Regulation

Guideline

Regulatory Monitoring and Testing Reporting Requirements

Updated April 2016[1]

EPA 651/16: This guideline describes the requirements imposed by the Environment Protection Authority for reporting of monitoring and testing. Effective analysis and reporting of monitoring data will assist the authority and licensees to assess environmental impacts arising from the activities monitored.

1 Legal framework

Under the *Environment Protection Act 1993* (EP Act) the Environment Protection Authority (EPA) can require reporting on monitoring and testing as a condition of an authorisation or Environment Protection Order (EPO)[2]

The most common tool the EPA uses to impose a requirement for monitoring is a condition of authorisation, including licences (section 36), exemptions (section 38) and works approvals (section 35). Section 52(1) of the EP Act, states that:

> … the Authority may, by conditions of an environmental authorisation, require the holder of the authorisation to … carry out specified tests and environmental monitoring relating to the activity undertaken pursuant to the authorisation … and to make specified reports to the Authority on the results of such tests and monitoring …

The EPA may also require monitoring as a condition of EPOs (section 93) and Clean-up Orders (section 99). Under clause 21 of the *Environment Protection (Water Quality) Policy 2015*, the EPA is obliged to impose monitoring where an exemption is granted.

2 Why does the EPA require monitoring?

The EPA may impose monitoring as a condition of an authorisation or order where there is a hazard that the EPA considers poses a priority environmental risk.

Generally, the EPA will specify monitoring:

- to assist with characterising or assessing a priority environmental risk
- to assist with the management of an environmental risk, e.g. to assess performance against criteria and therefore assess compliance with a licence condition and/or requirement of the EP Act.

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1 Updated according to *Environment Protection (Water Quality) Policy 2015.*

2 In addition to the requirements outlined in this document, the Act (section 83) requires that 'if serious or material environmental harm from pollution is caused or threatened in the course of an activity undertaken by a person, the person must, as soon as reasonably practicable after becoming aware of the harm or threatened harm, notify the Authority' … Section 83 applies to 'becoming aware' of such harm through monitoring as well as through other means.

3 Monitoring report requirements

The minimum requirements for a monitoring report to satisfy the EPA are summarised in Table 1, followed by further explanation.

Table 1 Monitoring report requirements

Report section	Requirements
Certification	• Certification by authorisation holder that report is true and accurate
Report identification	• EPA licence number • name and address of licensed site • period covered by report (e.g. October 2004–October 2005) • date of submission, version number • person responsible for the report
Monitoring objective	• monitoring objective stated in the authorisation or order • other monitoring requirements (e.g. assessment criteria) stated in the authorisation or order
Monitoring plan	• statement on whether the approved monitoring plan was adhered to and details on any deviation from the approved monitoring plan or licence conditions and reasons for the deviation OR • if no monitoring plan was required by the licence, information on monitoring locations, frequency and sampling procedures including any deviations from licence requirements or EPA sampling guidelines
Monitoring results—presentation	• summary of all current results in a graph or table that includes the assessment criteria and highlights results that do not comply with the assessment criteria • analytical methods and the limits of reporting (LoR) for each analyte reported • summary of previous results (sufficient to highlight trends) • calculation of pollutant load discharged into the environment (where required by condition of authorisation)
Monitoring results—quality assurance/quality control (QA/QC) evaluation	• discussion of data completeness • evaluation of QC information from the laboratory and the field data, ie data representativeness, precision and accuracy
Discussion and interpretation of results	• discussion of results where criteria was exceeded • review of trends when compared with previous monitoring data • discussion of results based on monitoring objective(s)
Report section	**Requirements**
Conclusions and proposed actions	• conclusions on meeting monitoring objective, compliance with assessment criteria and impact on environment • major assumptions or uncertainties • conclusions about effectiveness of the monitoring plan and overview of any proposed changes to monitoring plan (if required) • proposed actions to address non-compliance

3.1 Certification

The holder of the authorisation must certify the monitoring report. Licensees can use the certification form in the appendix, or include the certification statement as part of the monitoring report. The wording for the certification shall be:

I certify that I have reviewed these reports and to the best of my knowledge and ability all the information provided in these reports is a true and accurate reflection of the regulatory monitoring and testing performed.

3.2 Report identification

The report must be clearly identifiable, and include the licence number, name and address of where the licensed activity is conducted, the reporting period, and the name and contact details of the person submitting the report.

3.3 Monitoring objective

In order to assess the results of a monitoring plan, the monitoring objective needs to be clearly understood. The EPA will generally specify the objective(s) of monitoring as a condition of authorisation or order. Along with the other key monitoring conditions (such as monitoring point locations, analytes, frequency and assessment criteria), this should be clearly stated at the beginning of the monitoring report.

3.4 Monitoring plan

Before starting monitoring, most licensees will be required to develop and submit a monitoring plan and forward it to the EPA for approval.

Where there is an approved monitoring plan

The information contained in the monitoring plan is vital to assess the monitoring. The current approved monitoring plan must be clearly identified by providing the monitoring plan title, date of submission, date of approval of the plan by the EPA, and name of the person responsible for submitting the plan. The licensee does not have to restate the methodology employed (since it is detailed in the monitoring plan), but must highlight any deviations that occurred (e.g. extended holding times, alternative decontamination procedures or alternative analysis methods.

Where there is not an approved monitoring plan

If the submission of a monitoring plan was not required, sufficient information must be provided with the monitoring report so that the results can be assessed with regard to the receiving environment and licensee's processes and sampling methods. Such information should include:

- current map showing sampling locations (including control site locations), major infrastructure, sensitive environmental receptors, scale bar and north arrow
- detail of factors that affect variability in emissions, e.g. peak production months
- sampling methods, including deviations from EPA sampling manuals
- a description of the receiving environment, including environmentally sensitive receptors and significant features.

3.5 Presentation of monitoring results

The clear and concise presentation of monitoring results is a critical component of a monitoring report. Current monitoring results should be presented in tabular and graphical format with the exception of continuous online samplers (eg air) where clear graphical results will suffice.

When presenting results it is important to ensure that:

- all results correspond to a sampling location shown on the site plan
- the method used for analysis and the limit of reporting (LoR) are clearly shown for each analyte
- the level of precision is presented for results obtained from field instruments (e.g. results from a multi-meter)
- units are clearly stated, correct and correspond to assessment criteria units

- assessment criteria are clearly shown, including type (e.g. maximum or mean, five-day or three-day Biological Oxygen Demand, soluble or total metals) and units
- calculations have been made, if required, to compare data with assessment criteria (e.g. calculation of medians, means, running averages and pollutant loads). Air quality data should be averaged according to the units in the licence (i.e. hourly averages if limit is 50 µg/m3/h)
- all results that fall outside assessment criteria limits are clearly highlighted.

The licensee must also include sufficient results from earlier monitoring in a format that shows changes over time or trends (Figure 1). The presentation should be graphical as a minimum. It is expected that five years of data will be required to identify if a trend is occurring. At a minimum, two years of data must be presented.

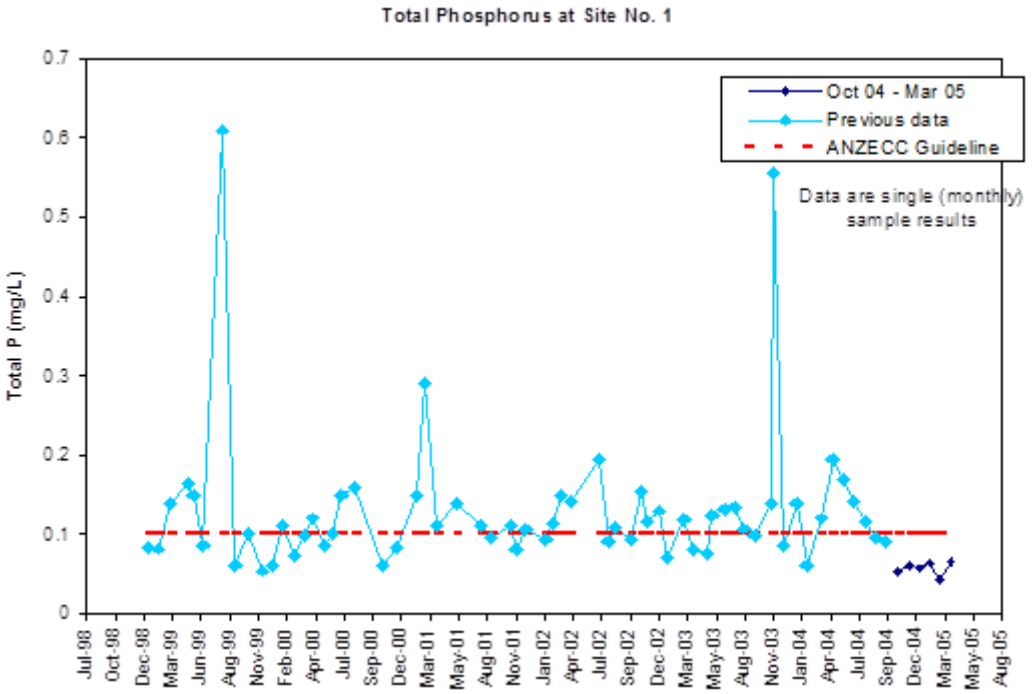

Figure 1 An example of presentation of historical data to show trends

3.6 Quality assurance of monitoring results

Licensees should review the results presented in the monitoring report for data completeness, accuracy and precision. Some typical quality assurance (QA) questions are included in Table 2.

Table 2 Typical quality assurance questions in relation to monitoring results

	Sample questions
Completeness	Were all samples taken at the correct location and frequency?
Precision	Are duplicate results from the same laboratory within an acceptable range (e.g. within tolerances specified for analytical procedure)?
Accuracy	Are spike recovery values between 80 and 120%? Were calibration checks made and were results within an acceptable range? Are duplicate results from a secondary laboratory within an acceptable range?

Differences between a result and its duplicate should be expressed as relative percentage difference (RPD), as follows:

$$RPD = \left[(R_1 - R_2) \div \frac{(R_1 + R_2)}{2} \right] \times 100$$

where R1 = result of sample, R2 = result of duplicate sample

An 'acceptable' RPD is dependent upon factors such as matrix and the analytical procedure. Where the RPD is significant (e.g. >20-30%) the cause should be investigated and the effects on the interpretation of results determined.

Further details on quality assurance/quality control (QA/QC) requirements of monitoring are discussed in the EPA Guidelines—Regulatory monitoring and testing: Monitoring plan requirements (EPA 2006a), as well as in sampling guidelines.

3.7 Discussion and interpretation of results

The licensee must review the results of their monitoring and interpret and discuss them. In particular, the licensee must review data against monitoring objectives, assessment criteria and trends. When monitoring groundwater, determining the direction of groundwater flow is critical to interpreting results.

Anomalous results

Anomalous results must be discussed. An anomalous result may be an accurate reflection of the parameter being tested (e.g. if failure of plant or spill occurred) or it may be due to a failure in the sampling and QA/QC process. The likely cause of an anomalous result and factors leading to that conclusion should be presented.

Monitoring objectives

The results must be assessed against the monitoring objective. Examples of types of monitoring objectives and the expected assessment are provided in Table 3.

Table 3 Examples of assessments against monitoring objectives

Objective		Assessment
To determine whether the emission of ammonia from the site complies with the load limit set in the licence	⇒	A statement as to whether the load complies with the limit, including the basis for this statement (e.g. load calculations, assumptions and result)
To determine whether the wastewater in the lagoon is leaching into groundwater	⇒	A statement as to whether the licensee believes that leaching is occurring and why (e.g. properties of waste within the lagoon compared with results of groundwater analyses)
To determine if the discharge of wastewater is affecting the aquatic ecosystem values of creek X	⇒	A statement as to whether wastewater is affecting the stated ecosystem values, to what degree and why (e.g. quality of wastewater, volume of wastewater compared with creek flow and information on the aquatic ecosystem values of the creek)

Assessment criteria

Assessment criteria may be written directly into the authorisation, or the authorisation may refer to other documents such as Environment Protection Policies. The criteria may be a set value (eg lead to be less than 10mg) or comparative (eg nitrogen concentrations in downstream bore to be not greater than 110% of concentrations in upstream bore).

Licensees must take extreme care to ensure that the results are in the same format as the assessment criteria, eg the same units and same statistic type (eg maximum and median).

Results that fall outside the assessment criteria must be discussed, including:

- likely cause of non-compliance
- actual or potential effect of non-compliance
- risk of further non-compliance.

Trends

If trends are evident in the results, their causes and implications must be discussed.

3.8 Conclusions and proposed actions

The regulatory monitoring report must have clear conclusions and proposed actions. This must include conclusions about:

- whether the monitoring objective was met
- whether compliance was achieved against the assessment criteria
- if, and to what extent, the emission or discharge caused environmental harm.

If a conclusion cannot be drawn as to whether the monitoring objective has been met, the monitoring plan must be assessed and changes to it proposed so that this difficulty is removed.

Where there is continuing and/or major non-compliance, the licensee must inform the EPA about what they propose to do to address this issue. The proposed actions will form the basis of discussions with the EPA on future conditions and/or compliance and enforcement methods.

Proposed actions will depend on the non-compliance, but may include changes to the monitoring plan, further investigation, development of new procedures, staff training, changes to industrial processes to minimise or eliminate pollutant discharges and/or development of an Environment Improvement Program.

3.9 Other requirements

For large monitoring reports with multiple objectives and/or locations and analytes, an executive summary should be considered. It should state the monitoring plan objectives and summarise major non-compliances, conclusions and recommendations.

If groundwater is monitored and independent verification is not required, all field datasheets showing time, location, sampler, depth of collection and field chemical parameters should be attached.

3.10 Independent verification

It may be necessary to obtain an independent assessment of how the monitoring was executed. This will be clearly stated as a condition of the authorisation or order. The independent verification shall be submitted with the monitoring report unless otherwise stated. Requirements for verification, including reporting requirements, are outlined in the *EPA Guidelines—Regulatory monitoring and testing: Independent verification of monitoring* (EPA 2006b).

4 The reporting process

4.1 Preparation of reports

The licensee is responsible for ensuring that the report is prepared and submitted to the EPA. A consultant or third party, including a verifier, can prepare the monitoring report. The verifier, however, must be independent of the development of the monitoring plan and execution of the monitoring.

The licensee should ensure that they review and understand a monitoring report before it is submitted to the EPA. The responsibility for ensuring that the monitoring report meets the EPA's requirements, and that all information contained in it (including results, discussion and conclusions) is true and accurate, rests with the licensee.

4.2 Submission of reports

The date for submission of the report is set as a condition of the licence.

Reports should be submitted electronically to the licence co-ordinator[3] or by hard copy to:

Environment Protection Authority
GPO Box 2607
Adelaide SA 5001

Attn: <*Name of licence co-ordinator*>

The certification can be submitted by hard copy (mail or fax) or electronically. If the certification is submitted electronically the signature of the authorisation holder should be scanned in.

The EPA has a web-based electronic reporting of data (ELMO) system. Entering data into ELMO does not exempt a licensee from the requirements of this guideline. A monitoring report must be submitted that addresses the requirements of this guideline, such as evaluation of monitoring results, discussion and conclusions.

4.3 What happens when a monitoring report is lodged?

The EPA will assess the report to determine:

- whether the report meets the requirements of licence and this guideline
- whether any action is needed with regard to the environmental risk being assessed.

If the report is not acceptable to the EPA, the licensee will be required to submit an amended report that addresses the EPA's concerns. Where the report highlights areas of concern such as increased environmental risk or possible environmental harm, the licence coordinator will determine an appropriate course of action.

5 Glossary

Assessment criteria	Criteria specified within the licence that the monitoring results are to be assessed against. In many cases the assessment criteria will be the compliance criteria such as discharge or emission limits
Authorisation	A licence, exemption or works approval as defined under the *Environment Protection Act 1993*

[3] The name of your licence co-ordinator is printed at the bottom of the licence

EPA sampling guidelines	Guidelines or manuals prepared by the EPA that state the minimum standards for sampling for regulatory monitoring and testing, including sampling methods, quality control, transportation and preservation techniques. The EPA is currently developing regulatory monitoring and testing guidelines on groundwater sampling, and water and wastewater sampling for publication in 2007
IVR	Independent verification report**.** A document prepared by an independent party on the procedures, processes and results of regulatory monitoring and testing
Licensee	The term 'licensee' is used throughout this guideline as a licence is the most common authorisation, or order, that may specify monitoring. Where 'licensee' is used, it should be understood to mean the person responsible under authorisation or order of the EP Act.
Monitoring plan	A document produced as a condition of authorisation or order. It details the actions, responsibilities and timeframes for monitoring. Legal responsibility for the development and submission of the monitoring plan rests with the licensee. The plan must be accepted by the EPA
Regulatory monitoring and testing (RMT)	Collection of monitoring data as a condition of an authorisation or order to enable an environmental risk to be assessed, or to assess the effectiveness of risk controls and management within the scope of the EP Act

6 References and related reading

Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand 2000, *Australian guidelines for water quality monitoring and reporting*, National Water Quality Management Strategy No. 7, ANZECC & ARMCANZ, Canberra.

South Australian Environment Protection Authority 1995, *Emission testing methodology for air pollution manual*, EPA, Adelaide.

——2006a, *EPA Guidelines—Regulatory monitoring and testing: Monitoring plan requirements*, EPA, Adelaide.

——2006b, *EPA Guidelines—Regulatory monitoring and testing: Independent verification requirements*, EPA, Adelaide.

Disclaimer

Further information

Legislation

Online legislation is freely available. Copies of legislation are available for purchase from:

Service SA Government Legislation Outlet
Adelaide Service SA Centre
108 North Terrace
Adelaide SA 5000

Telephone: 13 23 24
Facsimile: (08) 8204 1909
Website: shop.service.sa.gov.au
Email: ServiceSAcustomerservice@sa.gov.au

General information

Environment Protection Authority
GPO Box 2607
Adelaide SA 5001

Telephone: (08) 8204 2004
Facsimile: (08) 8124 4670
Freecall: 1800 623 445 (country)
Website: www.epa.sa.gov.au
Email: epainfo@epa.sa.gov.au

Appendix

CERTIFICATION OF MONITORING REPORT

FOR ENVIRONMENT PROTECTION AUTHORITY

Authorisation Number:

Report name and date or version no:

Reporting period:

I certify that I have reviewed these reports and to the best of my knowledge and ability all the information provided in these reports is a true and accurate reflection of the regulatory monitoring and testing undertaken as a condition of authorisation.

Name:

Position and Company Name:

Signature:

Date:

Note: Providing false and misleading information is an offence under section 119 of the *Environment Protection Act, 1993.*