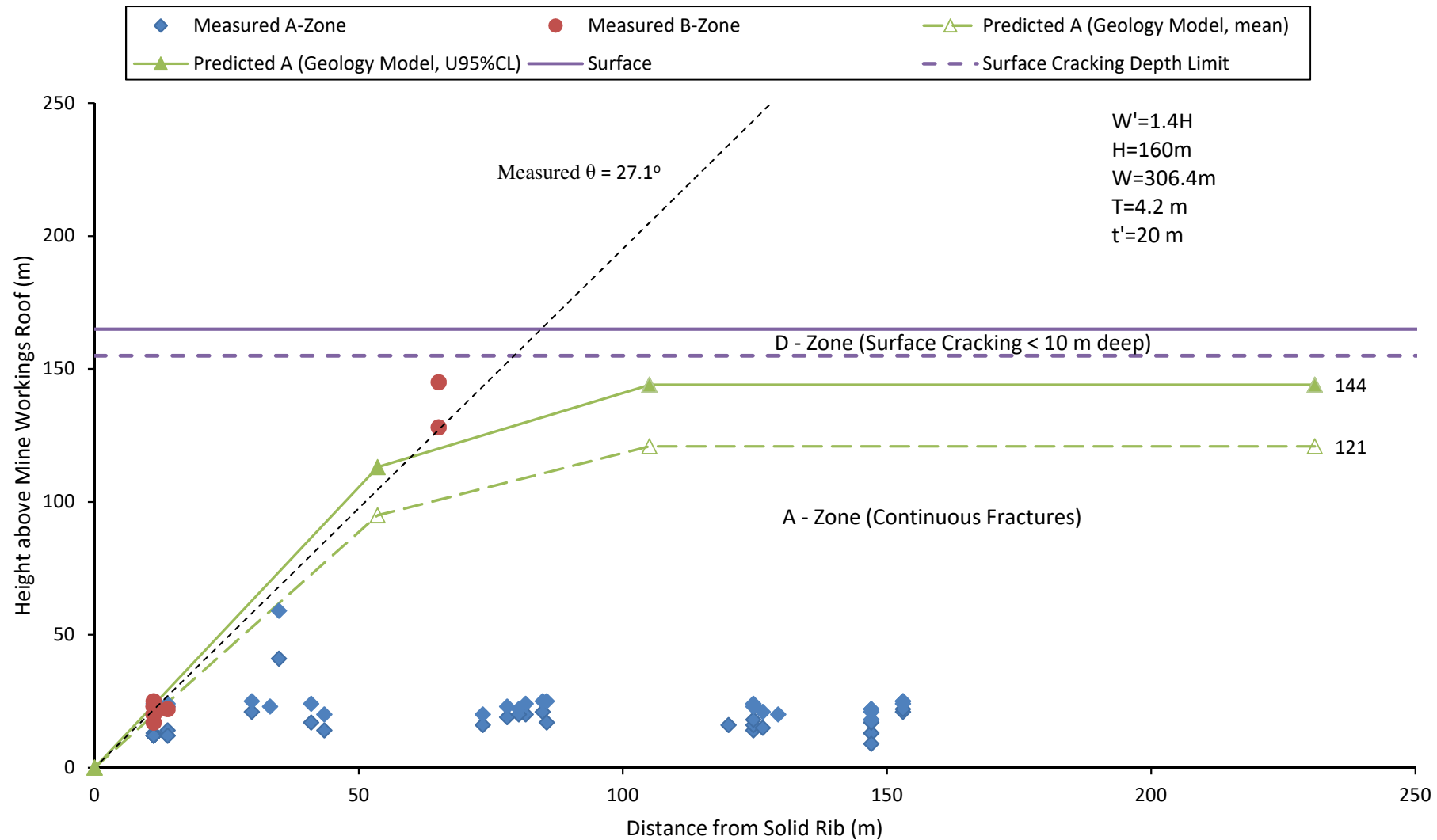




Engineer: S.Ditton

Drawn: S.Ditton

Date: 15.08.17

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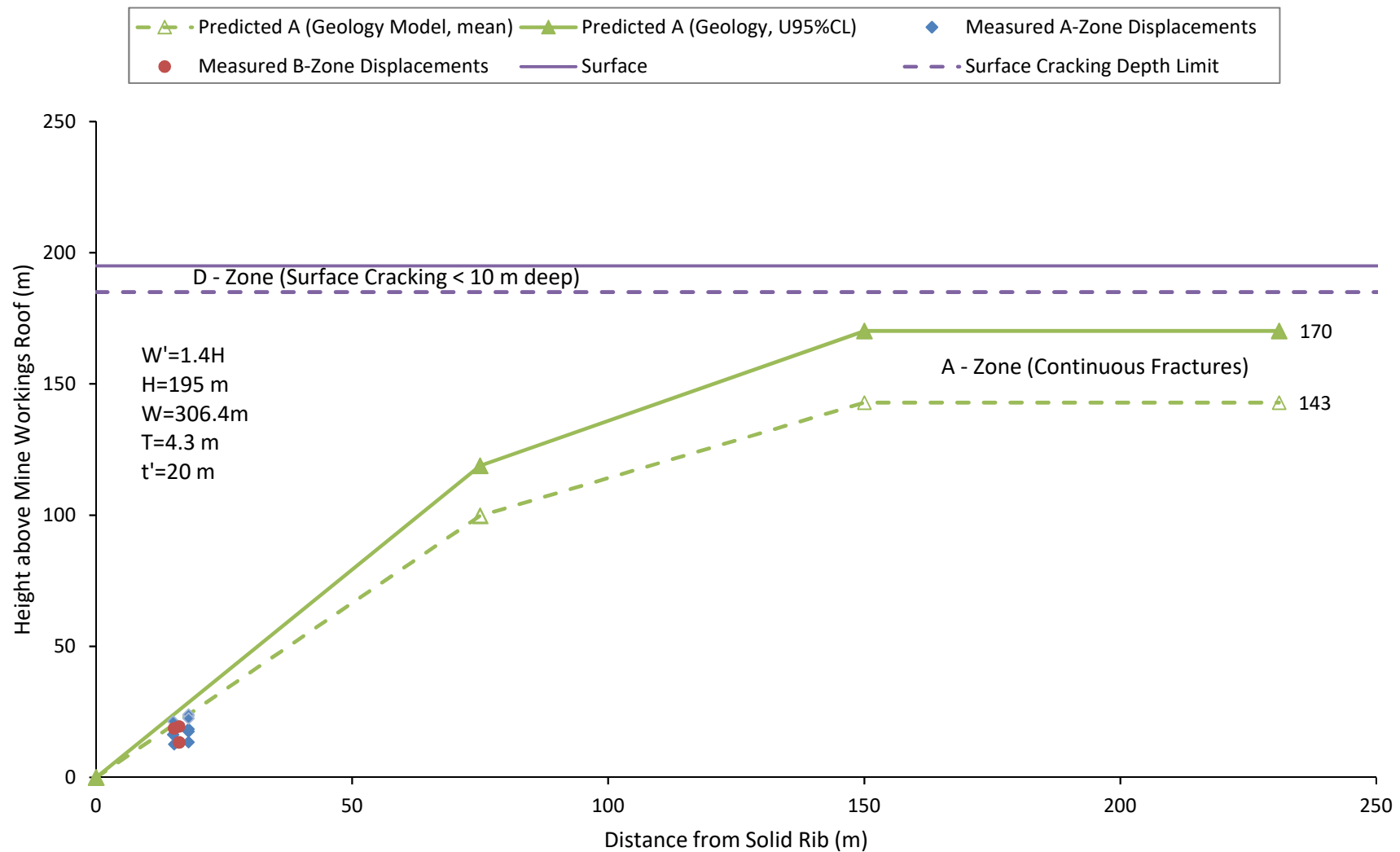
Client: Narrabri Mine

NAR-005/1

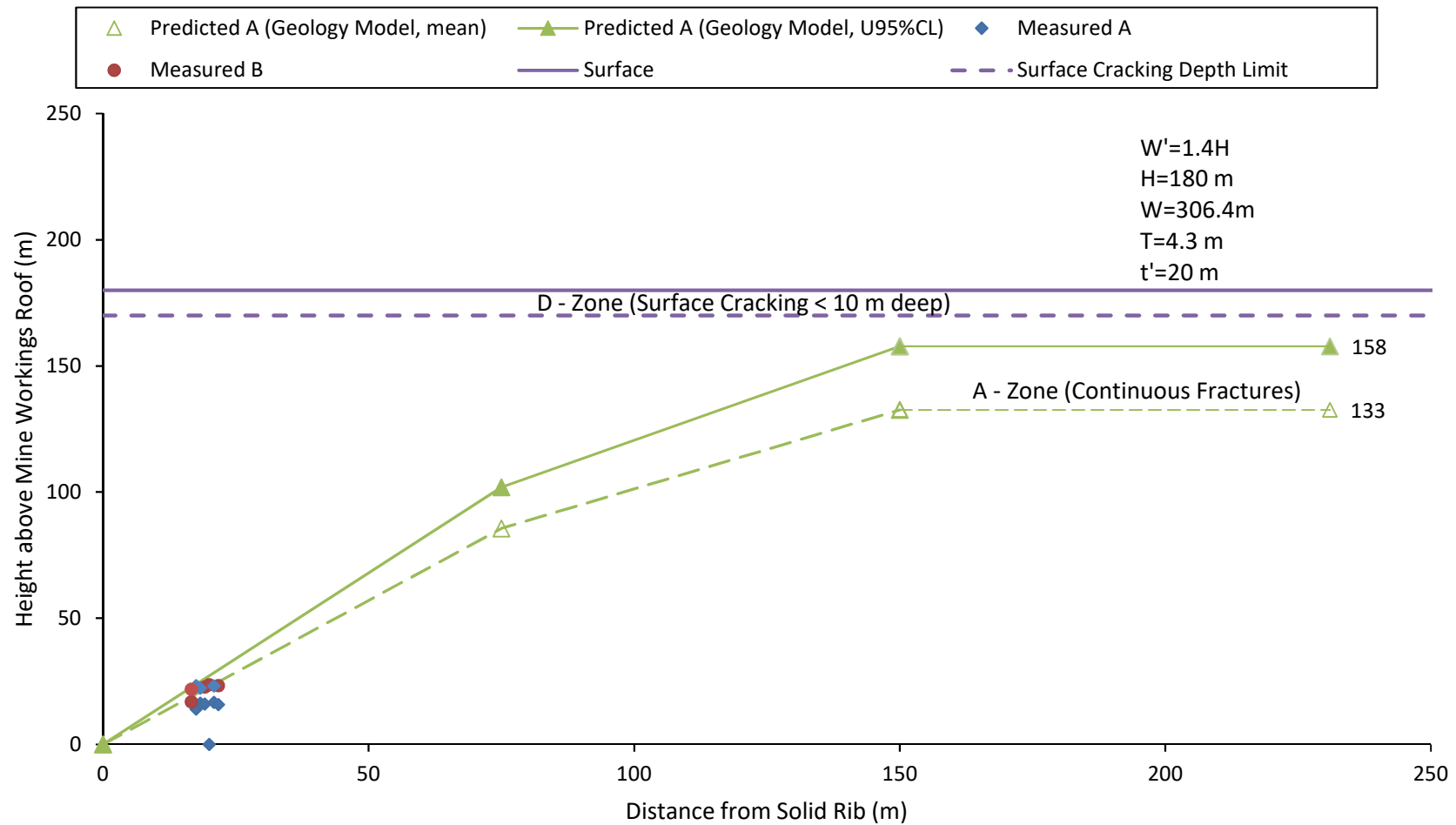
Title: Measured v. Predicted Subsurface Fracturing Above LW101 to 102 from Borehole
Extensometers

Scale: NTS

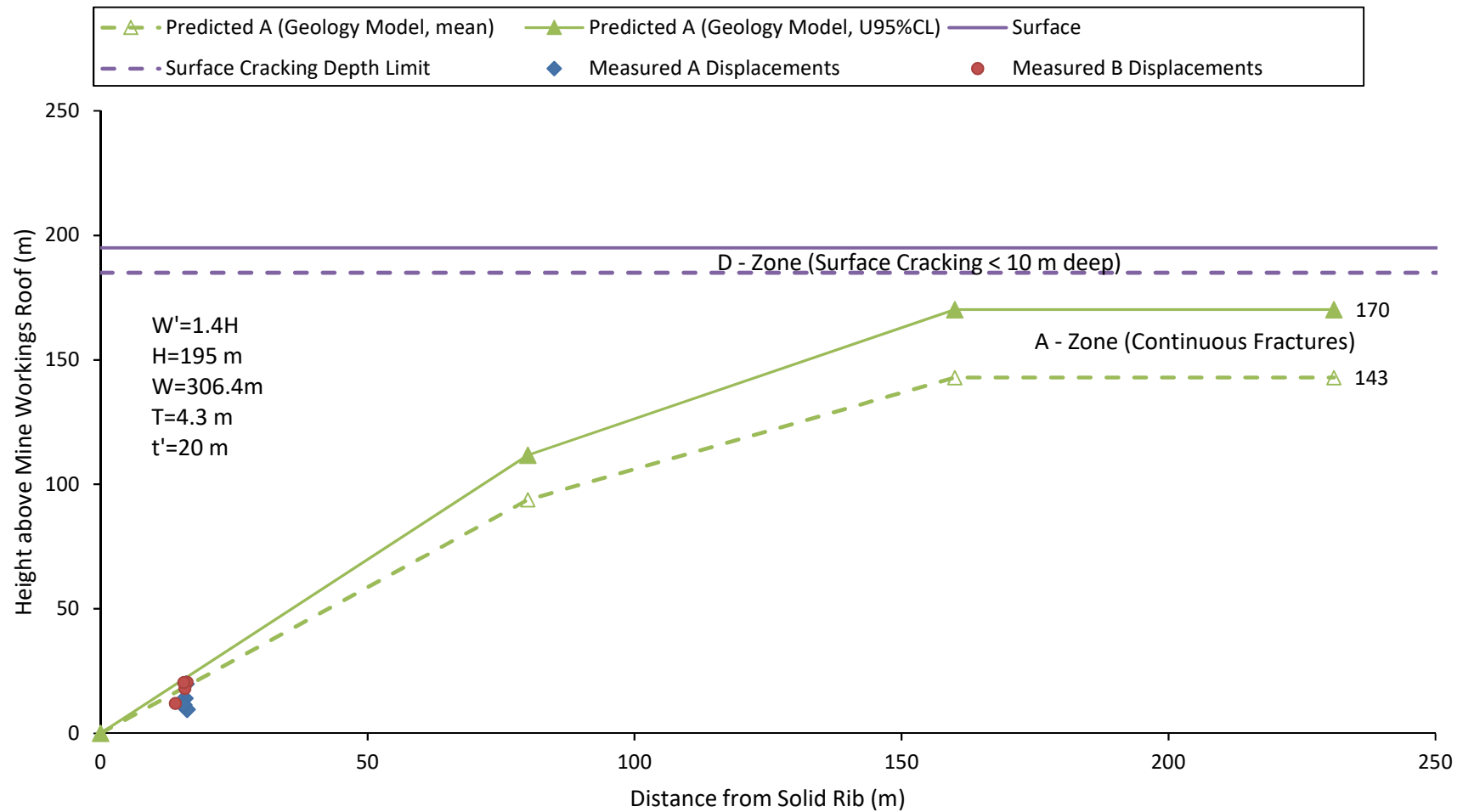
Figure No: 16a



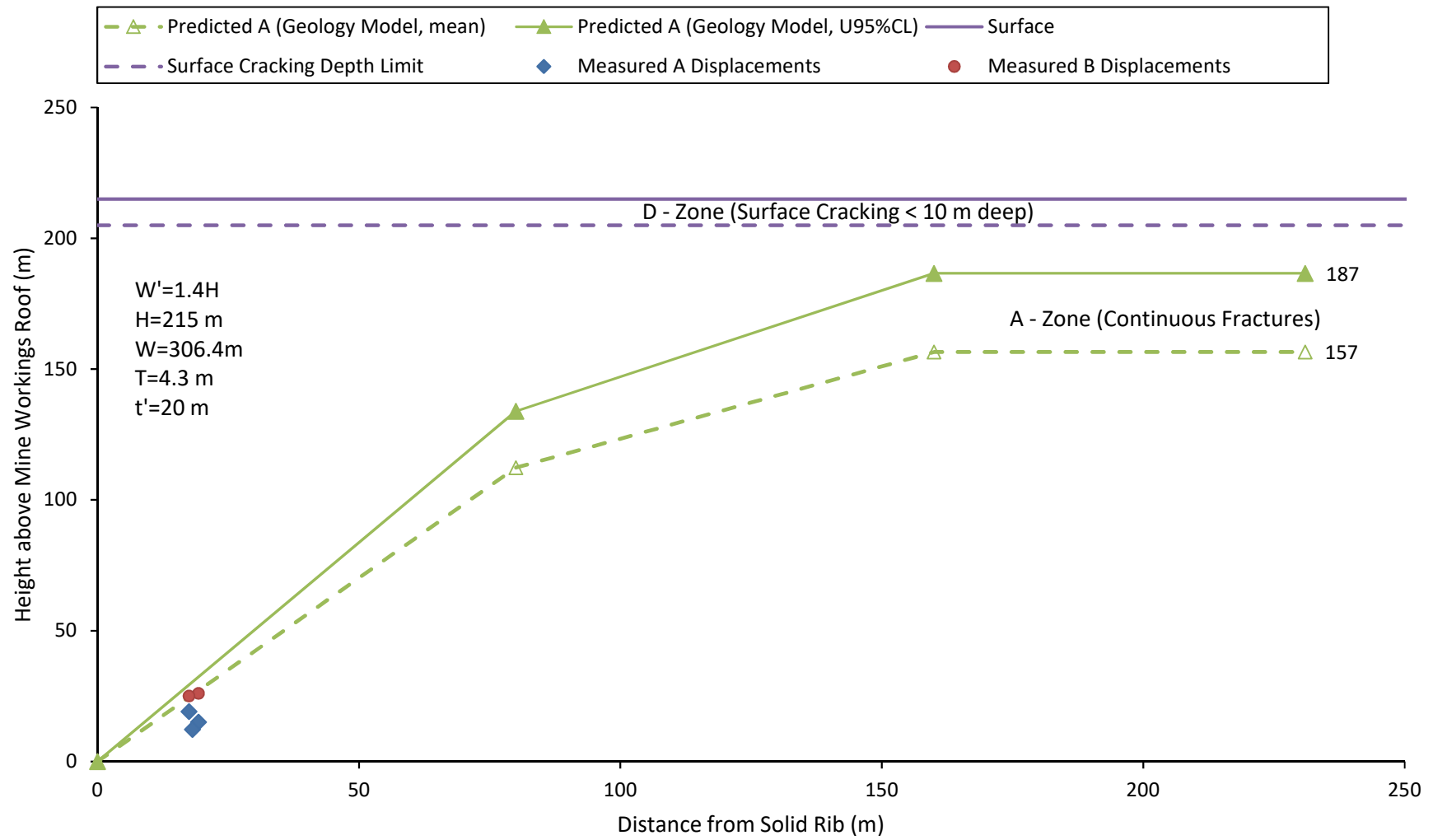
	Engineer:	S.Ditton	Client:	Narrabri Mine			
	Drawn:	S.Ditton		NAR-005/1			
	Date:	15.08.17	Title:	Measured Subsurface Fracturing Above LW103 from Borehole Extensometers			
	Ditton Geotechnical						
	Services Pty Ltd		Scale:	NTS		Figure No:	16b



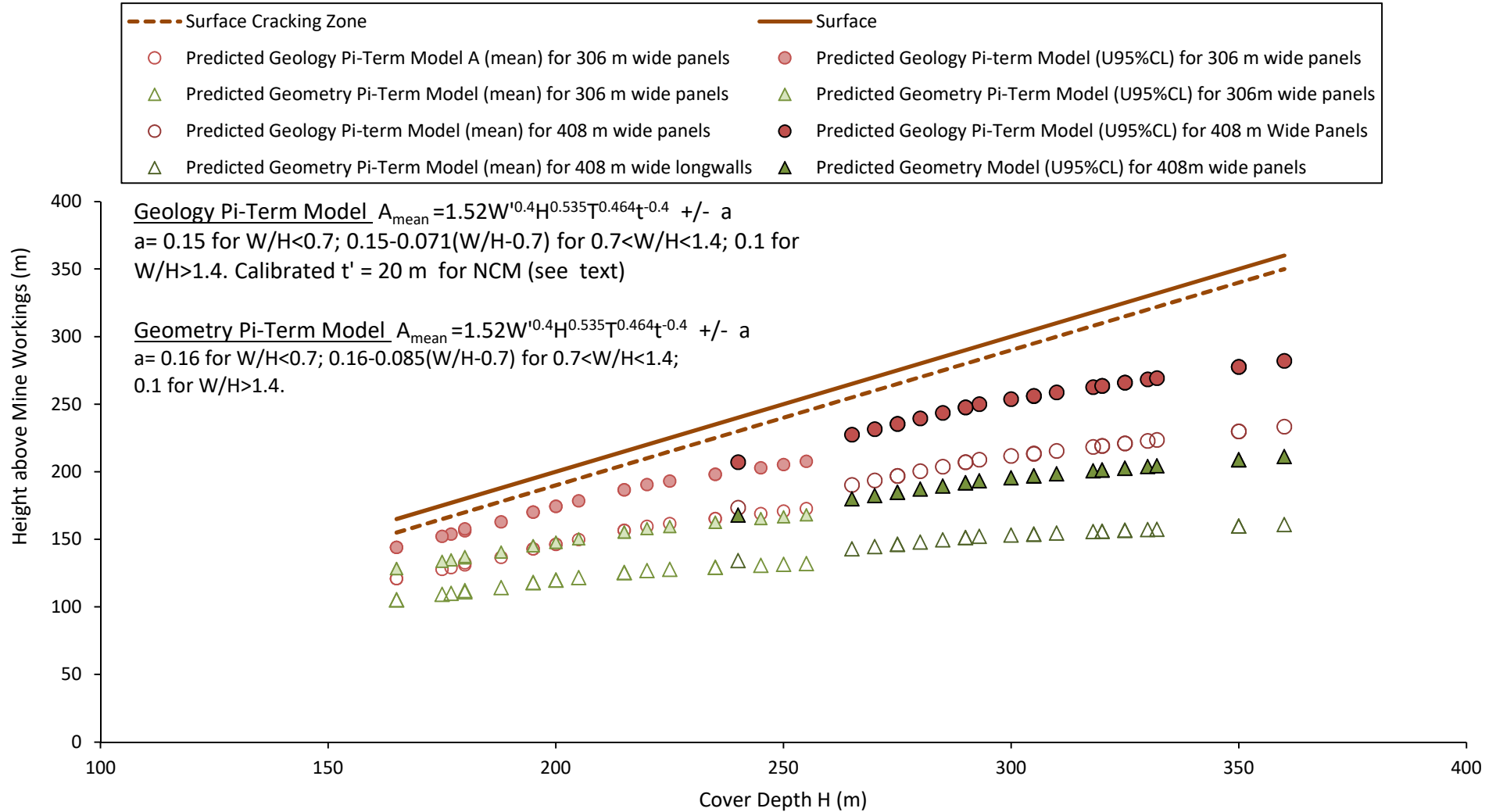
	Engineer:	S.Ditton	Client:	Narrabri Mine			
	Drawn:	S.Ditton		NAR-005/1			
	Date:	15.08.17	Title:	Measured Subsurface Fracturing Above LW104 from Borehole Extensometers			
	Ditton Geotechnical						
	Services Pty Ltd		Scale:	NTS		Figure No:	16c



	Engineer:	S.Ditton	Client:	Narrabri Mine			
	Drawn:	S.Ditton		NAR-005/1			
	Date:	15.08.17	Title:	Measured Subsurface Fracturing Above LW105 from Borehole Extensometers			
	Ditton Geotechnical						
	Services Pty Ltd		Scale:	NTS		Figure No:	16d



Engineer:	S.Ditton	Client:	Narrabri Mine		
Drawn:	S.Ditton		NAR-005/1		
Date:	15.08.17	Title:	Measured Subsurface Fracturing Above LW106 from Borehole Extensometers		
Ditton Geotechnical Services Pty Ltd		Scale:	NTS		Figure No: 16e



Engineer: S.Ditton

Drawn: S.Ditton

Date: 20.11.18

Ditton Geotechnical

Services Pty Ltd

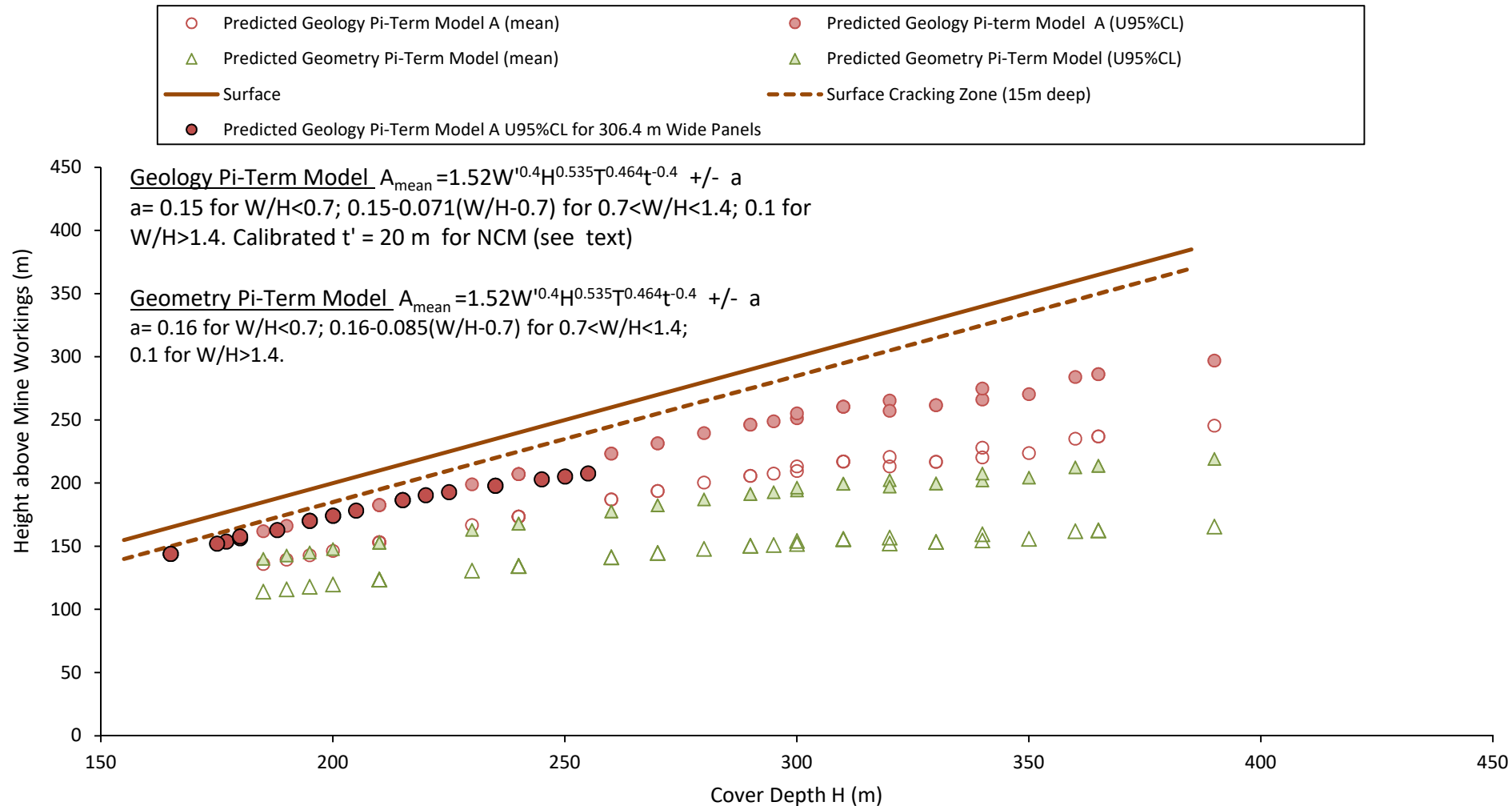
Client: Narrabri Mine

NAR-005/1

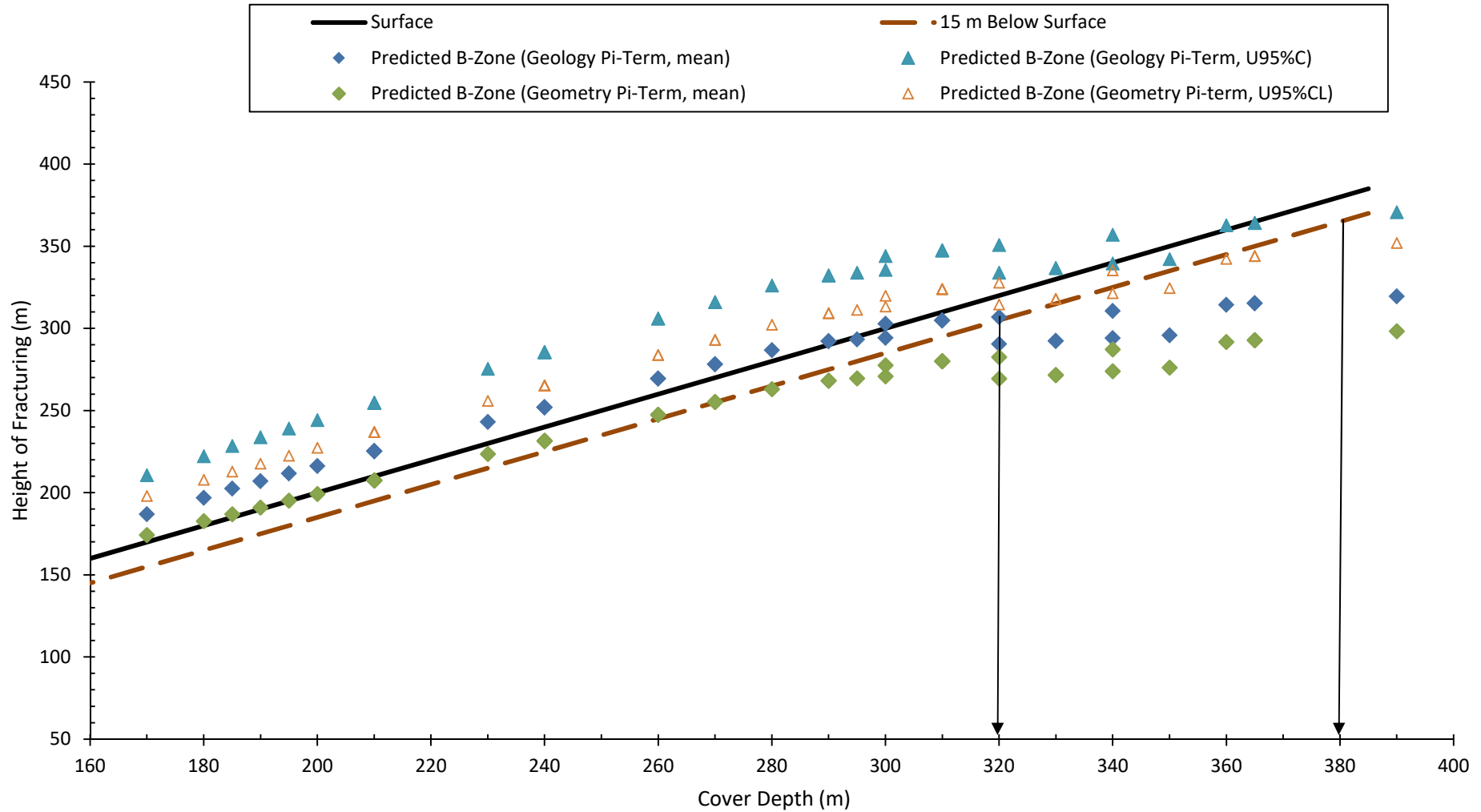
Title: Predicted Heights of Connective Cracking Above LW101 to 111 based on Pi-Term Models
(refer **Ditton & Merrick, 2014**)

Scale: NTS

Figure No: 16f

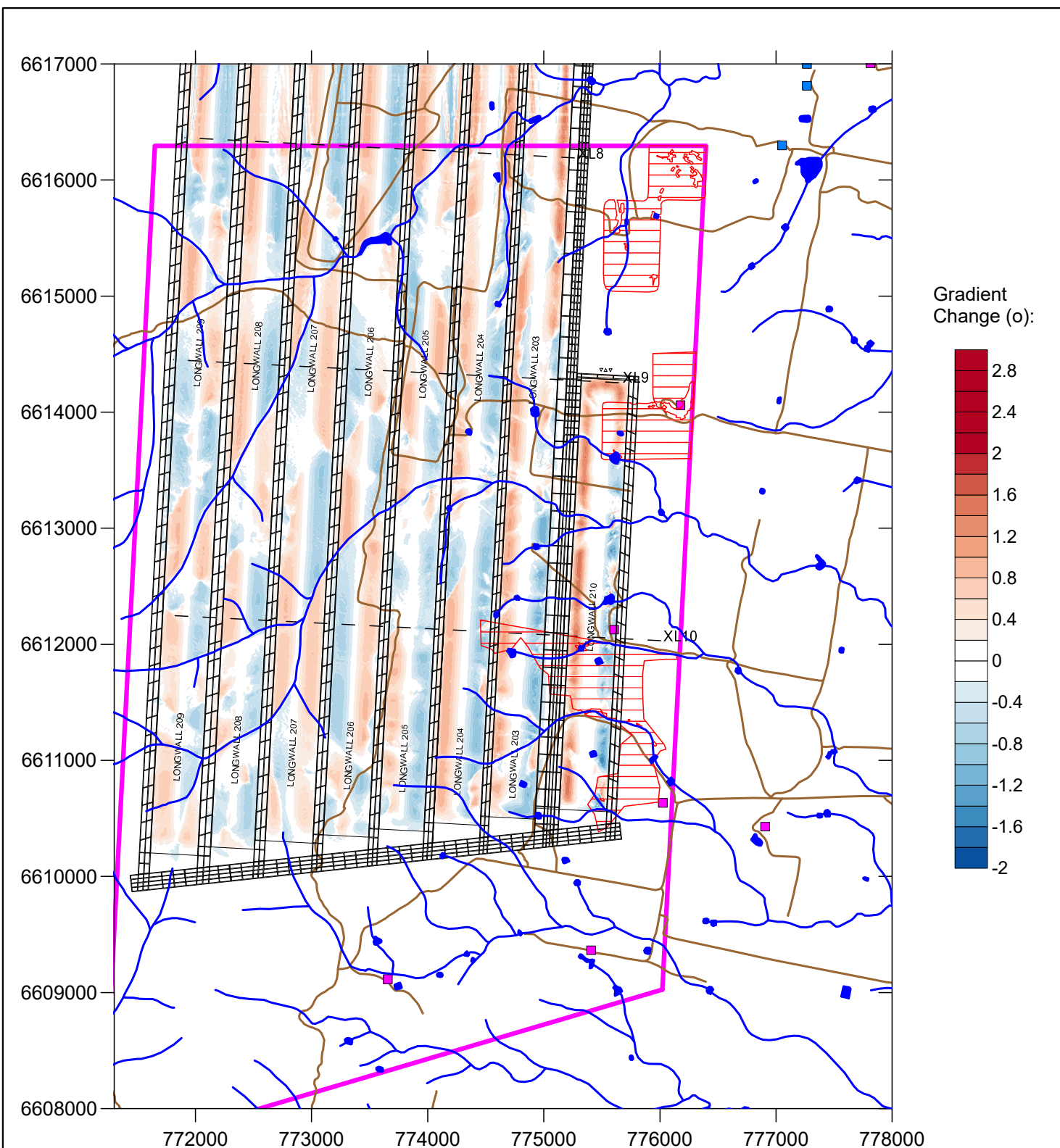


Engineer:	S.Ditton	Client:	Narrabri Mine
Drawn:	S.Ditton		NAR-005/1
Date:	20.11.18	Title:	Predicted Heights of Connective Cracking Above LW201 to 210 based on Pi-Term Models (refer Ditton & Merrick, 2014)
Ditton Geotechnical Services Pty Ltd		Scale:	NTS
		Figure No:	17a



Reference: Ditton & Merrick, 2014 Sub-surface Fracture Model Outcomes

	Engineer:	S.Ditton	Client:	Narrabri Mine				
	Drawn:	S.Ditton		NAR-005/1				
	Date:	15.08.17	Title:	Discontinuous (B-Zone) Sub-Surface Fracture Heights in Constrained Zone				
	Ditton Geotechnical Services Pty Ltd			above the Proposed LW201 to 210				
			Scale:	NTS			Figure No:	17b



Key:

- Roads (unsealed)
- Proposed Longwall Panels
- Ephemeral Creeks & Watercourses
- Dwellings (Private/NCO-Owned)
- BSAL
- Farm Dams
- Gateway Certificate Application Boundary

DgS

Engineer: S.Ditton
Drawn: S.Ditton
Date: 20.11.18

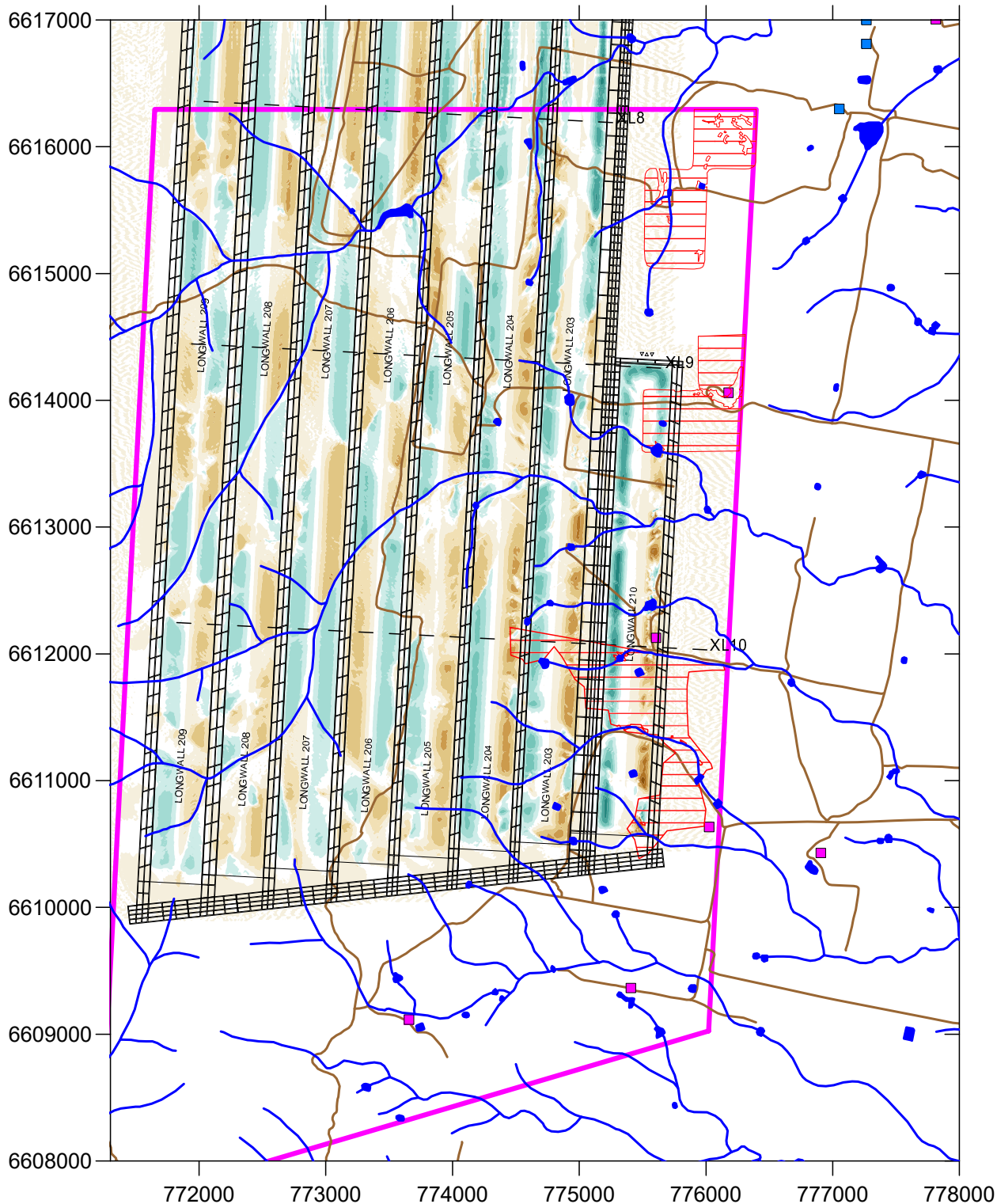
Ditton Geotechnical
Services Pty Ltd

Client: Narrabri Mine
NAR-005/1

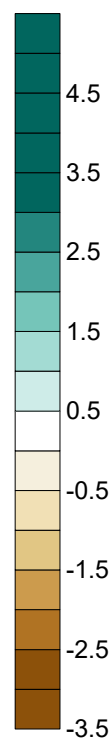
Title: Predicted Surface Gradient Changes (degrees) due to U95%CL
Subsidence Contours above the Proposed LW203 to 210 in the
Application Area

Scale: 1:60,000

Figure No: 18a



Gradient Change (%):



Key:

- Roads (unsealed)
- Dwellings (Private/NCO-Owned)
- Proposed Longwall Panels
- BSAL
- Gateway Certificate Application Boundary
- Ephemeral Creeks & Watercourses
- Farm Dams

DgS

Engineer: S.Ditton
 Drawn: S.Ditton
 Date: 20.11.18

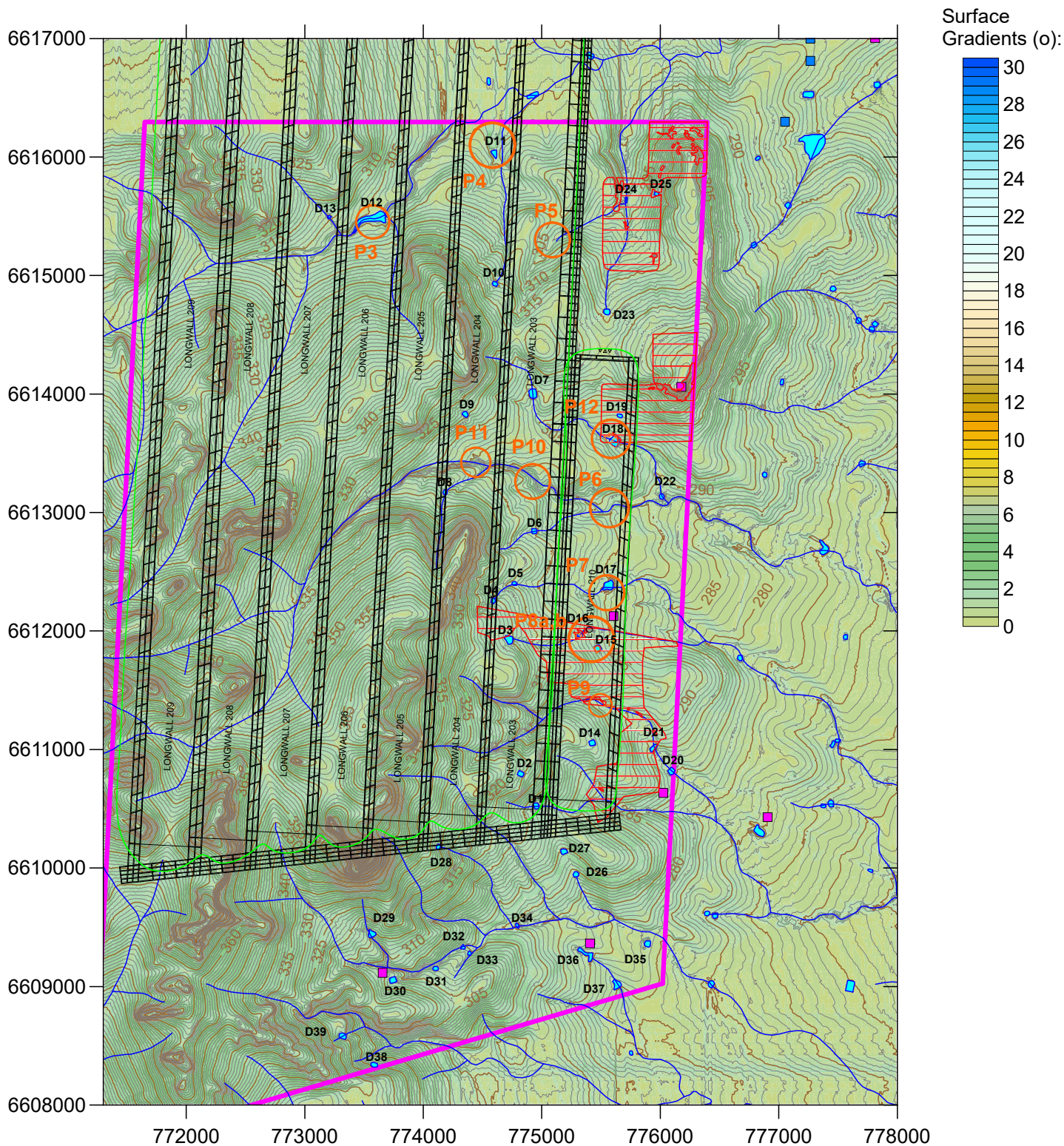
Ditton Geotechnical Services Pty Ltd

Client: Narrabri Mine
 NAR-005/1

Title: Predicted Surface Gradient Changes (percent) due to U95%CL Subsidence Contours above the Proposed LW203 to 210 in the Application Area

Scale: 1:60,000

Figure No: 18b



Key:

- Surface Level contours (m)
- Gateway Certificate Application Boundary
- BSAL
- Angle of Draw
- Proposed mine workings
- Access Roads (unsealed)
- Creeks/Ephemeral Watercourses
- Existing Dwellings (Private/NCO-Owned)
- Farm Dams (D1-D39)
- P10 Likely Ponding Locations (Pre - Mining)

DgS

Engineer: S.Ditton
 Drawn: S.Ditton
 Date: 20.11.18

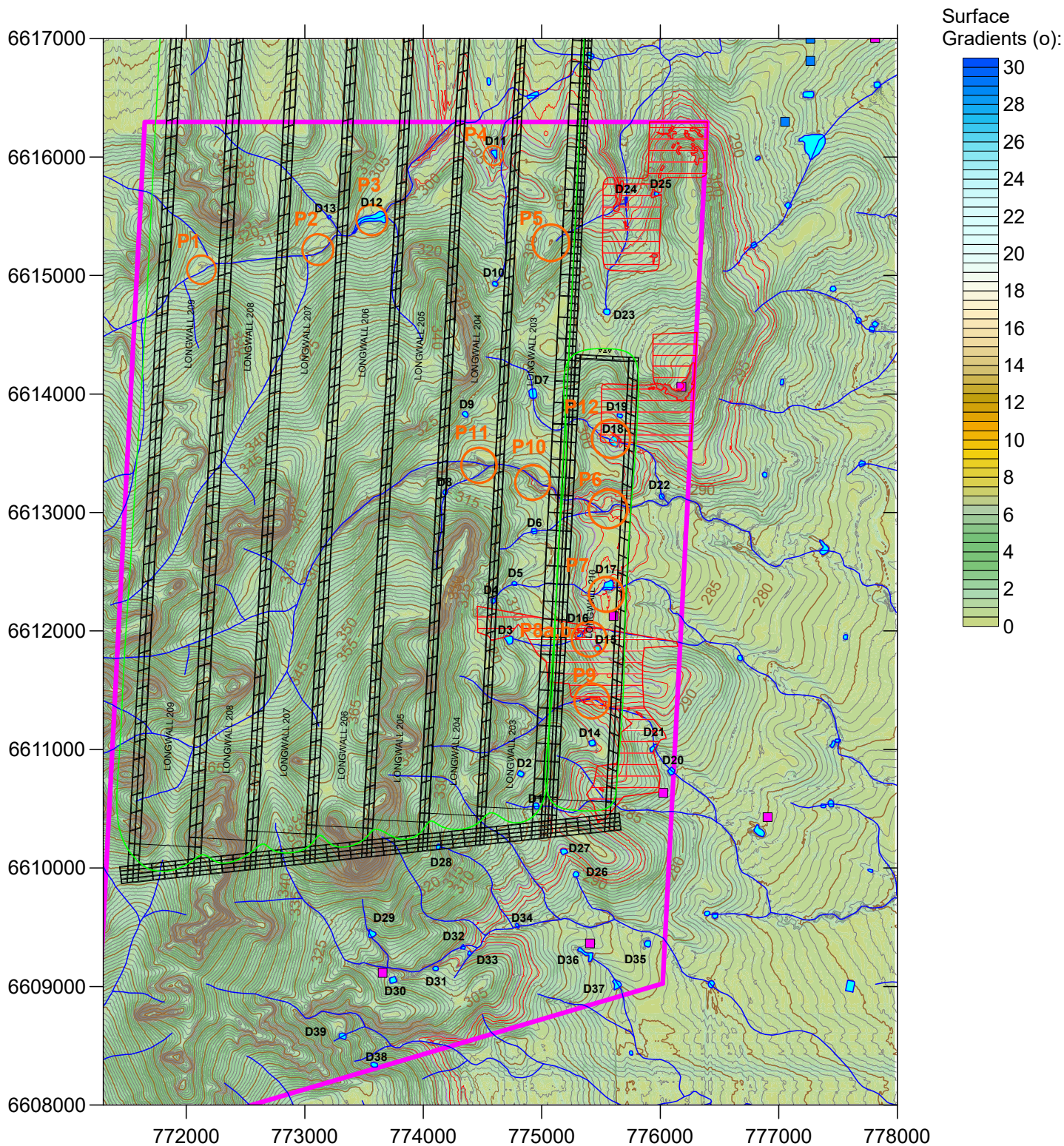
Ditton Geotechnical
 Services Pty Ltd

Client: Narrabri Mine
 NAR-005/1

Title: Predicted Pre-Mining Surface Level Contours and Likely Ponding Locations above the Proposed LW203 to 210 in the Application Area

Scale: 1:60,000

Figure No: 19a



DgS

Engineer: S.Ditton
Drawn: S.Ditton
Date: 20.11.18

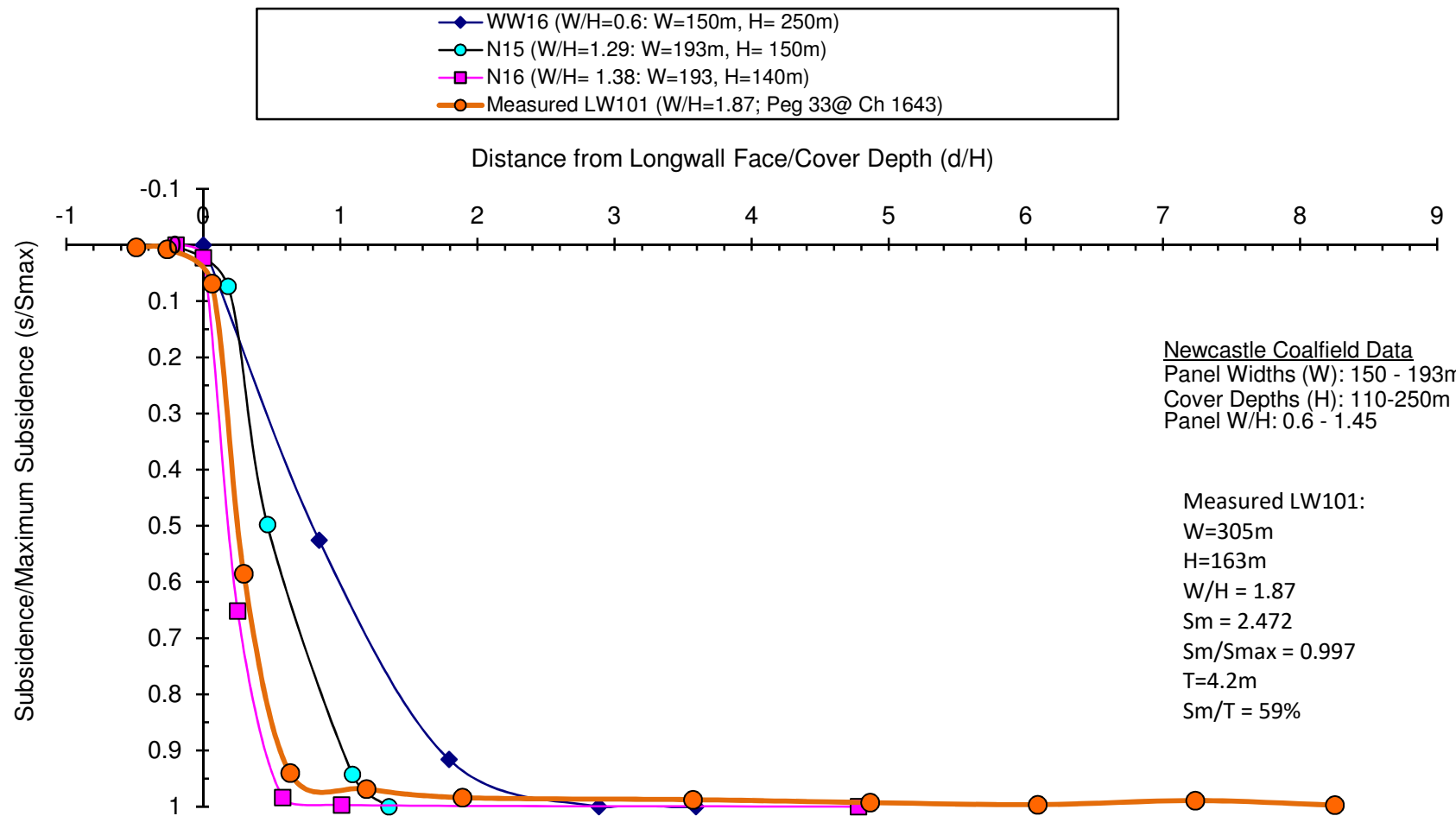
Ditton Geotechnical
Services Pty Ltd

Client: Narrabri Mine
NAR-005/1

Title: Predicted Post-Mining Surface Level Contours and Likely Ponding
Locations above the Proposed LW203 to 210 in the Application Area

Scale: 1:60,000

Figure No: 19b



Engineer:	S.Ditton	Client:	Narrabri Coal Operations Pty Ltd
Drawn:	S.Ditton		NAR-005/1
Date:	25/11/2017	Title:	Empirical Single Longwall Centreline Subsidence Development Prediction Model (based on Newcastle Coalfield Measurements and LW101 Data)
Ditton Geotechnical Services Pty Ltd		Scale:	NTS
			Figure No: 20