Approval

PURSUANT TO

SECTION 53M(7) OF THE

ENVIRONMENT PROTECTION ACT 1970

CERTIFICATE OF APPROVAL

An approval is hereby issued by Environment Protection Authority ('EPA') under Section 53M(7) of the *Environment Protection Act* 1970 ('the Act')

TO: EARTHSAFE ENVIRONMENTAL PTY LTD

FOR: EARTH SAFE ES10PC

Treatment type: Aerated Wastewater Treatment System (AWTS)

This is to certify that the above system ('the system') is a type of septic tank system approved by EPA for the purposes of Part IXB of the Act, subject to the attached conditions.

A separate permit ('the permit') is required from the relevant municipal council before installation, pursuant to Section 53M(5)(b) of the Act. The permit shall govern the dispersal method and maintenance requirements.

Approval Number: **CA 110.2/09**

Date of Issue: **30 March 2011**

A C Robinson

ANTHONY CRAIG ROBINSON
DELEGATE
ENVIRONMENT PROTECTION AUTHORITY

This Certificate of Approval is valid until 1 April 2012, unless withdrawn earlier by EPA.

SYSTEM DESCRIPTION

The Earth Safe ES10PC Aerated Wastewater Treatment System (AWTS) collects, treats and disinfects domestic wastewater.

I. Treatment System Components (see Attachment A – Schematic drawing):

a) A single concrete tank with five chambers:

i. Primary treatment and settlement,

ii. Aeration,

iii. Clarification,

iv. Chlorine disinfection,

v. Effluent storage for irrigation.

b) An aeration pump and air diffusers.

c) Submerged media.

d) Surface skimmer.

e) Irrigation pump.

f) Electrical control unit for power supply and audio/visual alarm.

II. Treatment Process:

a) Household wastewater enters the primary treatment chamber, where solids are separated by sedimentation and the resultant sludge is treated by anaerobic digestion.

b) Wastewater is decanted from the primary treatment chamber via a baffle to the aeration chamber. This chamber contains fixed filter media below the water level which acts as a base for the micro-organisms to grow on. Aeration is supplied through air diffusers at the bottom of the chamber which provides both mixing and biological degradation.

c) Treated wastewater from the aerobic chamber then enters the clarification chamber, where suspended solids (biomass) settle out which further clarifies the effluent. Settled sludge is automatically returned to the primary inlet by a venturi device and the surface skimmer returns floating material back to the aeration chamber.

d) Treated wastewater from the settling chamber then flows into the chlorine disinfection chamber where the effluent is disinfected by dosing with a solid chlorine disinfection agent.

e) Treated effluent then flows to the final irrigation chamber and is automatically pumped to the irrigation area. The number of times that the irrigation pump runs each day depends upon the litres of wastewater generated by the premises.

CONDITIONS OF APPROVAL

General

1. This approval is valid until 1 April 2012 unless withdrawn earlier by EPA.

2. No modifications or variations to the system may be made unless the manufacturer has prior approval from the EPA in writing.

3. At least three months before the expiry of this Certificate of Approval, a completed Application for Reapproval must be submitted by the manufacturer to EPA for the purpose of verification of the system's performance. The effluent from systems installed in Victoria must be tested to ensure that they comply with the Renewal of Approval testing procedures as outlined in the latest version of EPA Publication 760 *Guidelines for aerated on-site wastewater treatment systems* (as amended) or other methods approved by EPA in writing.

4. The system is approved subject to the following activities meeting the requirements outlined in the most recent version of EPA Publication 891.2 *Code of Practice - Onsite Wastewater Management* (see EPA website www.epa.vic.gov.au) and the most recent version of Australian/New Zealand

Standards AS/NZS 1546.1 *On-site Domestic Wastewater Units: Septic Tanks,* AS/NZS 1546.3 *On-site Domestic Wastewater Treatment Units: Aerated Wastewater Treatment Systems,* and AS/NZS 1547 *On-site Domestic Wastewater Management*:

a) the design, manufacture, installation and maintenance of the treatment system; and

b) the design, installation and maintenance of the irrigation system.

5. All persons involved in the activities in condition 4 must be aware of and fulfil their responsibilities as outlined in the most recent version of EPA Publication 891.2 *Code of Practice - Onsite Wastewater Management.* In addition to system designers, manufacturers, installers and accredited service agents, other responsible persons include:

a) municipal council officers that assess applications for permits to install and to use on-site wastewater treatment systems; and

b) land capability assessors; and

c) owners and occupiers of the site where the system is installed.

Performance

6. Hydraulic and Organic Loading:

The system is approved for treatment of wastewater from residential and commercial premises with the following MAXIMUM hydraulic and organic loads:

Model	Hydraulic load (L/day)	Biochemical Oxygen Demand (g/day)
EarthSafe ES10PC	1500	700

7. Treated effluent from the system must not exceed the following limits (90% of samples):

For sub-surface irrigation:	
5-day Biochemical Oxygen Demand (BOD_5)	20 mg/L (max. 30 mg/L)
Total Suspended Solids (TSS)	30 mg/L (max. 45 mg/L)
For surface irrigation:	
5-day Biochemical Oxygen Demand (BOD_5)	20 mg/L (max. 30 mg/L)
Suspended Solids (SS)	30 mg/L (max. 45 mg/L)
E.coli	10 cfu/100 mL (max. 20 cfu/100 mL)
Free Chlorine	0.2 (min) to 2.0 (max) mg/L

8. Estimated Electricity Usage for a 4 person household with average wastewater flows and loads:

The system must be continuously connected to a 240V/50Hz AC power supply. A weather-proof isolating switch must be provided at the power outlet. The power supply must have its own clearly marked designated residual-current device (RCD) circuit breaker in the fuse box and no other appliances connected.

Electrical Equipment	Electricity Usage per Day	KWh/year	Approx. Cost per year
HP-80 Aeration Pump or equivalent	71W per hour for 24 hours per day = 1.70 kWh/d	620	653 kWh x $0.22/kWh ~ $144
DAB-NOVA600A or equivalent Effluent Irrigation Pump	550W per hour for 10 minutes (maximum) per day = 0.09kWh/d	33	

Permitted Uses

9. End Uses for the treated effluent:
   a) Dispersal to land via sub-surface irrigation;
   b) Dispersal to land via surface irrigation;
   c) Disposal to land via infiltration trenches, evapo-transpiration beds/trenches or a mound.

   The land application system must be installed in accordance with Australian Standard AS/NZS 1547 *On-site domestic-wastewater management.*

Installation

10. When a treatment system is purchased, the manufacturer or supplier must provide the homeowner with a copy of the following documents:
    - Statement of warranty and of service life;
    - Schematic drawing and detailed specifications (Attachment A);
    - Owner or occupier's operation instruction manual (Attachment B);
    - Minimum A4 size onsite treatment system installation plans;
    - Service agreement contract;
    - Sample service report form;
    - A full description of the treatment train and mechanical and electrical component parts; and
    - Approval documentation obtained from EPA i.e. this Certificate of Approval CA 110.2/09.

    The premises owner must supply a copy of any of the above documents as required by the local council, as part of the application for a permit to install or to use this on-site wastewater treatment system.

11. Installation of the treatment system must be carried out in accordance with this Certificate of Approval, the manufacturer's specifications and instructions by a licensed plumber.

12. The irrigation system and the pipework connecting the treatment system to the house and to the irrigation area must be installed by a person licensed or registered with the Victorian Plumbing Industry Commission (PIC) in Plumbing (Drainage) work or working under the direct supervision of a person licensed with the PIC, in accordance with the most recent versions of:
    a) Australian Standard AS/NZS 1546.1 *On-site domestic wastewater treatment units: Part 1 Septic tanks;*
    b) Australian Standard AS/NZS 1546.3: *On-site domestic wastewater treatment units: Aerated wastewater treatment systems*;
    c) Australian Standard AS/NZS 1547 *On-site domestic wastewater management;* and
    d) *Victorian Plumbing Regulations 2008.*

13. The electrical components of each treatment system and the associated irrigation area must be installed by a licensed electrician and in accordance with the manufacturer's specifications set out in the Installation Manual.

14. Each system must be fitted with an effective effluent collection point so that samples of treated wastewater can be easily taken without compromising the sample.

15. The system must be installed so that unimpeded and ongoing access to all chambers and equipment is ensured for the purpose of inspection and maintenance. Access openings over all chambers must be watertight and located at finished ground surface level or above.

16. A permanent, clear and indelible notice listing the manufacturer's name and contact details, the model name and number and the date of installation of the treatment system, must be attached to the system in a prominent position.

Maintenance and Monitoring

17. An audio-visual alarm system with mute (maximum 24 hours) facilities must be installed in an appropriate location to indicate any failure or fault in the system.

18. The maximum permissible noise level from the treatment system (except the alarm) shall be 40 dB L_{Aeq} at a distance of 1 m.

19. The relevant local Council shall require the owner/user of the system to enter into an on-going service contact with an accredited service agent to service and maintain the treatment and irrigation system in accordance with the manufacturer's specifications every 3 months. An accredited service agent is a person who:

    a) has been suitably trained by the system manufacturer regarding the installation, operation and service requirements of the system; and

    b) is accredited by the system manufacturer in writing to undertake the service.

20. The system must be desludged once every 3 years or as deemed necessary, based upon sludge and scum depths, after inspection and maintenance.

21. Where treated wastewater from the system is recycled via surface irrigation onto land, the service agent must ensure the effluent is sampled and analysed annually. The sample must be tested for '5-day Biochemical Oxygen Demand' (BOD_5), 'Total Suspended Solids' (TSS) and E.coli. Where effluent from the system is recycled via sub-surface irrigation, annual effluent sampling is not required unless deemed necessary by the local council.

22. All sampling and analysis referred to in Condition 21 must be undertaken in accordance with the most recent version of EPA Publication IWRG701 *Industrial Waste Resource Guidelines: Sampling and Analysis of Waters, Wastewaters, Soils and Wastes*, or other methods approved by EPA in writing.

23. All treated effluent samples must be taken by an appropriately trained person and analysed by a laboratory that is accredited by the National Association of Testing Authorities (NATA) to undertake the required tests. The cost of effluent sampling and analysis is to be borne by the owner or the user of the system.

Reporting

24. The service agent of a system must submit an annual report to the local council containing copies of all the following reports from the previous 12 months:

    a) treatment and irrigation system inspection and maintenance reports; and

    b) laboratory analytical test reports on NATA laboratory letterhead (where applicable).