essential element to satisfy the Construction Environmental Management Plan requirements when applying for the dewatering effluent discharge permit.
- 7 Refer to Appendix B for an example of inspection sheet for the dewatering process.

23.2.12 Training Requirements

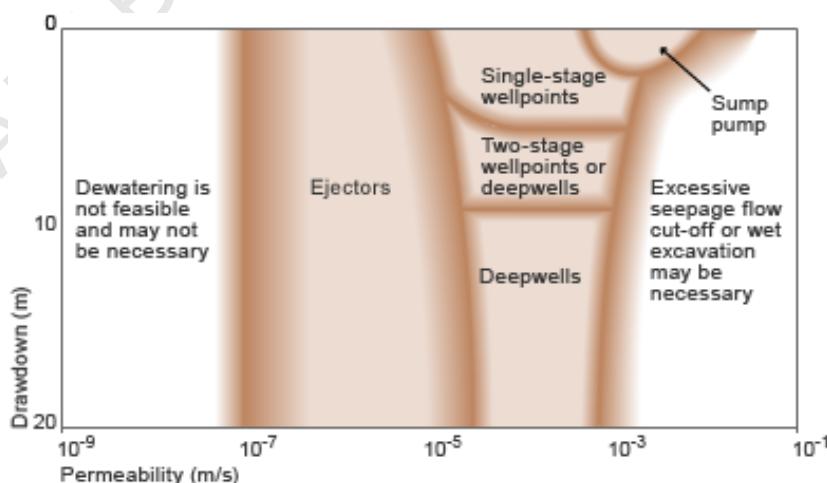
- 1 The Contractor shall prepare a Construction Dewatering Training Plan submitted along with the necessary documentation for a discharge permit.
- 2 The construction dewatering training plan shall be submitted to the Engineer for approval within 30 days of contract award.
- 3 The training plan will assist the licensing authority in evaluating the level of knowledge passed on to the Contractor's staff, and is therefore an indirect indication on how well the dewatering process is being executed. The components of the submitted training plan are detailed below.
- 4 The integration of construction dewatering training into the Training Plan of the Contractor is essential to introduce all staff to construction dewatering related information.
- 5 It is recommended that information on dewatering equipment and related emergencies are included in the training provided to staff entering or working on the site.
- 6 The training for all staff does not have to be comprehensive; however, it shall include basic items such as:
 - (a) Brief explanation of the construction dewatering purpose
 - (b) Introduction to the dewatering equipment. Inclusion of photos in the training presentation.

- (c) Health and safety related concerns, education on related emergencies, and contact information of person in charge of dewatering to be provided in the presentation.

23.3 DEWATERING TECHNIQUES

23.3.1 Construction Dewatering Methods Guide Lines

- 1 The design of effective construction dewatering methods shall be based on a number of information sources:
 - (a) Geotechnical and groundwater site investigations undertaken at the commencement of any project;
 - (b) Information provided by any geotechnical study undertaken during the concept design stage (if applicable);
 - (c) Groundwater information sourced from relevant authorities; and,
 - (d) A site risk assessments.
- 2 The Contractors choice of dewatering method will depend primarily on the soil type and permeability and the amount of groundwater to be removed. Whilst the Contractor will be trying to find the most cost effective method of dewatering (based on the geotechnical report) he shall implement the most effective dewatering method which minimises environmental damage, protects the health & safety of on-site personnel and meets all legislative discharge limits.
- 3 It is important to note that if contamination exists in the area all precautions need to be implemented. Contamination will be dealt with in coordination with MOECC by safe disposal in designated areas as per the Environmental Law number 30 for 2002.
- 4 The figure below demonstrates the range of common dewatering techniques, whilst accounting for soil permeability and drawdown.



Range of Application of Pumped Well Groundwater Control Techniques

** Source: Preene, M. Roberts, T. Powrie, W. Dyer, M R (2000)- Groundwater Control Design & Practice (CIRIA C515), London, CIRIA.

- 5 As seen in the above figure, the choice of dewatering method depends on the required drawdown and permeability. The drawdown is determined during the design stage of structures and the groundwater investigation stage at the start of the project and the permeability is tested during the geotechnical investigation stage.
- 6 After the drawdown is determined, the Contractor shall choose the method of dewatering based on the permeability of soil and rock. The method can vary during the stages of the project depending on the required drawdown. The shaded areas near the methods' boundaries indicate that the choices can overlap, and then the Contractor can decide between the two (or more) options.
- 7 Filtering and filling materials of aggregate is required by most dewatering methods. Therefore when required, aggregates to be used shall be free draining, washed and free of debris (organic or non-organic) and contamination and not subject to any dissolving. Preference is for a single sized aggregate (less than 10% fines).
- 8 Whilst the range of dewatering practices varies across sites depending on their size, construction depth and site conditions, the most commonly used methods of dewatering in Qatar are indicated below. Each method's use depends on the requirements and stage of project.

23.3.2 Sump Pits

- 1 The Sump Pit method is the simplest form of dewatering system on a construction site. Sump pits are generally utilised as a quick, least cost, solution and can be seen to be used at the start of projects as the excavation stage commences. Provided with an aggregate lining, as per O&M requirements, sump pits can be an effective means of filtering groundwater, unless the groundwater has come into contact with silt and/or limestone, which usually results in reported high turbidity.
- 2 If soil has silty characteristics; it is recommended that proper installation of geotextile and aggregates in sump pits be implemented in order to improve the quality of dewatering effluent and significantly decrease turbidity.

23.3.3 Well System

- 1 The most common practice of dewatering used in Qatar is the implementation of a Well System. Wells are systematically drilled around the construction area and submersible pumps placed into these wells. This practice appears to work effectively for many projects, especially those building projects that require excavations for deep basements.

23.3.4 Deep Wells

- 1 Deep wells are rarely used in Qatar. Deep wells are usually equipped with filter packs & submersible pumps, and are operated using a control cabin.
- 2 Although not found to be present in Qatar at present, deep wells have unlimited drawdown, they require a minimum spacing of 10 meters, and have far greater efficiency.

23.3.5 Ditches/ French Drains

- 1 Ditches and French drains (commonly known as trenches in construction projects in Qatar) are also used on Qatar's construction sites. The ditches are formed in a pre-planned manner, allowing groundwater flow to surface in the deeper level trenches. Perforated pipes are then placed in the trenches, and groundwater extracted through these pipelines to be filtered. These trenches were particularly common in infrastructure network projects.
- 2 Graded aggregates and geotextile layer to be used when laying out the pipelines.

23.3.6 Cut-Off Excavation Barriers

- 1 Cut Off barriers are designed to limit and/or control groundwater entering the construction site from a neighbouring property. An assessment of groundwater infiltration is required to determine to what extent barriers are required and how they are constructed.
- 2 Commonly used excavation barriers in Qatar include structural concrete walls and secant piles. Both techniques are applicable to most types of soil and provide slope stability for deep excavated areas.

23.3.7 Dewatering Effluent Treatment

23.3.8 Settlement Tank

- 1 The settlement tank is the most common and most effective methods of treatment in Qatar. The settlement tank is primarily used to maximise the distance that the effluent has to travel prior to reaching the discharge point, and therefore increasing the settlement efficiency.
- 2 All projects in Qatar which apply for a discharge permit are obligated to provide a settlement tank.
- 3 When choosing the settlement tank, the choice shall be based on the following factors:
 - (a) The type of soil to be dewatered.
 - (b) Flow rate quantity and frequency.
 - (c) Possible peak factors flows.
 - (d) Retention time required for solids to settle. This will also be based on the soil type.
 - (e) Capacity of the settlement.

23.3.9 Settlement Tank Types

- 1 The common types of weir tanks used are Regular tank and V-notch tanks (30° , 60° , and 90°). The V-notch tanks serve to accelerate the passing of the effluent through the tank.
- 2 For safety purposes, it is recommended that tanks be suitably covered with a top cover or specific lid, to ensure unauthorised access is not permitted.
- 3 It is important to note that sometimes these tanks are used onsite as a discharge tanks. Therefore, it is important that tanks are used as settlement tanks and be marked clearly as such.

23.3.10 Tank Size

- 1 In order to make a decision on the tank size, the volume of tank are to be estimated as per the below equations.
- 2 The volumes calculated depend primarily on the retention time of water in the tank, and the flow rate of discharge.

	Equation	
Tank volume	$V = Q t$	V: Volume (m^3) Q: Expected flow rate ($m^3/hour$) t: retention period (hour)
The tank's depth	$d = V/A$	d: depth (m) V: volume(m^3) A: surface area(m^2)

- 3 It is important to note that these equations are to be used as a guide only, but do provide a basis for calculating the minimum tank size required based on the flow rate provided by the Contractor.
- 4 For fine grained type of soils, it is preferred to have secondary methods of treatment as detailed below.

23.4 OTHER TREATMENT

23.4.1 Silt and Fine Grained Soils

- 1 For the removal of silt and fine grained suspended particles, the following inexpensive methods can be effectively applied:

(a) Dewatering Tank:

a dewatering tank can remove sediment (sand, silt, and visible oil). The dewatering tank is equipped with a fabric filter. The flow passes through the filter before being discharged at the bottom end of the tank. The tank can be used in addition to the weir tank or any other treatment method. It is portable, inexpensive and many types of filter clothes can be used.

Yet, the dewatering tanks shall be subjected to periodic cleaning based on the visual inspection or reduced flow, through lifting the sand and silt from the tank.

(b) Gravity Bag Filter:

(Also known as dewatering bag) is made of geotextile fabric that can filter out silt and fine grained soil particles. This filter is easy to install, inexpensive, and becomes more effective as sediment builds up inside the bag. The type of bag shall be selected based on the flow rates of discharge and permeability of soil.

This method is to be used as a secondary treatment for groundwater. It requires continuous monitoring to avoid hose failure, particularly if sediment builds up in a manner that interferes with the acquisition of a reasonable flow rate discharge.

The Gravity Bag Filter does not require cleaning, as it is a disposable filter. The filter is to be disposed of in accordance with the waste management guidelines of the project. The filter is to be replaced when it starts passing solids, or blocks the passing of water at a rate that is adequate.

(c) Slurry Water

"The drilling [slurry] muds containing substantial quantities of organic liquids and water-soluble salts are treated to render them environmentally acceptable for disposal" (C M Wilwerding 1989)

Slurry water occurrence is common during dewatering processes in Qatar. While there is filtration equipment and water treatment technology available to treat slurry water, these are best used in countries with a different climate to that of Qatar's.

- 2 The best option for treating slurry by filtration is using a Centrifugal Filter. However, as previously mentioned, this is not a preferable to be used in Qatar as slurry can be dried easily in a more environmentally friendly manner.
- 3 It is also important to note that even when treatment equipment is used, the resulting silt will have to be disposed at a licensed landfill, along with having to dispose of the equipment at its end of service life.
- 4 If the silt contains hazardous material, then a license and approval shall be issued from Kharamma and MOECC as per the procedures detailed in Annex (7.2) of the Qatari Law of Environment (Copy of the procedures together with the form of application is provided in **Appendix (C)**). And if the silt has no hazardous materials then the license shall be issued from the concerned Municipality.
- 5 To eliminate the issues with incompatible equipment and hot climates, it is recommended that treatment methods be designed to manage the slurry either onsite by drying the first instance before transfer to landfill, or by transfer to the landfill directly. A acceptable dumping site shall be identified prior to any dumping process.
- 6 The conventional drying process comprises laying out of slurry mud on an air permeable drying bed lined with suitable material.
- 7 The drying process must commit to the following environmental considerations:
 - (a) Amount of slurry generated must not exceed the capacity of the spreading system.
 - (b) Drying process must not impose nuisance or emit odor.
 - (c) Drying process must not impose health and safety risks.
- 8 The choice of drying process, whether by using a centrifuge machine or a drying lagoon is subject to project settings and expected amount of slurry to be generated.
- 9 The slurry handling process is to be submitted with the dewatering permit application if generation of slurry is expected to occur.

23.4.2 Contamination of Groundwater

- 1 In the event of discovering the contamination of the receiving environment such as groundwater by dewatering effluent, the contractor is obligated to report the discovery to the main licensing authority (Kahramma, ASHGHAL, MOECC) and the effluent is to be dealt with as per the construction Environmental Management Plan (CEMP). Samples of groundwater shall be taken and tested. Reasonable suspicion can be established by one of the following methods:
- (a) Possible history of contamination in the area; such as prior land use (eg. petrol station), or the area is known to have septic tank issues.
 - (b) EIA: if there is an EIA prepared for the project, it shall be reviewed and approved by MOECC in order to eliminate the possibility of contamination. If the EIA indicates the presence of contamination, the Contractor is obligated to report the findings to MOECC for their feedback, and test for the type of contamination detected in the EIA.
 - (c) The Contractor shall use the following Water Quality Assessment to establish the possibility of contamination in the area.

Water Quality Assessment		
The following questions provide an initial assessment of the quality of the water to be discharged from the dewatering operation.		
Common Sense Test	1. Review the project records. Is there any reason to suspect that the water may be polluted by something other than sediment? No Yes	
	2. Is the water located in an area of known contamination? No Yes	
Sight Test	Does the water have an abnormal visual feature, such as: (circle) Oily Sheen, Floating Foam, Murky Appearance, Unusual Colour Other	
Smell Test	Does the water have an odor? No Yes Possible odors include gasoline, petroleum, ammonia, sewage, etc.	
If you answered YES to any of the above questions, explain: If you answered YES to any of the questions in the assessment or suspect that the water contains pollutants other than sediments, contact the Engineer for assistance with additional testing and management options.		

Water Quality Assessments

**** Adapted from Source:** The office of Environmental Engineering, California Department of Transportation (Caltrans), Field Guide to Construction Site Dewatering, USA, 2001.
In the event of discovering groundwater contamination, the Contractor is obligated to report the discovery to the Engineer and Licensing Authority (MOECC / ASHGHAL) and the effluent is to be dealt with as per the Construction Environmental Management Plan (CEMP), or as directed by the Engineer.

23.5 DISPOSAL OPTIONS

- 1 Qatar construction sites use four (4) common means of disposal, namely:
- (a) Discharge to sea via the Surface and Groundwater Network, only if the discharge water is free from contamination;

- (b) Direct Discharge to the sea;
 - (i) Discharge to lagoon totally covered by geotextile on all sides from the site and the base of the discharge lagoon;
 - (ii) Discharge to lagoon not covered, ;
- (c) Discharge by injection to deep groundwater aquifer (Deep well injection) with the following requirements:
 - (i) Contractor shall submit method of statements for drilling and development of deep well injection including the method of drilling, depths of the wells, casing of the well, depth of injection, etc. to obtain approval and license from Kahramaa.
 - (ii) No injection shall be conducted without a license and written approval from Kahramaa.

23.6 DISCHARGE TO SEA

23.6.1 Discharge to Sea via Surface and Groundwater Network

- 1 Disposal of dewatering effluent to the Surface and Groundwater Network is the most common practice in Qatar. The Surface and Groundwater Network eventually leads to outfalls that discharge to Sea.
- 2 The disposal to the network directly via pipelines, or via tankers, depends on the availability of Surface and Groundwater Network in the project area.
- 3 The Surface and Groundwater Network is an acceptable option for disposal given that Contractor is also reusing the effluent on site whenever possible.
- 4 If a Contractor chooses to discharge to the Surface and Groundwater Network, obtaining a license from Kahramma and Ashghal is required to allow the discharge of groundwater to the Surface and Groundwater Network. A license from the Ministry of Environment and Climate Change [MOECC] is also required through the submission of an Environmental Permit Application.
- 5 Measurements of flow rates must be undertaken in order to monitor the discharge flow and ensure that it is within the limits provided to the licensing authority (refer **Appendix A** for discharge limits).
- 6 The Contractor must provide the licensing authority with the maximum expected flow rate (i.e the peak flow) and the expected average flow rate, in order to avoid back flooding when flows exceed the capacity of the manhole assigned to the Contractor. Therefore, the contractor shall install a flow meter at the construction site in order to measure the quantities of groundwater flow.
- 7 The Contractor shall also notify the licensing authority if peak flows are expected to be reached frequently during the winter season, particularly when heavy rain is forecast, so as to avoid penalties if the manhole back floods.
- 8 If a Contractor is operating from an area which is not served by a Surface and Groundwater Network, and determines that the most cost effective solution is to use tankers to transport dewatering effluent to the nearest assigned manhole, the Contractor is then obligated to provide a brief statement demonstrating the traffic impacts caused by their tankers.

- 9 If the resultant traffic impact proves to be significant, the Contractor is either to consider other options of disposal, or retain dewatering effluent onsite and then transport the effluent when traffic is less congested, therefore minimising traffic impacts.
- 10 In the event that tankers are used to transport dewatering effluent, in order to monitor discharge to Surface and Groundwater Network the Contractor must record all particulars associated with its removal, such as:
- (a) Installing a flow meter at the construction site in order to measure the quantities of groundwater flow.
 - (b) Record of tankers coming to and leaving the site (eg. registration plate no., capacity, records of water quality)
 - (c) Volumes of effluent transported.
- 11 The recording of tanker movements is in addition to the installation of a meter on the weir/sediment tank.
- 12 When applying for the discharge permit the following documents are required:
- (a) Official letter from the company addressed to: The Manager of Drainage Networks O&M Dept- Asset Affairs- ASHGHAL. (Includes start and end date of dewatering works & method of statement for dewatering). official letter from the company should address mainly to the Director of Water Network Affairs in Qatar General Electricity and Water Corporation (Kahramaa) to obtain the discharge permit. Note: Any discharge without permit from Kahramaa will be considered committed a criminal offense.
 - (b) Application form for pumping groundwater to be filled and stamped.
 - (c) Copy of building permit.
 - (d) Copy of the site map.
 - (e) Copy of ID card of the applicant's engineer.
 - (f) Copy of the registration company.
 - (g) Copy of Road Opening (RO) Permit.
 - (h) Copy of Traffic Department Approval, as part of the RO Permit
 - (i) Testing of samples, and conformation of compliant results prior to obtaining the two-month permit. The Contractor must note that the sample testing is to be carried out after obtaining the five-day temporary permit, and is to be submitted after the previous requirements are submitted and a temporary permit is granted.
- 13 Once the application is submitted, the project is given a reference number which includes a serial number, type of discharge (e.g. groundwater) and the date of application. Drawing and comments are then returned to the applicant for information and/or action and the applicant will be advised the applicable disposal option and a manhole to be assigned for the discharge.
- 14 The applicant is issued a temporary permit for five days. The purpose of the temporary permit is to allow the applicant to obtain approvals from the concerned authorities, and install the equipment in order to take water samples.

- 15 During the temporary dewatering permit; only discharge is allowed for collecting samples and to proceed with other department requirements. All samples are taken by laboratory representative from the list of laboratories approved by Kahramma, Ashghal and MOECC; it's prohibited for samples to be taken by the Contractor. The collected samples shall be tested for Total Suspended Solids (TSS, turbidity and the short list of parameters included in **Appendix A**. Test results shall be uploaded online to QSD by the laboratory. Yet, it shall be highlighted here that any testing activities are not only limited to the parameters provided on the short list developed by QSD; it shall also cover the list of parameters required by MOECC for dewatering permit. Approval is then granted if the test results meet the requirements of discharge. The Quality Limits are attached in **Appendix A**.
- 16 If the installation requires a road crossing, a RO permit is required. If not, a RO is not required. The applicant must obtain a license from the concerned authorities for installation of all tanks and hoses.
- 17 Following the issuance of the permit, regular inspections by the O&M staff are carried out. The Contractor is then required to undertake weekly laboratory tests for TSS and turbidity of effluent samples, and bi-monthly tests prior to renewing the permit. Permit renewal request shall be submitted in 7 days advance before expiry day of the previous permit. The bi-monthly tests are for TSS, turbidity and the short list of parameters included in **Appendix A** together with the parameters listed under Annex (4) of the law of Environment number 30/2002.
- 18 A copy of the Permitting Application and pro-forms are attached in **Appendix C**.
- 19 Refer to **Appendix D** for a flowchart of the permitting procedure for the discharge to sea via Surface and Groundwater network.

23.6.2 Direct Discharge to Sea

- 1 MOECC is the licensing authority for discharging dewatering effluent direct to the Sea.
- 2 If a Contractor found that the applicable option for dewatering is the direct discharge to sea, a secondary method of treatment must be installed to allow the dewatering effluent to settle before reaching the discharge outfall point. The discharge to the outfall point is achieved through the use of pipelines or transportation via tankers. Based on the number of tankers, the transportation may be subjected to a traffic impact assessment study based on the requirements of MOECC.
- 3 The Contractor may therefore be subject to a number of pertinent laws and regulations:
- 4 When issuing direct sea discharge permits, MOECC have the following concerns that need to be addressed as per Annex 4 of the Qatari Law of Environment and the list of parameters required by MOECC for dewatering permit (included in **Appendix A**), which includes the test of the following parameters:
 - (a) Bacterial counts
 - (b) Turbidity and TSS levels
 - (c) Presence of Petroleum compounds.
 - (d) Presence of heavy metals.
 - (e) Others, as per MOECC requirements.

5 Refer to **Appendix D** for a flowchart of the permitting procedure for the direct discharge to sea. A copy of the environmental permit application form is included in **Appendix E**.

6 Discharging dewatering effluent shall not be conducted in the area subjected to salt water intrusion)

23.6.3 Discharge to Lagoons:

Discharge to Lagoon totally covered with geotextile on all sides and the base of the lagoon

1 Lagoons are licensed by MOECC and Kahramma.

2 It is recommended that a lagoon totally covered with geotextile on all sides and the base of the lagoon, formed in a depressive area, is used in locations where it is logically impossible or cost and socially prohibitive to deliver effluent to the Surface and Groundwater Network using other means.

3 If the Contractor chooses to discharge the dewatering effluent to a lagoon, license is given by MOECC. The dewatering to lagoons is shall be as perthe requirements of Kahramma and MOECC which is given for case by case. The use of this option is depending on the water quality. Yet, the general requirements of MOECC can be summarised in the following information:

- (a) Dewatering effluent quantity.
- (b) Detailed Engineering drawings for the lagoon showing the geotextile lining of the lagoon.
- (c) Duration of dewatering discharge
- (d) Dewatering effluent quality. Dewatering effluent quality is tested initially against the list of parameters required by MOECC and Kahramma for dewatering permit (included in **Appendix A**). And then tested weekly. Monthly testing is also required for selected parameters.
- (e) Coordinates of lagoon, inclusive of dewatering discharge points.
- (f) Location map
- (g) Others, as per Kahramma and MOECC requirements.

4 Refer to **Appendix D** for a flowchart of the permitting procedure for the discharge through the use of lagoons. A copy of the environmental permit application form is included in **Appendix E**.

Discharge to Lagoon not covered

5 The discharge to a logon which is not covered is depending on the discharged water quality. Similar to the above option, the licensing authority for this option is the MOECC and Kahramma. The list of parameters required by MOECC for dewatering permit is included in **Appendix A**. The general requirements of MOECC are similar to the above option. The water discharge in lagoon not covered should be totally free from chemical, biological, petroleum, etc. pollutants.Refer to **Appendix C** for a flowchart of the permitting procedure for the discharge through the use of lagoons. A copy of the environmental permit application form is included in **Appendix E**.

23.6.4 Discharge by injection to deep groundwater aquifer (Deep well injection)

- 1 Disposal by injection to groundwater aquifer is a common method in Qatar to dispose of treated effluent of sewage treatment plants. Yet, the use of deep well injection for the discharge of dewatering effluent to groundwater aquifer is also done in few big projects.
- 2 Prior to the discharge to the deep well, a careful assessment of geological conditions must be conducted in order to determine the suitable depth and location of porous aquifer reservoirs and identifying the safe rate of injection to the deep aquifer. Generally, the depth of the deep well shall not be less than 400 – 600 m deep, which is the expected depth of Umm Er Radhumma (UER) aquifer. The license for discharging in deep aquifer shall obtain a license from Kahramaa for any discharged water and the discharged water should be totally free from chemical, biological, petroleum, etc. pollutants. A license and written approval shall be obtained from Kahramaa prior to any discharging activity.
- 3 In all cases, MOECC require the contractor to conduct an Environmental Assessment for the impact from the project as soon as drilling of the deep well and the analysis of the samples is achieved. This shall be done by a qualified consultant with previous experience in similar projects.
- 4 The general requirements of MOECC for the use of the deep well injection can be summarised in the following information:
 - (a) Duration of dewatering discharge.
 - (b) Dewatering effluent quality. Dewatering effluent quality is tested initially against the parameters specified in the standards for the water use for irrigation purpose of the Qatari Law of Environment. And then periodically testing each week based on MOECC requirements.
 - (c) The parameters required for the physical, chemical, biological, microbiological analysis includes but not limited to: EC, Temperature, DO, pH, Turbidity, FRC, TPH, O&G, Sulphide, Metals, BOD, COD, TOC, surfactants, VOC, BETX, TDS, TSS, PAHs, TALK, Nitrate, Nitrite, Ammonia, TKN, Phosphorus, Chloride, Sodium, Sulphite, Total Phenol, Carbonate, E-Coli, Faecal Coliform, Bacteria and SAR.
 - (d) A0 design map for the whole project including the location of the injection well and network of shallow trenches connecting the wells.
 - (e) Comparison study between the use of the shallow networking and the perforated pipelines.
 - (f) Drilling of monitoring wells to suitable depth to monitor the impact on the shallow aquifer.
 - (g) Providing the injection wells with emergency valves to stop injection in case of contamination.
- 5 Refer to **Appendix D** for a flowchart of the permitting procedure for the discharge through the use of deep well injection. A copy of the environmental permit application form is included in **Appendix E**.
- 6 As mentioned above, the injection of dewatering effluent to groundwater aquifer is licensed by MOECC and Kahramma and is completely subject to their approval.

23.6.5 Groundwater Recycle & Reuse Onsite

- 1 It is recommended, where environmentally safe and cost effective, that dewatering effluent is reused or recycled onsite.
- 2 The reuse options onsite will depend on a number of factors, including the type of project. The contractor shall propose the treatment in case the water is polluted by organic and inorganic chemicals or subjected to biological contamination. The treatment shall focus but not limited to low DO, presence of Bacteria, elevated levels of TSS or turbidity and presence of oil.
- 3 The CEMP shall be used to identify all opportunities of reuse onsite. The options for the reuse of the groundwater shall be discussed with Kahramma and MOECC and shall be subjected to the approval by Kahramma and MOECC.
- 4 Options could include but not be limited to:
 - (a) Control of dust onsite. (Subject to the level of safety and quality of dewatering effluent).
 - (b) Reuse of dewatering effluent.
 - (c) Concrete curing.
 - (d) Excavation activities requiring water.
 - (e) Washing of machinery and site equipment.
 - (f) Watering of onsite landscaping, when the turbidity is very low to avoid compromising the integrity of the soil.
 - (g) If the dewatering effluent quality is within limits of soil compaction parameters requirements (refer to QCS), it can be used for soil compaction purposes.
- 5 Contractor to conduct a feasibility study to evaluate whether it's feasible to erect an RO system for dewatering effluent treatment, in order to use the dewatering effluent instead of fresh potable water.
- 6 The feasibility study is to compare both options in terms of technical and financial viability.

23.6.6 Integrated Management of Construction Dewatering

- 1 Construction dewatering practices are better managed if they are integrated with existing construction management systems, such as a CEMP, monitoring plan and training programmes. The dewatering practice will then form part of the regular construction inspection/monitoring program.

23.6.7 Construction Environmental Management Plan (CEMP)

- 1 The CEMP is prepared to minimise the impacts of the project and its activities on the receiving environment. The CEMP is prepared prior to mobilising to site.
- 2 The Contractor shall uses the geotechnical investigations and previous EIA (if applicable) as guidelines when preparing the CEMP.
- 3 When dewatering activities are included within the project site, the preparation of the CEMP shall include the following:

- (a) Identification of opportunities to reuse the dewatering effluent onsite in order to reduce the amount of disposed effluent.
 - (b) Dewatering techniques being employed on site
 - (c) Disposal methods employed on-site and relevant monitoring plan to ensure compliance with discharge limits.
 - (d) Copy of discharge limits.
 - (e) Roles and responsibilities of the Environmental Advisor on site.
- 4 Roles and responsibilities have to be clearly defined when designing a dewatering system. These roles and responsibilities are to be submitted as an essential element to satisfy the CEMP requirements when applying for the dewatering effluent discharge permit.
- 5 Refer to **Appendix B** for an example of inspection sheet for the dewatering process.

23.6.8 Monitoring Plan

- 1 The environmental monitoring plan is used to monitor the anticipated impacts of the project on the surrounding and receiving environments. It is imperative that, shall dewatering activities exist on site, there is integration all testing and monitoring requirements.
- 2 Integration of monitoring plans may be between systems within individual sites or between several sites, depending on management systems or owners
 - (a) **Environmental monitoring plan:** The environmental monitoring plan is to outline the steps required for monitoring of construction dewatering practices. The integration of dewatering practices into the monitoring plan will pave the way to introduce a dewatering monitoring plan.
 - (b) The findings of the dewatering monitoring reports are to be summarised and included in the environmental monitoring reports.
 - (c) **The dewatering practices monitoring plan:** Introduction of a dewatering practices monitoring plan, sampling points, variables, frequencies and reporting. This plan shall be cyclic which stands to be audited as part of the master environmental monitoring plan. Corrective actions from audits are to be implemented to ensure improved performance.

23.6.9 Training Plan

- 1 The integration of construction dewatering training into the training plan of the Contractor is essential to introduce all staff to construction dewatering related information.
- 2 It is recommended that information on dewatering equipment and related emergencies are included in the training provided to staff entering or working on the site.
- 3 The training for all staff does not have to be comprehensive; however, it shall include basic items such as:
 - (a) Brief explanation of the construction dewatering purpose
 - (b) Introduction to the dewatering equipment. Inclusion of photos in the training presentation.

- (c) Health and safety related concerns, education on related emergencies, and contact information of person in charge of dewatering to be provided in the presentation.
- 4 Training for dewatering staff, however, shall be the responsibility of the Project Consultant and as per each Project needs and requirements. The training shall be comprehensive and shall include all components dewatering staff need to be familiar with.

23.6.10 Odour Control

- 1 The odour levels have been given a threshold value as indicated in the Qatar Construction Specifications (QCS). Therefore, it is highly recommended to measure the level of odour parameters, a devise shall be installed within the construction site to measure odour parameters (eg: H₂S).
- 2 The QCS has identified two types of odour control equipment; control equipment carbon type and control equipment scrubber type. Refer to Section 9 Part 9 and Part 10 for details.

23.6.11 Health & Safety Considerations

- 1 Health and safety issues are the most important part of any construction project. It is recommended that health and safety measures in relation to dewatering practices are enforced strictly, in order to prevent and/or minimise on-site accidents.
- 2 In addition to the conventional health and safety measures implemented in construction sites, the following considerations are to be incorporated to contribute to the health and safety practices relating to construction dewatering:

23.6.12 Site Investigation

- 1 During the initial site investigations, the Contractor has to identify potential health and safety risks in the project area. Examples of risks are: potential contamination posing health and safety concern to labour workers and site staff, slope stability issues due to dewatering practices... etc.
- 2 Identified risks have to be considered and mitigated against during design and execution of dewatering.
- 3 This exercise can be undertaken during the Risk Assessment process as described earlier in this Guideline.

23.6.13 Design Considerations

- 1 The design of dewatering stage is the most convenient stage to plan properly in order to prevent foreseeable health and safety issues arising during operational dewatering.
- 2 All designs must take into account the health & safety considerations associated with dewatering, which include but are not limited to:
 - (a) Preparation of layout plan for dewatering equipment.
 - (b) Ensure access to dewatering equipment, without compromising the safety of staff.
 - (c) Ensure that all dewatering equipment –especially equipment placed offsite- is marked clearly with name of project and Contractor, and contact person details.

- (d) Provide protective covers for assigned manholes which do not hinder the discharged flow.
- (e) The mandatory use of PPE. All staff entering a project's safe zone have to be wearing appropriate safety gear. This also applies to staff managing dewatering equipment offsite.
- (f) The Contractor is to exercise duty of care when designing, installing and operating the dewatering equipment and process.

23.6.14 Housekeeping Considerations

- 1 It is recommended that during the regular inspection of projects, the licensing authority is to observe the status of housekeeping of dewatering equipment. Inadequate housekeeping can expose staff and visitors to injury.

APPENDICES

- Appendix A:** Short List of Parameters as provided by ASHGHAL- MOECC list of Parameters for Dewatering Permit - Environmental Laws and Regulations- Annex 4, Law 30 of 2002
- Appendix B:** Dewatering Process Inspection Sheet
- Appendix C:** Discharge Permit Forms
- Appendix D:** Application for Permit- Procedure Flowchart for each Dewatering Option
- Appendix E:** Environmental Permit Application- MOECC

APPENDIX A

Short list of parameters as provided by Ashghal

MOECC list of parameters required for dewatering permits

Environmental laws and regulations- annex 4, law 30 of 2002

Discharge Permit Application

Water Quality Self Monitoring Report

Public Works Authority
Quality, Safety and Environment Department

Project Name:

Contractor Name:

Dewatering Discharge Permit Situation: (1) Experimental, (2) In Operation (Permit No.:), (3) For renewals

TO: Director of Quality, Safety and Environment Department, Environmental Section

Public Works Authority

FROM: (

Project Name: () LABORATORY

Analysis Results Report of Dewatered Water Quality

Date of Sampling:

Date of Analysis:

Parameter	Symbol	Unit	Sample (1)	Sample (2)	Sample (3)	Discharge Limit	Comments
Location:	describe sample location						
Discharge Rate (m ³ /sec):	To Be Filled by Contractor						
p H						6 - 9	
Alkalinity as Ca CO ₃	Alk.	mg/l					
Turbidity		NTU				50	
Total Dissolved Solids	TDS	mg/l				1500	
Total Suspended Solids	TSS	mg/l				50	
Chemical Oxygen Demand	COD	mg/l				100	
Sulfide	S ²⁻	mg/l					
Oil & Grease	O&G	mg/l				15	
Odour		ppm					

CC: Director of Maintenance & Operation Department
Network Maintenance & Operation Section

Chemist In Charge Signature:
Laboratory Stamp:

Analysis Required by MoE for the Dewatering Permit

1. TDS (mg/l)
2. Turbidity (NTU)
3. Dissolved Oxygen (mg/l)
4. Sulphide (mg/l)
5. Oil & Grease (mg/l)
6. TSS (mg/l)
7. pH (mg/l)
8. Odor
9. Alkalinity (mg CACO₃/L)
10. Metals (Cr, Pb, Ni, Zn, Cd, As, Se, Cu) mg/l and (Hg) ug/l
11. BOD5 (mg/l)
12. COD (mg/l)
13. TPH (Gasoline Range Hydrocarbons, Diesel Range Hydrocarbons, Heavy Fractions) (mg/kg)
14. Total Coliform Bacteria (MPN/100 ml)
15. Escherichia Coli (MPN/100 ml)

The Test Results should show:

1. Material tested
2. Date of Sampling
3. Date of delivery of sample to the lab
4. Reporting Date
5. Lab where analysis was achieved
6. QA/QC Procedures of the used lab

Note

*Analysis sheet from the lab should be signed and stamped

*MoE has the right to add or delete parameters to and from this list



Annex No. (4)

Criteria and Specifications of the Hazardous Materials when Disposed of in the Water Environments

- 1) Criteria and Specifications of Some Materials when Disposed of in the Water Environments**
- 2) Liquid, Illiquid, Polluting and Unsolvable Materials Prohibited to be Disposed of in Water Environments:**



1) Criteria and Specifications of Some Materials when Disposed of in the Water Environments

Considering the provision of the Article (89) of the executive bylaws of the Environment Protection Law, no disposal of wastes is allowed except in the distance not less than four marine miles from the coastline if the waste water is treated and in the distance not less than twelve marine miles if the disposal is for the wastes not treated.

Also disposal is not allowed in the places of fishing or places of bathing or natural quarantines, protecting the economic or beauty value of the area.

Description	Symbol	Max Limit	Unit
1- Physical Experiments			
Total dissolvent	TDS	1500	Mg/L
Total suspended solids	TSS	50	Mg/L
Hydrogen base	PH	6-9	
Floating bodies		Nil	
Temperature Degree	T	Not more than three degrees above the relevant average	(ΔT)°C
Turbidity	NTU	50	Mg/L
Colour		Free from colour materials	
2- Inorganic Materials			
Ammonium	NH ₄ ⁺	3	Mg/L
Sediment Chloride	Cl ₂	0.05	Mg/L
Cyanide	CN	0.1	Mg/L
Fluorides	F	1	Mg/L
Phosphor in the form of Phosphate	PO ₄ ³⁻	2	Mg/L
Sulphur	S ⁻²	0.1	Mg/L
Required Vital Oxygen	BOD ₅	50	Mg/L
Required Chemical Oxygen	COD	100	Mg/L
Urea		2	Mg/L
Total Nitrogen	TKN	100	Mg/L

3- Rare Factors			
Aluminium	AL	3	Mg/L
Arsenic	As	0.5	Mg/L



Barium	Ba	2	Mg/L
Boron	B ⁻	1.5	Mg/L
Cadmium	Cd	0.05	Mg/L
Total Chrome	Cr	0.2	Mg/L
Cobalt	Co	2	Mg/L
Copper	Cu	0.5	Mg/L
Iron	Fe	1	Mg/L
Lead	Pb	0.1	Mg/L
Manganese	Mn	0.2	Mg/L
Mercury	Hg	0.001	Mg/L
Nickel	Ni	0.5	Mg/L
Zinc	Zn	2	Mg/L
Silver	Ag	0.005	Mg/L
Selenium	Se	0.02	Mg/L

4- Organic Materials

Oil and grease	O & G	15	Mg/L
Total phenols		0.5	Mg/L



Halogen Hydrocarbons and Different Kinds of Pesticides		0.1	Mg/L
Dioxine / Viran		1.34×10^{-7}	Ug/L
Tri Halomethane	THM	100	Ug/L
5- Biological Experiments			
Possible No. of Colon Group in 100 M ³	MPN	100	MPN/100ml
No of infantal eggs		Nil	
No of infantal worms		Nil	
No of fecal colon bacillus		100	MPN/100ml



Annex No. (4/2)

Liquid, Illiquid, Polluting and Unsolvable Materials Prohibited to be Disposed of in Water Environments:

Liquid, Illiquid, Polluting and Unsolvable Materials Prohibited to be Disposed of in Water Environments:

The unsolvable materials are those materials which are found in the environment for a long period, depending basically on the quantities disposed of in the water environments. Some of them are solved after a long period ranging from months to years depending on the components of these materials and concentration in the environment.

Inorganic Materials:

For Example:

Mercury and its components
Lead and its components
Cadmium and its components

Cobalt, Fantium, Nickel, Selenium, Zinc and its Components

Organic Materials

For Example:

Organophosphorus Pesticides
Dimethoate
Malathion

Organochlorine Pesticides
Aldrin
Dieldrino
DDT



Chloridane

Endrine

Unsolvable and Remaining the Residues for Many Years

Polychlorinated Biphenyls

(PCBs)

Aroclor 1254

2,3,5,6 Tetrachlorobiphenyl

2,3,6 Trichlorobiphenyl

Unsolvable completely and counted as high toxic in its very low concentrations:

Polynuclear Aromatic Hydrocarbons (PAH)

Benzo (a) Pyrene Naphthalene

Solvable, small quantity is solved within years.

Solid Materials

For Example: Plastic, Fishing Net, Coir, Containers.

APPENDIX B

Dewatering process inspection sheet

Dewatering Procedure Inspection Sheet

Site Information

Site Name	Date
Site Number	
Location	
Contractor	Present
Dewatering Contractor	
Consultant	Laboratory
Owner	
Other	

Type of Construction Site

Stage

Permit

Valid Permit	Y N	Ref Number
Quantity		Duration
M.H		

Comments

Field Inspections

Dewatering technique

Pre-disposal treatment	Y	N	Disposal Option
------------------------	---	---	-----------------

Compliance with permit	Y	N
------------------------	---	---

Record keeping	Y	N
----------------	---	---

Other Comments

Problems/issues:

Lab Tests

Turbidity Levels	Problem	Y	N
------------------	---------	---	---

Other Labor training	Y	N
----------------------	---	---

Housekeeping	Good	Fair	Poor
--------------	------	------	------

Water Quality Assessment				
The following questions provide an initial assessment of the quality of the water to be discharged from the dewatering operation				
Common Sense Test	1	Review the project records. Is there any reason to suspect that the water may be polluted by something other than sediment?		
	2	Is the water located in an area of known contamination?		
Sight Test	Does the water have an abnormal visual feature, such as (circle): Oily Sheen Floating Foam Murky Appearance Unusual Color Other			
Smell Test	Does the water have an odor? Possible odors include gasoline, petroleum, ammonia, sewage, etc.			
If you answered YES to any of the above questions, explain:				

APPENDIX C

Discharge permit forms

Public Works Authority Assets Affairs Drainage O&M Networks Department Application For Ground Water Pumping																																			
TO : Managers of Drainage O&M - DA and Quality , Safety & Environment Departments - PWA FROM : Contractor <input style="width: 150px; height: 15px;" type="text"/>																																			
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Date:																																			
General Conditions : <p>A) The Contractor undertakes to obey environmental law No.30,Year 2002, and its execution articles, specially article No. 4, regarding water quality specification and discharge limits to aquatic environment and any others specific condition.</p> <p>B) The contractor should design and implement discharge limits mitigation measures according to each site site specific condition, geotechnical and soil mechanics report. It could be one or more of the following:</p> <ol style="list-style-type: none"> 1) Filters/sand traps to comply with water specification required . 2) Geotechnical sheets to prevent suction of silt and mud from suction wells. 3) Odor mitigation measures specifications used in case of odor problem. 4) Weekly sampling and analyzing, TSS, TDS, pH, Turbidity, odour,any other parameters required. 5) All laboratory analysis and checks (weather initial, weekly or random) will be at contractors cost. 6) The contractor shall keep record of all laboratory analysis and make its ready for random inspection by PWA <p>C) The contractor shall respect and continue to respect the conditions & specifications mentioned above ,any violation will entitle Drainage O&M Dep. to cancel this permit and take legal actions.</p> <p>D) Drainage O&M Dep. has the right to cancel the issued permit for any reason without any claims.</p>																																			
For Contractor use only <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%;">We certify that We accept to obey and follow all the above mentioned general conditions & specifications.</td> <td style="width: 30%;">Stamp <input style="width: 150px; height: 15px;" type="text"/></td> </tr> <tr> <td>Name :</td> <td><input style="width: 150px; height: 15px;" type="text"/></td> </tr> <tr> <td>Signature :</td> <td><input style="width: 150px; height: 15px;" type="text"/></td> </tr> <tr> <td>Date:</td> <td><input style="width: 150px; height: 15px;" type="text"/></td> </tr> </table>				We certify that We accept to obey and follow all the above mentioned general conditions & specifications.	Stamp <input style="width: 150px; height: 15px;" type="text"/>	Name :	<input style="width: 150px; height: 15px;" type="text"/>	Signature :	<input style="width: 150px; height: 15px;" type="text"/>	Date:	<input style="width: 150px; height: 15px;" type="text"/>																								
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Date:	<input style="width: 150px; height: 15px;" type="text"/>																																		
Quality , Safety & Environment Department Approval		<input type="checkbox"/> Approved	<input type="checkbox"/> Not Approved																																
TO : Manager of Drainage O&M Department - AA		I would like to inform you that we have no objection to issue the permit as the above condition. Approval Ref. No.: <input style="width: 150px; height: 15px;" type="text"/>																																	
Manager of Quality , Safety & Environment Department																																			

N.B. Original approved application must be returned to Drainage O&M Dep. to issue the permanent permit.



**Public Works Authority
Assets affairs
Draiange Networks O&M Department
Permit For Ground Water Pumping**

Permit No.

**To : M/s. Abd Al Hamed Mohamed S & Co.
From : Manager Draiange Networks O&M Department**

As per the approval ref . No. (copy attached)

You are hereby authorised to discharge surface/ground water, subject to the following conditions:-

Discharge point

Quantity l/s

Duration days

Start date Expiry date

This permit is subject to the general
conditions and specifications
mentioned in application form.


Head of Unit


Head of Division

**Ahmed Mohamed Sharif
Manager Drainage Networks O&M Department**

cc: Manager of Quality , Safety & Environment Department
Area Engineer
File

N.B. Renewal request to be submitted 7 days before expiry of previous permit

أوافق على تنفيذ جميع الشروط الواردة بطلب الخدمة والشروط اعلاه.
We accept the permit on the application & above mentioned conditions .

Name:

Mob. No.

Signature

Date



Public Works Authority
Assest Affairs
Draiange Networks O&M Department

Temporary Permit For Ground Water Pumping
تصريح مؤقت لضخ مياه جوفية

Temporary
Permit No.

/2014

To : M/s. HBK Contracting Co.
From : Manager Draiange Networks O&M Department

As per the application ref . No.

You are hereby authorized to discharge surface/ground water, subject to the following conditions:-

Discharge point

Quantity l/s

Duration (Only 5 days) - **This permit only for taking sample**

Start date

Expiry date

The contractor shall take a sample of the water to an approved laboratory and submit the result report to Quality , Safety & Environment Department -PWA attached with application for approval.

This permit only for taking sample and over pumping is not allowed .


Head of Unit


Head Of Division

Ahmed Mohamed Sharif
Manager Drainage Networks O&M Department

cc: Manager of Quality , Safety & Environment Department

Area Engineer

MS Attached

File

أوافق على تنفيذ جميع الشروط الواردة بطلب الخدمة والشروط اعلاه.
We accept the permit on the application & above mentioned conditions .

Name:

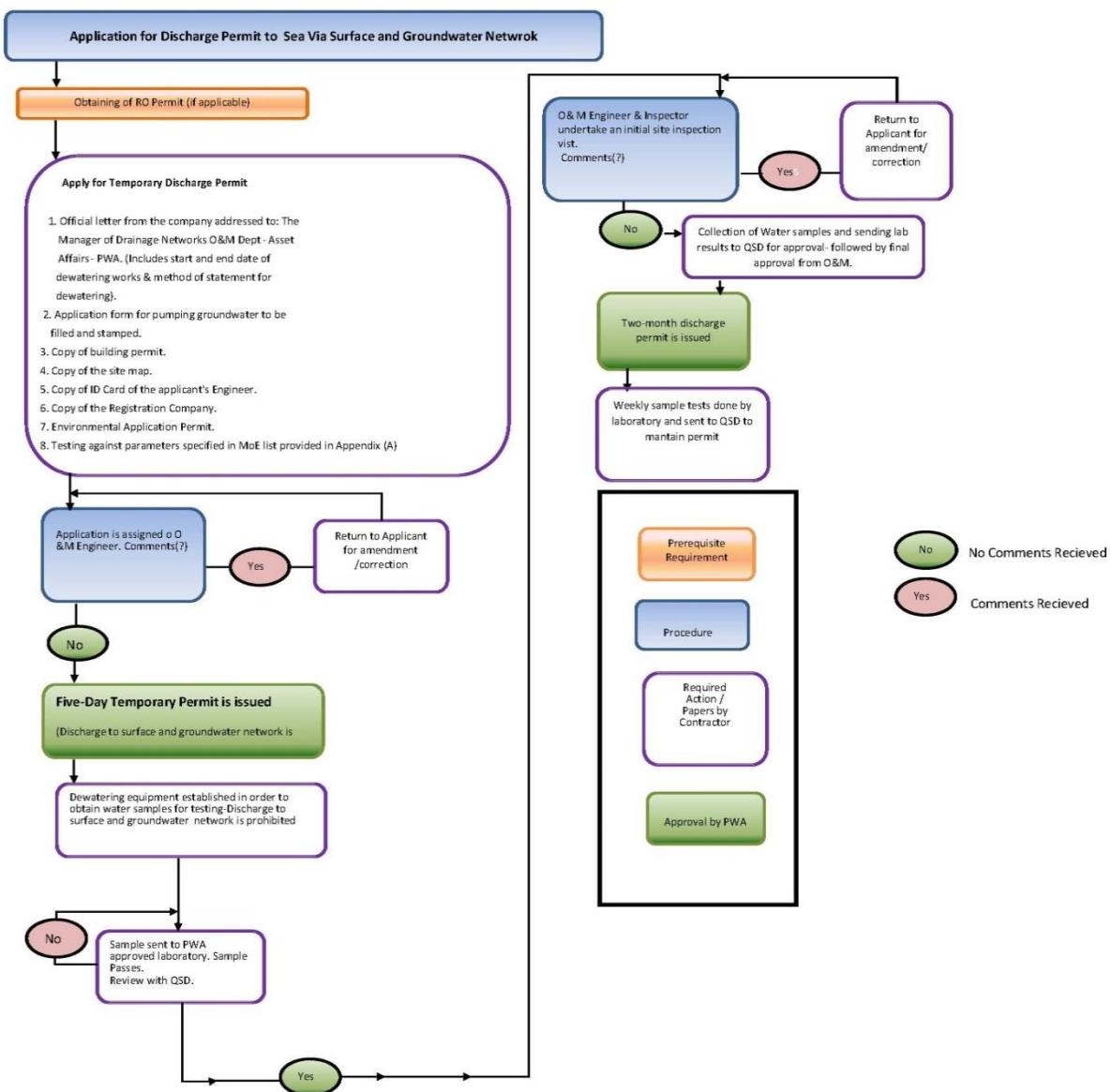
Mob. No.

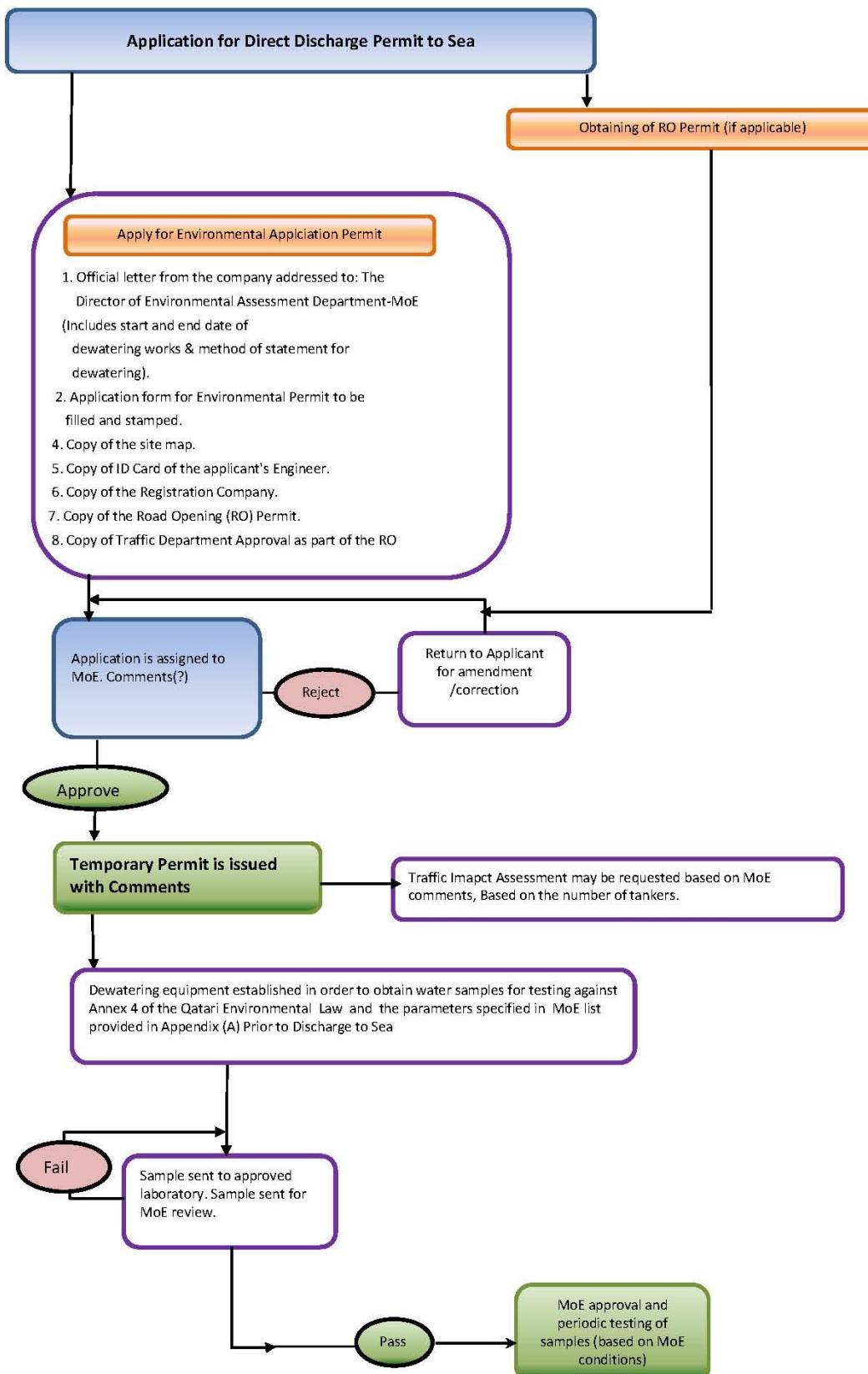
Signature

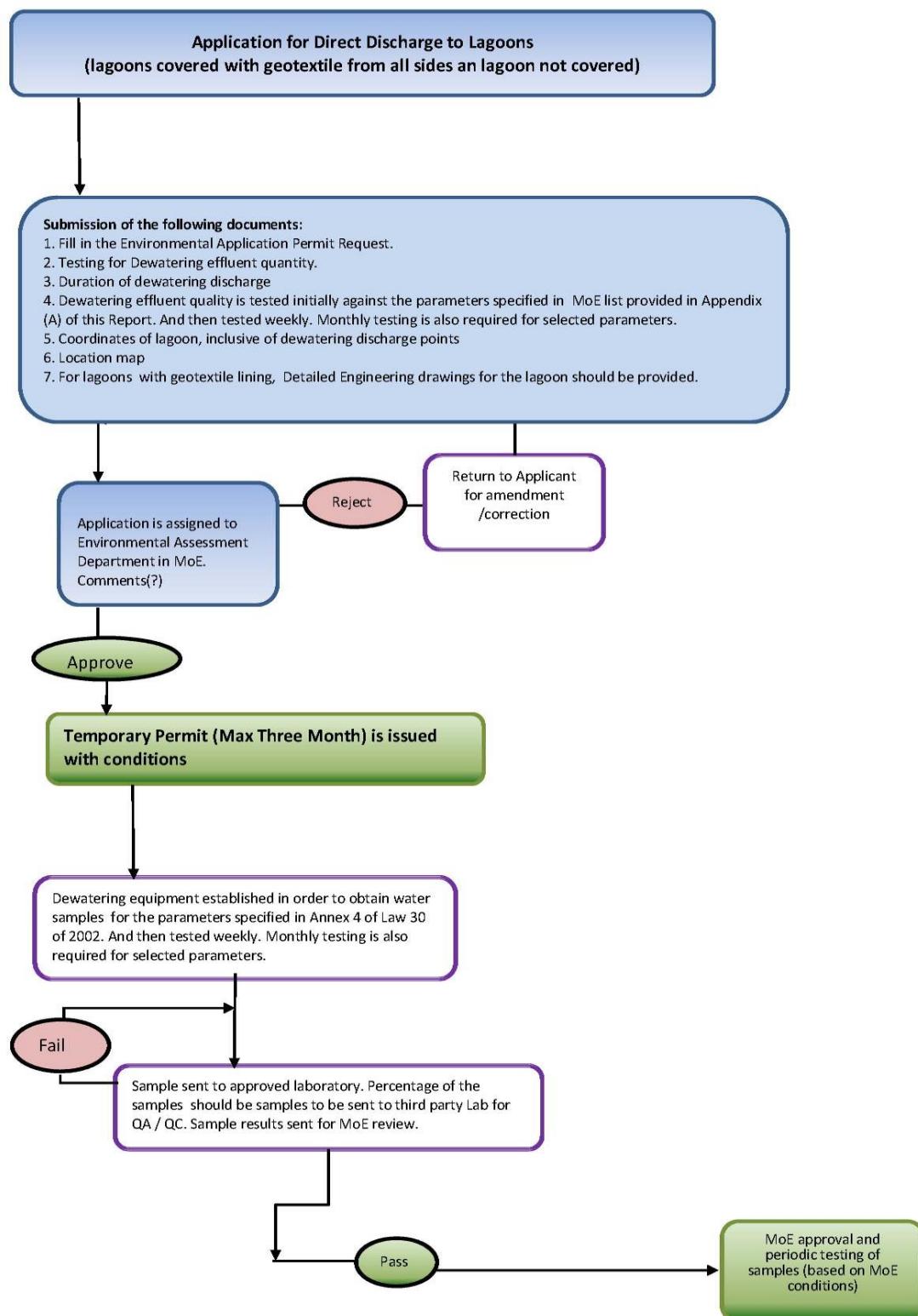
Date

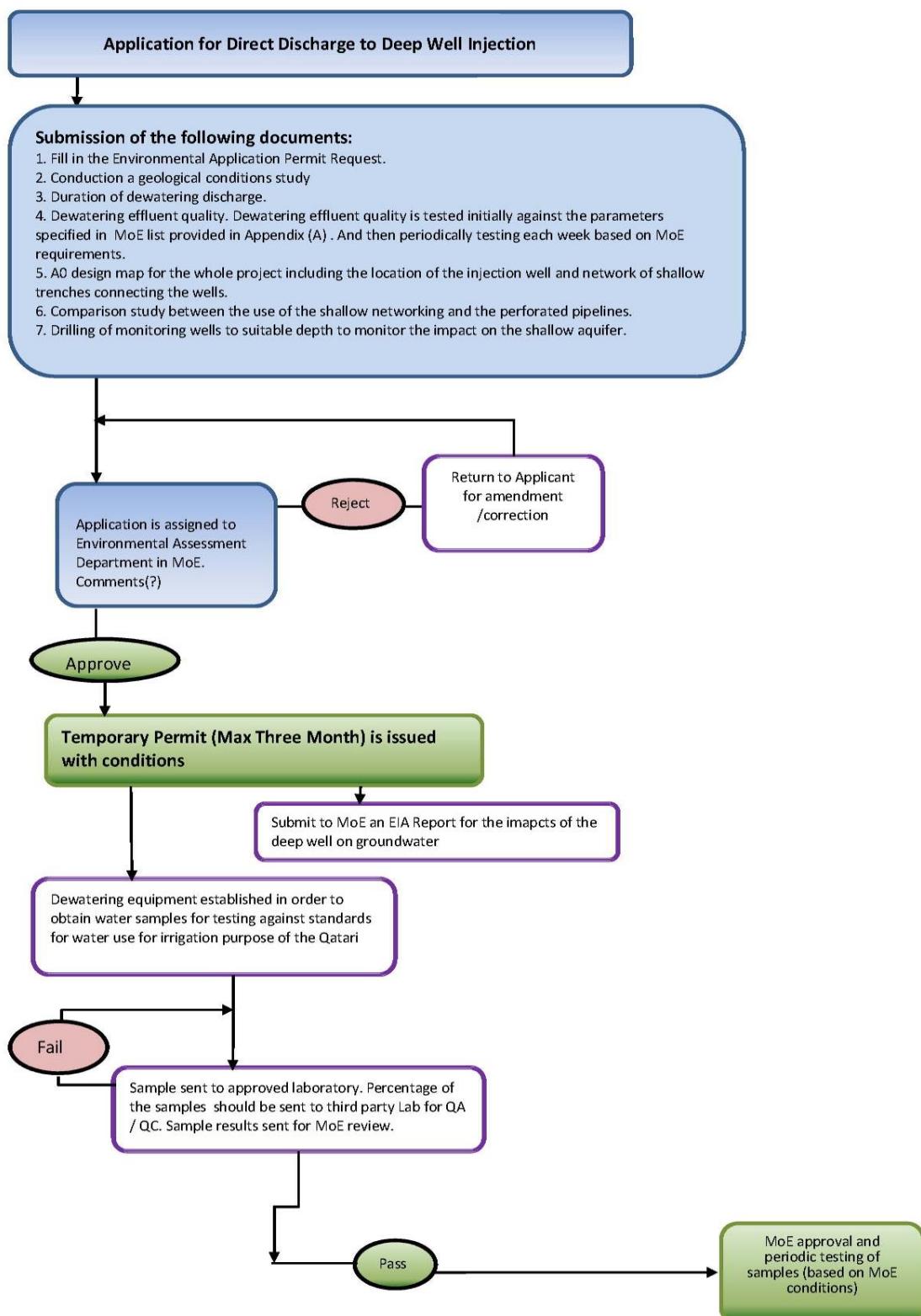
APPENDIX D

Application for permit- procedure flowchart for each dewatering option









APPENDIX E

Environmental permit application- MOECC

وزارة البيئة
Ministry of Environment



استمارة طلب الحصول على التصريح البيئي
(Application form for Environmental Permit)

رقم الطلب:

١ - معلومات عامة General Information

١ - ١ اسم المشروع Project Name

طبيعة المشروع Project Type
(بنية أساسية - صناعي - زراعي - أخرى) (Infrastructure - Industrial - Agricultural - Others)

١ - ٢ اسم مالك المشروع Name of Project Proponent

(شخص - شركة) (Individual- Company)

١ - ٣ اسم الشخص المسؤول Name of Person in - Charge

العنوان Address

..... Fax No. رقم الفاكس Tel. No. رقم التليفون:

١ - ٤ الجهة المانحة للتراخيص Licensing Authority

٢ - Project Data

مكان وموقع المشروع (يرجع إرفاق خريطة مفصلة ومعتمدة من الجهة الإدارية الخاتصة وبمقاييس رسم مناسب
موضحاً بها حدود الموقع وموقفه بالنسبة للكتلة السكنية والأنشطة المجاورة وطرق المواصلات والمناطق الأخرى
والحميّة والسياحية إن وجدت ، وبيان بنسبـة ملوثات الهـواء والضـوضـاء النـاجـة عنـ المـشـرـوـع
فيـ الـنـطـقـةـ).

Project Location (Please attach an approved, and detailed map of appropriate scale, showing project boundaries and location with respect to residential areas, nearby activites, roads, archaeological/reserve/tourist sites [if any], and data on air pollutants and noise expected to be generated from the project).

١ - موقع المشروع

Approved Industrial Zone منطقة صناعية معتمدة Village قرية City مدينة
..... أخرى (Other places, Specify)

Outside Planning Area خارج التخطيط Within Planning Area داخـل التـخطـيط
Commercial Area منطقة تجارية Residential Area منطقة سكنية
..... Independent Building مبني مستقل

المساحة الكلية للمشروع (م²) (Total Project Area, m²)
المساحة الكلية لمباني المشروع (م²) (Total Construction Area, m²)

٣ - طبيعة المشروع

Expansion توسيعات Existing قائم New جديد
Renovation تجديد Site Relocation استبدال موقع
..... Type of Expansion or Renovation طبيعة التوسيعات أو التجديـدـات

إذا كانت طبيعة المشروع توسيعات أو تجديـدـات فهل تم تقديم دراسة تقييم أثر بيئي للمشروع الأسـاسـيـ؟

If the Project type is expansion/renovation, was there an EIA for the original Project?

No لا

Yes نـعم

Date of the Previous Permit from MOE

تاريخ الحصول على موافقة وزارة البيئة السابقة

٣ - الطاقة الإنتاجية Production Capacity

أو or

السعة التخزينية Storage Capacity

مع ذكر الوحدات المستخدمة Provide Units Used

٤ - المنتج النهائي Final Product

٥ - المنتج الثانوي By- Product

٦ - وصف عام للمنطقة المحيطة بالمشروع متضمنة المناطق الأثرية والتاريخية والمحميات والمناطق السياحية والترفيهية.

A general decription of the area around the Project including a description of archaeological, historical, protected, tourist and recreational areas

٧ - البنية الأساسية المتوفرة وغير المتوفرة Available/Unavailable Infrastructure

- | | | | | | | |
|---------------|------------|--------------------------|-----------|--------|--------------------------|-------------------------------------|
| not available | غير متوفرة | <input type="checkbox"/> | available | متوفرة | <input type="checkbox"/> | - مصادر المياه water supply |
| not available | غير متوفرة | <input type="checkbox"/> | available | متوفرة | <input type="checkbox"/> | - شبكة الكهرباء electric power grid |
| not available | غير متوفرة | <input type="checkbox"/> | available | متوفرة | <input type="checkbox"/> | - شبكة صرف صحي sewer system network |
| not available | غير متوفرة | <input type="checkbox"/> | available | متوفرة | <input type="checkbox"/> | - شبكة طرق road network |
| not available | غير متوفرة | <input type="checkbox"/> | available | متوفرة | <input type="checkbox"/> | - مصدر للوقود fuel source |

٨ - أسباب اختيار الموقع Reasons for selecting project Site/Location

٩ - مراحل المشروع وتاريخ بدايتها المتوقعة Project Phases & Expected Starting Dates

- الانشاء Construction

- التشغيل Operation

٤ - وصف موجز للمشروع أثناء مراحل الإنشاء

.....

٤ - ١ مصادر المياه Water Sources
استخداماتها Consumption Rate

٤ - ٢ نوع الوقود Fuel Type
مصدر الوقود Consumption Rate
مع ذكر الوحدات المستخدمة Provide Units Used

٤ - ٣ العمالة المتوقعة وأماكن إقامتهم

٥ - المخلفات الناتجة عن الإنشاء وطرق التخلص منها

٥ - ١ مخلفات صلبة Solid Wastes
نوعيتها Type
طرق التخلص Method of Disposal
كميتها Quantity (with units)

٥ - ٢ مخلفات سائلة Liquid Waste
نوعيتها Type
طرق التخلص Method of Disposal
كميتها Quantity (with units)

٥ - ٣ انبعاثات غازية Gaseous Emissions
(دخان - رائحة - مواد عالقة - أخرى) (Smoke- Smell - Particulate Matter - Others)

مع ذكر الوحدات المستخدمة Provide Units Used

٥ - ٤ ضوضاء Noise
مع ذكر الوحدات المستخدمة Provide Units Used

١ - وصف تفصيلي لمرحلة التشغيل (ترفق أشكال أو رسومات توضيحية)

Detailed Description of the Operation Phase (Attach Illustrative Drawings/Diagrams)

١ - ١ المكونات الرئيسية للمشروع Main Project Components

١ - ٢ وصف العمليات الصناعية (مدعماً بالكتالوجات وخرائط التشغيل.. الخ)

Description of Industrial Processes (Supported by Catalogues Manuals, Diagrams, etc).

١ - ٣ الطاقة الكهربائية المستخدمة Electrical Power Used

مصدرها Source

١ - ٤ المواد الخام Raw Material

المصدر Source	الكمية (م³/يوم أو كجم/ يوم) Quantity (m³/day or kg/day)	النوع (غاز - سائل - صلب) Type (Solid-Liquid-Gas)	المادة Material

١ - ٥ البدائل المأكولة في الاعتبار للمواد الخام المستخدمة Alternatives Considered for the Raw Material Used

١ - ١ أسباب اختيار التكنولوجيا المستخدمة Reasons for Selecting the Used Technology

٧ - ١ العمالة المتوقعة وأماكن إقامتهم Expected Number of Workers and their Accommodation Site

٨ - ١ نوع ومصادر الوقود Type and Source of fuel

معدلات الاستهلاك Rate of Consumption

مع ذكر الوحدات المستخدمة Provide Units Used

(شبكة كهرباء عمومية Electricity Grid / مولدات / خلايا شمسية Solar cells)

٩ - ١ مصادر المياه Water Sources

معدلات الاستهلاك Consumption Rate

مع ذكر الوحدات المستخدمة Provide Units Used

(شبكة عمومية Public Network / مياه جوفية Groundwater / مياه سطحية Surface Water)

٧ - النفايات والخلفات الناجمة عن التشغيل ومعالجتها وطرق التخلص منها

(توضيح المعايير المتوقعة للانبعاثات الغازية ومياه الصرف بعد المعالجة)

Waste generated from the operation phase, treatment and methods of disposal

(Indicate Expected Concentration of Liquid Wastes, Gaseous emissions and solid wastes)

٧ - ١ الخلفات السائلة Liquid Wastes

١ - الصرف الصحي Sanitary

معدل الصرف: (Discharge Rate m³/day or kg/day)

وسائل التحكم Control Methods

طرق التخلص Disposal Methods

(شبكة عمومية - خزانات - ... الخ) (Sewer System- Tanks- etc.)

الصرف الصناعي Industrial Discharge

معدل الصرف () Discharge Rate m³/day or kg/day (م³/يوم أو كجم/يوم)

وسائل التحكم Control Methods

التحليل المتوقع للصرف الصناعي Expected Analysis of Industrial Discharge

طرق التخلص من الصرف Disposal Method of Discharge

(يختار أحد البديلات التالية) (select one of the following)

* على شبكة البلدية مباشرة (Directly to municipal system)

* توجد وحدة معالجة للصرف الصناعي خاصة بالنشاط، ثم يصرف على الشبكة (There is a treatment unit of industrial wastewater and after treatment, wastewater is discharged to public network)

(يرفق كتالوج بوحدة المعالجة المستخدمة ومعايير الصرف الناجح عن وحدة المعالجة).

There is a treatment unit of industrial wastewater and after treatment, wastewater is discharged to public network (Attach a scheme of the treatment unit to be used and the discharge concentration from the treatment unit)

* يجمع في مخزن بدون معالجة (Stored without treatment)

٧ - ٢ - المخلفات الغازية (ملوثات الهواء) Gaseous Emissions (Air Pollutants)

- الملوثات من المصادر الثابتة Pollutants from Stationary Sources

- الملوثات من المصادر المتحركة Pollutants from Mobile Sources

- الملوثات من مصادر حرق الوقود Pollutants from fuel Combustion

٧ - الخلفات الصلبة Solid Wastes

طرق النقل والتداول والتخزين Methods of Transport, Handling and Storage

التخلص من الخلفات Waste Disposal

(مدفن آمن - متعهد - أخرى) (Landfill- Contractor- Others)

٤ - النفايات والمواد الخطرة Hazardous Wastes & Materials

طرق النقل والتداول والتخزين Methods of Transport, Handling and Storage

التخلص من الخلفات Waste Disposal

(مدفن آمن - متعهد - أخرى) (Landfill- Contractor- Others)

٨ - قليل مبدئي للآثار البيئية أثناء مرحلة التشغيل والتحفييف من الآثار البيئية لها

Initial Assessment of Environmental Impacts During Operation and Mitigation of Impacts

٨ - ١ تأثير المشروع على نوعية الهواء

Project Impact on Air Quality

٨ - ٢ تأثير المشروع على جودة ووفرة المياه

Project Impact on Water Availability and Quality

٨ - ٣ تأثير المشروع على جودة وخصوبة التربة

Project Impact on Soil Quality and Fertility

٤ - ٨ التلوث البصري Visual Pollution

٥ - ٨ الضوضاء Noise

٦ - ٨ أي تأثيرات أخرى محتملة أو هامة ناجمة عن هذا النشاط

Any other major or potential impacts resulting from this project / activity

٧ - ٨ وصف لأي وسائل أخرى لتخفييف الآثار السلبية للمشروع لم يتم ذكرها سابقاً

Description of any other measures, which were not mentioned earlier, to mitigate project's negative impacts

٨ - ٨ الاحتياطات المتخذة بشأن صحة بيئة العمل وأمان العاملين وتسهيلات مكافحة الحريق .

Measures taken regarding quality of the working environment and workers' safety and fire fighting facilities / systems

٩ - التخزين Storage

١ - ٩ وسائل تخزين المواد الخام وكفاءتها

Methods and Efficiency of Raw Materials Storage

٢ - ٩ وسائل تخزين المنتجات الأساسية وكفاءتها

Methods and Efficiency of Main Products Storage

٣ - ٩ وسائل تخزين المنتجات الثانوية وكفاءتها

Methods and Efficiency of by-products Storage

١٠ - النقل

١٠ - ١ طرق نقل المواد الخام وكفاءتها

Methods and Efficiency of Raw Materials Transport

١٠ - ٢ طرق نقل المنتجات الأساسية وكفاءتها

Methods and Efficiency of Main Products Transport

١٠ - ٣ طرق نقل المنتجات الثانوية وكفاءتها

Methods and Efficiency by-products Transport

١١ - تكاليف حماية البيئة بالنسبة لرأس المال

Cost of Environmental Protection Relative to Capital Investment

١١ - ١ التكلفة الخاصة للتحكم في التلوث (ريال قطري)

Cost of Pollution Control (Qatari Riyals)

١١ - ٢ رأس المال (ريال قطري)

Capital Cost (Qatari Riyals)

* ترفق دراسة تقييم الآثار البيئي بالنسبة للمشروعات المدرجة في الملحق رقم (١) المرفق في اللائحة التنفيذية

Attach Environmental Impact Assessment Study of Projects Listed in Annex (1) of The Executive By-Law.

أقرار
Declaration

أقر أنا الموقع أدناه بأن البيانات المدونة بهذه الاستماراة صحيحة ودقيقة طبقاً للمعلومات المتوفرة لدى، وأنه في حالة أي تعديل لاحق سيتم إخطار وزارة البيئة على الفور.
وهذا إقرار مني بذلك..

I, hereby, declare that all the information and data provided in this application are correct and accurate as per the information available and in case of any modifications, the MoE would be immediately informed.

And this is my declaration.

..... Name المفر
..... Identification Card Number رقم البطاقة الشخصية
..... Position صفتة
..... Date التاريخ

بيانات ملأ بمعرفة الجهة الإدارية المختصة أو المانحة للترخيص
Form Filled with the Knowledge of the Competent
Governing or Licensing Authority

اعتماد الجهة الإدارية أو المانحة للترخيص
Signature of the Competent Government or Licensing Authority

..... Name الاسم
..... Occupation الوظيفة
..... Signature التوقيع

الجهة أو الإدارة المانحة للترخيص
Competent or Licensing Authority

خاتم الجهة
Official Stamp

المتطلبات الإدارية لطلبات التصريح البيئي المقدمة لوزارة البيئة

- ١ - أن يكون الطلب مرفق بكتاب صادر من صاحب العلاقة (الشخص الطبيعي أو المعنوي المالك للمشروع أو المفوض بإدارته) وموجه إلى مدير إدارة الشؤون الفنية بوزارة البيئة.
- ٢ - أن يكون الطلب مرفقاً بكتاب إحالة صادر من الجهة الإدارية المرخصة للمنشأة/ المشروع/ النشاط (وزارة الطاقة والصناعة، وزارة الاقتصاد والتجارة، وزارة البلدية والتخطيط العمراني، مدينة مسيعيد الصناعية، مدينة رأس لفان الصناعية... الخ). الطلبات الخاصة بالمنشآت الصناعية وجميع الحالات يتوجب تقديمها من خلال وزارة الطاقة والصناعة/ إدارة التنمية الصناعية.
- ٣ - أن تكون المعلومات المتضمنة في الطلب مطبوعة باللغة العربية، وتحديداً ما يتعلق بالبيانات الإدارية، وتقبل مرفقات الطلب الفنية حصراً باللغة الإنجليزية.
- ٤ - في حالة المشاريع الإنشائية يستوجب إرفاق الخرائط المناسبة بالإضافة إلى توصيف عام آليات التنفيذ (General Method Statement).
- ٥ - التأكد من أن جميع البيانات المتوفرة قد تم تضمينها في الطلب أو إرفاقها به، وبخلافه فيكتب في المقل المعني عبارة (لا يوجد أو لا ينطبق).
- ٦ - كتاب تخوين من صاحب العلاقة إلى الشخص المخول بمتابعة الطلب، ويستثنى من ذلك الجهات الحكومية، في حالة تقديم ما يثبت أن الشخص يعمل موظفاً لدى تلك الجهة بصفة مندوب أو ما يماثله.
- ٧ - صورة عن إثبات حجز الاسم التجاري للمشاريع الصناعية/ التجارية/ المهنية في حالة كون الطلب المقدم لمشروع جديد (الأول مرة).
- ٨ - صورة من البطاقة الشخصية مالك المشروع (الشخص الطبيعي)، أو المخول بالتوقيع على استئماره الطلب، ويستثنى من ذلك الجهات الحكومية، حيث يكتفي بالكتاب الموضح في (١) أعلاه.
- ٩ - في حالة إرفاق مستندات مع الطلب، فيجب إرفاق نسخة الكترونية عنها (CD or Disk)، إن أمكن.
- ١٠ - كافة المرفقات يجب أن تكون على ورق بحجم (A4) أو (A3).
- ١١ - في حالة كون الطلب المقدم لتوسيعة أو تعديل مشروع قائم، فيجب تقديم الآتي بالإضافة إلى ما ورد أعلاه باستثناء الفقرة (٦):
 - أ - صورة من شهادة قيد في سجل صناعي، وزارة الطاقة والصناعة (إن وجد).
 - ب - صورة من الرخصة التجارية، وزارة البلدية والتخطيط العمراني (إن وجد).
 - ت - صورة من السجل التجاري، وزارة الاقتصاد والتجارة (إن وجد).
 - ث - صورة من التصريح البيئي السابق.
 - ج - صورة من الشهادة الصادرة عن الإدارة العامة للدفاع المدني (إن وجد).