Supply Side Constraints

The respective individual influences of the five (5) dominant supply-side constraint factors varies between quarries and across the CDA's.

But industry feedback has been unilaterally consistent in its message that advanced communication and notification of the requirement to supply to TNRP projects will be required, if discretionary supply is to match TNRP demand (eg Mackay /Whitsunday, Fitzroy, Far North, North West, South West and Darling Downs regions).

With forewarning, quarries can plan to mitigate some of the other constraints – For example by arranging for mobile crushing plant, adding a second shift, booking cartage contractors, installing a pre-coat plant, undertaking stripping of overburden, opening up a second face, extending stockpile areas (if room available), and recruiting labour.

For approvals and licensing, government assistance to overcome barriers will be necessary.

TABLE 7: SUMMARY OF SUPPLY-SIDE CONSTRAINTS FOR CRITICAL DEMAND AREAS (AS SHOWN)

		Relative Influence of Constraint		
Constraints Area (Modifying Factor & no.)	**Constraints Description**	**MWR**	**FNQ/NW**	**SW**
1. Resource & Extraction	Lack of pit planning (eg campaign sites); Quarry dev. plans (DEEDI OH&S requirement); blast logistics; O/B or stripping ratio; Variability of basalt quality (SMC etc; efficacy of specs.); Poor sampling/testing knowledge in CDA's amongst quarries without and labs and labs without quarries	10%	5%	10%
3/4. Market (Customer) and Competitive Choice	Lack of Forewarning/Communication - Quarries in CDA's with discretionary supply capacity need forewarning (eg 3 months advanced notice for TNRP supply); Little or no stock; Quarries say they can satisfy TNRP peak demand needs provided they are given adequate notice - eg Can add extra shift, schedule campaign crushing, help secure access to labour and C&S plant, arrange road haulage contractors; Schedule production properly	50%	60%	60%
6. Processing	Reliance on mobile plant & campaign crushing (cf fixed plant); Capabilities of contract crushing firms (labour; skills; expertise affecting plant availability); Most quarries don't have pre-coat plants	15%	5%	10%
7. Truck Transport	Insufficient truck availability during peak demand; Problem reduces with production and delivery in advance of projects; Cartage price increases during term of supply contracts; Access for road trains; Haulage restrictions; Driver experience / driver fatigue	10%	20%	15%
2. Approvals & Licensing	Access to reserves; DERM ERA thresholds; DA's currently under assessment; DA's for accommodation camps; Extended hours of operation; Sale of quarry materials from mining leases; Access road/entrance requirements; Native title requirements & exemptions	15%	5%	5%

Note, these factors are based on the assessment of overall constraints to supply from the Ecoroc project officers in the 'field' – their gut feel if you like. The data in Table 6 uses this information as an input – the factors in Table 6 are those used in the demand~supply analysis for CDA's.

FTR Discretionary Supply Constraints Addressed	
Type 2.1 Roadbase **Jan 2012: Scenario Only**	
Strategic Quarry	**t/month**
Pinnacle (Mt Curio)	
Tolmie Creek	
Orange Creek	
Sibelco Calliope	
Caves	
Marmor	
Midgee	
Peak Hill	
Nerimbera (Holcim)	
Bauhinia Downs (The Dump)	
Blackhill	
Mt Schofield (Willows)	
Shepton	
Kianga	
Stanwell	
Biloela (Rameel)	
Castle Creek	
Fairview Road	
Tableland Rd	
Red Rock ('Kullanda')	
Yarwun	
Ten Mile Pit	
Westwood	
Total	**270,000**

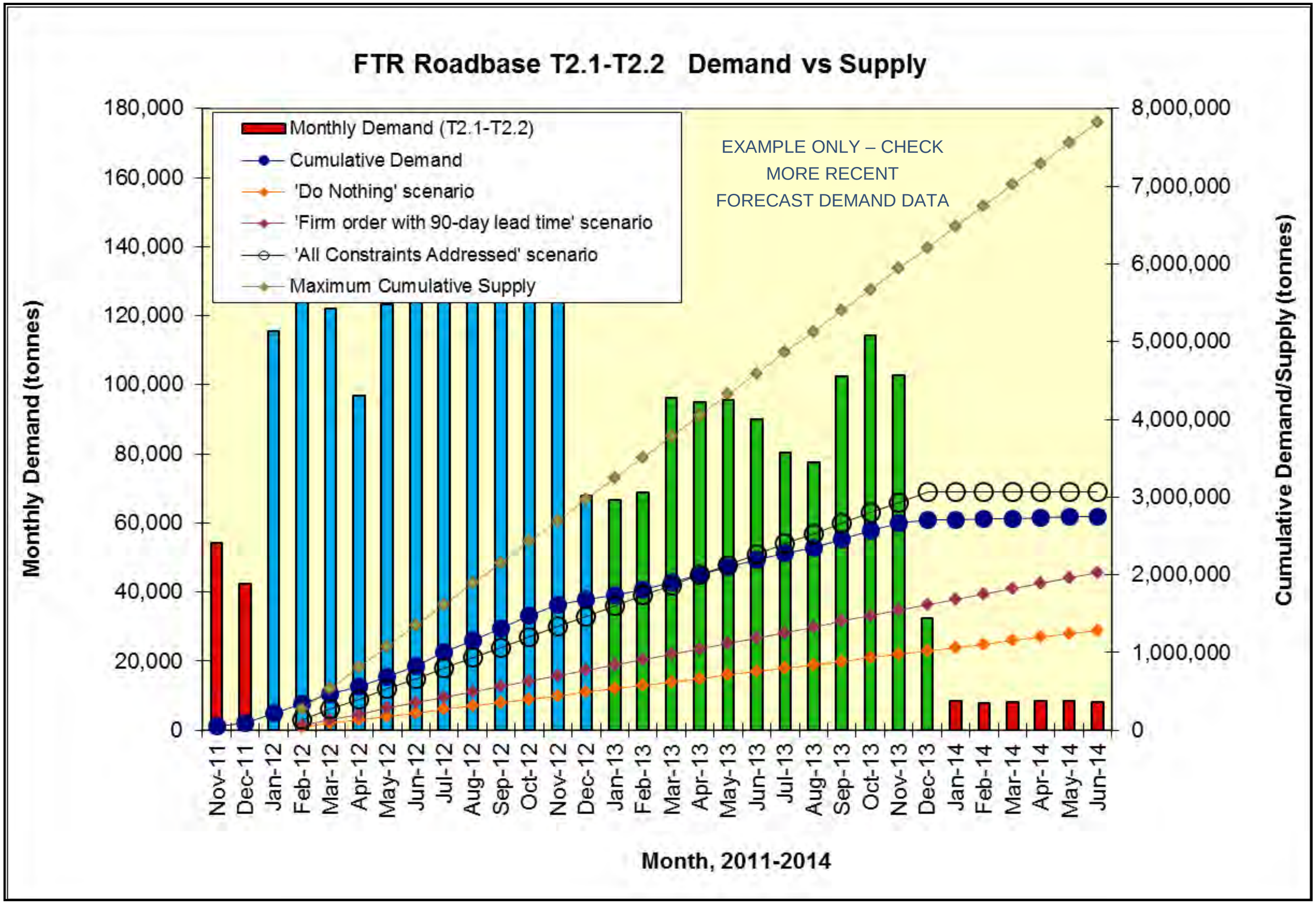


FIGURE 28: DEMAND V STRATEGIC QUARRIES' TNRP DISCRETIONARY SUPPLY FOR ROADBASE – FITZROY REGION

FTR Discretionary Supply
Constraints Addressed

Cover Aggregate
Jan 2012: Scenario Only

Strategic Quarry	t/month
Pinnacle (Mt Curio)	
Tolmie Creek	
Orange Creek	
Sibelco Calliope	
Caves	
Marmor	
Midgee	
Peak Hill	
Nerimbera (Holcim)	
Bauhinia Downs (The Dump)	
Blackhill	
Mt Schofield (Willows)	
Shepton	
Kianga	
Stanwell	
Biloela (Rameel)	
Castle Creek	
Fairview Road	
Tableland Rd	
Red Rock ('Kullanda')	
Yarwun	
Ten Mile Pit	
Westwood	
Total	**80,000**

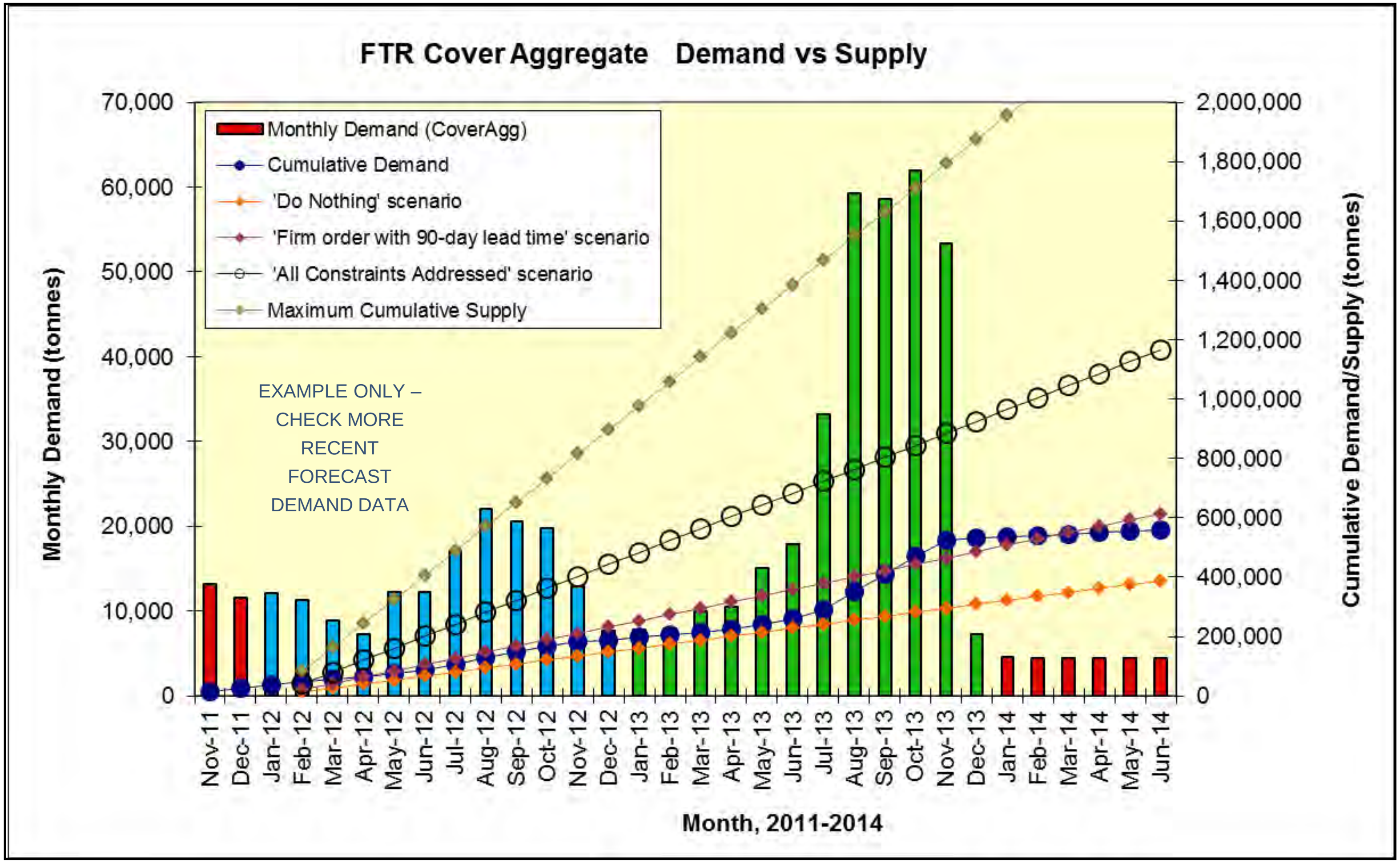


FIGURE 29: DEMAND V STRATEGIC QUARRIES' TNRP DISCRETIONARY SUPPLY FOR COVER AGGREGATE – FITZROY REGION

DDR Discretionary Supply
Constraints Addressed

Type 2.1 Roadbase
Jan 2012: Scenario Only

Strategic Quarry	t/month
Huston Rd Dalby	
Jimbour (Dalby)	
Glenvale (Holcim)	
Harlaxton	
Wellcamp Downs (Boral)	
Braeside (Wall's)	
Inglewood (Johnstone's)	
Braeside (Payne's)	
Leslie Dam (Hutchison)	
Malu (Boral)	
Bland Sands Basalt	
Antonio's (Captains Mtn)	
Yarraman	
Weringa	
Total	**60,000**

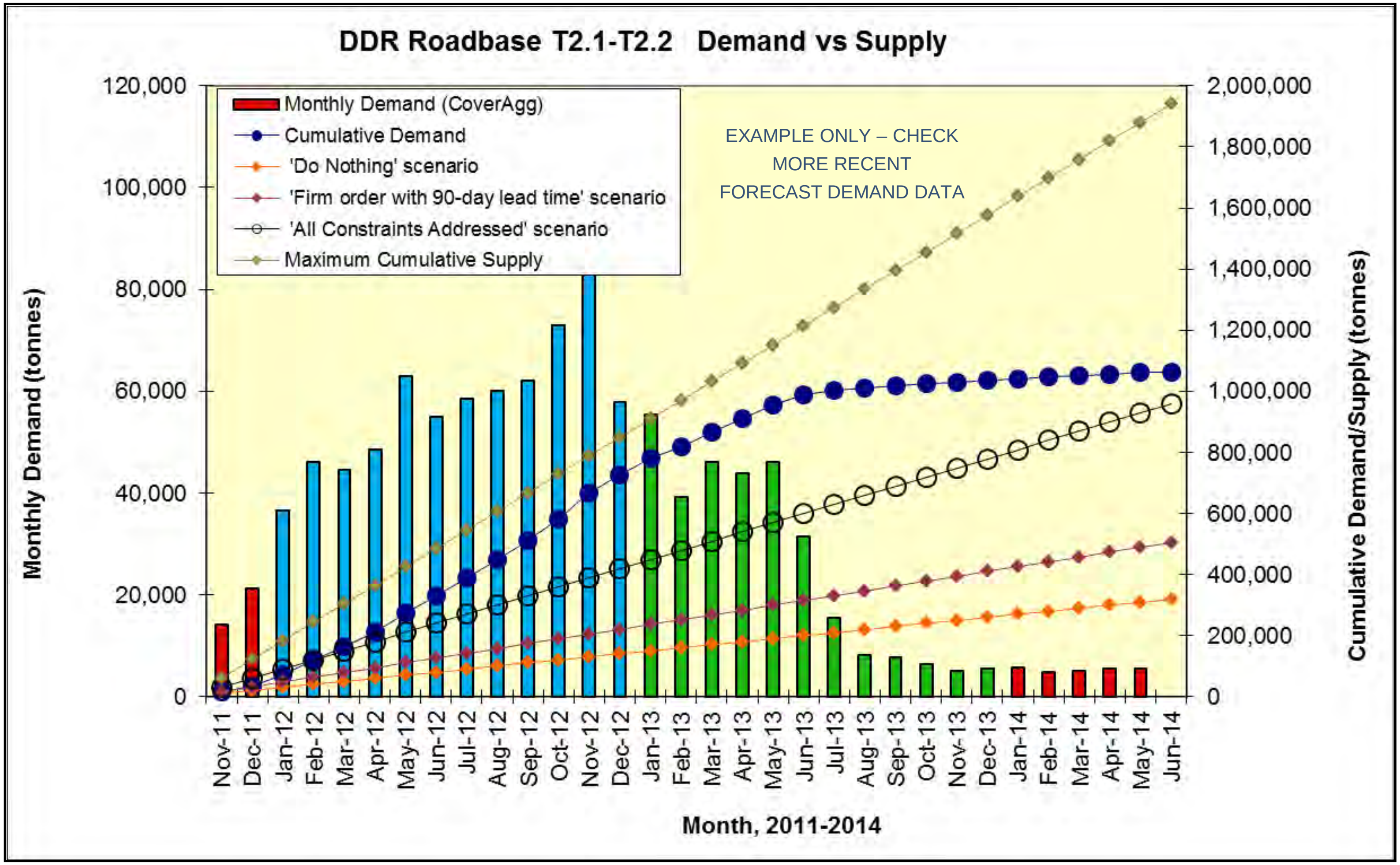


FIGURE 30: DEMAND V STRATEGIC QUARRIES' TNRP DISCRETIONARY SUPPLY FOR ROADBASE – DARLING DOWN REGION

SWR Discretionary Supply
Constraints Addressed

Cover Aggregate
Jan 2012: Scenario Only

Strategic Quarry	t/month
Warrians (Boral)	
Roma	
Amby	
Warrians ('Greenfield site)	
Amby ('Greenfield site')	
Total	**9,000**

NOTE:

DISCRETIONARY SUPPLY FROM STRATEGIC QUARRIES IS DYNAMIC AND CAN CHANGE

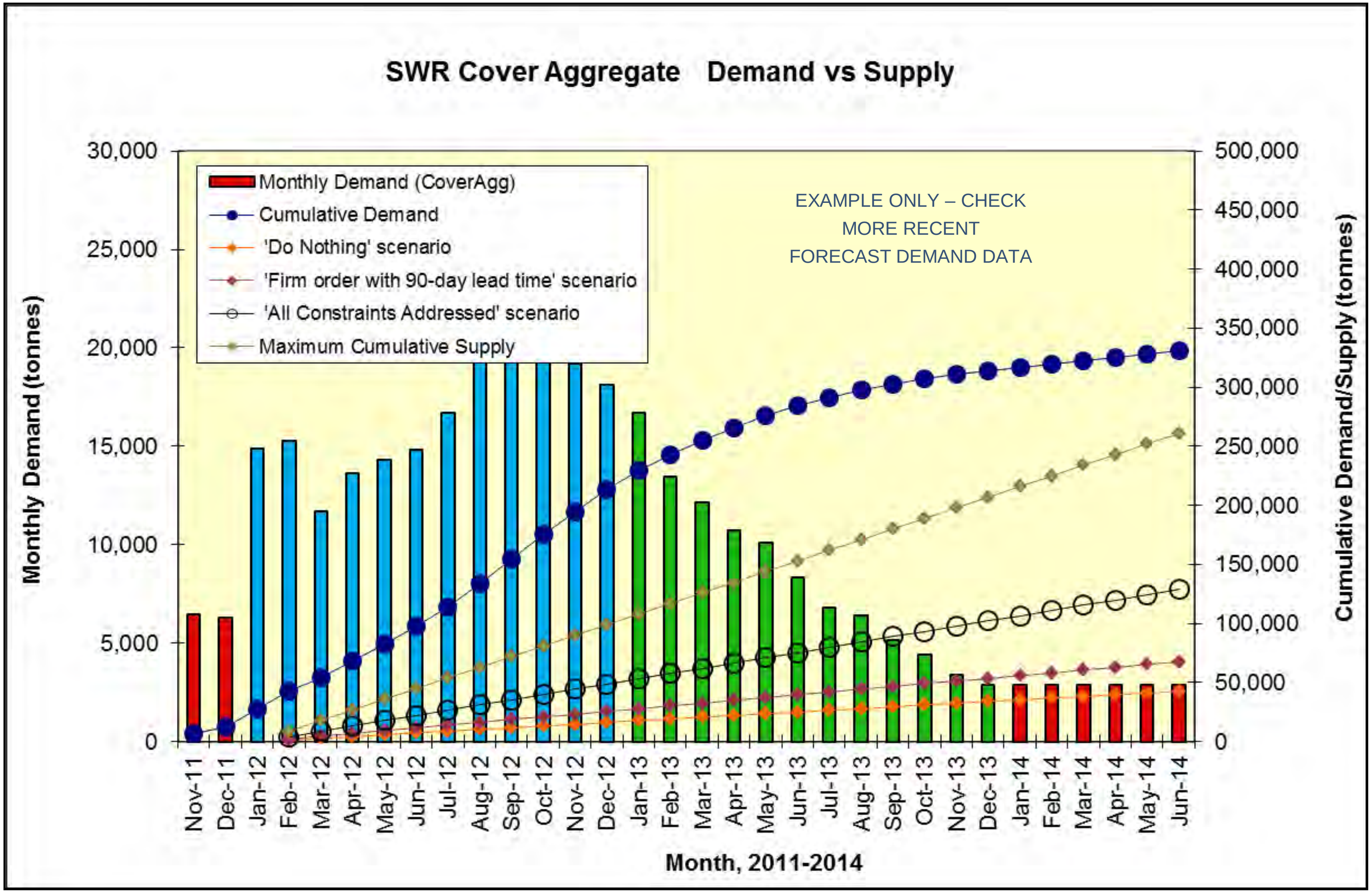


FIGURE 31: DEMAND V STRATEGIC QUARRIES' TNRP DISCRETIONARY SUPPLY FOR COVER AGGREGATE – SOUTH WEST REGION

ORICA

Source: Orica website, 2012 – Loading explosives at a coal mine in Central Qld

CASE STUDY: ORICA – SUPPLY OF EXPLOSIVES IN CRITICAL DEMAND AREAS

Supply of explosives to the Qld quarrying sector is dominated by two firms - Orica 40% and Maxam 60%. If supply to the construction industry is added, then market share is about 50/50. Supply of explosives is a potential constraint during TNRP and Qld RA peak demand.

Orica expect demand from the construction sector in the CDA's to rise by 50% over the next 12 months. From Orica's perspective, the supply of drilling rigs shouldn't be a constraint, but the firms are small and some can get into financial difficulty – they can struggle to fund their growth and Orica often find they have to 'nurse' drilling firms that owe them money for explosives previously supplied. Orica also find that a surprising number of quarries have little or poor quarry development planning and this can create significant productivity problems for Orica – Eg they are told by the quarry that the next shot will be ready in 2 days and will take 8 tonnes of explosives. When Orica arrive, the shot is still not ready, it can only take 5 tonnes, and the explosives truck can't safely drive to the blast site because no-one thought about access. Orica believes there needs to be better training and understanding by quarry operators of what is needed by drill and blast contractors (such as forward planning, site preparation, provision of safe access etc).

A significant additional problem is there is no available accommodation for the Orica people (and other subcontractors that visit CDA's). Large companies pre-book all hotel rooms and so after a long day handling explosives, Orica personnel may have to drive several hours back to their nearest accommodation.

Orica have a good presence in Central Qld – they are able to re-load fairly quickly in the coal mine provinces – they can use existing facilities at mine sites (take extra emulsion, then top up with prill at mine sites) to service campaign blasting programs – eg at Roma Amby, they can produce 120,000 tonnes of broken rock over 5 days using 40-60t of product.

To obtain people, Orica recruit, train, induct people themselves mainly from the regions and they offer project duration contracts. It costs about $15-20k to induct and train a new employee + an allowance for a demobilisation fee (after the project, there is not necessarily continuity of work so Orica pay out their local workers).

The biggest constraint aside from labour is the availability of explosives trucks (MPU's or mobile processing units). These are made in Australia but there is a 6-9 month lead time to make a unit. For TNRP demand of say 15Mt of shot rock to produce roadbase and aggregates, at 2.7 tonnes/m3 and 0.6 kg/m3 powder factor, about 3333 tonnes of explosives will be consumed. A productive MPU can do about 1000 tonnes per year, so the TNRP component alone would require about 3 MPU's. If Qld RA (LGA) needs are added in, then an additional 4-5 MPU's are probably needed over the next 2.5 years. But then what? MPU's have a useful life of say 7-8 years.

Orica also believe that availability and demands on truck drivers are real issues. At an average age of 53, and with longer haul distances, and with fatigue (OH&S) laws in effect, longer haul sites might only get to deliver one load per day from quarry to project – this could considerably delay TNRP projects unless more drivers and trucks can be found.

Source: Interview notes with Rob Sloman, Orica - ABM Quarries and Construction, Queensland

BALANCING DEMAND WITH SUPPLY

The LHS diagram shows the total tonnes (Total TNRP demand) for cover aggregate (red) and roadbase (green) by DTMR Region, for the eight (8) CDA's over the period 2012 and 2013.

The RHS diagram shows the discretionary supply capacity on a monthly basis PROVIDED supply side constraints and bottlenecks can be satisfactorily addressed and overcome, in advance of peak demand.

Note that the RHS discretionary supply chart represents a 'reasonable case' scenario only if constraints can be overcome by prompt action.

Note also that these regional summaries do not identify supply-demand variations at Local Government Area level, or within LGA's. Such iterations can be explored using the TNRP All Quarries database and MapInfo, as required.

TNRP demand in MWR and FTR is amongst the highest of the CDA's. However extractive resources are available if approvals, timing, licensing, labour and processing constraints can be addressed.

New quarries &/or multiple plants at existing sites are likely to be necessary to address peak TNRP demand in SWR, CWR and DDR

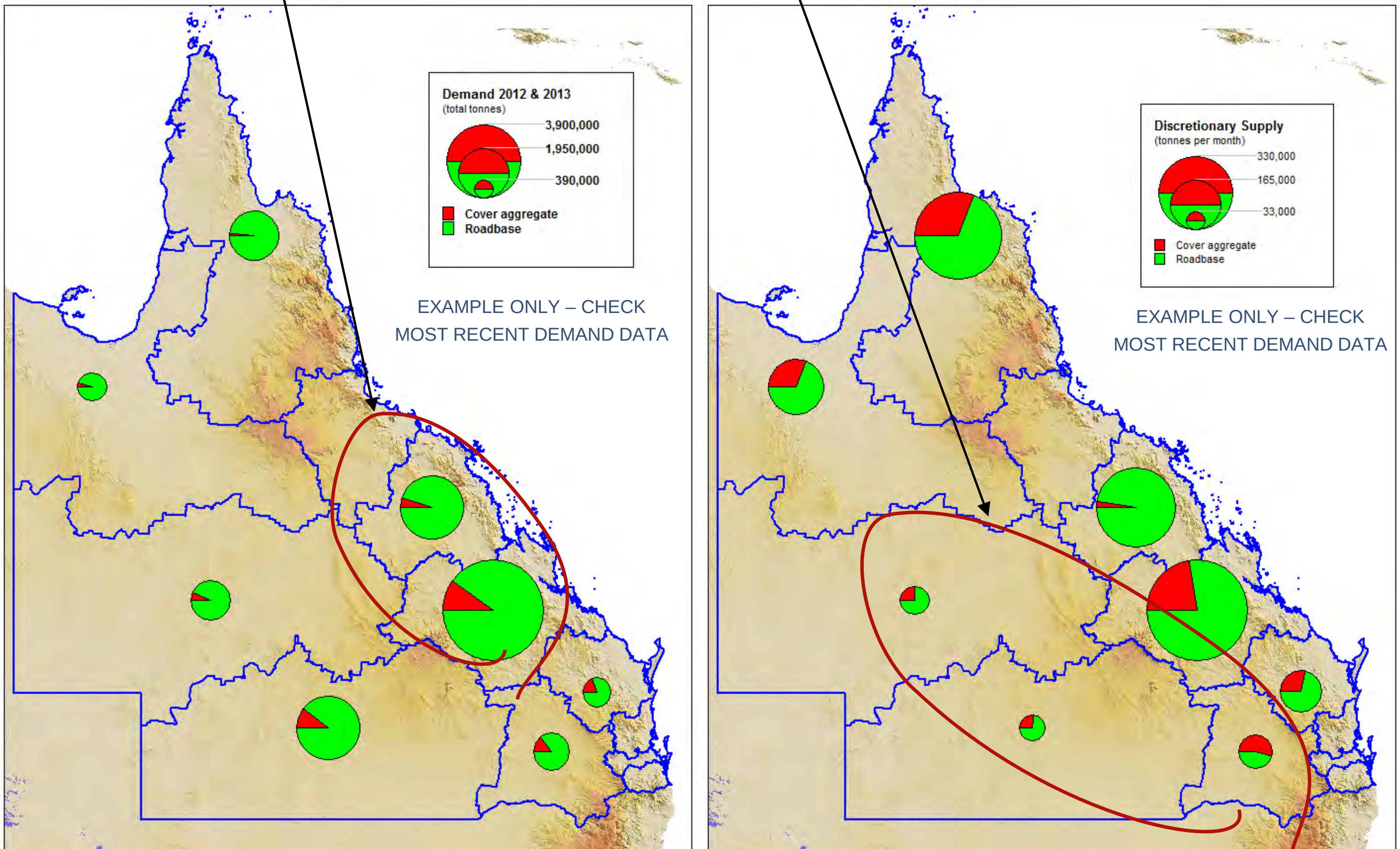


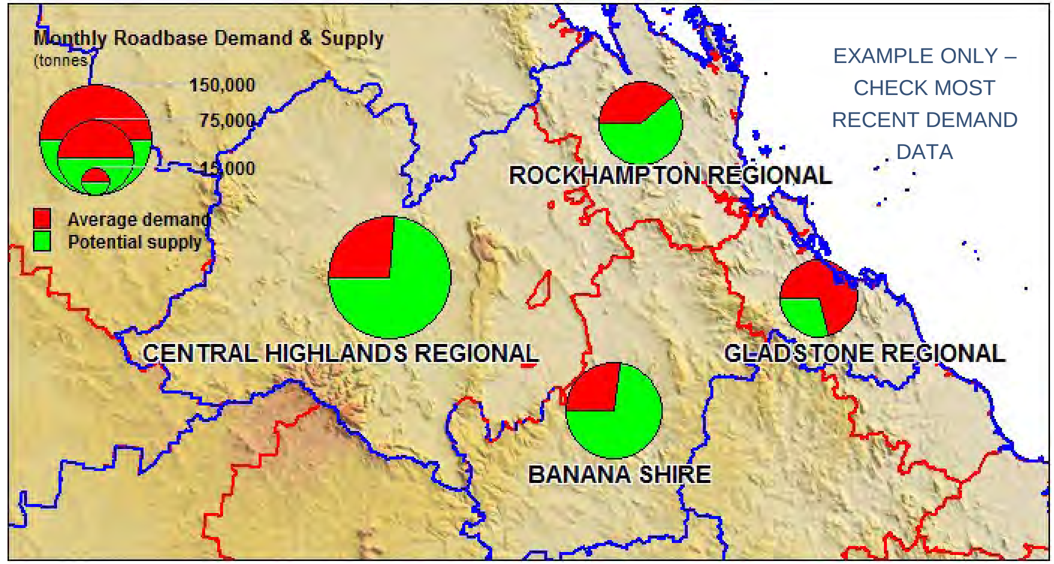
FIGURE 32: TNRP TOTAL QUARRY MATERIAL DEMAND (2012-2013) AND MONTHLY DISCRETIONARY SUPPLY (CONSTRAINTS ADDRESSED) FOR THE EIGHT (8) CRITICAL DEMAND AREAS

There are numerous options and iterations that can be generated using MapInfo outputs from the TNRP All Quarries database.

FIGURES 33 and 34 are illustrations only using the Fitzroy region as an example, of the different ways demand and supply indicators can be generated from the database.

Note that these data are shown for illustrative purposes only and may have changed.

FIGURE 33: FITZROY REGION – AVERAGE MONTHLY DEMAND FOR QUARRY MATERIALS AND POTENTIAL TNRP SUPPLY (BY LGA)

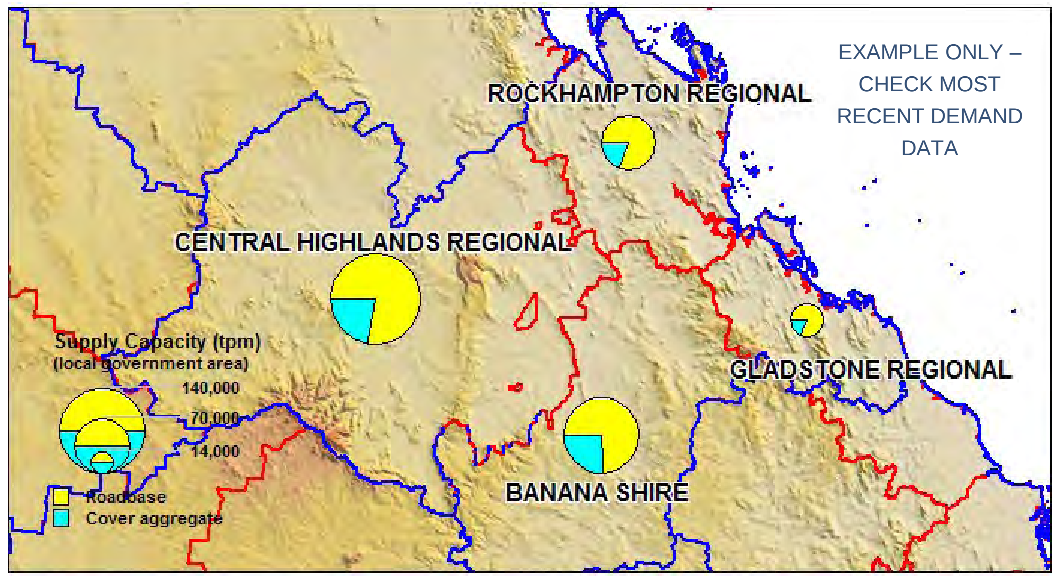


FITZROY REGION: AVERAGE MONTHLY DEMAND & POTENTIAL SUPPLY BY LGA 2012-13

LGA	ROADBASE	COVER AGGREGATE
Rockhampton Regional	702,069	94,413
Central Highlands Regional	916,405	240,148
Gladstone Regional	1,156,200	47,736
Banana Shire	70,000	21,941
TOTALS	3,414,759	404,238

TABLE 8 : FITZROY REGION – TNRP FORECAST 2012-2013

FIGURE 34: FITZROY REGION –AVERAGE MONTHLY DISCRETIONARY SUPPLY BY PRODUCT TYPE AND LGA



FITZROY REGION: MONTHLY DISCRETIONARY SUPPLY BY LGA (TONNES PER MONTH) (2012-2013)

Chesalon Quarry near Alpha operated by Crushing Industries Australia is the only known hard rock quarry site in the Central West Region. It is one of 13 sites CIA use for contract crushing.

But the development of coal mines in the Galilee Basin has triggered investigations for new quarry sites.

Two such sites are at Frankfield and Surbiton – both are still the subject of negotiations with landowners, leaseholders and mining companies.

These quarries are being positioned to be suppliers for rail development and new mine development in the Galilee Basin.

Nevertheless, if they received approval in time, and (if on a mining lease) were able to supply off-site, then they could assist in TNRP supply to both the Central West and Isaac Regional Council areas.

But for most of the Central West, silcrete and residual gravel won from ‘borrow pits are the critical supply sources.

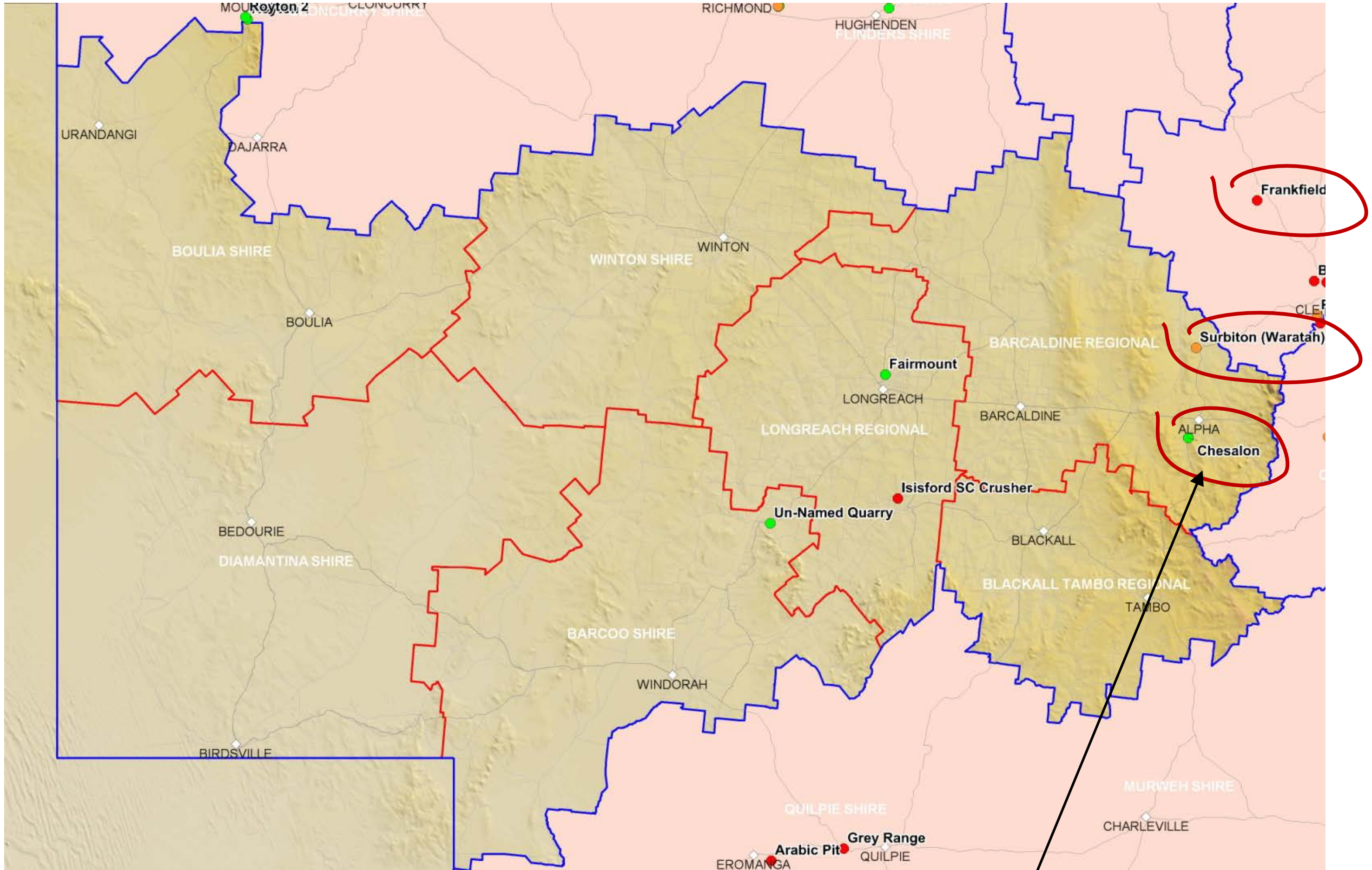


FIGURE 35: CENTRAL WEST REGION – LOCATION OF ACTIVE AND INACTIVE QUARRIES

Chesalon Quarry is a Strategic Quarry and the only known hard rock source for the Central West. The constraints are largely geological. New quarry sites in igneous rocks in the Alpha/Galilee Basin region are proposed at Frankfield and Surbiton, but negotiations on terms of tenure are yet to be finalised and the sites have no development approvals.