

Upper Hunter Mining Dialogue

Air Quality Monitoring Data Analysis Project

Presented by: Damon Roddis 19 November 2019

© Copyright 2019 by ERM Worldwide Group Limited and/or its affiliates ('ERM'). All Rights Reserved. No part of this work may be reproduced or transmitted in any form or by any means, without prior written permission of ERM.



The business of sustainability

Air Quality Monitoring Data Analysis Project

- Analysis of publically available environmental monitoring data:
 - Upper Hunter Air Quality Monitoring Network (UHAQMN)
 - NSW Regional Air Quality Monitoring Stations
 - Bureau of Meteorology (BoM).
- Project underway to be completed later this year / early 2020.
- Key points of investigation:
 - 1. Has the air quality in the Upper Hunter changed since monitoring began?
 - 2. Is the air quality in the Upper Hunter measured at the monitoring stations different from air quality measured at other locations in NSW?

Particulate Matter (PM)

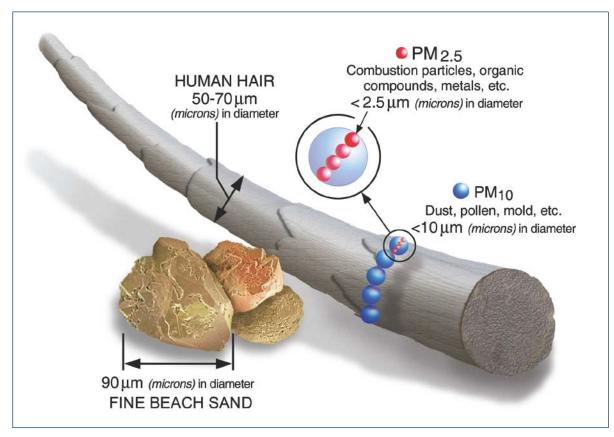
- National ambient air quality standards for specific size fractions and averaging periods:
 - PM10 and PM2.5
 - 24 hour and annual averages.
- Analysis primarily focuses on:

<u>PM10</u>:

Size fraction associated with mechanical processes (e.g. mining, wind erosion). Inclusive of PM_{2.5}.

Annual averages:

Allow analysis of overall trends and performance (removes 'noise').



Source: US Environmental Protection Agency

Air Quality Monitoring Stations

- Sydney five locations
- Lower Hunter six locations
- Upper Hunter 14 locations
- Illawarra three locations
- Other regional areas four locations

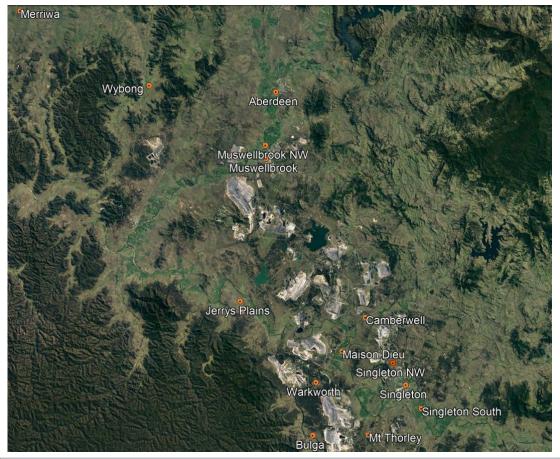


Camberwell AQMS

Source (OEH, 2016)

Upper Hunter Air Quality Monitoring Network

The Upper Hunter Air Quality Monitoring Network was created by the Department of Planning, Industry and Environment, in partnership with the Upper Hunter coal and power industries, in response to community concern about the effect of coal mining on air quality in the region.



Population centres = Singleton, Muswellbrook and Aberdeen

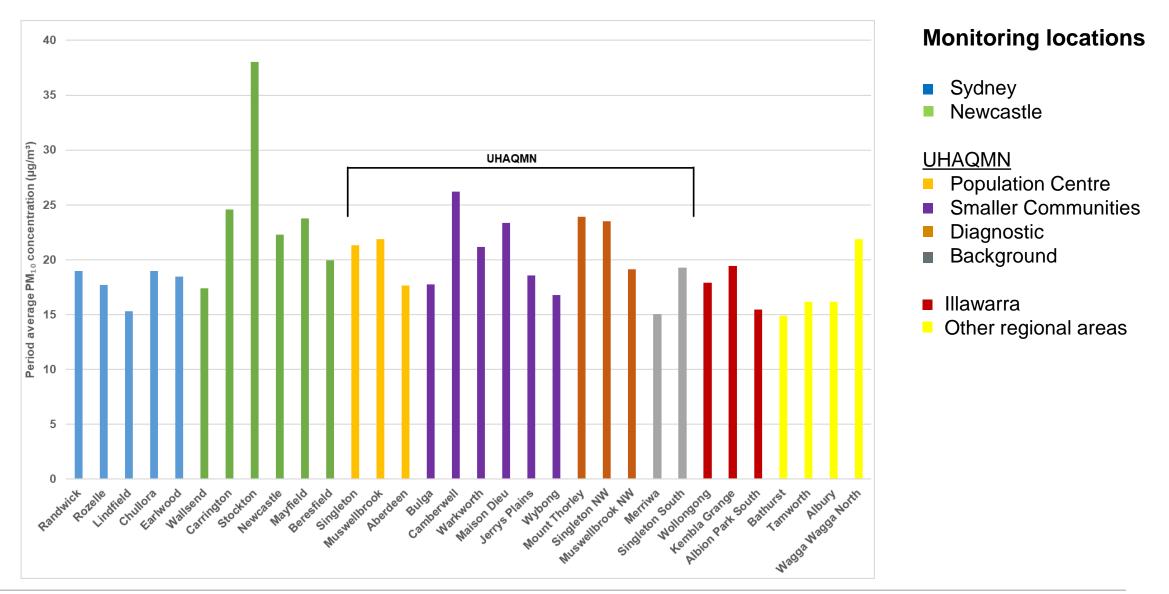
Smaller communities = Bulga, Camberwell, Warkworth, Maison Dieu, Jerry's Plains and Wybong

Diagnostic = Mount Thorley, Singleton NW, Muswellbrook NW

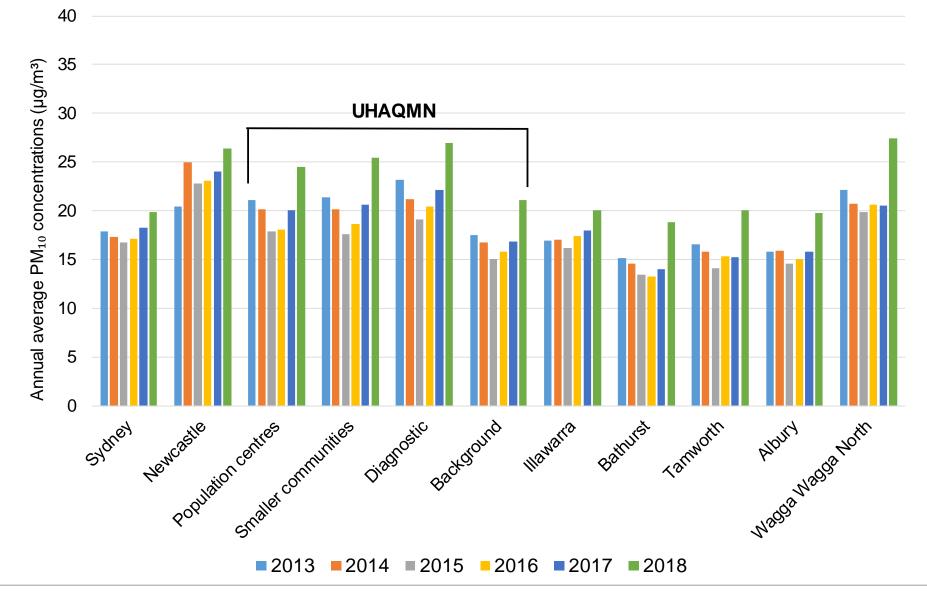
Background = Merriwa and Singleton South

Discussion of PM₁₀ Concentrations

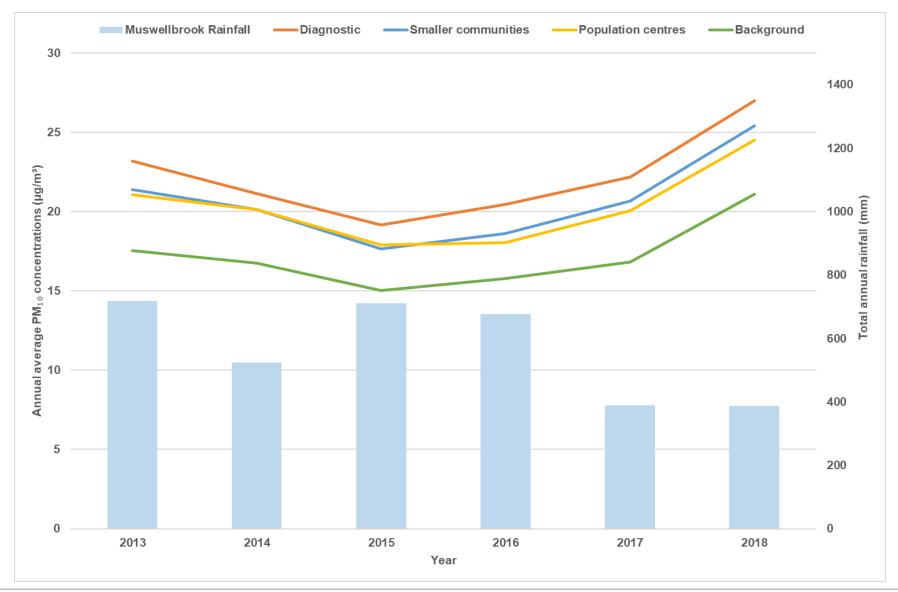
Comparison of period average PM₁₀ concentrations



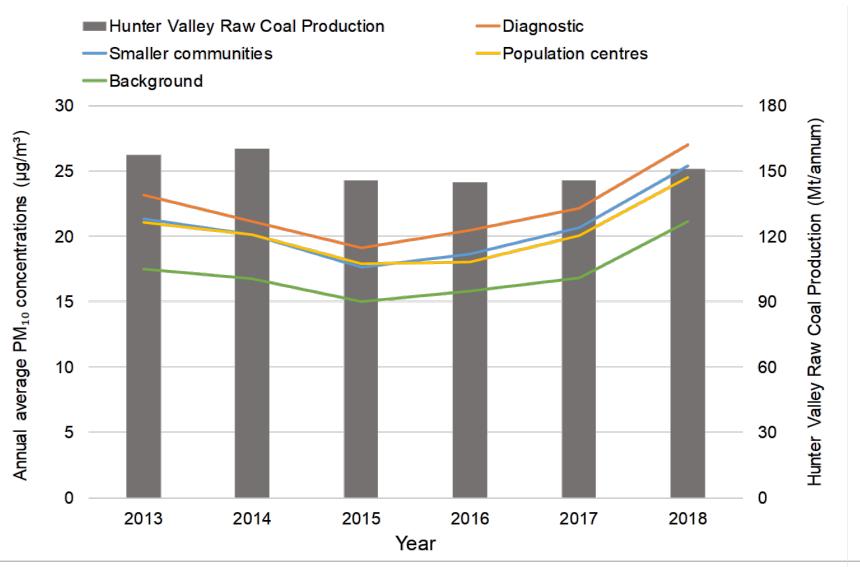
Comparison of annual average PM₁₀ concentrations



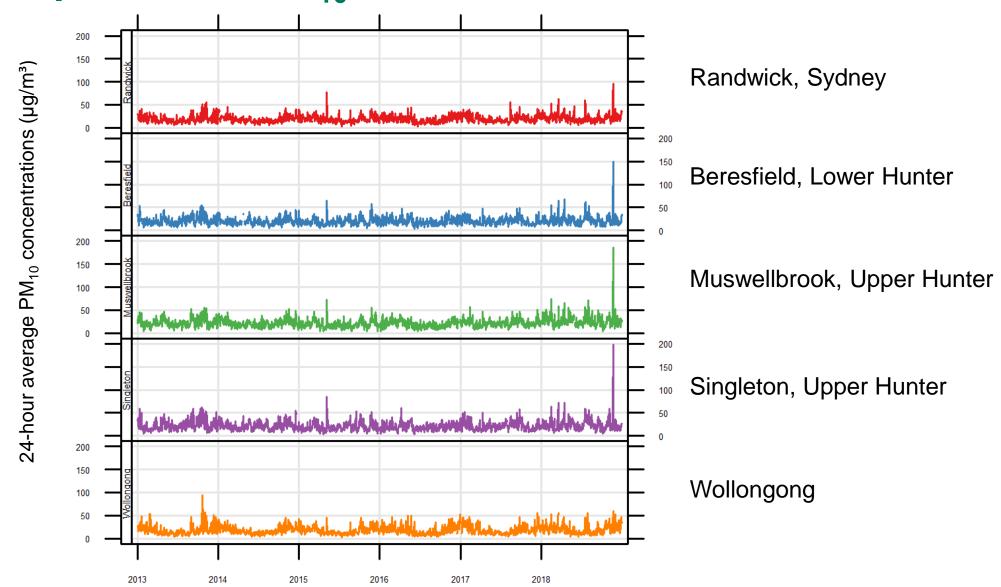
Comparison of rainfall and Upper Hunter PM₁₀



Comparison of coal production and Upper Hunter PM₁₀



Comparison of PM₁₀ concentrations at selected sites



PM₁₀ Calendar Plots for 2018

Randwick

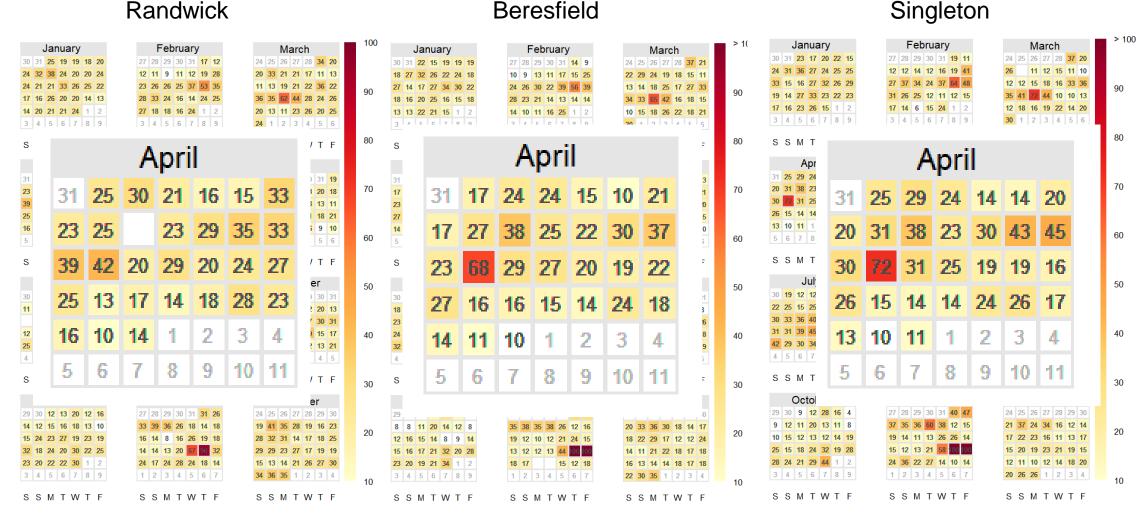
January	February	March	100	January	February	March	> 100	January	February	March	> 10				
30 31 25 19 19 18 20	27 28 29 30 31 17 12	24 25 26 27 28 34 20		30 31 22 15 19 19 19	27 28 29 30 31 14 9	24 25 26 27 28 37 21		30 31 23 17 20 22 15	27 28 29 30 31 19 11	24 25 26 27 28 37 20					
24 32 38 24 20 20 24	12 11 9 11 12 19 28	20 33 21 21 17 11 13		18 27 32 26 22 24 18	10 9 13 11 17 15 25	22 29 24 19 18 15 11		24 31 36 27 24 25 25	12 12 14 12 16 19 41	26 11 12 15 11 10					
24 21 21 33 26 25 22	23 26 26 25 37 53 35	11 13 19 21 22 36 22	90	27 14 17 27 34 30 22	24 26 30 22 39 56 39	13 14 18 25 17 27 33	90	33 15 16 27 32 26 29	27 37 34 24 37 64 48	12 12 15 18 16 33 36	90				
17 16 26 20 20 14 13	28 33 24 16 14 24 25	36 35 62 44 28 24 26	50	18 16 20 25 16 15 18	28 23 21 14 13 14 14	34 33 65 42 16 18 15	90	19 14 27 33 23 22 23	31 26 25 12 11 12 15	35 41 72 44 10 10 13					
14 20 21 21 24 1 2	27 18 18 16 24 1 2	20 13 11 23 26 20 25		13 13 22 21 15 1 2	14 10 11 16 25 1 2	10 15 18 26 22 18 21		17 16 23 26 15 1 2	17 14 6 15 24 1 2	12 18 16 19 22 14 20					
3 4 5 6 7 8 9	3 4 5 6 7 8 9	24 1 2 3 4 5 6		3 4 5 6 7 8 9	3 4 5 6 7 8 9	30 1 2 3 4 5 6		3 4 5 6 7 8 9	3 4 5 6 7 8 9	30 1 2 3 4 5 6					
SSMTWTF	SSMTWTF	ѕѕмтwтғ	80	SSMTWTF	SSMTWTF	SSMTWTF	80	SSMTWTF	SSMTWTF	SSMTWTF	80				
April	May	June		April	May	June		April	Мау	June					
31 25 30 21 16 15 33	28 29 30 18 23 25 19	26 27 28 29 30 31 19		31 17 24 24 15 10 21	28 29 30 17 18 22 35	26 27 28 29 30 31 13		31 25 29 24 14 14 20	28 29 30 18 26 25 47	26 27 28 29 30 31 19	70				
23 25 23 29 35 33	17 21 18 36 32 25 13	20 20 15 15 13 20 18	70	17 27 38 25 22 30 37	21 20 16 31 31 32 27	11 13 11 9 10 18 21	70	20 31 38 23 30 43 45	27 21 26 40 37 42 35	15 13 15 10 10 13 26	70				
39 42 20 29 20 24 27	7 18 21 14 17 18 21	12 12 14 16 18 13 11		23 68 29 27 20 19 22	12 10 20 20 21 20 30	13 9 10 14 19 25 20		30 72 31 25 19 19 16	20 14 22 33 21 28 36	15 10 12 16 19 30 26					
25 13 17 14 18 28 23	16 13 13 15 20 22 22	10 6 13 18 21 18 21		27 16 16 15 14 24 18	25 25 24 31 32 25 23	14 13 10 8 15 14 15		26 15 14 14 24 26 17	31 31 37 40 32 30 25	21 16 13 9 15 23 17					
16 10 14 1 2 3 4	30 32 26 47 10 18 1	21 13 17 19 16 9 10		14 11 10 1 2 3 4	24 17 28 29 13 15 1	18 20 26 31 21 8 10		13 10 11 1 2 3 4	27 21 30 30 14 16 1	24 21 19 20 14 10 11	60				
5 6 7 8 9 10 11	2 3 4 5 6 7 8	10 1 2 3 4 5 6	60	5 6 7 8 9 10 11	2 3 4 5 6 7 8	15 1 2 3 4 5 6	60	5 6 7 8 9 10 11	2 3 4 5 6 7 8	14 1 2 3 4 5 6	00				
SSMTWTF	SSMTWTF	ѕѕмтwтғ		SSMTWTF	SSMTWTF	SSMTWTF		SSMTWTF	SSMTWTF	SSMTWTF					
July	A							Luke.	A	O a set a sea ha a s					
July	August	September	50	July	August	September	50	July	August	September	50				
30 10 15 16 20 14 12	28 29 30 31 19 31 27	September 25 26 27 28 29 30 31	50	July 30 21 13 16 16 16 16	28 29 30 31 35 21 26	September 25 26 27 28 29 30 31	50	30 19 12 12 22 19 28	28 29 30 31 29 24 34	25 26 27 28 29 30 31	50				
30 10 15 16 20 14 12 11 9 15 19 22 20 12	28 29 30 31 19 31 27 16 26 23 24 5 5 21	25 26 27 28 29 30 31 8 14 12 12 12 20 13	50	30 21 13 16 16 16 16 18 18 25 20 25 26			50	30 19 12 12 22 19 28 22 25 15 25 24 28 30	28 29 30 31 29 24 34 56 36 27 42 23 23 24	25 26 27 28 29 30 31 23 16 10 6 8 10 10	50				
30 10 15 16 20 14 12 11 9 15 19 22 20 12 4 60 46 22 20 12	28 29 30 31 19 31 27 16 26 23 24 21 18 8 11 18 20 17 21	25 26 27 28 29 30 31 8 14 12 12 12 20 13 17 11 18 26 27 30 31	50	30 21 13 16 16 16 16	28 29 30 31 35 21 26	25 26 27 28 29 30 31	50	30 19 12 12 22 19 28 22 25 15 25 24 28 30 30 33 36 40 59 58 42	28 29 30 31 29 24 34 56 36 27 42 23 23 24 28 16 29 34 46 36 29	25 26 27 28 29 30 31 23 16 10 6 8 10 10 11 19 24 16 28 33 37					
30 10 15 16 20 14 12 11 9 15 19 22 20 12 10 10 14 60 46 22 12 14 19 21 21 21 25	28 29 30 31 19 31 27 16 26 23 24 21 18 8 11 18 20 17 21 17 10 19 13 15 14 12	25 26 27 28 29 30 31 8 14 12 12 12 20 13 17 11 18 26 27 30 31 27 16 18 27 30 51 17	50 40	30 21 13 16 16 16 16 18 18 25 20 25 26 23 32 27 33 56 62 37 24 26 35 38 41 30 30	28 29 30 31 35 21 26 54 34 21 38 21 24 19 22 11 20 21 29 31 27 31 27 22 18 20 21 29 31 27 21	25 26 27 28 29 30 31 18 17 12 8 8 10 8	50	30 19 12 12 21 19 28 22 25 15 25 24 28 30 30 33 36 40 59 58 42 31 39 45 41 46 28	28 29 30 31 29 24 34 56 36 27 42 23 23 24 28 16 29 34 46 36 29 34 21 29 24 24 24 34 16 29 34 46 36 29 34 21 29 26 25 22 16	25 26 27 28 29 30 31 23 16 10 6 8 10 10 11 19 24 16 28 33 37 42 25 22 36 37 5	50 40				
30 10 15 16 20 14 12 11 9 15 19 22 20 12 14 60 46 22 24 12 14 12 14 25 25 15 13 17 1 2 3	28 29 30 31 19 31 27 16 26 23 24	25 26 27 28 29 30 31 8 14 12 12 12 20 13 17 11 18 26 27 30 31 27 16 18 27 39 15 17 20 22 15 10 12 13 21		30 21 13 16 16 16 16 18 18 18 25 20 25 26 23 32 27 33 56 62 37 24 26 35 38 41 30 30 32 22 21 24 1 2 3	28 29 30 31 35 21 26 54 34 21 38 21 24 19 22 11 20 21 29 31 27 21 22 18 25 24 27 22 14 31 31 97 21 21 24 21	25 26 27 28 29 30 31 18 17 12 8 8 10 8 14 11 23 21 23 37 26 28 25 20 22 35 18 18 18 24 11 9 14 8 19		30 19 12 12 22 19 28 22 25 15 25 24 28 30 30 33 36 40 59 58 42 31 39 45 41 46 28 42 29 30 34 1 2 3	28 29 30 31 29 24 34 56 36 27 42 23 23 24 28 16 29 34 46 36 29 34 21 29 26 25 22 16 34 21 29 26 25 22 16 15 14 17 20 21 23 26	25 26 27 28 29 30 31 23 16 10 6 8 10 10 11 19 24 16 28 33 37 42 25 22 36 37 33 34					
30 10 15 16 20 14 12 11 9 15 19 22 20 12 10 10 14 60 46 22 12 14 19 21 21 21 25	28 29 30 31 19 31 27 16 26 23 24 21 18 8 11 18 20 17 21 17 10 19 13 15 14 12	25 26 27 28 29 30 31 8 14 12 12 12 20 13 17 11 18 26 27 30 31 27 16 18 27 30 51 17		30 21 13 16 16 16 16 18 18 25 20 25 26 23 32 27 33 56 62 37 24 26 35 38 41 30 30	28 29 30 31 35 21 26 54 34 21 38 21 24 19 22 11 20 21 29 31 27 31 27 22 18 20 21 29 31 27 21	25 26 27 28 29 30 31 18 17 12 8 8 10 8 14 11 23 21 23 37 26 28 25 20 22 35 18 18		30 19 12 12 21 19 28 22 25 15 25 24 28 30 30 33 36 40 59 58 42 31 39 45 41 46 28	28 29 30 31 29 24 34 56 36 27 42 23 23 24 28 16 29 34 46 36 29 34 21 29 24 24 24 34 16 29 34 46 36 29 34 21 29 26 25 22 16	25 26 27 28 29 30 31 23 16 10 6 8 10 10 11 19 24 16 28 33 37 42 25 22 36 37 5					
30 10 15 16 20 14 12 11 9 15 19 22 20 12 14 60 46 22 24 12 14 12 14 25 25 15 13 17 1 2 3	28 29 30 31 19 31 27 16 26 23 24	25 26 27 28 29 30 31 8 14 12 12 12 20 13 17 11 18 26 27 30 31 27 16 18 27 39 15 17 20 22 15 10 12 13 21		30 21 13 16 16 16 16 18 18 18 25 20 25 26 23 32 27 33 56 62 37 24 26 35 38 41 30 30 32 22 21 24 1 2 3	28 29 30 31 35 21 26 54 34 21 38 21 24 19 22 11 20 21 29 31 27 21 22 18 25 24 27 22 14 31 31 97 21 21 24 21	25 26 27 28 29 30 31 18 17 12 8 8 10 8 14 11 23 21 23 37 26 28 25 20 22 35 18 18 18 24 11 9 14 8 19		30 19 12 12 22 19 28 22 25 15 25 24 28 30 30 33 36 40 59 58 42 31 39 45 41 46 28 42 29 30 34 1 2 3	28 29 30 31 29 24 34 56 36 27 42 23 23 24 28 16 29 34 46 36 29 34 21 29 26 25 22 16 34 21 29 26 25 22 16 15 14 17 20 21 23 26	25 26 27 28 29 30 31 23 16 10 6 8 10 10 11 19 24 16 28 33 37 42 25 22 36 37 33 34					
30 10 15 16 20 14 12 11 9 15 19 22 20 12 12 4 10 46 60 46 22 12 14 19 21 21 21 25 15 15 17 1 2 3 4 5 6 7 88 9 10	28 29 30 31 19 31 27 16 26 23 24 5 6 21 18 8 11 18 20 17 21 17 10 19 33 15 14 22 20 18 20 16 22 19 22 1 2 3 4 5 6 7	25 26 27 28 29 30 31 8 14 12 12 12 20 13 17 11 18 26 27 30 31 27 16 18 27 39 5 17 20 22 15 10 12 13 21 18 14 1 2 3 4 5	40	0 21 13 16 16 16 16 18 18 25 20 25 26 23 32 27 33 56 52 37 24 26 35 38 41 30 30 32 22 24 4 1 2 3 4 5 6 7 8 9 10	28 29 30 31 35 21 26 54 24 38 21 38 21 41 90 22 11 20 21 29 31 27 29 14 22 18 25 24 27 20 14 13 13 19 21 21 24 22 14 22 33 4 5 6 7	25 26 27 28 29 30 31 18 17 12 8 8 10 8 14 11 23 21 23 37 26 28 25 20 22 35 18 18 18 24 11 9 14 8 19 20 14 1 2 3 4 5	40	30 19 12 12 22 19 28 22 25 15 25 24 28 30 30 33 36 40 59 58 42 31 31 36 40 59 58 42 32 34 34 41 46 28 42 29 30 34 1 2 3 4 5 6 7 8 9 10	28 29 30 31 29 24 34 56 36 27 42 23 23 24 28 16 29 34 46 36 29 34 21 29 26 25 22 16 15 14 17 20 21 23 6 7 1 2 3 4 5 6 7 S S M T W T F	25 26 27 28 29 30 31 23 16 10 6 8 10 10 11 19 24 16 28 33 37 42 25 22 36 37 31 33 34 9 12 9 21 34 35 14 9 12 9 21	40				
30 10 15 16 20 14 12 11 9 15 19 22 20 12 12 14 14 10 46 22 12 14 19 21 21 21 21 25 15 13 17 1 2 3 4 5 6 7 8 9 10	28 29 30 31 19 31 27 16 26 23 24 24 21 18 8 11 18 20 17 21 17 10 19 13 15 14 12 20 18 20 16 22 19 22 1 2 3 4 5 6 7 S S M T W T F	25 26 27 28 29 30 31 8 14 12 12 12 20 13 17 11 18 26 27 30 31 27 16 18 27 39 15 17 20 22 15 10 12 13 21 18 14 1 2 3 4 5 S S M T W T F	40	30 21 13 16 16 16 16 18 18 18 25 20 25 26 23 32 27 33 56 52 37 24 26 35 38 41 30 30 32 22 21 24 1 2 3 4 5 6 7 8 9 10 S S M T W T F	28 29 30 31 35 21 26 54 34 21 38 21 24 19 22 11 20 21 29 31 27 22 18 25 24 27 22 14 13 13 19 21 21 24 22 1 2 3 4 5 6 7 S S M T W T F	25 26 27 28 29 30 31 18 17 12 8 8 10 8 14 11 23 21 23 37 26 28 25 20 22 35 18 18 18 24 11 9 14 8 19 20 14 1 2 3 4 5 S S M T W T F	40	30 19 12 12 22 19 28 22 25 15 25 24 28 30 30 33 36 40 59 58 42 31 39 45 41 46 28 42 29 30 34 1 2 3 4 5 66 7 8 9 10 S S M T W T F	28 29 30 31 29 24 34 56 67 42 23 23 24 28 16 29 34 46 36 29 34 21 29 26 25 22 16 15 14 17 20 21 23 26 1 2 3 4 5 6 7 S S M T W T F	25 26 27 28 29 30 31 23 16 10 6 8 10 10 11 19 24 16 28 33 37 42 25 22 36 37 - 31 33 14 9 12 9 21 25 15 1 2 3 4 5 S S M T W T F Decentertertertertertertertertertertertertert	40				
30 10 15 16 20 14 12 11 9 15 19 22 20 12 14 60 46 22 12 14 19 21 21 21 25 15 15 13 17 1 2 3 4 5 6 7 8 9 10 S S M T W T F	28 29 30 31 19 31 27 16 26 23 24 24 21 18 8 11 18 20 17 21 17 10 19 13 15 14 12 20 18 20 16 22 19 22 1 2 3 4 5 6 7 S S M T W T F	25 26 27 28 29 30 31 8 14 12 12 12 20 13 17 11 18 26 27 30 31 27 16 18 27 39 15 17 20 22 15 10 12 13 21 18 14 1 2 3 4 5 S S M T W T F	40	30 21 13 16 16 16 18 18 18 25 20 25 26 23 32 27 33 56 52 37 24 26 35 38 41 30 30 32 22 21 24 1 2 3 4 5 6 7 8 9 10 S S M T W T F	28 29 30 31 35 21 26 54 34 21 38 21 24 19 22 11 20 21 29 31 27 22 18 25 24 27 22 14 13 13 19 21 21 24 22 1 2 3 4 5 6 7 S S M T W T F	25 26 27 28 29 30 31 18 17 12 8 8 10 8 14 11 23 21 23 37 26 28 25 20 22 35 18 18 18 24 11 9 14 8 19 20 14 1 2 3 4 5 S S M T W T F	40	30 19 12 12 22 19 28 22 25 15 25 24 28 30 30 33 36 40 59 58 42 31 39 45 41 46 28 42 29 30 34 1 2 3 4 5 66 7 8 9 10 S S M T W T F COUNT 29 30 9 12 28 16 4 9 12 11 20 13 11 8	28 29 30 31 29 24 34 56 67 42 23 23 24 28 16 29 34 46 36 29 34 21 29 26 25 22 16 15 14 17 20 21 23 26 1 2 3 4 5 6 7 S S M T W T F Composition M T W T F 27 28 29 30 31 40 47 37 35 36 60 38 12 15	25 26 27 28 29 30 31 23 16 10 6 8 10 10 11 19 24 16 28 33 37 42 25 22 36 37 - 31 33 14 9 12 9 21 25 15 1 2 3 4 5 S S M T W T F	40				
30 10 15 16 20 14 12 11 9 15 19 22 20 12 12 14 19 21 21 21 25 15 15 13 17 1 2 3 4 5 6 7 8 9 10 S S M T W T F 29 30 12 13 20 12 16 14 12 15 16 18 13 10 15 24 23 27 19 23 19	28 29 30 31 19 31 27 16 26 23 24 2 21 18 8 11 18 20 17 21 17 10 19 13 15 14 12 20 18 20 16 22 19 22 1 2 3 4 5 6 7 S S M T W T F V V T F 20 28 29 30 31 31 26 33 39 36 26 18 14 18 16 14 8 16 26 19 18	25 26 27 28 29 30 31 8 14 12 12 12 20 13 17 11 18 26 27 30 31 27 16 18 27 39 15 17 20 22 15 10 12 13 21 18 14 1 2 3 4 5 S S M T W T F Certextructure VEXT F	40	30 21 13 16 16 16 16 18 18 12 52 20 25 26 23 32 27 33 56 52 37 24 26 35 38 41 30 30 32 22 21 24 1 2 3 4 5 6 7 8 9 10 S S M T W T F	28 29 30 31 35 21 26 54 34 21 38 21 24 19 22 11 20 21 29 31 27 24 13 13 19 21 21 24 22 14 13 13 19 21 21 24 22 14 1 2 3 4 5 6 7 S S M T W T F 27 28 29 30 31 31 30 S S M T W T F 28 29 30 31 31 30 31 31 30 38 35 38 36 37 38 35 38 35 38 36 32 34 35 36 36 36 36	25 26 27 28 29 30 31 18 17 12 8 8 10 8 14 11 23 21 23 37 26 28 25 20 22 35 18 18 18 24 11 9 14 8 19 20 14 1 2 3 4 5 S S M T W T F	40	30 19 12 12 22 19 28 22 25 15 25 24 28 30 30 33 36 40 59 58 42 31 39 45 41 46 28 42 29 30 34 1 2 3 4 5 66 7 8 9 10 S S M T W T F COUNT 29 30 9 12 28 16 4 9 12 11 20 13 11 8 9 12 14 20 13 11 8 10 15 12 13 12 14 19	28 29 30 31 29 24 34 56 36 27 42 23 23 24 28 16 29 34 46 36 29 34 21 29 26 25 22 16 15 14 17 20 21 23 26 1 2 3 4 5 6 7 28 29 30 4 5 6 7 35 S M T W T F 40 5 30 31 40 5 6 7 27 28 29 30 31 40 47 37 35 36 60 38 2 15 49 44 11 32 26 5 14	25 26 27 28 29 30 31 23 16 10 6 8 10 10 11 19 24 16 28 33 37 42 25 22 36 37 - 31 33 14 9 12 9 21 25 15 1 2 3 4 5 S S M T W T F Control Control Control Control Control Control Control 24 25 26 27 28 29 30 21 24 25 26 27 28 29 30 21 24 25 26 27 28 29 30 21 21 37 24 34 46 12 14 14	40				
30 10 15 16 20 14 12 11 9 15 19 22 20 12 12 14 19 21 21 21 25 15 15 17 1 2 3 4 5 6 7 8 9 10 S S M T W T F 29 30 12 13 20 12 16 14 12 15 16 18 13 10	28 29 30 31 19 31 27 16 26 23 24 2 21 18 8 11 18 20 17 21 17 10 19 13 15 14 12 20 18 20 16 22 19 22 1 2 3 4 5 6 7 S S M T W T F Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4"Colspan="4">Colspan="4"Col	25 26 27 28 29 30 31 8 14 12 12 12 20 13 17 11 18 26 27 30 31 27 16 18 27 39 15 17 20 22 15 10 12 13 21 18 14 1 2 3 4 5 S S M T W T F Certextextextextextextextextextextextextext	40	30 21 13 16 16 16 16 18 18 12 52 20 25 26 23 32 27 33 56 52 37 24 26 35 38 41 30 30 32 22 21 24 1 2 3 4 5 6 7 8 9 10 S S M T W T F COUNT 29 30 9 14 26 12 9 8 81 12 04 14 28 14	28 29 30 31 35 21 26 54 34 21 38 21 24 19 22 11 20 21 29 31 27 22 14 13 13 19 21 21 24 22 14 13 13 19 21 21 24 22 14 1 2 3 4 5 6 7 S S M T W T F 27 28 29 30 31 31 30 S S M T W T F 28 29 30 31 31 30 35 38 35 38 35 34 5 36 32	25 26 27 28 29 30 31 18 17 12 8 8 10 8 14 11 23 21 23 37 26 28 25 20 22 35 18 18 18 24 11 9 14 8 19 20 14 1 2 3 4 5 S S M T W T F 20 14 1 2 3 4 5 S S M T W T F V D 20 34 5 7 7 8 7 7 24 25 26 27 28 29 30 3 36 30 18 14 17	40	30 19 12 12 22 19 28 22 25 15 25 24 28 30 30 33 36 40 59 58 42 31 39 45 41 46 28 42 29 30 34 1 2 3 4 5 66 7 8 9 10 S S M T W T F 29 30 9 12 8 9 10 S S M T W T F V V V T W T F 20 30 9 12 28 16 4 9 12 14 20 13 11 8 10 15 12 13 12 14 19 20	28 29 30 31 29 24 34 56 67 42 23 23 24 28 16 29 34 46 36 29 34 21 29 26 25 22 16 15 14 17 20 21 23 26 1 2 3 4 5 6 7 28 29 34 5 6 7 7 5 S M T W T F 70 28 29 30 31 40 47 72 28 29 30 31 40 47 37 35 36 60 38 12 15 19 14 11 32 26 14 14 15 12 33 21 56 14 14 <td>25 26 27 28 29 30 31 23 16 10 6 8 10 10 11 19 24 16 28 33 37 42 25 22 36 37 - 31 33 14 9 12 9 21 25 15 1 2 3 4 5 5 S M T W T F Colspan="4">Colspan="4" Colspan="4"Colspan="4" <td c<="" colspan="4" td=""><td>40</td></td></td>	25 26 27 28 29 30 31 23 16 10 6 8 10 10 11 19 24 16 28 33 37 42 25 22 36 37 - 31 33 14 9 12 9 21 25 15 1 2 3 4 5 5 S M T W T F Colspan="4">Colspan="4" Colspan="4"Colspan="4" <td c<="" colspan="4" td=""><td>40</td></td>	<td>40</td>				40
30 10 15 16 20 14 12 11 9 15 19 22 20 12 12 14 19 21 21 24 25 15 15 17 1 2 3 4 5 6 7 8 9 10 5 8 7 8 9 10 5 6 7 8 9 10 5 6 7 8 9 10 5 6 7 8 9 10 5 6 7 8 9 10 5 6 7 8 9 10 6 7 8 9 10 12 6 6 7 8 9 12 14 12 15 16 18 10 15 24 23 <td>28 29 30 31 19 31 27 16 26 23 24 2 2 21 18 8 11 18 20 17 21 17 10 19 13 15 14 12 20 18 20 16 22 19 22 1 2 3 4 5 6 7 S S M T W T F Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4"Colspan="4">Colspan="4"Colspa</td> <td>25 26 27 28 29 30 31 8 14 12 12 12 20 13 17 11 18 26 27 30 31 27 16 18 27 39 15 17 20 22 15 10 12 13 21 18 14 1 2 3 4 5 S S M T W T F 24 25 26 27 28 29 30 19 41 35 28 19 16 23 28 32 31 4 17 18 25 29 20 32 37 17 19 19 30 34 41 7 36 27 30 31</td> <td>40</td> <td>30 21 13 16 16 16 16 18 18 12 52 20 25 26 23 32 27 33 56 62 37 24 26 35 38 41 30 30 32 22 21 24 1 2 3 4 5 6 7 8 9 10 S S M T W T F Correctore Correctore V T 8 12 13 14 14 12 14 23 30 9 14 26 12 9 14 12 14 12 14</td> <td>28 29 30 31 35 21 26 54 34 21 38 21 24 19 22 11 20 21 29 31 27 24 13 13 19 21 21 24 22 14 13 13 19 21 21 24 22 14 1 2 3 4 5 6 7 S S M T W T F 27 28 29 30 31 31 30 S S M T W T F 28 29 30 31 31 30 31 31 30 38 35 38 36 37 38 35 38 35 38 36 32 34 35 36 36 36 36</td> <td>25 26 27 28 29 30 31 18 17 12 8 8 10 8 14 11 23 21 23 37 26 28 25 20 22 35 18 18 18 24 11 9 14 8 19 20 14 1 2 3 4 5 S S M T V T F 20 14 1 2 3 4 5 S S M T V T F 20 14 1 2 3 4 5 S S M T V T F 20 25 26 27 28 29 30 20 33 36 30 18 14 17 <</td> <td>40</td> <td>30 19 12 12 22 19 28 22 25 15 25 24 28 30 30 33 36 40 59 58 42 31 39 45 41 46 28 42 29 30 34 1 2 3 4 5 66 7 8 9 10 5 S M T W T X 6 7 8 9 10 10 5 S M T W T X 6 7 8 9 10 10 10 5 S M T W T X 6 7 8 9 10 11 10 6 7 10 13 11 18 14 9 10</td> <td>28 29 30 31 29 24 34 56 36 27 42 3 3 4 28 16 29 34 46 36 29 34 21 29 26 25 22 16 15 14 17 20 21 23 26 1 2 3 4 5 6 7 28 29 30 4 5 6 7 5 S M T W T F 60 30 31 40 5 6 7 7 28 29 30 31 40 47 37 35 36 60 38 12 15 40 11 32 26 26 14 15 12 13 21 36 36 36 4</td> <td>25 26 27 28 29 30 31 23 16 10 6 8 10 10 11 19 24 16 28 33 37 42 25 22 36 37 - 31 33 14 9 12 9 21 25 15 1 2 3 4 5 5 S M T W T F Colspan="4">Colspan="4" 7 22 23 16 11 13 17</td> <td>40</td>	28 29 30 31 19 31 27 16 26 23 24 2 2 21 18 8 11 18 20 17 21 17 10 19 13 15 14 12 20 18 20 16 22 19 22 1 2 3 4 5 6 7 S S M T W T F Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4"Colspan="4">Colspan="4"Colspa	25 26 27 28 29 30 31 8 14 12 12 12 20 13 17 11 18 26 27 30 31 27 16 18 27 39 15 17 20 22 15 10 12 13 21 18 14 1 2 3 4 5 S S M T W T F 24 25 26 27 28 29 30 19 41 35 28 19 16 23 28 32 31 4 17 18 25 29 20 32 37 17 19 19 30 34 41 7 36 27 30 31	40	30 21 13 16 16 16 16 18 18 12 52 20 25 26 23 32 27 33 56 62 37 24 26 35 38 41 30 30 32 22 21 24 1 2 3 4 5 6 7 8 9 10 S S M T W T F Correctore Correctore V T 8 12 13 14 14 12 14 23 30 9 14 26 12 9 14 12 14 12 14	28 29 30 31 35 21 26 54 34 21 38 21 24 19 22 11 20 21 29 31 27 24 13 13 19 21 21 24 22 14 13 13 19 21 21 24 22 14 1 2 3 4 5 6 7 S S M T W T F 27 28 29 30 31 31 30 S S M T W T F 28 29 30 31 31 30 31 31 30 38 35 38 36 37 38 35 38 35 38 36 32 34 35 36 36 36 36	25 26 27 28 29 30 31 18 17 12 8 8 10 8 14 11 23 21 23 37 26 28 25 20 22 35 18 18 18 24 11 9 14 8 19 20 14 1 2 3 4 5 S S M T V T F 20 14 1 2 3 4 5 S S M T V T F 20 14 1 2 3 4 5 S S M T V T F 20 25 26 27 28 29 30 20 33 36 30 18 14 17 <	40	30 19 12 12 22 19 28 22 25 15 25 24 28 30 30 33 36 40 59 58 42 31 39 45 41 46 28 42 29 30 34 1 2 3 4 5 66 7 8 9 10 5 S M T W T X 6 7 8 9 10 10 5 S M T W T X 6 7 8 9 10 10 10 5 S M T W T X 6 7 8 9 10 11 10 6 7 10 13 11 18 14 9 10	28 29 30 31 29 24 34 56 36 27 42 3 3 4 28 16 29 34 46 36 29 34 21 29 26 25 22 16 15 14 17 20 21 23 26 1 2 3 4 5 6 7 28 29 30 4 5 6 7 5 S M T W T F 60 30 31 40 5 6 7 7 28 29 30 31 40 47 37 35 36 60 38 12 15 40 11 32 26 26 14 15 12 13 21 36 36 36 4	25 26 27 28 29 30 31 23 16 10 6 8 10 10 11 19 24 16 28 33 37 42 25 22 36 37 - 31 33 14 9 12 9 21 25 15 1 2 3 4 5 5 S M T W T F Colspan="4">Colspan="4" 7 22 23 16 11 13 17	40				
30 10 15 16 20 14 12 11 9 15 19 22 20 12 12 14 19 21 21 24 25 15 15 17 1 2 3 4 5 6 7 8 9 10 5 8 7 8 9 10 5 8 7 8 9 10 5 12 13 20 12 16 6 7 8 9 10 7 7 8 9 10 7 8 12 13 10 14 12 13 20 12 16 14 12 15 16 18 13 10 15 24 23 27 19 23 19 32 18 24	28 29 30 31 19 31 27 16 26 23 24 2 21 18 8 11 18 20 17 21 17 10 19 13 15 14 12 20 18 20 16 22 19 22 1 2 3 4 5 6 7 S S M T W T F Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4">Colspan="4"Colspan="4">Colspan="4"Col	25 26 27 28 29 30 31 8 14 12 12 12 20 13 17 11 18 26 27 30 31 27 16 18 27 39 15 17 20 22 15 10 12 13 21 18 14 1 2 3 4 5 S S M T W T F 24 25 26 27 28 29 30 19 41 35 28 19 16 23 28 22 32 31 14 17 18 25 29 23 27 37 37 37 37	40	30 21 13 16 16 16 16 18 18 12 52 20 25 26 23 32 27 33 56 62 37 24 26 35 38 41 30 30 32 22 21 24 1 2 3 4 5 6 7 8 9 10 S S M T W T F 29 30 9 14 26 12 9 8 8 11 20 14 12 8 12 16 15 14 8 9 14	28 29 30 31 35 21 26 54 34 21 38 21 24 19 22 11 20 21 29 31 27 22 18 25 24 27 22 14 24 13 13 19 21 21 24 22 1 2 3 4 5 6 7 S S M T W T F 27 28 29 30 31 31 30 S S M T W T F 28 29 30 31 31 30 38 35 38 35 38 36 32 34 30 39 32 36 38 35 38 36 32 34 36 30 32	25 26 27 28 29 30 31 18 17 12 8 8 10 8 14 11 23 21 23 37 26 28 25 20 22 35 18 18 18 24 11 9 14 8 19 20 14 1 2 3 4 5 S S M T W T F 20 14 1 2 3 4 5 S S M T W T F 20 14 1 2 3 4 5 S S M T W T F 20 33 36 30 18 14 17 20 33 36 30 18 14 17 <	40	30 19 12 12 22 19 28 22 25 15 25 24 28 30 30 33 36 40 59 58 42 31 39 45 41 46 28 42 29 30 34 1 2 3 4 5 66 7 8 9 10 S S M T W T F 29 30 9 12 8 9 10 S S M T W T F V V V T W T F 20 30 9 12 28 16 4 9 12 14 20 13 11 8 10 15 12 13 12 14 19 20	28 29 30 31 29 24 34 56 67 42 23 23 24 28 16 29 34 46 36 29 34 21 29 26 25 22 16 15 14 17 20 21 23 26 1 2 3 4 5 6 7 28 29 34 5 6 7 7 5 S M T W T F 70 28 29 30 31 40 47 72 28 29 30 31 40 47 37 35 36 60 38 12 15 19 14 11 32 26 14 14 15 12 33 21 56 14 14 <td>25 26 27 28 29 30 31 23 16 10 6 8 10 10 11 19 24 16 28 33 37 42 25 22 36 37 - 31 33 14 9 12 9 21 25 15 1 2 3 4 5 5 S M T W T F Colspan="4">Colspan="4" Colspan="4"Colspan="4" <td c<="" colspan="4" td=""><td>40</td></td></td>	25 26 27 28 29 30 31 23 16 10 6 8 10 10 11 19 24 16 28 33 37 42 25 22 36 37 - 31 33 14 9 12 9 21 25 15 1 2 3 4 5 5 S M T W T F Colspan="4">Colspan="4" Colspan="4"Colspan="4" <td c<="" colspan="4" td=""><td>40</td></td>	<td>40</td>				40

Beresfield

Singleton

April 2018

Randwick



Beresfield

July 2018

Randwick

Januar 30 31 25 19 24 32 38 24 24 21 21 33 17 16 26 20 14 20 21 21 21	19182202022625220141	4 2 3	 27 28 12 11 23 26 28 33 	9 11 1 26 25 3	117 12 12 19 28 17 53 35 14 24 25		24 25 2 20 33 2 11 13 1 36 35 6	Var 27 28 34 20 12 17 11 13 9 21 22 36 22 24 28 24 26 1 23 26 20 25	10 90	Jan 31 22 18 27 32 27 14 17 18 16 20 13 13 22	26 22 24 27 34 30 25 16 15	18 22 18	27 2 10 5 24 2 28 2	9 13 11 26 30 22 23 21 14	31 14 9 17 15 2 39 56 3 13 14 1 225 1 2	5 9 4	 24 29 13 34 33 	March 37 21 26 27 28 37 21 24 19 18 15 11 18 25 17 27 33 56 42 16 18 15 18 26 22 18 21	> 100 90	Jan 30 31 23 24 31 36 33 15 16 19 14 27 17 16 23	27 24 25 27 32 26 33 23 22	25 29 23	2728121227373126	Februa 29 30 14 12 7 34 24 5 25 12 4 6 15	31 19 11 16 19 41 37 64 48 11 12 15		24252626111121215354172	27 28 37 20 12 15 11 10 18 16 33 36 44 10 10 13 19 22 14 20	> 100 90
3 4 5 6 S S M T	789	9	3 4		789		24 1	2 3 4 5 6 A T W T F	80	13 13 22 3 4 5 S S M	6 7 8	9	3 4	4 5 6	7 8 9 W T F)	30 1	2 3 4 5 6 M T W T F	80	3 4 5 S S M				5 6 M T				3 4 5 6 T W T F	80
31 25 3 23 25 39 42 2			J	uly	/			30 31 19 13 20 18 18 13 11	70	31 17 17 27 23 68			J	July	/			10 30 31 10 18 21 4 19 25 20	70	31 25 20 31 30 7			J	uly	/			e 30 31 19 10 13 26 19 30 26	70
35 42 2 25 13 1 16 10 1 5 6 1	30	10				14		10 13 11 21 18 21 16 9 10 4 5 6	60	 23 03 27 16 14 11 5 6 	30					16		19 25 20 15 14 15 1 21 8 10 4 5 6	60	2615131056	30	19	12				28	152317141011456	60
SSN	11	9	15	19 14	22 60	20 46		W T F		SS	18 23		18 27	25 33	20 56	25 62	26 37	WTF		SS	22 30	25 33	15	25	24	28	30 42	WТF nber	50
30 10 1 11 9 1	12	14	19	21	21	21	25	29 30 31 12 20 13 27 30 31	50	30 2118 1823 32	24				41	30	30	3 29 30 31 8 10 8 1 23 37 26	50	30 1922 2530 33	30 31	33 31	36 39	40 45	55 41	эо 46	4Z 28	29 30 31 8 10 10 28 33 37	50
12 14 1 25 15 1 4 5 0	<mark>25</mark>	15	13	17	1	2	3	39 15 17 12 13 21 3 4 5	40	 23 32 24 26 32 22 4 5 	32	22	21	24	1	2	3	2 37 20 2 35 18 18 14 8 19 3 4 5	40	313142425	42	29	30	34	1	2	3	37 4 12 9 21 3 4 5	40
SSI	4	5	6	7	8	9	10	WTF	30	SS	4	5	6	7	8	9	10	WTF	30	S S	4	5	6	7	8	9	10	WTF	30
29 30 12 13 14 12 15 16 15 24 23 27 32 18 24 20	20 12 1 18 13 1 19 23 1 30 22 2	0 9 5	27283339161414	36 26 1 8 16 2 13 20 1	31 26 18 14 18 26 19 18 37 96 32		24 25 2 19 41 3 28 32 3 29 29 2	cember 6 27 28 29 30 5 28 19 16 23 11 14 17 18 25 13 27 17 19 19	20	293098811121615151617	20 14 12 14 8 9 21 32 20	8 14 28	27 2 35 3 19 1 13 1	35 38 12 10 12 12 12 13	31 31 3 26 12 1 21 24 1 44 100 1	6 5 10	24 2520 3318 2214 11	Becember 8 29 30 26 27 28 29 30 36 30 18 14 17 29 17 12 12 24 21 22 18 17 18	20	2930991211101512251518	20 13 11 13 12 14 24 32 19	8 19 28	2728373519141512	29 30 3 29 30 5 36 60 4 11 13 2 13 21	31 40 47 38 12 15 26 26 14 58 100 100		242526213724172223152019	27 28 29 30 34 16 12 14 16 11 13 17 23 21 19 15	20
23 20 22 22 3 4 5 6 S S M T	789)	1 2	3 4	24 18 14 5 6 7 VTF		34 36 3	4 21 26 27 30 5 1 2 3 4 1 T W T F	10	23 20 19 3 4 5 S S M	6 7 8	9		2 3 4	15 12 1 5 6 7 W T F	7	22 30	14 14 18 17 18 35 1 2 3 4 M T W T F	10	28 24 21 3 4 5 S S M	6 7 8	9	1 2	5 22 27 3 4 M T	567		20 26 26	12 14 18 20 1 2 3 4 T W T F	10

Beresfield

Singleton

November 2018

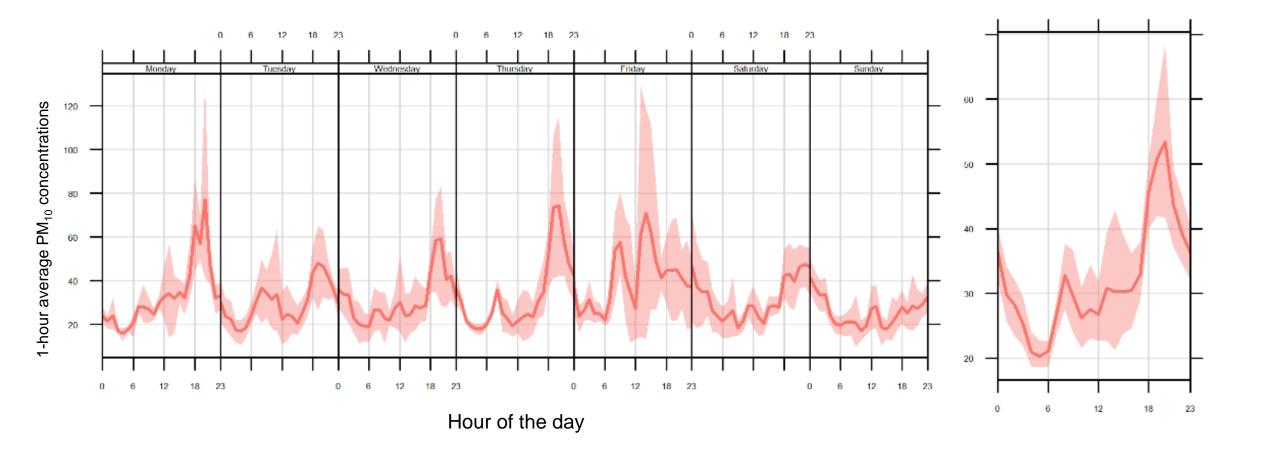
Randwick

Januarya 30 31 25 19 19 18 20 24 32 38 24 20 20 24 24 21 21 33 26 25 22 17 16 26 20 20 14 13 14 20 21 21 24 1 2 3 4 5 6	Image: Section 1 <	100 90 80	Java Java Java Java Java Java Java Java	18 10 9 13 11 17 15 25 22 24 26 30 22 39 56 39 18 28 23 21 14 13 14 14 2 14 10 11 16 25 1 2				Value Value <th< th=""><th>> 10(90</th><th>30 31 23 17 20 24 31 36 27 24 33 15 16 27 32 19 14 27 32 23 17 16 23 61 15 3 4 5 6 7</th><th colspan="4">FEBERESENENENENENENENENENENENENENENENENENEN</th><th></th><th>24 25 26 26 1 11 12 12 15 35 41 72 12 18 16</th><th>A C S</th><th>> 100 90 80</th></th<>			> 10(90	30 31 23 17 20 24 31 36 27 24 33 15 16 27 32 19 14 27 32 23 17 16 23 61 15 3 4 5 6 7	FEBERESENENENENENENENENENENENENENENENENENEN					24 25 26 26 1 11 12 12 15 35 41 72 12 18 16	A C S	> 100 90 80		
April	November		April						r		TF		Ap November								VTF	00
31 25 30 21 23 25 23 27	28 29 30 31 31 26 ^{31 19} 2 ^{0 18}	70	31 17 24 24 17 27 38 25	27		29	30	31	31	30	31131821	70	3125292420313823	07			en	9di	r to	47	0 31 19 0 13 26	70
39 42 20 29 25 13 17 14 16 10 14 1 5 6 7 8	39 36 26 18 14 18	60	27 16 16 15			35	38	26	12	16	25 20 14 15 8 10 5 6	60	30 72 31 24 26 15 14 14 13 10 11 1	27 37	28 35	29 36	30 60	31 38	40 12	47 15	9 30 26 5 23 17 4 10 11	60
<u>з я м т</u> 16				19	12	10	12	21	24	15	TF		5 6 7 8 S S M T	19	14	11	13	26	26	14	156 VTF	
July 14	14 13 20 67 96 32 er	50	July 1	13	12	12	13	44	100	100	er 30 31	50	Jul 30 19 12 1;	15	12	13	21	58	100	100)er	50
11 9 15 19 14 24	50 51		23 32 27 33	18	17			15	12	18	10 8 37 26		30 13 12 11 22 25 15 2 30 33 36 44	24	36	22	27	14	10	14	3 10 10 8 33 37	
12 14 19 21 25 15 13 17 4 5 6 7	2 3 4 5 6 7 ¹⁵ ¹⁷ ¹³ ²¹ ⁴ ⁵	40	24 26 35 38 32 22 21 24 4 5 6 7	1	2	3	4	5	6	7	18 18 8 19 4 5	40	31 31 39 4 42 29 30 3 4 5 6 7	1	2	3	4	5	6	7	7 2 9 21 3 4 5	40
SSMTWTF	SSMTWTF SSMTWTF	30	SSMTWTF	SMTWTF SSMTWTF			F	SSMTWTF			30	ѕѕмтw	SSMTWTF					SSMTWTF		30		
Vert Coll Vert Coll <t< td=""><td>V V</td><td>20</td><td>October 4 26 12 9 8 8 11 20 12 8 12 16 15 14 8 9 1 15 16 17 21 32 20 2</td><td colspan="3">30 9 14 26 12 9 8 11 20 14 12 8 16 15 14 8 9 14 12 16 19 12 10 12 12 16 17 21 32 20 28 13 12 12 13 44 10 10</td><td>2 16 4 15 0 100</td><td colspan="3">UPERENENT 24 25 26 27 28 29 30 20 33 36 30 18 14 17 18 22 29 17 12 12 24 14 11 21 22 18 17 18</td><td>20</td><td colspan="3">29 30 9 12 28 16 4 9 12 11 20 13 11 8 10 15 12 13 12 14 19 25 15 18 24 32 19 28</td><td colspan="5">Y <thy< th=""> <thy< th=""> <thy< th=""> <thy< th=""></thy<></thy<></thy<></thy<></td><td colspan="3">December 24 25 26 27 28 29 30 21 37 24 34 16 12 14 17 22 23 16 11 13 17 15 20 19 23 21 19 15</td></t<>	V V	20	October 4 26 12 9 8 8 11 20 12 8 12 16 15 14 8 9 1 15 16 17 21 32 20 2	30 9 14 26 12 9 8 11 20 14 12 8 16 15 14 8 9 14 12 16 19 12 10 12 12 16 17 21 32 20 28 13 12 12 13 44 10 10			2 16 4 15 0 100	UPERENENT 24 25 26 27 28 29 30 20 33 36 30 18 14 17 18 22 29 17 12 12 24 14 11 21 22 18 17 18			20	29 30 9 12 28 16 4 9 12 11 20 13 11 8 10 15 12 13 12 14 19 25 15 18 24 32 19 28			Y Y <thy< th=""> <thy< th=""> <thy< th=""> <thy< th=""></thy<></thy<></thy<></thy<>					December 24 25 26 27 28 29 30 21 37 24 34 16 12 14 17 22 23 16 11 13 17 15 20 19 23 21 19 15		
23 20 22 22 30 1 2 3 4 5 6 7 8 9 S S M T W T F	24 17 24 28 24 18 14 15 13 14 21 26 27 30 1 2 3 4 5 6 7 34 36 35 1 2 3 4 S S M T W T F S S M T W T F	10	23 20 19 21 34 1 2 3 4 5 6 7 8 9 S S M T W T F	9		2 3	15 12 4 5 6 T W T	7	2	2 30 35	14 18 17 18 1 2 3 4 T W T F	10	28 24 21 29 44 3 4 5 6 7 S S M T W	89		24 36 22 1 2 3 S S M	4 5	6 7		20 26 26	12 14 18 20 1 2 3 4 1 W T F	10

Beresfield

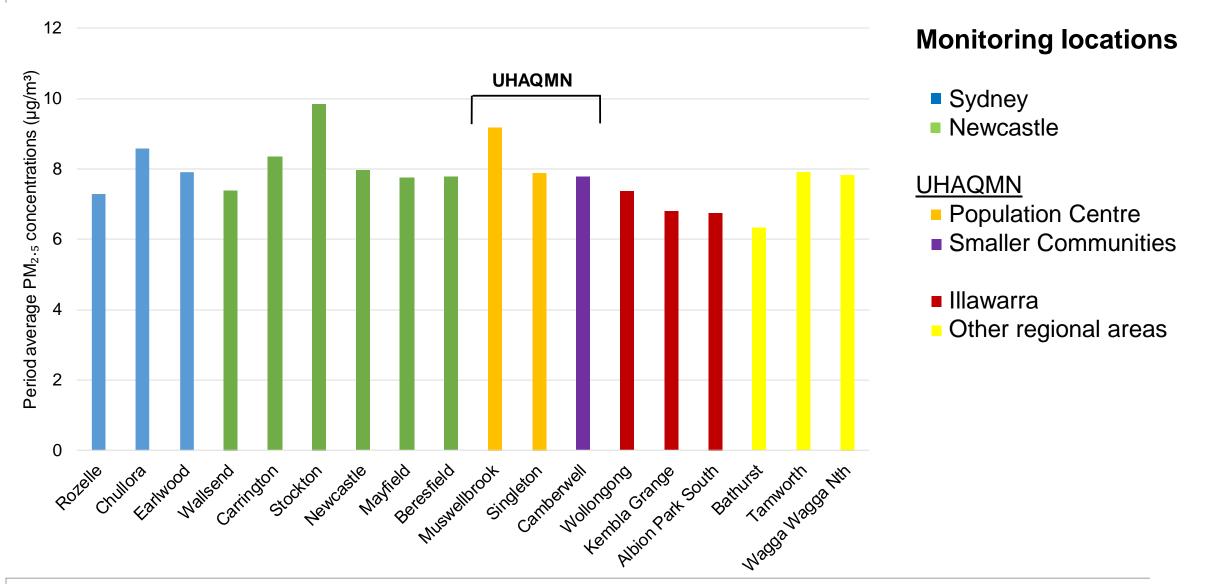
Singleton

PM₁₀ concentrations in Muswellbrook during May 2018

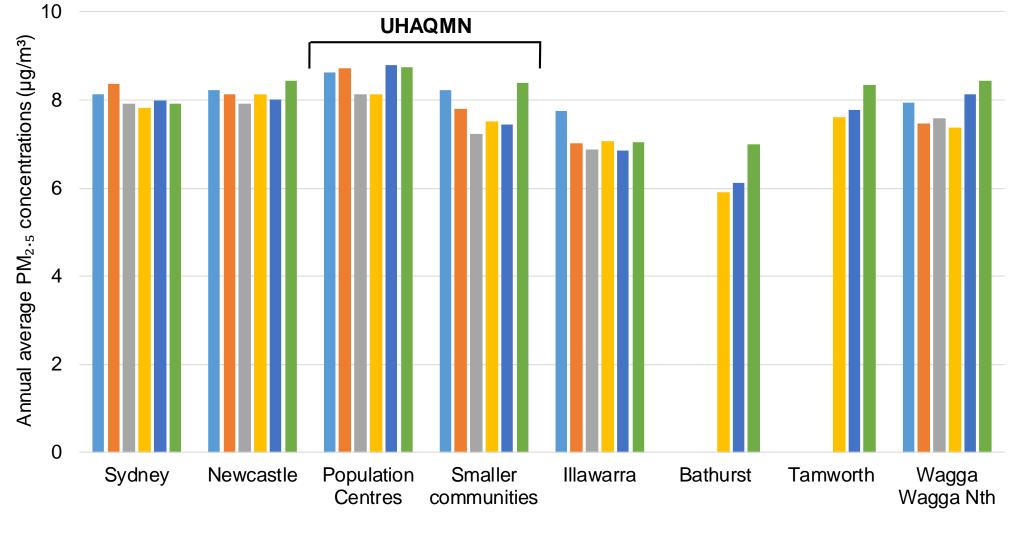


Discussion of PM₂₋₅ Concentrations

Comparison of period average PM2.5 concentrations

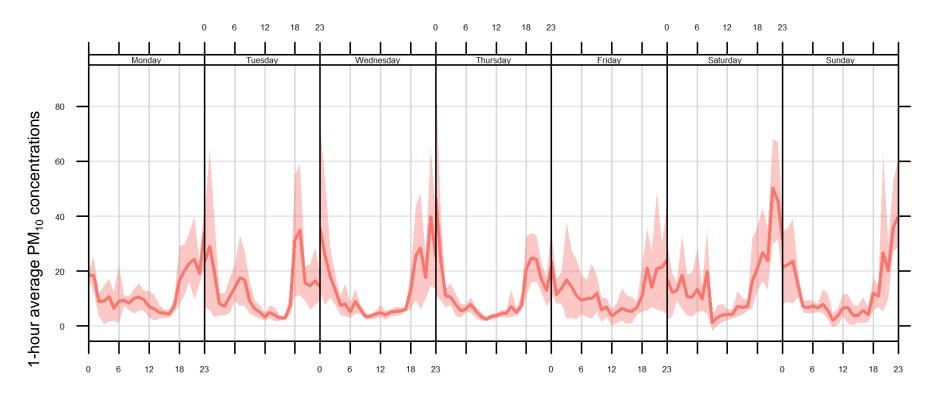


Comparison of annual average PM2.5 concentrations



■2013 ■2014 ■2015 ■2016 ■2017 ■2018

PM_{2.5} concentrations in Muswellbrook during May 2018



Hour of the day

Summary

1. Has the air quality in the Upper Hunter changed since monitoring began?

- From 2013 to 2015 there were reductions in annual average PM_{10} and $PM_{2.5}$ concentrations at most monitoring locations within the Upper Hunter.
- From 2015 to 2018 there were year-on-year increases in annual average PM_{10} and $PM_{2.5}$ concentrations at almost all monitoring locations within the Upper Hunter.
- In 2018, there was a 45% reduction in total annual rainfall from 2015 levels.
- Annual trends appear to be more strongly correlated to rainfall than coal production.

Summary

2. Is the air quality in the Upper Hunter measured at the monitoring stations different from air quality measured at other locations in NSW?

- Since 2015, there has been a year-on-year increase in annual average PM₁₀ concentrations in Sydney, Newcastle, Upper Hunter and Illawarra.
- Elevated dust concentrations during 2018 were apparent across the Sydney GMR, Newcastle/Lower Hunter and the Upper Hunter with peaks evident across all regions.



Thank you



The business of sustainability