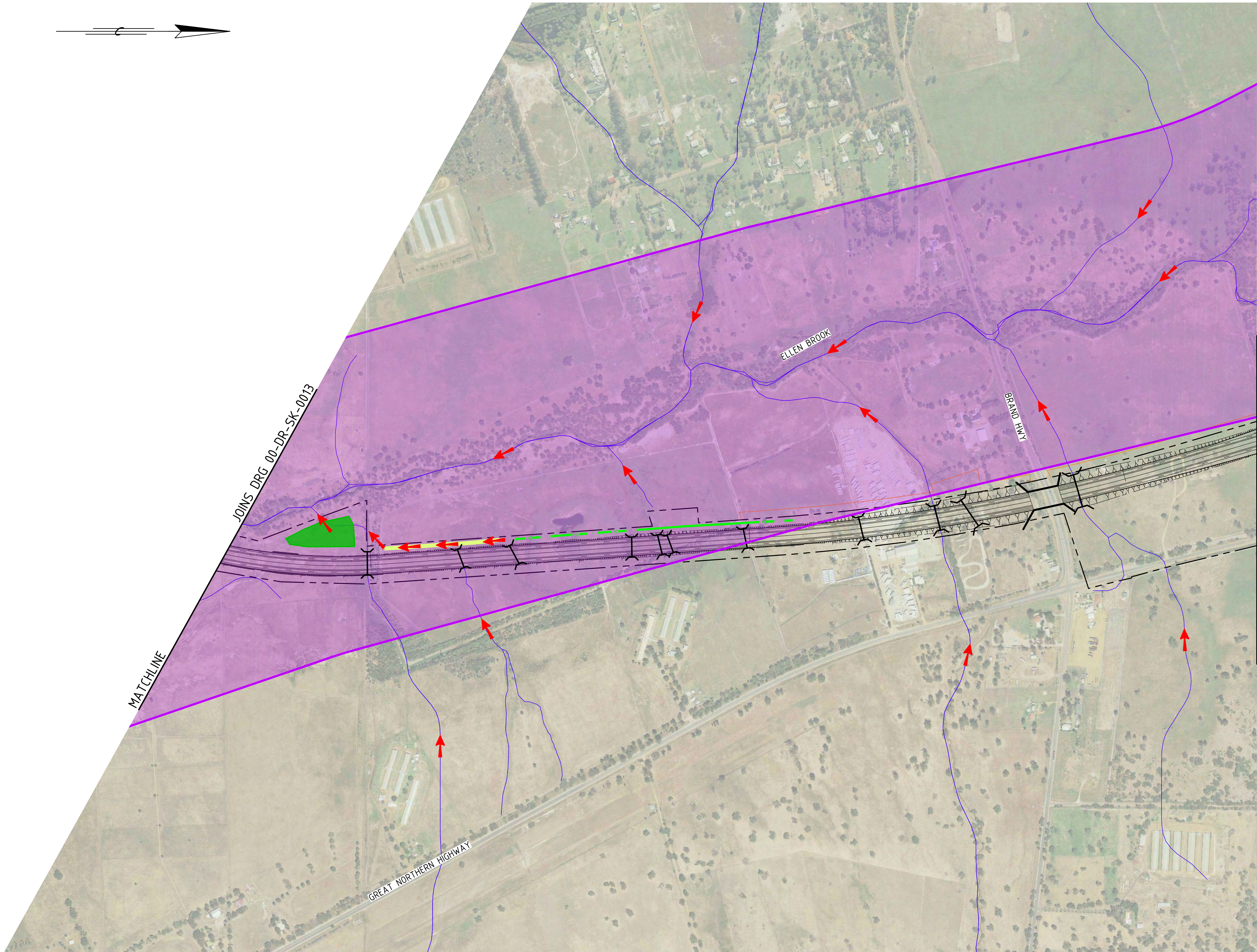
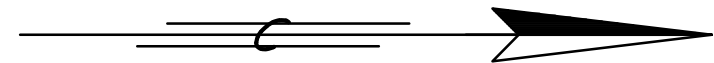


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- LEGEND:
- WELL HEAD PROTECTION ZONE
 - ELLEN BROOK AREA OF INFLUENCE
 - PROPOSED FLOOD STORAGE AREA
 - PROPOSED BIORETENTION
 - PROPOSED LINEAR INFILTRATION
 - PROPOSED GRASSED SWALE
 - PROPOSED CULVERT
 - MRS BOUNDARY
 - EXISTING DRAINAGE
 - EXISTING WATERWAYS
 - EXISTING WETLANDS
 - EXISTING WATER CORP DRAINS
 - MAJOR FLOW PATH
 - LOCATION OF LOCAL FLOODING

THE ORIGINAL OF THIS DRAWING WAS PRODUCED USING COLOUR SEPARATION FOR GREATER CLARITY. WORKING WITH BLACK AND WHITE COPY MAY CAUSE ERRORS.

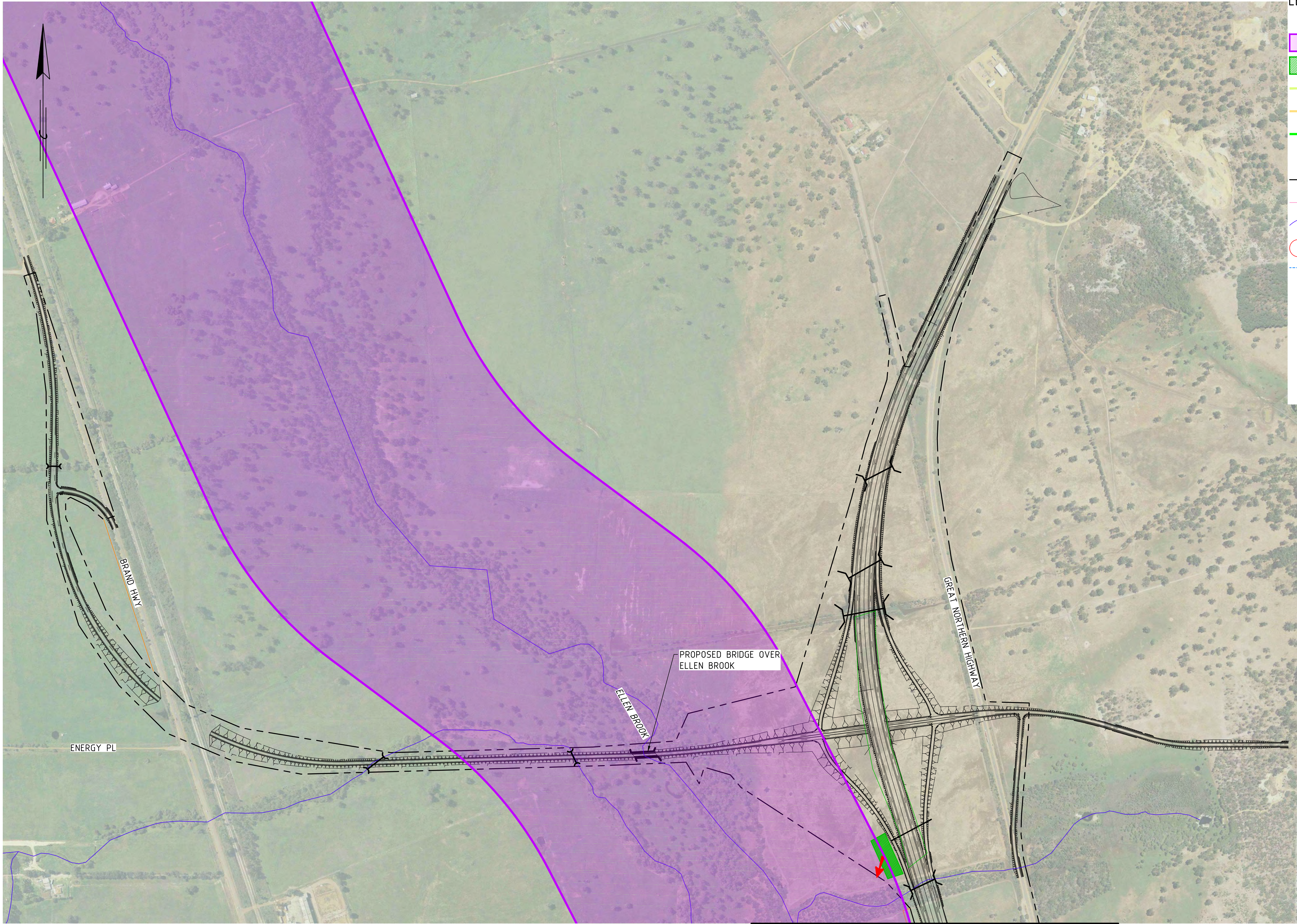
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GRID	PCG94				
PREPARED	EM				
SHEET	13 OF 14	PROJECT No.	P13362	SKETCH No.	NLWA-00-DR-SK-0014
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- LEGEND:
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MATCHLINE

JOINS DRG 00-DR-SK-0014

SKETCH ONLY

NorthLinkWA

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DATE	10/02/2015
SCALE	1:5000 AT A1
GRID	PCG94
PREPARED	EM
SHEET	14 OF 14

PROJECT NORTHLINK WA	
TITLE MAJOR FLOW PATHS SHEET 14	
PROJECT No. P13362	SKETCH No. NLWA-00-DR-SK-0015
REV B	



APPENDIX B

DRG Minutes

NORTHLINK WA

DRAINAGE REFERENCE GROUP MEETING #1

Venue: Old Midland Courthouse, Helena Street, Midland

9:00am, Wednesday 9th July 2014

MEETING MINUTES

1. WELCOME, MEETING PURPOSE AND PROCESS

Linton Pike, NorthLink WA, welcomed participants to the Drainage Reference Group Meeting and outlined the process. The purpose of the meeting is to:

- Establish the Drainage Reference Group (DRG) for the NorthLink WA projects;
- Provide an overview of the projects;
- Discuss and agree the DRG's Terms of Reference;
- Identify and agree an approach to addressing key drainage goals, opportunities and issues; and
- Build project understanding and support to pave the way for successful and timely project outcomes.

The meeting Agenda is provided at Attachment One. A list of meeting participants and apologies is provided at Attachment Two.

2. PERSONAL INTRODUCTIONS

Each meeting participant provided a brief personal introduction.

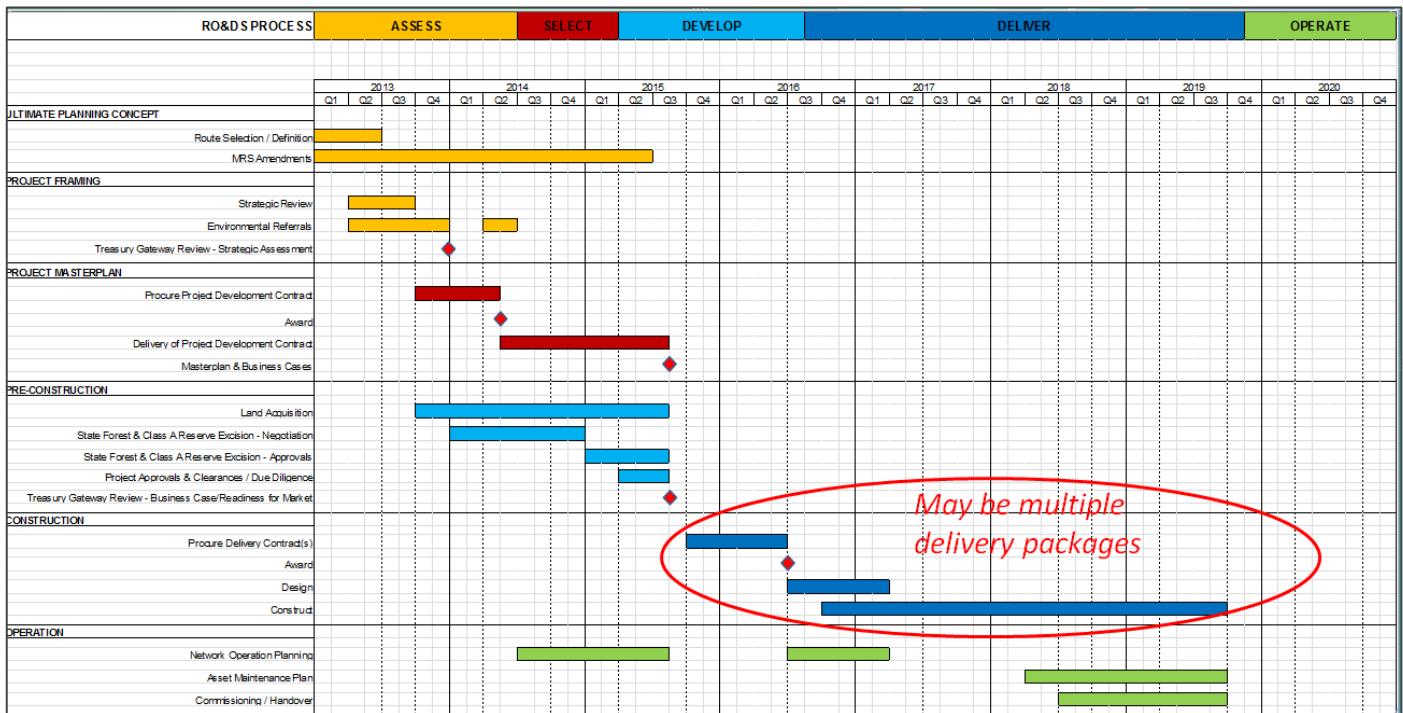
3. PROJECT OVERVIEW AND CONTEXT

Dominic Boyle, Main Roads WA, provided a project overview and context noting the following key points:

NorthLink WA comprises the following funded projects:

- PDNH – (Tonkin to Muchea) - \$845M
- Tonkin Grade Separations (Collier Rd to Reid Hwy) - \$281M





Overall Program

Project Objectives

- Improve freight capacity, efficiency and productivity;
- Reduce urban congestion now and into the future;
- Improve road safety through the “Towards Zero” initiative;
- Maximise sustainability through economic, social and environmental responsibility;
- Improve the amenity for the community, tourists and road users; and
- Create value through affordable infrastructure.

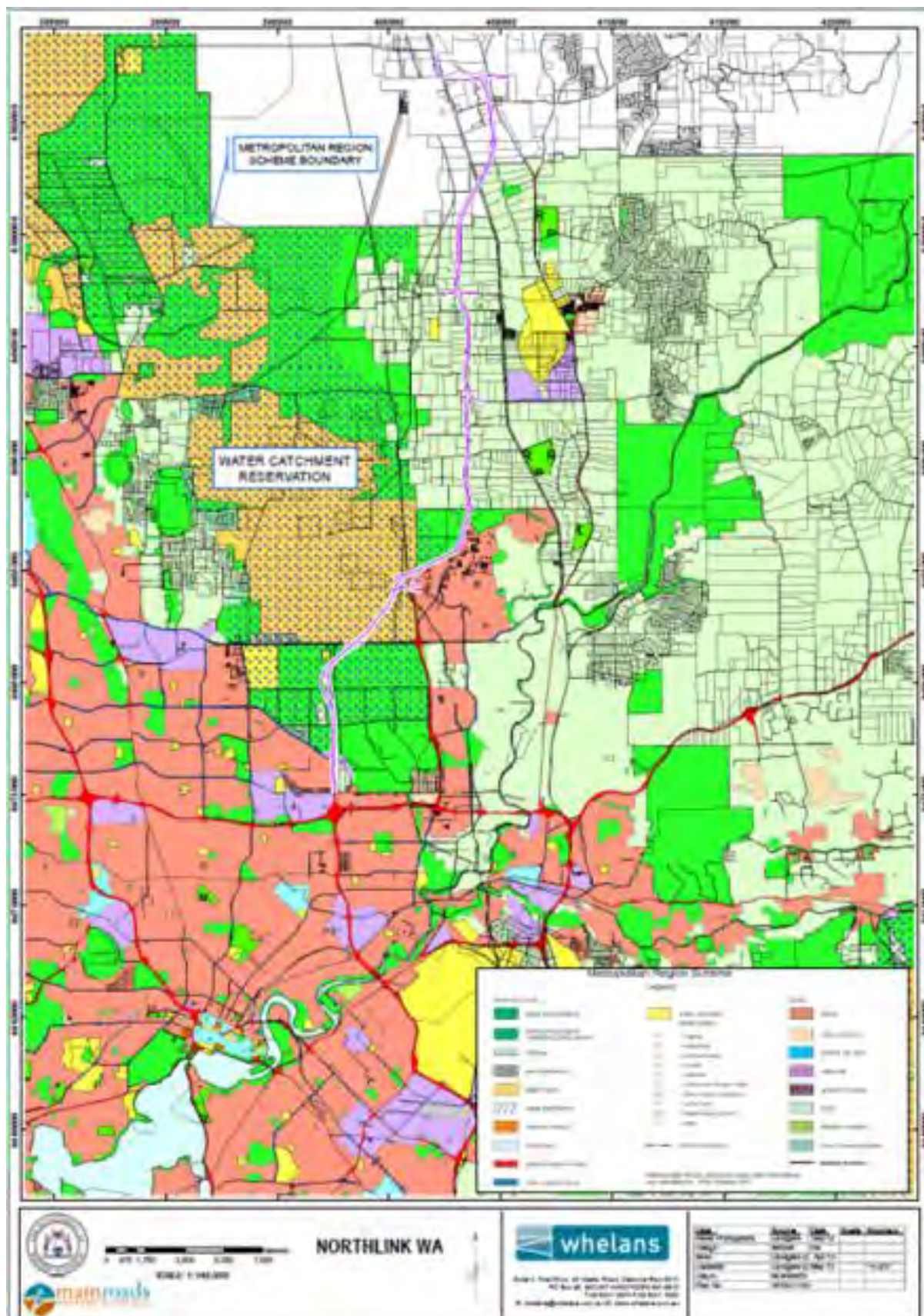
Overview of Projects

PDNH (Tonkin to Muchea)

- 37 km new link connecting Tonkin Hwy to Brand Hwy and GNH;
- Green fields freeway construction through State owned land:
 - Class A Reserve
 - Ngarara water mound;
- Highway construction through privately owned farmland; and
- Extends beyond Metropolitan boundary.

Tonkin Grade Separations

- Grade separation of 3 intersections on Tonkin Highway so that Tonkin becomes free-flow from Reid Hwy to Roe Highway; and
- Brown fields urban environment.



Assumed Scope - PDNH (Tonkin to Muchea)

Scope assumed for funding application:

- Dual carriageway south of Ellenbrook;
- Single carriageway north of Ellenbrook; and
- Interchanges at Reid, Hepburn, Gngangara, Ellenbrook, Neaves.

Budgeted Funds: \$845M

Project Development: refine Ultimate Planning Design Concept, explore staging options that offer greatest benefits and define first stage build projects.

Consider:

- Future land use planning and development / access; and
- Future EWNSR?



Assumed Scope – Tonkin Grade Separations

Scope assumed for funding application:

- Based on simple grade separations (diamond) at Collier Rd and Morley Dr.
- Flyover at Benara
- Retaining current 4 lane configuration

Budgeted funds:

- \$281m – delivery funds 2016 to 2018

Opportunity:

To upgrade this section of Tonkin Highway to full freeway standard.

Traffic analysis indicates that 6 lanes will be required once Swan Valley Section is connected!



Key Opportunities

Opportunity	Potential Benefit
Optimise project scope <ul style="list-style-type: none"> Network connectivity options Cross section options / Lane configuration Interchange configuration options Intersection options Muchea tie – in options 	Provide best solution and maximise return on investment
Heavy Vehicle Operations <ul style="list-style-type: none"> new RTAA HWL route triple road trains into project area 	Freight efficiency
Service Centre	Travel wellbeing, Concession Opportunity
Construction Materials <ul style="list-style-type: none"> early identification of sourcing opportunities 	Cost savings, sustainability, better environmental or community outcome
Project Packaging <ul style="list-style-type: none"> related projects 	Economies of scale, procurement cost savings or spread the works across industry
Environmental offsets <ul style="list-style-type: none"> Early identification Rehabilitation of redundant land Water management 	Facilitate environmental approvals / reduce risk of delay

Key Risks

State Forest / Whiteman Park - Excision requires Parliamentary Approval
HF Radio Communication Facility Relocations - Air Services Australia & ACMA Installations west of Bullsbrook
Gnangara Underground Water Source Protection Area – Department of Water agreement to Project and Mitigation Requirements
Acquisition of Commonwealth (Defence) Land near RAAF Pearce
Freight Movements <ul style="list-style-type: none"> – Project may not realise expected benefits (e.g. High Wide Loads and some permit vehicles remain on Great Northern Highway) – Residents adjacent to Tonkin Highway object to Freight Route
Whiteman Park – Access issues still to be resolved to satisfaction of Friends of Whiteman Park / Park users
Environmental Approvals - Objections to Project may cause delay



Land Acquisition - Swan Valley Bypass

Section	Ownership
Reid to Hepburn	Predominantly State
Hepburn to Maralla	State Forest / Class A Reserve
Maralla to MRS	Private (rural) Defence
Chittering	Private (rural)

* Delay purchase north of MRS boundary until 2014/15

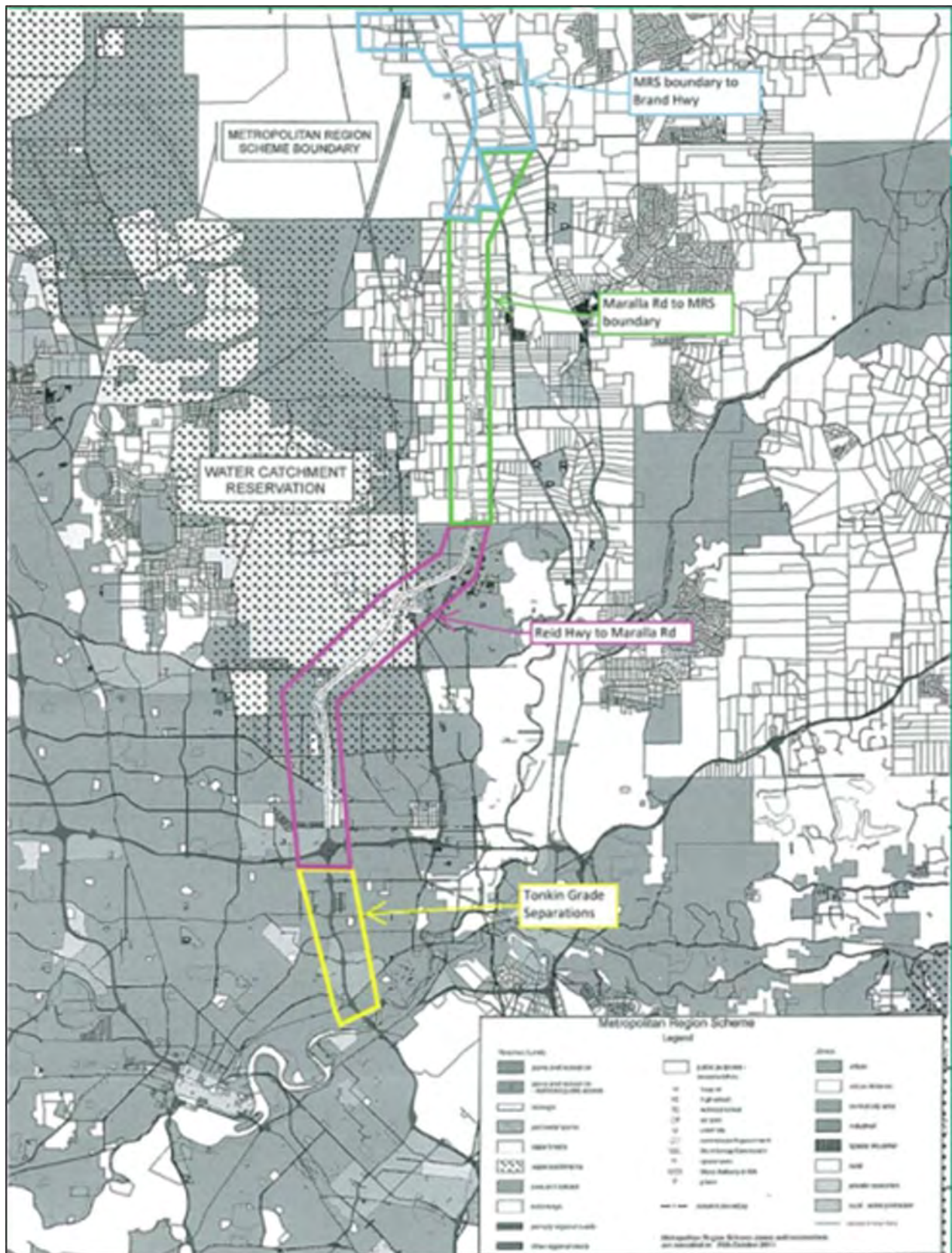
Tonkin Grade Separations

- 3 whole takes, 1 part take.

Offset Sites

- Purchased property in Chittering; and
- Further offsets required.

Land acquisition commenced April 2014.



The project land requirements are shown above