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Going Further in Managing Risk

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NEAR SURFACE TEMPERATURE MONITORING
CRINGILA PUBLIC SCHOOL - NW HOTSPOT

Weekly Summary Report
15/10/2018 – 19/10/2018

NSW Department of Education

Cringila Public School

35 Sheffield Street
Cringila NSW 2502

October 2018
C107826: J153825: RC

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Document Control

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Near Surface Temperature Monitoring

Cringila Public School NW Hotspot – 35 Sheffield Street, Cringila NSW 2502

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1. INTRODUCTION

At the request of the Department of Education, Greencap were engaged to undertake 'spot-check' surface and near surface temperature monitoring utilising real-time monitoring devices at Cringila Public School, 35 Sheffield Street Cringila NSW 2502. The aim of this investigation was primarily to investigate surface and near surface temperatures associated with the pre-identified subsurface hotspot located in the northwest grounds at the school.

Based on the correspondence provided by the Department of Education, the objectives of this assessment are as follows:

- Conduct spot checks, to gather surface and near surface temperature readings via the use of heat sensing equipment; and
- Gather data at various points across the site to aid in the spatial delineation of the subsurface hotspot.

This report presents the results of Greencap's historical data relating to surface and near surface temperatures as well as the results of the ongoing temperature monitoring investigation carried out between on a weekly basis, between 15th October 2018 and 19th October 2018 in the northwest Hotspot, situated on the Cringila Public School grounds, located at 35 Sheffield Street, Cringila NSW 2502.

2. TEMPERATURE MONITORING METHODOLOGY

2.1. Visual Observations

Visual site observations such as evidence of vegetation stress and associated surface combustion hazards are recorded on a Site Diary. Meteorological data such as wind and ambient temperature is also recorded.

2.2. Surface Temperature Monitoring

Surface temperature is recorded via the use of a hand-held infrared thermometer. Readings are taken at multiple locations across the area associated with the northwest hotspot. Surface temperature data has been extrapolated to produce surface temperature isotherm maps for the hotspot.

2.3. Near Surface Temperature Monitoring

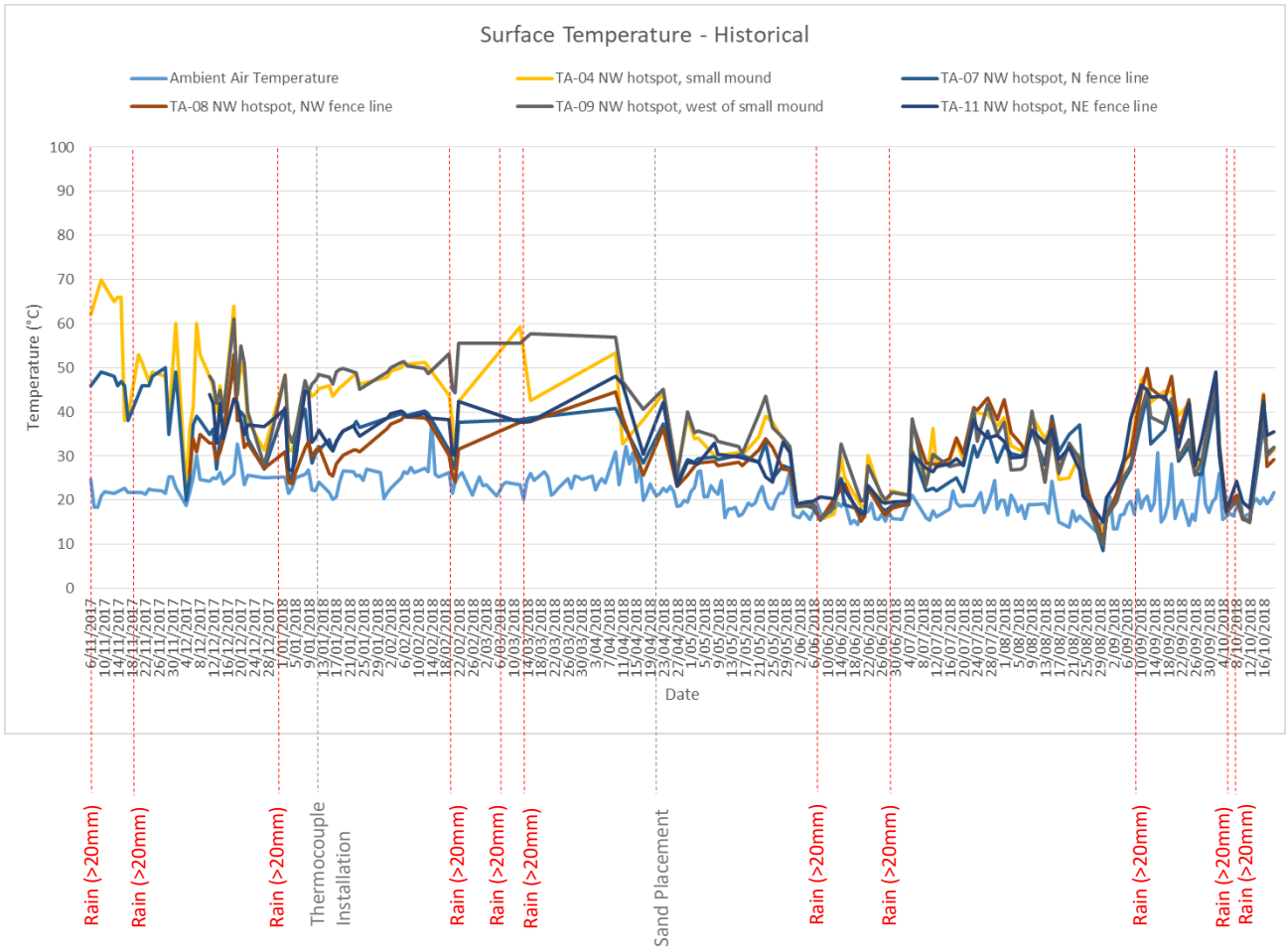
Across the northwest hotspot, a grid system has been established in order to provide a near-surface temperature profile for the hotspot and the immediate surrounding area. Grid locations have been determined by Greencap Consultants following initial surface temperature spot checks. Thermocouple monitoring points have been installed at depths of 0.3m and 0.5m across the northwest hotspot. Temperature measurements are taken at each grid point location using digital thermometers with 'K type' thermocouples designed for continuous temperature measurement. Near surface temperature data has been extrapolated to produce subsurface temperature isotherm maps for the hotspot.

3. TEMPERATURE MONITORING RESULTS

The surface and near surface temperatures for representative monitoring locations, spread across the northwest Hotspot, are presented in the tables below. Temperature isotherms have been plotted on a site map to show an illustration of the surface and near surface temperatures in a spatial context. Refer to **Appendix B: Surface Temperature Isotherm Map** and **Appendix C: Near Surface Temperature Isotherm Map (0.5m)**.

3.1. Surface Temperature Graph – Selected Points (Historical)

Surface temperature measurements for key locations, progressive from Monday 6th November 2017 to present.

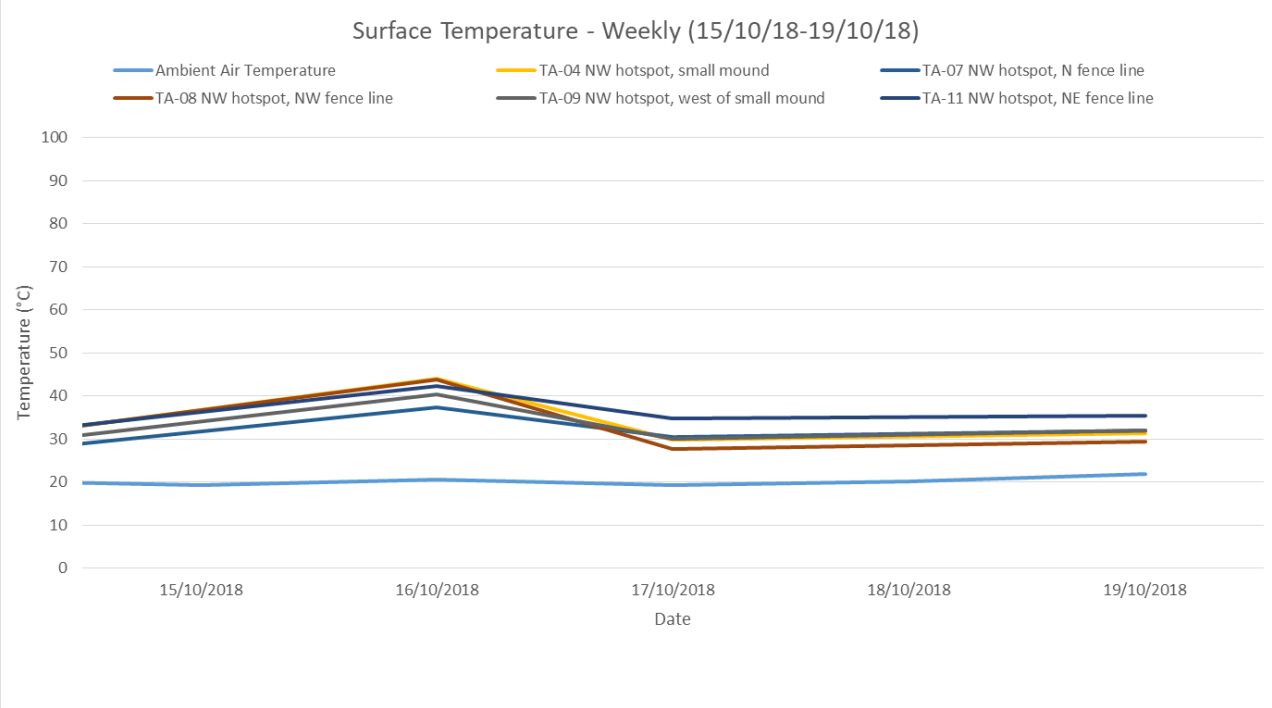


The surface temperature appears to have decreased and stabilised following the placement of sand (approximately 100mm) across the surface of the northwest hotspot grid monitoring area.

Fluctuations in surface temperature are evident following significant rain events (i.e. over 20mm rain). Surface temperature also appears to correlate with the ambient air temperature and the range of direct sunlight throughout the day.

3.2. Surface Temperature Graph – Selected Points (Weekly)

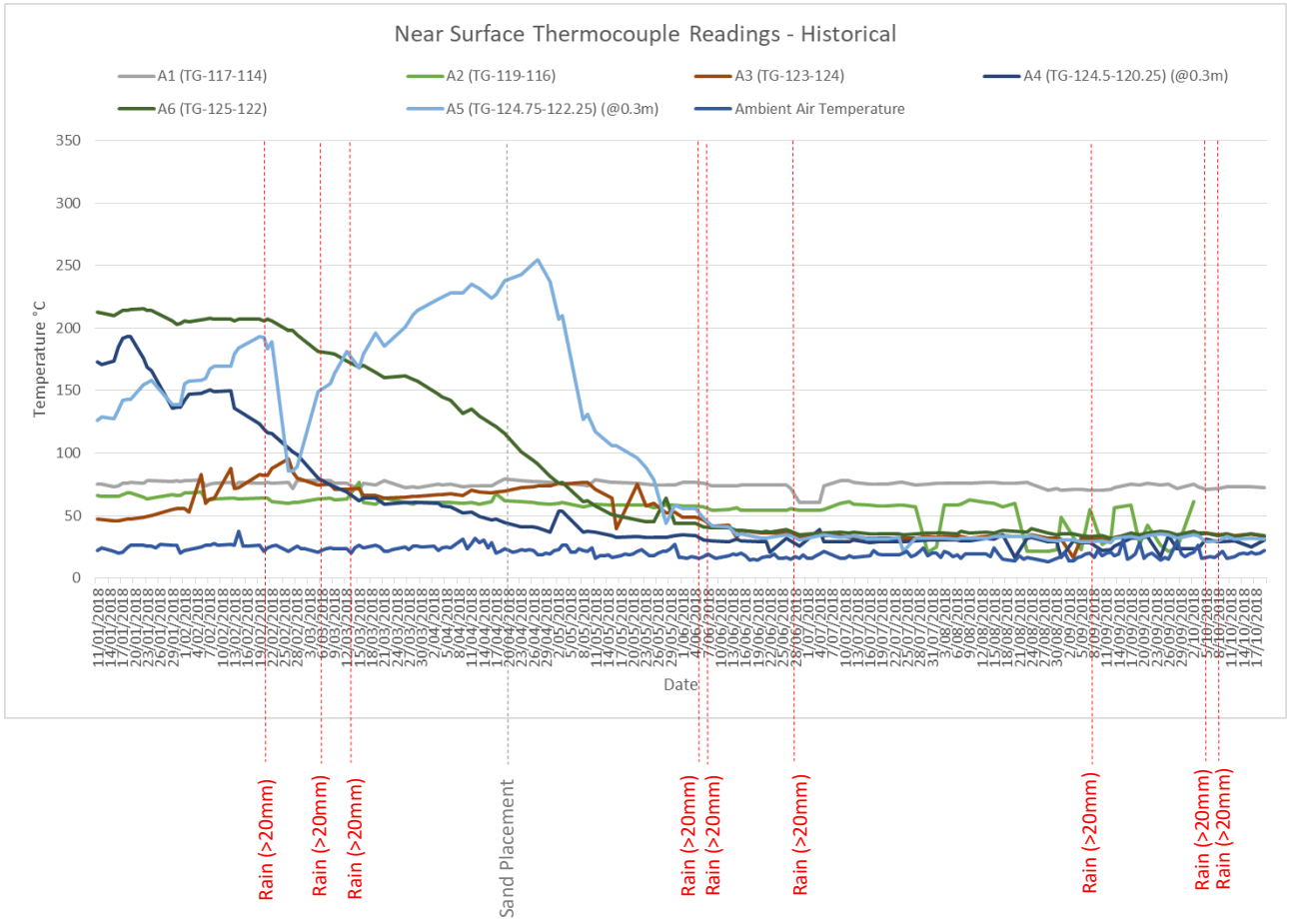
Surface temperature measurements for key locations, over monitoring week – 15/10/2018 to 19/10/2018.



The surface temperature at selected points across the northwest hotspot over the week of monitoring – 15/10/2018 to 19/10/2018, appear to remain consistent.

3.3. Near Surface Temperature Graph – Selected Points (Historical)

Near surface temperature measurements for key thermocouple locations, progressive from Thursday 11th January 2018 to present.

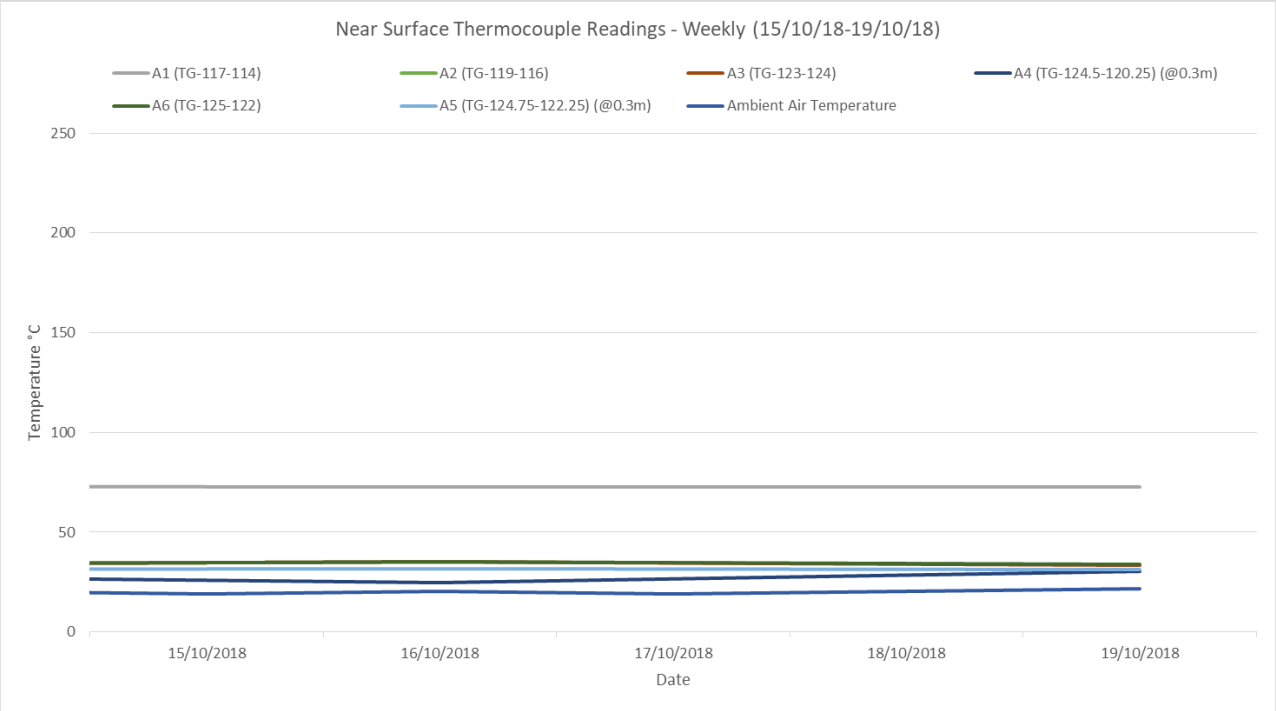


The near surface temperature appears to be trending downwards following the placement of sand (approximately 100mm) across the surface of the northwest hotspot grid monitoring area.

Fluctuations in near surface temperature are evident following significant rain events (i.e. over 20mm rain).

3.4. Near Surface Temperature Graph – Selected Points (Weekly)

Near surface temperature measurements for key thermocouple locations, over monitoring week - 15/10/2018 to 19/10/2018.



The near surface temperature at selected points across the northwest hotspot over the week of monitoring – 15/10/2018 to 19/10/2018, appear to remain consistent.

4. ANALYSIS OF ISOTHERM MAP DATA

The isotherm map shows the general zone of influence for temperatures between 30°C and 82°C at 0.5m, coloured orange. The isotherm map suggests that the hotspot may extend deeper than 0.5m and that the increased temperature in these areas is a result of heat venting to the surface.

It is noted that temperature at the near-surface may be variable across the hotspot due to inconsistencies in the consolidation and compaction of subsurface materials.

5. DISCUSSION

The surface and near surface temperature monitoring conducted between 15th October 2018 and 19th October 2018 indicates that the spatial extent of the northwest hotspot appears to remain localised.

There were no significant surface or near surface temperature variations identified during the week of monitoring – 15th October 2018 and 19th October 2018.

There were moderate rainfall events during the week of monitoring, with 8mm recorded on 16th October 2018.

It is recommended that weekly site inspections and recording are continued to monitor the surface and near surface temperatures surrounding the hotspot identified at the site.

Subsurface Temperature Investigation

Cringila Public School NW Hotspot – 35 Sheffield Street, Cringila NSW 2502

Appendix A: Area of Concern – Northwest Hotspot Map


CRINGILA PUBLIC SCHOOL
Area of Concern – Northwest Hotspot
N
Lackawanna St
Lackawanna St
Cringila Public School
Lake Ave
Lake Ave
Lake Ave
Cringila Park - Home of Cardinals Baseball

Subsurface Temperature Investigation

Cringila Public School NW Hotspot – 35 Sheffield Street, Cringila NSW 2502

Appendix B: Surface Temperature Isotherm Map

CRINGILA HOTSPOT
SURFACE ISOTHERM MAP

N

LEGEND

- Surface Temperature Monitoring Point
- 28-44°C
- Fencing
- Residential Boundary
- Previous Remediation Line
- Sand Coverage Area

28-44°C

TA-11

TA-05

TA-06

TA-07

TA-04

TA-08

TA-09

Scale (m)

0 1 2 3 4 5

Subsurface Temperature Investigation

Cringila Public School NW Hotspot – 35 Sheffield Street, Cringila NSW 2502

Appendix C: Near Surface Temperature Isotherm Map (0.5m)

CRINGILA HOTSPOT

NEAR SURFACE ISOTHERM MAP (0.5M)

N

LEGEND

- Thermocouple Monitoring Point (0.5m)
- Fencing
- Residential Boundary
- Previous Remediation Line
- Sand Coverage Area
- >30°C

>40°

>60°

>70°

>32°

A1

A2

A3

A4

A5

A6

Scale (m)

0 1 2 3 4 5