Package Treatment Plant Operation and Management

Regulatory Controls and Compliance

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NSW Legislative Responsibility

Prior to July 1999:

- Small Sewage Treatment Plants (>10EP) approved and regulated by the EPA and previously SPCC
  - Clean Waters Act (1970)
  - Pollution Control Act (1970)

Post July 1999:

- The PoEO Act transferred much responsibility to local authorities (Councils) to act as the Appropriate Regulatory Authority (ARA)

State Legislative Framework

State Government

- Protection of the Environment Operations (PoEO) Act 1997
  - Sewage Treatment – Schedule 1 activity
  - Including plant, pump stations, overflow works and reticulation
  - Limits of application – **>2,500EP** or **>750kL** per day
  - Operated using individual Environmental Protection Licences (EPL's) and administered by (EPA)

State Planning Framework

State Government

- Environmental Planning and Assessment (EP&A) Act 1979
  - Section 79(C) – Matters for Consideration (general)
  - Consent Authority must consider:
    - The likely impacts of a development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality
    - This includes the wastewater management system(s) of a development

Local Legislative Framework

Local Government

- Protection of the Environment Operations (PoEO) Act 1997
  - Council is Appropriate Regulatory Authority (ARA) for plants treating <750kL per day
  - Council officers are able to manage operation of such plants using the authority available under the Act

Local Planning Framework

Local Government

- Local Government Act 1993 (Section 68)
- Council approval required to:
  - Install, construct or alter a waste treatment device or a human waste storage facility or a drain connected to any such device or facility not licensed by EPA
  - Operate a system of sewage management including:
    - Treatment plants, wetlands, mounds, trenches, effluent polishing systems and related land application or re-use

NSW (State) Regulation

Protection of the Environment Operations (General) Regulation 2009

- Ch. 2 Part 1 – sets out licensing requirements for Environmental Protection Licence (EPL) holders
  - Fees, periods etc.
- Ch. 4 Part 2 – sets out reporting and record keeping requirements for EPL holders
  - Monitoring parameters, concentrations limits, monitoring locations etc.
- Ch. 6 – sets out offences and penalties for EPL holders

NSW (State) Regulation

Protection of the Environment Operations (General) Amendment (Pollution Incident Response Management Plans) 2012

- Regulation sets out requirement for 'preparation and implementation of a "Pollution Incident Response Management Plan (PIRMP)" for each licensed activity
- Also requires stricter reporting of (actual/potential) pollution incidents and publishing of results

NSW (Local) Regulation

Local Government (General) Regulation 2005

- §44(1) sets performance standards:
  - Prevention of disease; odours; water contamination; soil/vegetation degradation; vermin; human contact; amenity and re-use of resources
  - Operation in accordance with specifications and procedures
- §45 sets conditions of approval:
  - Compliance with Regulation; system maintenance and sanitation; system accreditation (≤10EP); evidence of compliance

Compliance Toolbox

The PoEO Act (1997) gives Council (the ARA) the power to issue facilities or activities approved under their authority with:

- Section 91/93 - Clean-up Notices
  - Written/verbal direction to take specified "immediate" action (§91(1))
  - Maximum penalties - $1M (corporation) and $250K (individual)
- Section 96 – Prevention Notices
  - Written direction to take specified "remedial" action (§96(2))
  - Maximum penalties - $1M (corporation) and $250K (individual)
- Section 104 – Compliance Cost Notices
  - Written direction to pay for all reasonable costs associated with enforcing requirements of a Clean Up Order (§104(1)), Prevention Notice (§104(3)) or Prohibition Order (§104(4))

Compliance Toolbox

Section 124 of the NSW Local Government Act (1993) gives Council the power to issue orders for activities under their authority, requiring a person:

- To comply with an approval (Order 30)
- To take action to maintain premises in a healthy condition (Order 21)
- To store, treat or dispose of waste (Order 22)
- Not to use or permit a human waste storage facility to be used (Order 25)
- To connect premises to a public sewer when the sewer is within 75 metres (Order 24)

Available Guidelines
(The Australian Standard)

- AS/NZS 1547:2012
  On-site domestic-wastewater management
- Sound technical reference
- Limited application – system size <2,000L/day or 10EP
- Available from:
  SAI Global
  www.saiglobal.com
  or
  www.standards.org.au

Available Guidelines
(The Australian Standard)

- Package Plants not "technically" covered
- System Size = <2,000 L/day
- Provides some relevant information on:
  - Part 2 – Risk Management
  - Part 3 – Management
    - Procedures, roles, training, O&M and monitoring
  - Part 4 – Performance
    - Site capability assessment, land application, treatment processes, construction and installation, monitoring

Available Guidelines
(NSW Guideline – Environment & Health Protection Guidelines – The Silver Book)

- Encourages systematic approach to system design
- Applicable for small systems only - <2000L/day
- Available from:
  Office of Local Government
  https://www.olg.nsw.gov.au/wp-content/uploads/Onsite-sewage-management-guide.pdf

Available Guidelines
(NSW Guideline – Environment & Health Protection Guidelines – The Silver Book)

1998 document now rather dated

- Many recent advances in technology and management
- 2003 Technical revision not released
- WaterNSW Designing and Installing On-site Wastewater Systems (A Water NSW Current Recommended Practice) provides more up-to-date information, but main focus is domestic systems

Available Guidelines
(NSW Guideline – Environment & Health Protection Guidelines – The Silver Book)

- Minimal applicability - System Size <2,000 L/day
- Provides some relevant information on:
  - Section 3 – Regulation
    - Auditing, monitoring, reporting and training
  - Section 4 – Evaluation
    - Site capability assessment, risk management and reporting
  - Section 5 – System Options
    - Waste characterisation, simplified process descriptions, land application systems and common effluent sewer (decentralised systems)
  - Section 6 – System Selection
    - Matching system to site conditions and investigating alternate technologies (options assessment)

Available Guidelines
(NSW SPCC Design Guide)

- Published in 1978 to address performance criteria for the large number of 'new' package wastewater treatment plants being installed in NSW at the time
- Companion document "Guidelines for the Use of Package Wastewater-Treatment Facilities. WP4. SPCC / EPA" published concurrently

Available Guidelines
(NSW SPCC Design Guide)

- Applicable for "activated-sludge" process plants including continuous (separate settling) and intermittent (sequencing) design
- Detailed guidance on:
  - treatment plant location, layout and staging
  - typical design flows for selected developments - hydraulic and organic
- Prescribed design criteria for:
  - organic loading - F/M ratio, sludge volume index (SVI)
  - screening and comminution (shredding) equipment
  - aeration – delivery systems, mixing/contact, capacity and efficiency
  - settlement (clarification) – overflow rate/rise velocity, sludge & scum return
  - sludge wasting
  - flow measurement, controls and access

Available Guidelines
(NSW SPCC Design Guide)

- Additional information on:
  - Further treatment opportunities including –
    - polishing ponds (10 days Average Dry Weather Flow (ADWF))
    - disinfection (chlorination)
  - Plant monitoring
  - Routine performance testing and process control
  - Acidity and alkalinity management
  - Keeping of records

Available Guidelines
(DWE – Private Recycled Water Schemes – 2008)

- Applicable for projects requiring Section 68(c) approval under LG Act:
- Risk-based assessment procedure
- Non-prescriptive approach to
  - Planning
  - Monitoring
  - Management
  - Training
  - Operations

Available Guidelines
(DECC – Effluent Irrigation – 2004)

Additional detailed information on:

- Planning and site selection including –
  - Site capability (soils etc.)
  - Constraints and opportunities
- Effluent characteristics
- Design considerations including –
  - Climate and nutrient modelling
  - Difficult constituents (salinity, heavy metals etc.)
  - Irrigation setup and scheduling
- Operation and maintenance (O&M)
- Licensing and compliance

Available Guidelines
(Other States)

- EPA Vic – Code of Practice for Small Wastewater Treatment Plants
  - Design Guidance – systems < 500EP
  - Bio-filtration, activated sludge and stabilisation ponds
- DPI QLD – Plumbing and Wastewater Code (2009)
  - Performance criteria – systems < 20EP
  - criteria and solutions for system design, layout, construction, effluent quality, documentation and reporting
- DPIWE TAS – Emission Limit Guidelines for Sewage Treatment Plants
  - Performance limits and discharge criteria – systems < 500kL/day
  - limited to surface water discharge systems

Available Guidelines
(Overseas)

New Zealand – Ministry for the Environment (MFE)
- Sustainable Wastewater Management – A handbook for smaller communities.
- Detailed guidance on system options, decision making, selection, siting and design, performance, management and costing

USA – Technology Fact Sheets. USEPA
- Aerobic Treatment, Anaerobic Lagoons, Chemical Precipitation, Facultative Lagoons, Membrane Bio-reactors, Oxidation Ditches, Package Plants, Screening, Sequencing Batch Reactors, Trickling Filters, Aerobic Treatment, Wetland systems, Disinfection

Europe (Germany, Norway, U.K.)
- BS EN 12566-3 Code of Practice for design and installation of Small Wastewater Treatment Systems - Packaged and/or Site-assembled Domestic Wastewater Treatment Plants

Reference Manuals

- Wastewater Engineering – Treatment and Reuse (5th ed.), Metcalf and Eddy (2013)
- Small and Decentralized Wastewater Management Systems, Crites and Tchobanoglous (1998)
- Water and Wastewater Engineering – Design Principles and Practice, M. L. Davis (2010)
- Operation of Wastewater Treatment Plants (Volumes I & II), USEPA Office of Water Programs (2002)
- Handbook for the Operation of Wastewater Treatment Works, Water Institute of Southern Africa (2002)
- Selecting Package Wastewater Treatment Works, Project report 72, CIRIA (2001)