DEPARTMENT OF WATER AFFAIRS & FORESTRY

FAX: (061) 208 7160 PRIVATE BAG 13184

TEL: (061) 208 7111 WINDHOEK

REFERENCE NO: …….. NAMIBIA

APPLICATION FOR A WASTEWATER DISCHARGE LICENCE, IN TERMS OF PART 13 OF THE WATER RESOURCES MANAGEMENT ACT, 2013

(Act No. 11 of 2013 - as published in the Government Gazette of the Republic of Namibia, No. 5367, of 19 December 2013, Government Notice No. 332)

A. GENERAL INSTRUCTIONS

1. Applications must be submitted in duplicate to:

   The Permanent Secretary
   Attn.: Law Administration
   Ministry of Agriculture, Water and Forestry
   Private Bag 13184
   WINDHOEK

2. Application Fee (to accompany this document): N$_____

3. The various sections have to be completed as follows:

   Section B & C - All applicants
   Section D - Complete only the part relevant to technology employed in your works.
   Section E - All applicants (compulsory!)

4. Only the relevant Sections that have been filled in need to be submitted with this application.

5. A separate application needs to be filled in for each different plant/works.

NAME OF TREATMENT PLANT/WORKS: _____

PLACE: _____ **GPS Coordinates:** _____
(e.g. town, settlement)

B. GENERAL INFORMATION

1. Name of applicant: _____

2. Address - Contact Person: _____

   - Postal: _____

   - Physical: _____

   - Tel No.: _____

   - Fax No.: _____

   - E-mail: _____

3. Region in which plant is situated: _____

4. Constituency in which plant falls: _____

5. Type of establishment:
   (e.g. school, town, industry) _____

6. Source of water supply:
   (e.g. borehole, river, sea) _____

7. Total water consumption: _____ m^3/day ADWF*

   (*ADWF = Average Dry Weather Flow) _____ m^3/day ADWF*

   - Consumption based on the average usage over a 12-month period. _____ m^3/day ADWF*
   - List different sources separately _____ m^3/day ADWF*

8. Application:

   - Prepared by: Name : _____ Position: _____

     (e.g. Consultant) Signature: _____ Date: _____

   - Responsible Executive: Name : _____ Position: _____

     Signature: _____ Date: _____

C. TECHNICAL DETAILS - GENERAL

Answers to the following information must be contained in this application either from the questionnaire or as an attachment thereto (see also details in Appendix A):

NAME OF TREATMENT PLANT/WORKS: _____

1. Type of effluent (please also refer to Section D for classifications): _____

2. Site of works:

2.1 Submit a site plan indicating the exact location (or intended location) of the works. This plan should indicate (as a minimum):

2.1.1 General location of the works with regards to settlements, main roads, boreholes, rivers etc.

2.1.2 Layout plan of property showing all existing and proposed water pipes and effluent and drainage lines in distinctive colours.

2.1.3 Topographical plan/area photograph/contour plans showing the property and effluent treatment plant in relation to residential areas, rivers, pans, dams, lakes and boreholes.

2.1.4 Contour plans indicating the exact location of the effluent treatment works and point of discharge of final effluent in relation to watercourses that drain the area.

2.1.5 Give the following information:

2.1.5.1 Distance to nearest inhabitants: _____m

2.1.5.2 Distance to nearest water abstraction point (e.g. river, borehole): _____m

2.1.5.3 Distance to nearest watercourse (e.g. dry river) and specify: _____m

2.1.5.4 Wind direction (main/normal) _____

2.2 Submit overall details of works:

2.2.1 Type of effluent treatment system and a brief description of its method of operation. (If domestic effluents are dealt with by the local authority please enclose a letter from the authority confirming this agreement).

2.2.2 Flow diagram/mass balances to show the present average quantities of incoming water, recycled water, final outflow, seepage and evaporation losses (all in m^3/day).

2.2.3 Layout orientation drawing indicating all major treatment units and fence around works.

2.2.4 Complete flow diagram and key design parameters to include:

2.2.4.1 Dimensions and design capacities of each unit process;

2.2.4.2 Process Flow Diagram(s) and major instrumentation employed, e.g. water meters;

2.2.4.3 Loadings on the system (e.g. hydraulic, COD, BOD, nitrogen, phosphate);

2.2.5 Indicate allowances that have been made for future expansion and increased loads (if any).

2.2.6 Methods of sludge disposal or recirculation.

2.2.7 Disinfection of the final effluent (indicate dosing type, method, retention period and optimum disinfectant level in final effluent).

3. Monitoring boreholes for monitoring groundwater pollution over time must be available within 500 m of the point of final effluent discharge.

4. Please note: Additional information is required for new treatment plants (e.g. an environmental impact assessment) - details can be obtained from the Department of Water Affairs and Forestry.

5. All relevant information must be included with this application. **It is a criminal offence to deliberately withhold vital information relevant to this application.** Where applicants are found to be in contravention with this requirement, they may/will be prosecuted.

D. TECHNICAL DETAILS - SPECIFIC

Applicants should only complete sections relevant to their specific effluent (please tick relevant box):

☐	D-1: Domestic Effluent - Includes wastewater collected in towns (excluding industrial effluent!), villages, schools, lodges, administration buildings.
☐	D-2: Industrial Effluent - Includes wastewater generated by any industry, factory, etc.
☐	D-3: Mining Effluent - Includes wastewater accumulated or collected due to mining operations (e.g. Acid mine wastewater)
☐	D-4: Combination/mix of various effluents (list major effluent streams on page 11)

Final Effluent Reuse

The pressure on Namibia's existing fresh-water supplies can, to a great extent, be eased by the sensible reuse of effluents for a variety of purposes including dust control, agriculture and industrial processes. Therefore, reuse of effluent after suitable treatment is encouraged.

The allowable reuse of an effluent is dependent upon its quality as well as many local circumstances and hence each application in this category needs careful and individual scrutiny, which should be undertaken by a specialist in this field and must be supported by an environmental impact assessment study.

A separate licence for effluent reuse is required and more details in this regards can be obtained from the Department of Water Affairs and Forestry.

D-1. DOMESTIC EFFLUENT TREATMENT WORKS

System employed (please tick relevant box)

☐ D1.1: Conservancy Tank /Septic Tank System

☐ D1.2: Pond System (e.g. oxidation/facultative/evaporation ponds, reed beds, wetlands)

☐ D1.3: Advanced Biological Treatment Systems
(e.g. trickling filter, bio discs, oxidation ditch, activated sludge, submerged membranes)

☐ D1.4: Other

Table 1: Most recent (not older than 6month) analysis of the raw sewage and the final effluent:

Date of sample collection:		**Date of analysis:**	
Laboratory*:		**Source**	
		Raw Sewage	Final Effluent* (envisaged, if new works)
Parameter analyzed			
Biological Oxygen Demand (BOD)	mg O/ℓ		
Soluble Ortho Phosphate	mg P/ℓ		
Oxygen Absorbed (OA)	mg O/ℓ		
Nitrate (NO_3-N)	mg N/ℓ		
Chemical Oxygen Demand (COD)	mg O/ℓ		
Ammonia (NH_4-N)	mg N/ℓ		
Total Kjeldahl Nitrogen (TKN)	mg N/ℓ		
Sodium	mg Na/ℓ		
Fat, Oil and Grease (FOG)	mg/ℓ		
Conductivity @ 25ºC	m**S**/m		
Temperature	ºC		
pH			
Faecal coliforms	number/100 mℓ		
Suspended solids	mg/ℓ		

* Only if sampled correctly and analysed by a registered (by the Ministry of Trade and Industry) laboratory.

D1.1 Conservancy/Septic Tank System*

Location/Plant Name: ……

1.1.1	Number of population served		people
1.1.2	Number of tanks serving the establishment		off
1.1.3	Overall tank size* V = … m x … m x … m = …m^3		m^3
1.1.4	Construction material (of main structure)		
1.1.5	Grease/oil trap provided?		Yes/No
1.1.6	Number of compartments in tank		off
1.1.7	Retention / holding time per each compartment		h
1.1.8	Capacity / Flowrates:		
	Design - Average daily flow		m^3/d
	- Peak hourly flow		m^3/h
	Actual (if in operation) - Average daily flow		m^3/d
	- Peak hourly flow		m^3/h
1.1.9	Frequency of inspection		
1.1.10	Frequency of desludging/emptying		
1.1.11	Disposal method of final effluent (further details to be given in Section E):		
1.1.12	Disposal method of sludge		
1.1.13	Disposal of screenings		

*****If more than one tank, list different tank sizes here:

1. _____
2. _____
3. _____

NOTE: For more information on Septic Tank Systems refer to the general guidelines available from the Department of Water Affairs and Forestry, Code Of Practice, Volume 1: Septic Tank Systems.

D1.2 Pond Systems

Plant Name: ……

1.2.1	Number of population served		people
1.2.2	Number of ponds in system		off
1.2.3	Overall size of pond area … m x … m = …m^2		m^3
1.2.4	Type of system (e.g. Oxidation. Evaporation, reed beds):		
	• Anaerobic pond(s)		days
	• Aerobic/facultative pond(s)		days
	• Evaporation/Stabilisation pond(s)		days
	• With internal recycle? (Yes/No)		
1.2.5	Overall retention time of ponds		days
1.2.6	Capacity / Flowrates :		
	Design - Average daily flow		m^3/d
	- Peak hourly flow		m^3/h
	Actual (if in operation) - Average daily flow		m^3/d
	- Peak hourly flow		m^3/h
1.2.7	Frequency of inspection		
1.2.8	Frequency of desludging/empting		
1.2.10	Is there a grease trap provided upstream of the ponds?		
1.2.11	Disposal method of sludge when ponds are cleaned		
1.2.12	Frequency of clearing unwanted vegetation		
1.2.13	Disposal of screenings		
1.2.14	Are the ponds lined (Yes/No)		
	- if "Yes", describe		
1.2.15	If evaporation ponds are employed: – annual precipitation at location; – evaporation rate at location; – state source on which above data relies		 mm mm

Is there any possibility that this effluent could be reused more beneficially for industrial or agricultural purposes? Give details:

_____

NOTE: For more information on Pond Systems refer to the general guidelines available from the Department of Water Affairs and Forestry, Code Of Practice, Volume 2: Pond Systems.

D1.3 Advanced Biological Treatment Systems

Plant Name: ……

1.3.1	Number of population served		people
1.3.2	Treatment technology employed (e.g. trickling filter, activated sludge) - give short description:		
1.3.3	Capacity / Flowrates :		
	Design - Load (COD, TKN, P)		kg/d
	- Average daily flow		m^3/d
	- Peak hourly flow		m^3/h
	Actual (if in operation) - Average daily flow		m^3/d
	- Peak hourly flow		m^3/h
1.3.4	Does the design incorporate:		
	- Biological N removal (Yes/No)		
	- Biological P removal (Yes/No)		
1.3.5	Describe method of desludging		
1.3.6	Frequency of desludging		
1.3.7	Final disposal of sludge		
1.3.8	Disposal of screenings		

NOTE: For more information on Advanced Biological Treatment Systems refer to the general guidelines available from the Department of Water Affairs and Forestry, Code Of Practice, Volume 3: Biological Filtration Systems (Trickling Filters) or Volume 4: Biological Treatment Activated Sludge Processes.

D-2. INDUSTRIAL EFFLUENTS

Plant Name: ……

2.1	Describe industry and major activities resulting in effluent generation		
2.2	Capacity / Flowrates :		
	Design - Average daily flow		m^3/d
	- Peak hourly flow		m^3/h
	Actual (if in operation) - Average daily flow		m^3/d
	- Peak hourly flow		m^3/h
	If ponds are employed, state total surface area		m^2
2.3	List only major contaminants (also attach full analysis of typical effluent sample)		
2.4	Type of treatment employed (give short overview of process):		
2.5	List major treatment chemicals* employed in the unit process(es):		
2.6	Final effluent quality after treatment (put envisaged final quality for a new plant):		
2.7	Sludge generation:		
	- Volume generated		m^3/d
	- Mass		kg/d (dry solid)
	- Method of disposal		
	- Place of disposal		
	- Major constituents		
	- If sludge ponds, state frequency of cleaning		
2.8	Do you employ cleaner production principles (CPP)? Yes/No If "yes", elaborate:		
2.9	Is the following documentation included (give reason if not)? ▪ Water (and waste) management plan: Yes/No ▪ Decommissioning plan: Yes/No		

* For the chemicals employed, proper mass balances should be included that show chemical usage, movement and discharge within the factory/process(es). All safety aspects related to handling, storage and disposal of chemicals on site must be followed at all times.

D-3. MINING EFFLUENT

Plant Name: ……

3.1	Describe mining activity and major source of effluent generated:		
3.2	Capacity / Flowrates :		
	Design - Average daily flow		m^3/d
	- Peak hourly flow		m^3/h
	Actual (if in operation) - Average daily flow		m^3/d
	- Peak hourly flow		m^3/h
3.3	List only major contaminants (also attach full analysis of typical sample)		
3.4	Type of treatment employed (give short overview of process):		
3.5	List major treatment chemicals* employed in the unit process(es):		
3.6	Final effluent quality after treatment (put envisaged final quality for a new plant):		
3.7	Sludge and tailings generation:		
	- Volume generated		m^3/d
	- Mass		kg/d (dry solid)
	- Method of disposal		
	- Place of disposal		
	- Major constituents		
	- If sludge ponds, state frequency of cleaning		
3.8	Do you employ cleaner production principles (CPP)? Yes/No If "yes", elaborate:		
3.9	Is the following documentation included (give reason if not)? ▪ Water (and waste) management plan: Yes/No ▪ Decommissioning plan: Yes/No		

* For the chemicals employed, proper mass balances must be included that show chemical usage, movement and discharge within the factory/process(es). All safety aspects related to handling, storage and disposal of chemicals on site must be followed at all times.

D-4. COMBINATION OF VARIOUS EFFLUENTS

Plant Name: ……

4.1	Describe major activities resulting in effluent generation (e.g. type of industry):				
4.2	Capacity / Flowrates of different streams (major only)	1	2	3	
	Type (e.g. domestic, industrial, mining, others)				
	Design - Average daily flow				m^3/d
	- Peak hourly flow				m^3/h
	Actual (if in operation) - Average daily flow				m^3/d
	- Peak hourly flow				m^3/h
4.3	List only major contaminants (also attach full analysis of typical effluent sample)				
4.4	Type of treatment employed (give short overview of process)				
4.5	List major treatment chemicals employed in the unit process(es):				
4.6	Final effluent quality after treatment (put envisaged final quality for a new plant)				
4.7	Sludge generation:				
	- Volume generated				m^3/d
	- Mass				kg/d (dry solid)
	- Method of disposal				
	- Place of disposal				
	- Major constituents				
	- If sludge ponds, state frequency of cleaning				

E. FINAL EFFLUENT DISPOSAL

1.4.1	Where is the final effluent discharged to? (E.g. French drain, pumped out by Local Authority, dry river course, perennial river, etc.)	
1.4.2	IF soakaway, state: - Type of soil - Suitability/porosity of soil - Size of soakaway area - Include topography and plan of soakaway area	
1.4.3	Is there any post-treatment applied? (e.g. disinfection, filtration)	
1.4.4	Is the final effluent re-used? (Yes/No)	
	If "Yes", complete:	
	- Do you have a reuse licence?	
	- Amount of water that will be re-used:	m^3/d
	- For what application:	
	- Type of irrigation used (if applicable):	
	- What crops are grown:	
	- Area of land that will be irrigated:	ha
1.4.5	Name (if any) downstream users (downstream of discharge point).	
1.4.6	Past records of complaints or objections by people living close to works:	

Reuse:
A reuse licence is required – details can be obtained from the Department of Water Affairs and Forestry.

Irrigation:

The crops allowed to be irrigated are dependent upon effluent quality (details will be supplied on request by the Department of Water Affairs and Forestry).

APPENDIX A – TECHNICAL DETAILS

Answers to the following information must be contained in this application, either from the questionnaire or as an attachment thereto:

1. General

1.1 Layout plan of property showing all existing and proposed water circuits, effluent and drainage lines in distinctive colours.

1.2 Topographical plan showing the property in relation to residential areas, rivers, pans, dams, lakes and boreholes.

1.3 Flow diagram for water and effluent to show the present average quantities of incoming water, recycled water, final effluent, infiltration and evaporation losses (all in m^3/day).

1.4 Provide contour plans indicating the exact location of the effluent treatment works and point of discharge of final effluent in relation to watercourses that drain the area.

2. Domestic and Industrial

2.1 Type of effluent treatment system, layout plans of the plant and a brief description of its method of operation. (If domestic effluents are dealt with by the Local Authority please enclose a letter from the authority confirming this agreement).

2.2 Complete flow diagram indicating dimensions and capacities of each unit of the system.

2.3 Indicate allowances that have been made for future expansion and increased loads (if any).

2.4 Retention time in each unit of the unit process at design flow.

2.5 Loading on the system (in terms of Biological Oxygen Demand).

2.6 Methods of sludge disposal or recirculation.

2.7 Chlorination of effluent (indicate dosing method, retention period and optimum chlorine level in final effluent).

3. Disposal of Final Effluents (Domestic and Industrial)

3.1 Discharge into a watercourse (Only for final effluents meeting General Standard quality requirements).

3.1.1 Uses of watercourse downstream of the discharge point.

3.1.2 Other sources of effluent discharging above and below the proposed point of discharged.

3.1.3 Past records of complaints of pollution or objectives by users downstream of discharge point.

3.1.4 Flow data for the watercourse (average and flood conditions).

3.1.5 Is there any possibility that the effluent could be utilised more beneficially by re-use for industrial or agricultural purposes? (See Sections 3.2 and 3.6)

3.2 Irrigation (The crops allowed to be irrigated are dependent upon effluent quality, details of which are supplied on request by the Department of Water Affairs and Forestry.)

3.2.1 Full details together with plans (showing contours) should be provided with respect to the suitability of the proposed irrigable lands.

3.2.2 Specify the type of crop to be grown and its water requirements. If during periods of rain irrigation is not required, state what provisions will be made for disposal of the excess.

3.2.3 Protective measures to prevent direct surface run-off from the irrigation areas into adjacent watercourses.

3.2.4 Sources of underground water that may receive percolating waters from the land.

3.3 Total Evaporation (e.g. for stabilization pond effluent).

3.3.1 Evaporation and rainfall data upon which the calculations for total evaporation of effluent have been based.

3.3.2 Expected loss of effluent by seepage.

3.3.3 Is there any possibility that this effluent could be more beneficially re-used for industrial or agricultural purposes? Give details (see Section 3.2 and 3.6)

3.4 Land Burial (For conservancy tank or sanitary bucket sewage).

3.4.1 Detailed plan of site with respect to watercourse that drain the area.

3.4.2 Suitability of soil to accept sewage with special emphasis on its porosity.

3.4.3 Frequency of loads brought to the site and average amount of sewage contained in each.

3.4.4 Provisions for the prevention of health risks (e.g. frequency of adding chloride or lime and covering soil layers).

3.5 Seepage (E.g. for “French Drains” accepting septic tank effluents).

3.5.1 Detailed plan of the seepage site in relation to nearby watercourses.

3.5.2 Dimensions and composition of the seepage site.

3.5.3 Soil type and permeability.

3.6 Other Re-use

The pressure on Namibia’s existing fresh-water supplies can to a great extent be eased by the sensible re-use of effluents for a variety of purposes including dust control, agriculture and industrial processes.

The allowable re-use of an effluent is dependent upon its quality as well as many local circumstances as and hence each application in this category receives careful individual scrutiny.

Please give details of proposed re-used, effluent quality and effluent quantity.

4. Operation and Control of Water Purification Systems

4.1 Number of operators – indicate also during each shift (if applicable).

4.2 Indicate level of training of personnel in full-time charge of the operation of the treatment systems.

4.3 Indicate level of training/experience of the manager to whom operating personnel are responsible.

4.4 Availability of laboratory facilities for effluent analysis?

NOTE: It should be noted that the conditions of any licence that may be issued by the Department of Water Affairs are specified according to the information that has been supplied by the applicant in this questionnaire. The applicant must therefore ensure that his/her establishment is constructed and operated in accordance with the details that have been submitted!