Marine Environment Temperature Elevation Management Plan (METEMP)

NewGen Power Kwinana Pty Ltd

Department: Health, Safety and Environment

NPK-HSE-PLN-005

Document History

Date	Document Number	Amended Section	Author	Approved By	Board Approval
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Contents

1. Purpose

In November 2005, the NewGen Kwinana Gas-Fired Power Station received environmental approval with the issuing of Ministerial Statement 698 which contained approval to construct and operate a natural gas-fired power station on a site adjacent to Cockburn Sound on the western edge of the Kwinana Industrial Area.

This Marine Environment Temperature Elevation Management Plan (METEMP) addresses the issue of elevated marine temperature around the cooling water outflow diffuser from the power station in accordance with the following conditions contained in Ministerial Statement 698:

6-7 The proponent shall measure temperature in accordance with the Manual of Standard Operating Procedures 2005 which supports the State Environmental (Cockburn Sound) Policy 2005, and its updates, unless otherwise agreed in writing by the Environmental Protection Authority.

6-8 Prior to disturbance of the marine environment, the proponent shall prepare a Marine Environment Temperature Elevation Management Plan to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

Note 3: In preparation of advice to the Minister for the Environment, the Environmental Protection Authority expects that advice of the following agencies will be obtained:

- the Water Corporation;
- Cockburn Sound Management Council; and
- Western Power.

6.9 The proponent shall not allow thermal discharges from the diffuser other than in accordance with the Marine Environment Temperature Elevation Management Plan required by condition 6-8.

The objectives of this Plan are:

- to specify and ensure that upper limits of instantaneous and daily average cooling water effluent temperature are not exceeded;
- to ensure that the near-field mixing performance of the cooling water outflow diffuser is as predicted (pursuant to condition 6-1); and
- that the thermal discharge from the diffuser meets the objective of the *State Environment (Cockburn Sound) Policy 2005* and its updates.

This Plan shall address:

1. specific measures to monitor:
    a. cooling water effluent temperature;
    b. mixing performance of the diffuser to the edge of the near-filed mixing zone; and
    c. The temperature elevation filed in Cockburn Sound.

Note 4: The monitoring plan shall be in accordance with the Manual of Standard Operating Procedures 2005 which supports the State Environmental (Cockburn Sound) Policy 2005, and its updates.

Contingency plans to address exceedances of the Environmental Quality Guidelines specified in the *Environmental Quality Criteria Reference Document for Cockburn Sound (2003-2004)* and its updates.

Note 5: The contingency plans shall outline specific management actions to be taken in the event of an exceedance of the Environmental Quality Guidelines, including an investigation against the temperature Environmental Quality Standards included in the Environmental Quality Criteria Reference Document for Cockburn Sound (2003-2004) and its updates.

Note 6: The contingency plans shall outline management actions to be taken in the event of an exceedance of the Environmental Quality Standard.

2. Current Status

2.1 Project description

The power station supplies base load power into the South West Interconnected Network with a nominal generation capacity of 335 MW.

Approximately 430 ML/day of seawater, sourced from Cockburn Sound is used for non-contact cooling of steam condensate in the condenser. This is a once-through system with the seawater returned to Cockburn Sound via an ocean outfall pipeline and diffuser array.

2.2 Existing marine temperatures

Ambient surface water temperatures in Cockburn Sound measured between August 2021 and August 2022 are plotted in Figure 1. Water temperatures in Cockburn Sound showed a typical seasonal pattern with temperatures decreasing from a maximum of ~27.5°C at the end of summer to ~14.6°C mid-winter. Surface and bottom water temperatures were similar over time, with most sites reflecting near identical trends in temperature 'peaks' and 'troughs' (BMT,2022).

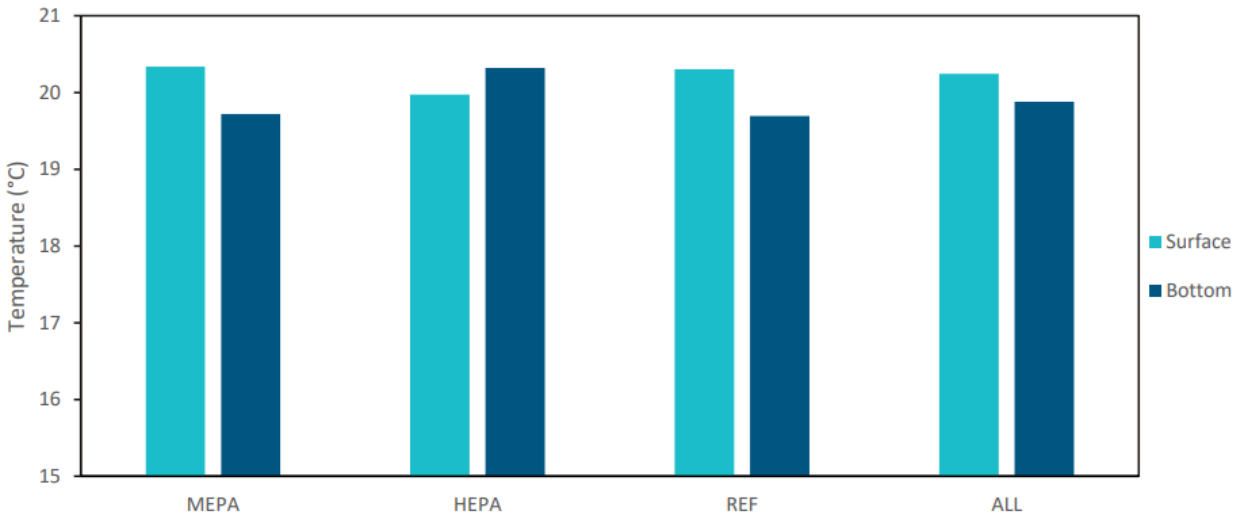

Figure 1: Mean surface and bottom water temperatures measured during the 2021-22

Keesing et al. (2016) determined there has been an increase in surface and bottom water temperatures with an increase in surface water between 1985 and 2014 of 0.0325 ± 0.016˚C per year. Similar rates of change are also reported elsewhere off the coastline of Western Australia and are attributed to global climate change (Keesing et al. 2016).

3. Potential Impacts

Cooling water re-enters Cockburn Sound at a temperature higher than at intake. This temperature elevation could adversely affect the environment and industrial users if not managed adequately.

4. Environmental Objectives

The cooling water intake and outfall is within the marine area covered by the State Environmental (Cockburn Sound) Policy 2015 (SEP) (Government of Western Australia 2015).

The Minister for the Environment first released the SEP in 2005 to declare, protect and maintain the environmental values of Cockburn Sound. Since it was established, the framework has resulted in significant improvements in the environmental and social values of the Cockburn Sound. The environmental values for Cockburn Sound are summarised in Table 1.

Table 1 Environmental values and objectives for Cockburn Sound

Environmental values	Environmental quality objectives[1]
Ecosystem health	Maintenance of ecosystem integrity in terms of structure (e.g. biodiversity, biomass and abundance of biota) and function (e.g. food chains and nutrient cycles).
Fishing and aquaculture	Maintenance of seafood safe for human consumption, such that seafood is safe for human consumption when collected or grown and maintenance of aquaculture, such that water is of a suitable quality for aquaculture purposes.
Recreation and aesthetics	Maintenance of primary contact recreation values, such that primary contact recreation (e.g. swimming) is safe. Maintenance of secondary contact recreation values, such that secondary contact recreation (e.g. boating) is safe. Maintenance of aesthetic values, such that the aesthetic values are protected.
Cultural and spiritual values	Maintenance of indigenous cultural and spiritual values, such that the cultural and spiritual values of the local indigenous community are protected.
Industrial water supply	Maintenance of water quality for industrial use, such that water is of suitable quality for industrial uses.

Environmental quality criteria (EQC) for Cockburn Sound are established in the Environmental Quality Criteria Reference Document for Cockburn Sound (Environmental Protection Authority 2015). The EQC and Reference Document may be amended by the EPA following public consultation from time to time. The EQC and guidance notes) have been developed and provide guidance for measuring success in achieving environmental quality objectives as set in the SEP (EPA 2015).

The Cockburn Sound EQC framework has been developed to be consistent with the recommended approaches in ANZECC & ARMCANZ (2000). As such, two main types of EQC have been developed as follows:

Environmental Quality Guidelines (EQG): threshold numerical values or narrative statements which if met indicate there is a high degree of certainty that the associated environmental quality objective has been achieved. If the guideline is not met, there is uncertainty as to whether the associated EQO has been achieved. A more detailed assessment against the EQS is triggered. The suggested detailed assessment is recommended to be risk based and investigative in nature (EPA. 2017).

Environmental Quality Standards (EQS): threshold numerical values or narrative statements that indicate a level beyond which there is a significant risk that the associated environmental quality objective has not been achieved. In this event, a management response is triggered. The response would typically focus on identifying the cause (or source) of the exceedance and then reducing loads

[1] *The environmental quality objectives for fishing and aquaculture, recreation and aesthetics, cultural and spiritual, and industry water supply apply to High, Moderate and Low ecological protection areas.*

of the contaminant of concern (i.e. source control). This may also require in situ remedial work to be undertaken (EPA, 2017).

The NewGen outfall diffuser is within an area designated by the SEP as a Low Ecological Protection Area (LEPA). The area surrounding the LEPA is an area of moderate ecological protection. The EQC for moderate protection is therefore required to be met at the boundary of the LEPA (see Figure 1). The EQS and EQG for temperature for areas of moderate and high ecological protection are listed in the EQC reference document (EPA 2015) for Cockburn Sound and are shown in Table 2.

Table 2 Environmental Quality Standard and Guideline for Temperature for Moderate Protection

Environmental Quality Guideline	Environmental Quality Standard
Moderate Protection	
Median temperature at an individual site over any season, measured according to SOP, not to exceed the 95th percentile of the natural temperature range measured at a suitable reference site for the same season[2].	• No persistent (i.e. ≥4 weeks) and significant change beyond natural variation in any ecological or biological indicators that are affected by water temperature unless that change can be demonstrably linked to a factor other than water temperature. • No deaths of marine organisms resulting from anthropogenically-sourced thermal stress.
High Protection	
Median temperature at an individual site over any season, measured according to SOP, not to exceed the 80th percentile measured at a suitable reference site for the same season.	• No significant change beyond natural variation in any ecological or biological indicators that are affected by water temperature unless that change can be demonstrably linked to a factor other than water temperature. • No deaths of marine organisms resulting from anthropogenically-sourced thermal stress.
Notes	
SOP – Standard Operating Procedure as provided in the Manual of Standard Operating Procedures for Cockburn Sound (EPA 2005). Or – means either one of the two alternative can be used. The choice will generally depend on the availability of quality reference site data.	Anthropogenically – of human origin (i.e. industry)

The EQC reference document also contains a set of numerical default trigger values which are used to measure the significance of temperature change before establishment of suitable reference sites and environmental and guidance notes relating to temperature measurements (Environmental Quality Criteria Reference Document for Cockburn Sound, Environmental Protection Authority 2015).

5. Performance Indicators/Criteria

5.1 Outflow temperature

Ministerial Condition 6-9 requires that upper limits of instantaneous and daily average cooling water temperature elevation above ambient are specified.

The maximum upper limit for instantaneous cooling water temperature elevation is specified at 27.1˚C whilst the maximum daily average cooling water temperature elevation is specified at 14.1 ˚C. These temperature values represent the highest discharge values given abnormal operating conditions, such as the unusual event that one cooling water pump goes out of operation.

During normal operation, the maximum upper target for instantaneous cooling water temperature elevation is specified at 13.1 ˚C, whilst the maximum upper target for daily average cooling water temperature elevation is specified at 9.5 ˚C.

Triggers and reporting mechanisms for temperature exceedances are provided in Section 7.2.

5.2 Diffuser performance

The diffuser has been designed to achieve sufficient dilution for a temperature elevation of 1.5˚C over background at the edge of its mixing zone in the worst case (highest heat load, lowest current) conditions. The mixing zone is targeted to extend 50m either side of the diffusers. Monitoring results have been compared to this performance level (Refer also to Section 7.2).

5.3 Temperature elevations

The environmental quality criteria (EQC) for temperature are specified in the SEP and are listed in Section 4. The cooling water outflow pipeline and diffuser array have been designed and modelled to meet:

- The EQGs for a moderate level of protection for seasonal temperature elevation at the edge of the LEPA;
- The EQC for a high level of protection for seasonal temperature elevation at the outer edge of the MEPA.

The EQS for temperature for both Moderate and High Ecological Protection Areas require that, if the EQs are exceeded, then monitoring is implemented that:

High Ecological Protection Area:
Assesses whether there is any significant change beyond natural variation in any ecological or biological indicators (i.e. other than temperature) that are affected by water temperature unless that change can be demonstrably linked to a factor other than water temperature.

Moderate Ecological Protection Area:
Assesses whether there this any persistent (i.e. ≥ 4 weeks) and significant change beyond natural variation in any ecological or biological indicators (i.e. other than temperature) that are affected by water temperature unless that change can be demonstrably linked to a factor other than water temperature.

Monitoring of the mixing zone from 2008-2014 confirmed that the EQC were being met at all times. Seasonal marine temperature monitoring therefore ceased in 2014. In August 2021, seasonal marine temperature monitoring was temporarily reinstated with results demonstrating that the EQC were met at all times. Subsequently, seasonal marine monitoring ceased in 2022.

It is important to note that the EQC define the limits of acceptable change to environmental quality. They do not represent pollution levels that trigger enforcement action if exceeded. Nor do they infer it is acceptable to load up the ecosystem to these levels – waste avoidance/minimisation strategies should always be adopted and reinforced.

6. Implementation

6.1 Design/construct

The NewGen Power cooling water outflow pipeline and diffuser array has been designed to meet the requirements of the environmental quality guidelines for temperature elevation in the SEP. The SEP designates a low ecological protection area (LEPA) in the waters of Cockburn Sound adjacent to the NewGen Power site. There are other outflows into the LEPA that have been considered in the design of the pipeline and diffuser.

Details of the location and design of the pipeline and diffuser and the hydrodynamic modelling of the diffuser thermal outflows are the subject of a separate environmental management plan (Final Diffuser Location and Design Management Plan, NewGen Power 2006) which should be consulted for more detailed information.

Ocean intake is from the expanded pumping basin facility at Verve Energy's Kwinana power station.

The following outflow characteristics for flow rates and temperature elevations were used as inputs into the hydrodynamic modelling of outflows either in operation or previously approved by the EPA (WorleyParsons 2006a):

- Synergy (formally Verve Energy) Kwinana Power Station Unit A/B and Unit C and Cockburn 1 – combined daily and seasonally variable flow rate of between 5 m^3/s and 29.36 m^3/s with a daily and seasonally variable elevation of between 7.2˚C and 11.25˚C.
- Water Corporation Perth Seawater Desalination Plant - constant flow rate 2.483 m^3/s with constant elevation of 1˚C.
- Synergy Cockburn 2 gas fired power station – constant flow rate of 5.1 m^3/s with constant elevation of 9˚C.
- BP refinery – constant total flow rate of 5.4 m^3/s with constant elevation of 13.83 ˚C.
- NewGen Power gas fired power station – constant flow rate 5 m^3/s with seasonally and daily variable overheat of between 5˚C and 13.1˚C.

The NewGen Power diffuser has been designed to avoid overlap between the near-field mixing zone and other existing or approved near-field mixing zones or intakes. This includes the diffuser and intake for Water Corporation's Perth Seawater Desalination Plant, Synergy's Cockburn 2 diffuser (approved but not constructed) and the existing intakes and outflow canals for Synergy's Kwinana and Cockburn Power Stations.

The NewGen Power diffuser design consists of 21 ports at 5m spacing along the 100m end section of the pipeline.

These diffusers and intakes are illustrated in Figure 2.

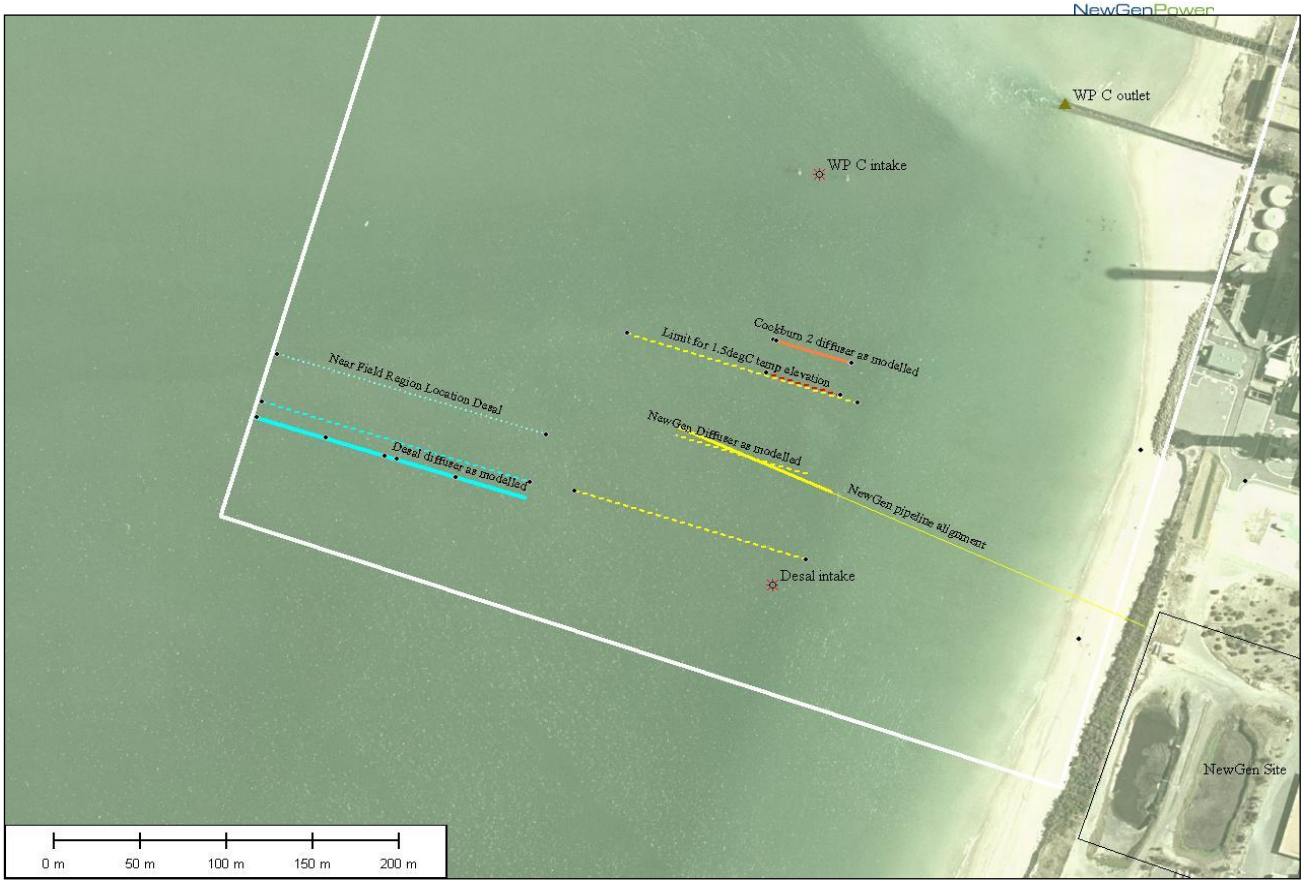

Figure 2 Location of other diffusers (solid lines) and intakes (black circles) adjacent to NewGen Power diffuser (yellow). White line is the boundary of the LEPA, mixing zones indicated by dashed lines

6.2 Operation

The maximum instantaneous temperature increase for NewGen Power's cooling water output of 5m^3/s is expected to be 13.1˚C during normal operations. This temperature increase occurs when the plant is running at full generation capacity which requires maximum supplementary duct firing in the Heat Recovery Steam Generator (HRSG) as well is maximum output from the combined cycle gas turbine (CCGT).

Whilst the plant is in continuous operation and therefore scheduled to operate consistently, excluding planned maintenance, it will not run at full generation capacity continuously but will have a varying load that reflects the demand and operational requirements of the SWIS. The temperature elevation of the cooling water will vary according to the generation output and is expected to vary regularly between 5˚C and 13˚C for the instantaneous temperature increase .

Routine preventative maintenance of the outflow pipeline and diffuser array will be undertaken in accordance with the design engineering and manufacturer's operation and maintenance recommendations and to minimize any potential loss of performance. Maintenance of the pipeline and diffusers will not involve excessive temperatures or the use of marine contaminants.

6.3 Roles and responsibilities

CEO

- Ensure review of compliance with this METEMP (conducted as required).
- Ensure all licences and permits are obtained and maintained.
- Ensure all obligations and commitments are communicated and actioned.
- Maintain effective relationships with stakeholders including regulatory authorities and Cockburn Sound Management Council.

Station Manager

- Ensure contract documentation specifies the responsibilities of contractors in regard to the requirements of this METEMP.
- Assist with review of compliance with this METEMP.
- Assist with meeting environmental monitoring and reporting requirements.
- Responsible for compliance with legislative requirements.
- Ensure effective communication with Team Leaders.
- Liaison with stakeholders, regulatory authorities and Cockburn Sound Management Council as required.

Engineering Manager, and Production Manager

- Ensure staff and contractors are familiar with requirements of this METEMP.
- Responsible for compliance with the administering authority.
- Responsible for the development of appropriate work procedures and ensuring that staff are trained in their use.
- Ensure staff are trained to competently conduct tasks required by this METEMP, appropriate licences and other legal requirements.
- Ensure instances of breach or potential breach of any legislation or licence conditions are identified, reported and actioned as required by regulation or the Site Access Agreement with Synergy.
- Ensure potential environmental hazards are identified and reported.
- Ensure ongoing effective communication with staff and contractors.

Engineering Team, and Operations & Maintenance Team

- Every NewGen staff member has a general environmental duty that will be undertaken through appropriate training, work practices and event reporting.
- It is the responsibility of every NewGen Power Kwinana staff member to report instances of breach or potential breach of any legislation or licence conditions.
- Comply with directions and procedures required by this METEMP.
- Ensure that contractors and other persons working at NewGen sites undertake works in accordance with this METEMP.

Contractors

- Shall comply with this METEMP as if they were NewGen staff members.

7. Monitoring

7.1 Temperature limits

Cooling water outflow temperatures will be monitored in-line on a continuous basis at the outflow from the condenser as part of the Distributed Control System (DCS). Cooling water discharge pump operational status is monitored on a continuous basis and recorded.

Monitoring and recording of the cooling water outflow will be compared to the specified upper limits for instantaneous and daily average cooling water outflow temperatures used in the pipeline and diffuser design studies and as provided in Section 5.1.

7.2 Reporting of temperature exceedances

An exceedance of the abnormal maximum daily average cooling water temperature limit (14.1 ˚C) and/or upper limit for instantaneous cooling water temperature elevation (27.1˚C) will be considered an **external** reporting incident and will be reported within 24 hours to the regulator. Such events shall trigger investigations of cause and implementation of remedial strategies as deemed appropriate. The number and duration of these events and an explanation of the causes and remedial strategies implemented shall also be included in the annual report to the DWER.

The following mechanisms will be established to identify actual and apparent temperature limit non-conformance(s) (exceedance(s)) and internal events:

Table 3 Trigger Action Response

Trigger	Action	Response
An external regulatory non-compliance is triggered if: In-line temperature sensors show that the cooling water temperature increase above ambient exceeds the upper limit for instantaneous cooling water temperature elevation of 27.1 ˚C or the increase above ambient averaged over a calendar day exceeds 14.1 ˚C.	Notify DWER of exceedance within one business day of the event and of the operating conditions along with exceptional circumstances (if applicable) and actions taken.	Initiate investigation of cause and implement remedial strategies as appropriate. Report number and duration of event(s) with explanation of cause and remedial strategies in AER to DWER.
In line temperature sensor malfunction.	Notify the DWER within 24 hours of the malfunction becoming apparent.	Initiate investigation to determine cause of malfunction. Provide DWER with estimated time for repair and projected temperature elevations during the period repair is required. Provide DWER with perceived potential impact if exceedance of external temperature limits are triggered.
An internal event is triggered if the maximum daily average cooling water temperature under normal conditions exceeds 9.5 ˚C but is less than 14.1 ˚C and/or if the instantaneous cooling water temperature exceeds 13.1 ˚C but is less than 27.1 ˚C.	Record occurrence as soon as made aware of temperature exceedance.	Determine the of cause of occurrence and implement remedial strategies if appropriate. Report number and duration of event(s) with explanation of cause and remedial strategies if appropriate in AER to DWER.

7.3 Diffuser performance

The dilution performance of the cooling water outflow diffuser was assessed after construction of the pipeline. For the first 5 years of operation, dilution performance of the cooling water outflow diffuser was measured annually. The results were compared against the predicted near-field mixing performance of the diffuser. All models showed the diffuser performance to be better than design. As such diffuser modelling is now required to be completed every 5 years.

The performance has been predicted by fine scale hydrodynamic modelling and is reported in a separate management plan (NewGen Power 2006). The sampling dates and times have been and will continue to be selected to be conducted under relatively constant cooling water heat loads and during a period of northerly flowing current that furthermore occurs after several days of consistent northerly flowing currents in the region. This is to avoid any potential confounding effects of temperature signatures caused by outflow from Synergy's existing cooling water discharge.

Surface drogues have been deployed during sampling events to determine the direction and speed of the prevailing current. The information on current speed and direction, together with cooling water discharge characteristics and the ambient salinity and, temperature conditions measured at the reference sites (see below), will be used as the input information for the initial dilution model (CORMIX). CORMIX will be used to predict the degree of dilution at distances of 25m and 50m from the edge of the diffuser, and the dilutions will, in turn, have been used to predict the expected temperature elevations at these locations.

CTD (conductivity, temperature and depth) profiling has been undertaken in the field to compare the recorded temperatures with those predicted by the CORMIX model. The temperature depth profiles of the water column have been measured using a CTD probe in accordance with the Manual of Standard Operating Procedures for Cockburn Sound (EPA 2005). Monitoring has been undertaken at fixed sites based on a 25 m grid that is centred on each end (0 m and 100 m) and the midpoint of the diffuser (50 m). CTD profiles have been taken at the 3 sites along the diffuser, then at distances of 25 m and 50 m (Figure 2). CTD profiles have been recorded at two locations 200 m south of the diffuser. The results from the CTD monitoring and the water temperatures predicted from modelling will be used to assess and compare the actual versus the modelled performance of the diffuser. The results are reported to the Office of the Environmental Protection Authority (OEPA).

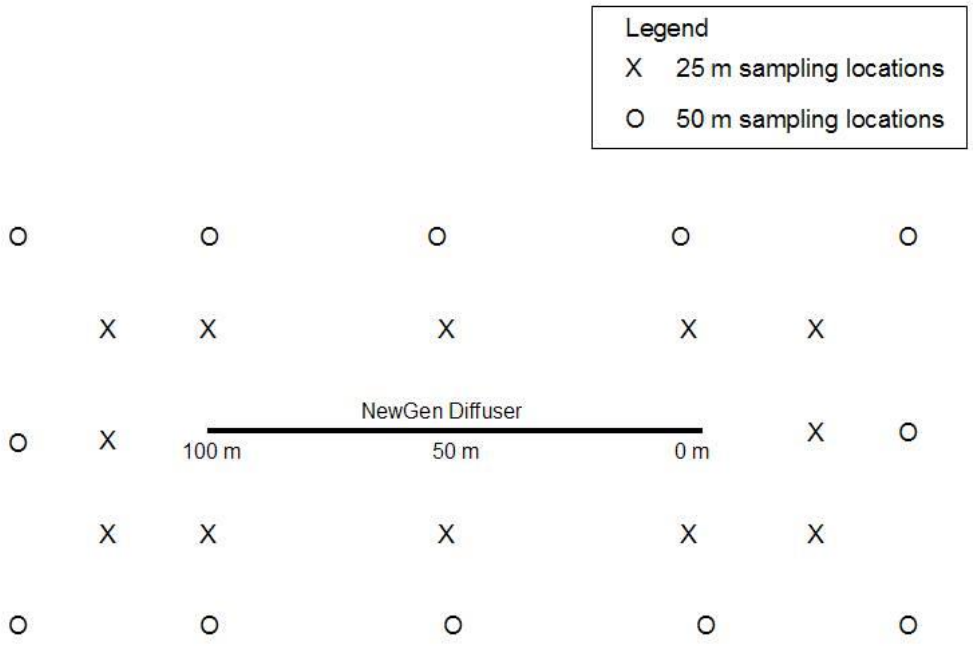

Figure 3 NewGen Diffuser Performance Monitoring Schematic

7.4 Temperature elevations

In addition to the monitoring of diffuser performance during the commissioning of the station, seasonal water quality monitoring (i.e. water temperature) was undertaken for the first 5 years of operation of the plant and compared to criteria of the then current State Environmental (Cockburn Sound) Policy 2005 (Government of Western Australia 2005). At all times NewGen was found to be compliant. As such seasonal water quality monitoring was no longer required, provided the temperature elevation limits of the main cooling water outfall remained in place as per (then) item 5.1 of the METEMP. A summary of the seasonal monitoring is provided below.

Temperature profiles were measured at three sites near the boundary of the low and moderate ecological protection area (sites A, B and C), two sites near the boundary of the moderate and high ecological protection areas (sites D and E) and at two reference sites: Cockburn Sound summer water quality monitoring site CS7 and Jervoise Bay Northern Harbour monitoring site NH5 in the northern end of Cockburn Sound (refer Figure 4). The reference sites were unaffected by thermal discharges and yet in similar waters as the NewGen diffuser. Over ten years of water quality monitoring data for this region have shown no sign of any measurable thermal pollution from the Western Power cooling water outfalls at these sites (e.g. Figure 4, and Oceanica 2006a). These waters are open and are some of the least sheltered in Cockburn Sound. As such, the waters over the shallower (approximately 8 to 10 m deep) eastern margin they are generally well mixed and are on the same sill and have similar depths to the NewGen diffuser area.

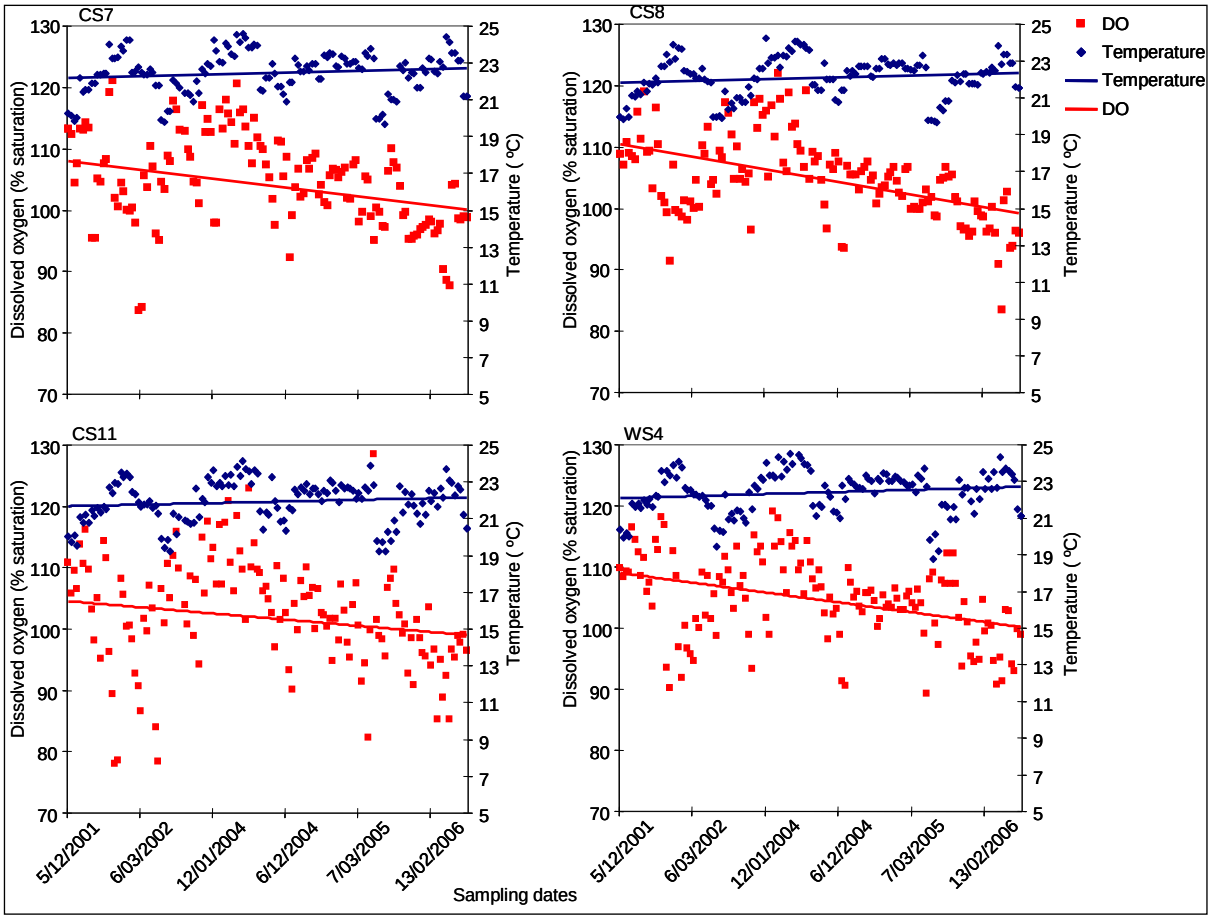

Figure 4 CS7 compared with other summer monitoring sites, it can be seen that there is no evidence of elevated temperatures at CS7 (data supplied by MAFRL; refer Wilson & Paling 2006).

Monitoring on the boundary of the low ecological protection area consisted of temperature profiles at the points on the northern, western and southern boundaries closest to the midpoint of the NewGen diffuser.

Temperature monitoring near the boundary of the moderate ecological protection zone was at two locations on the eastern shelf of Cockburn Sound, located west and north of the modelled outlet. The reference sites were Cockburn Sound summer water quality monitoring site CS7 and Jervoise Bay Northern Harbour monitoring site NH5 at a similar depth and distance from shore as the NewGen diffuser.

Temperature profiles were measured in accordance with the Manual of Standard Operating Procedures for Cockburn Sound (EPA 2005) and Guidance Note E from Table 1 (a) of the then current EQC Reference document (EPA, 2005a).

The CSMC was informed of the METEMP monitoring program, supplied with monitoring data, and informed of any exceedences of the water temperature EQG or EQS.

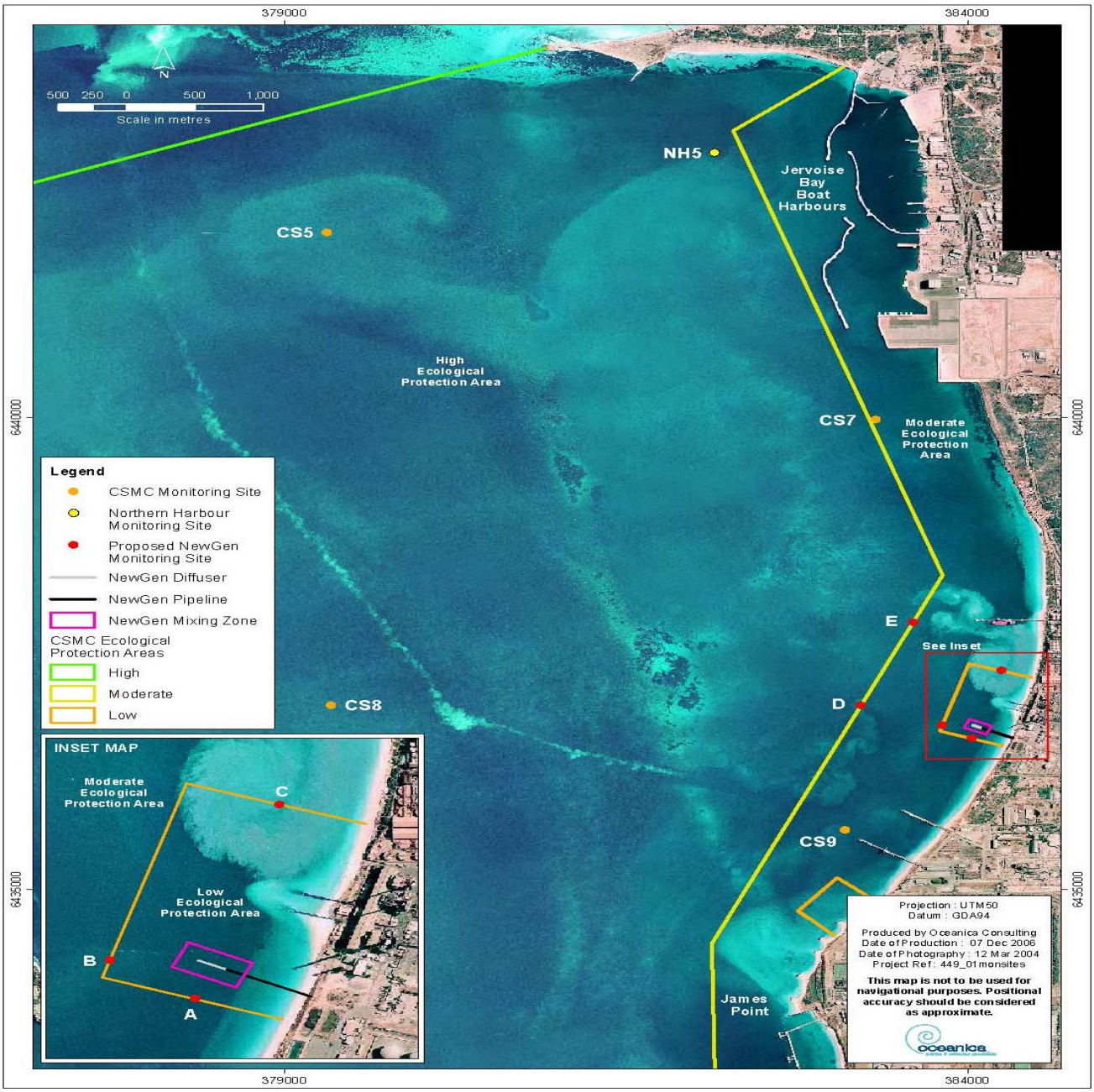

Figure 5 Temperature elevation monitoring sites

Seasonal water quality monitoring (i.e. water temperature) was temporarily reinstated between August 2021 and August 2022. The location and specification of the water temperature loggers changed sligtly throughout the monitoring period due to technical issues, damage, human

interference and failure to re-locate the logger moorings, nevertheless, the logger locations (Figure 6 and Figure 6 Temperature elevation monitoring sites (2021-2022)

Table 4) did not differ materially from the original sites and each of the new positions were located at the edge of the appropriate Ecological Protection Areas providing adequate capacity to demonstrate compliance with the METEMP and its requirements.

Figure 6 Temperature elevation monitoring sites (2021-2022)

Table 4 Water temperature monitoring site coordinates for the 2021–22 monitoring period

Zone	Site	Coordinates (UTM50, GDA94)	
		Easting	Northing
MEPA	A	384026.6	6436593
	B	383809.9	6436732
	C	384245.5	6437318
HEPA	D	383226.8	6436897
	E	383449.5	6437582
Reference	1	383069.3	6439712
	2	384026.6	6436593

Surface water temperature data for the 2021/22 period were similar to previous monitoring periods. Median surface water temperatures at all MEPA and HEPA monitoring sites were below the 80th and 95th percentiles of reference site water temperatures for all seasons. As a result, both EQG criteria for the 2021/22 reporting period were met and there was no requirement to undertake further assessment against the EQS. In meeting the EQG, there is a high degree of certainty that the associated EQO has been achieved (as per EPA 2005a).

7.5 Complaints

A complaints procedure has been established to receive complaints from the community associated with cooling water outflows from the power station. The following information about each complaint shall be recorded:

- Name of complainant (anonymous if preferred).
- Address/general location of complainant when incident occurred.
- Nature of incident (e.g. foam near outlet, odour).
- Detailed description of incident (e.g. if odour, what did the odour smell like?).
- Date/time.
    - When complaint logged.

When incident occurred.

The power station operator shall investigate all complaints and, where the power station is likely to be the cause of the incident, the operator shall take actions to identify the cause and implement measures to mitigate the risk of the incident recurring.

The operator shall record the following information in response to a complaint:

- Details of the activities undertaken at the time of the incident (e.g. normal operations at X% capacity, duct firing on/off, fuel burn data).
- Details of the nature of any abnormal activities or operational conditions.
- Results of on-site observations and investigations made to investigate the incident.
- Results of on-site observations of cooling water temperature, flow rate and weather conditions.
- Details of actions taken on-site, if any required, to alter activities to alleviate or mitigate the effects of the incident.
- Operator's conclusion as to the cause of the incident:
    - Is the incident likely to be due to on-site activities?
    - If the incident is likely to be due to on-site activities, detail the specific activities responsible and mitigation measures that will be implemented to reduce the risk of the incident recurring.
- Steps taken to notify complainant of the outcomes of the operator's investigations.

8. Stakeholder consultation

To satisfy Condition 6-8 of Ministerial Statement 0698 – Note 3, NewGen Power sought comments on the METEMP prior to disturbance of the marine environment from Synergy (formally Verve Energy), Water Corporation and the Cockburn Sound Management Council. The comments and advice provided were considered by NewGen and incorporated into the METEMP. Stakeholder responses were contained in the previous iteration of the approved METEMP (Rev 5) and are available under request.

The METEMP has been made publically available and is posted on the NewGen Power Website: http://newgenpowerkwinana.com.au/

NewGen Power will respond directly to all comments received from stakeholders on the current approved version of the METEMP.

9. Auditing

Internal audits will be conducted to assess compliance with this METEMP.

10. Review and revision

Review of this METEMP will be undertaken on an annual basis and updated where necessary or:

- following significant environmental incidents
- when there is a need to improve performance in an area of environmental impact

11. Reporting

11.1 Annual report

An annual report will be prepared within twelve months of completion of the first year of operation and annually thereafter, that:

- Summarises compliance with the METEMP commitments.
- Provides details of any incidents of non-compliance.
- Summarises marine temperature monitoring data collected as part of this METEMP.
- Summarises complaints.
- Summarises outcomes of auditing.

The report will be prepared in accordance with the Department of Environment Regulation guidelines for performance and compliance reporting.

11.2 Record keeping

The following records are to be kept on site and made available to an EPA representative on request.

- Cooling water monitoring reports and data;
- All environmental complaints – maintain complaints register;
- External reporting to EPA, including annual reports; and Daily checklists.

12. Key Management Actions Table

Table 5: Key Management Actions

Ref #	Timing/Phase	Key Management Action	EPA Reporting/Evidence	Status
METEMP1	During commissioning	Monitor diffuser performance against model prediction	Result submitted to EPA in post-commissioning compliance report	CLD
METEMP2	Post commissioning	Monitor seasonal temperatures as described in S7.3	Results submitted to EPA for the first 5 years or operation, no longer required	CLD
METEMP3	All phases	Implement a complaints handling process	Results summarised in Annual Report	
METEMP4	Post commissioning	Monitor maximum instantaneous and daily average temperature elevations	Report exceedances (abnormal limits only) or faults within 24 hours to EPA. Report exceedances (normal limits) in AER.	
METEMP5	Post commissioning	Investigate potential exceedances of EQG for temperature	No longer required.	

13. References

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14. Acronyms

Acronym	Definition
EPA	Environmental Protection Authority of Western Australia
FDLADMP	Final Diffuser Location and Design Management Plan
LEPA	Low Environmental Protection Area as defined in the State Environmental (Cockburn Sound) Policy 2005
METEMP	Marine Environment Temperature Elevation Management Plan
MIKE3	Marine modelling package from the Danish Hydraulic Institute
SEP	State Environmental (Cockburn Sound) Policy 2015
LEPA	Low Ecological Protection Area
MEPA	Medium Ecological Protection Area
HEPA	High Ecological Protection Area