



**FIG SYDNEY 2010**  
 XXIV FIG International Congress 2010  
 Facing the Challenges - Building the Capacity  
 Sydney Convention & Exhibition Centre  
 11-16 April 2010  
 Sydney, Australia

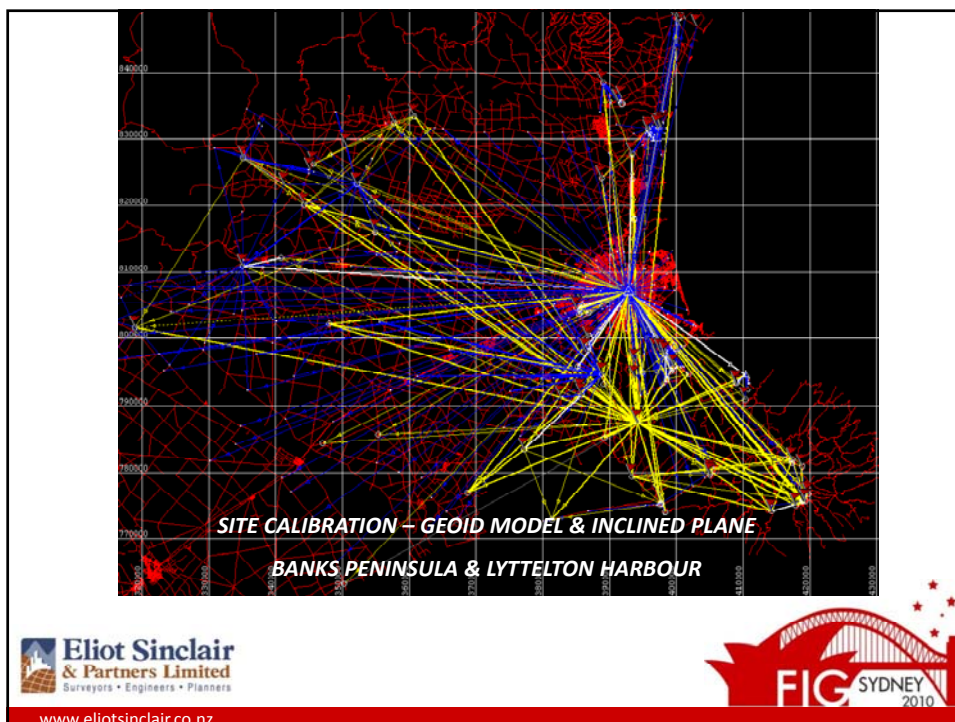
## **PROFILING LAKE ROXBURGH USING THE NEW ZEALAND QUASIGEOID 2005**

*TS 31 Paper 4596*  
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 Dip Surv, MNZIS, MISA(H1), RPSurv  
 Registered Professional Surveyor  
 Accredited Hydrographic Surveyor  
 Director



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**RIVER**

**ALEXANDRA**

**GORGE**

**LAKE**

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**TRAVERSING & FINDING OLD MARKS**

**RTK-1 CALIBRATION BAR & TRIMTALK RADIO TELEMETRY**

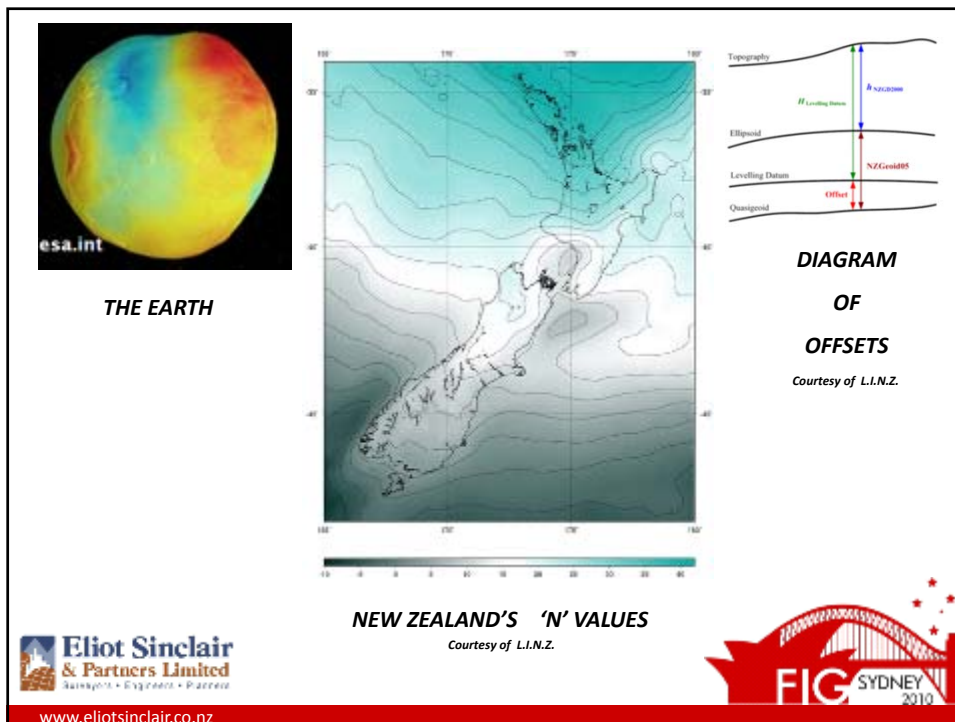
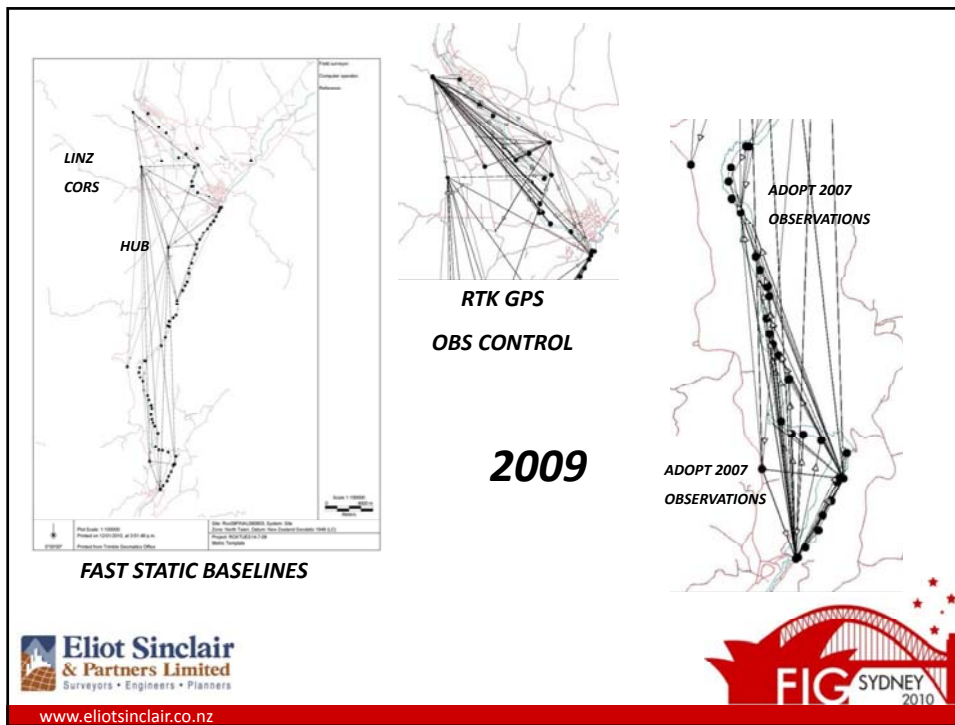
**FAST STATIC BASELINES**

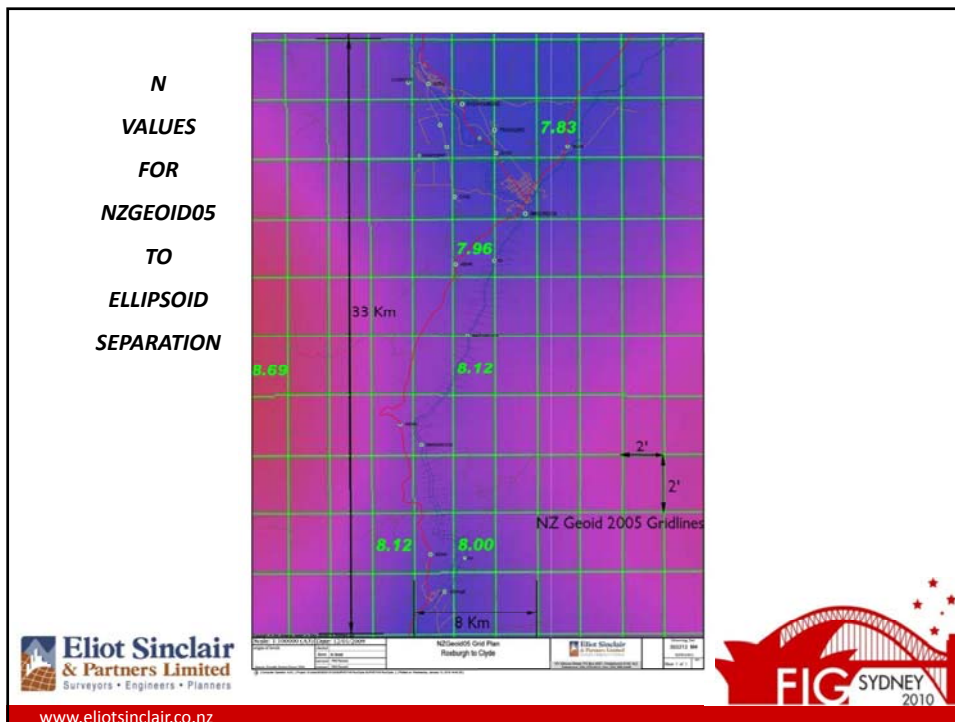
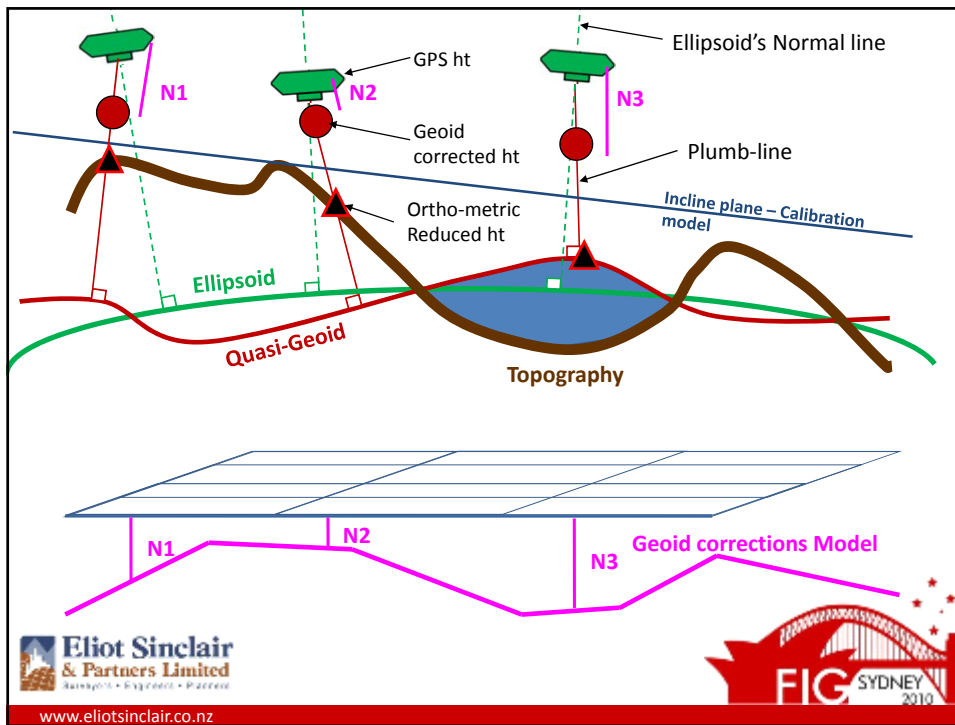
**CIRCA 1993 /1994**

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PRC	NO	Easting	Northing	Code	Remarks
PRE_500	70979.953	226248.029	148.976	CK	EM D122
PRE_1003	70979.953	226248.029	148.984	CK	EM D122
PRE_400	70979.958	226248.029	148.972	CK	EM D122
PRE_501	70979.958	226248.029	148.982	CK	EM D122
CAL_961A1C	70979.958	226248.029	148.956	CK	EM D122

### RESIDUALS ON LAKESIDE BENCH MARKS 2009 - 1993

Roxburgh 2009 Calibration - Control Points - Roxburgh to Clyde

Line	PRID	sub	HE	IN (2009)	Code	Obs Date/Time	raw	WV	RM	RM	RM
1	PRE_2	742124.811	225230.228	111.899	BM	WV	02/11/09	17.50	0.00	0.02	0.08
1	PRE_3	742124.811	225230.228	111.899	BM	WV	02/11/09	17.50	0.00	0.02	0.08

**BENCH MARK CONTROL – GPS RESIDUALS AFTER SITE CALIBRATION**

**Data processing using Trimble TGO**

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**LOOKOUT**  
VIEWS THE CLUTHA RIVER

**BELOW 0 Deg C**  
ACCESS DIFFICULT

**RTK-GPS REFERENCE POSITIONS AND COVERAGE**

**ROXBURGH DAM**

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**Plan View Map (Binning Mode : Newest) (Frame : Frame1)**

**Survey Text (F...)**

SO Name	waih0001
Line Brg (Tru)	120°28'45.2"
Heading (Tru)	
SOL Brg (Tru)	178°15'45.7"
SOL Dist (Gri)	0.03 m
SOL Dist (Gri)	4425.69 m
SOG	0.0 kts
EA300P	m
Ev Time	T.1
Ev F7	U.1
North	818228.17 m
East	351067.54 m
Offline	-0.03 m
Tide(GPS)	235.18 m
Hi	m
PC L	10:18:44

High freq depth: 0.03

For Help, press F1

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**'HYDR0PRO' POSITION & TIDE CHECK ON BENCH MARK**

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**RTK-GPS BENCH MARK L35D**

**1997 - PRESENT**

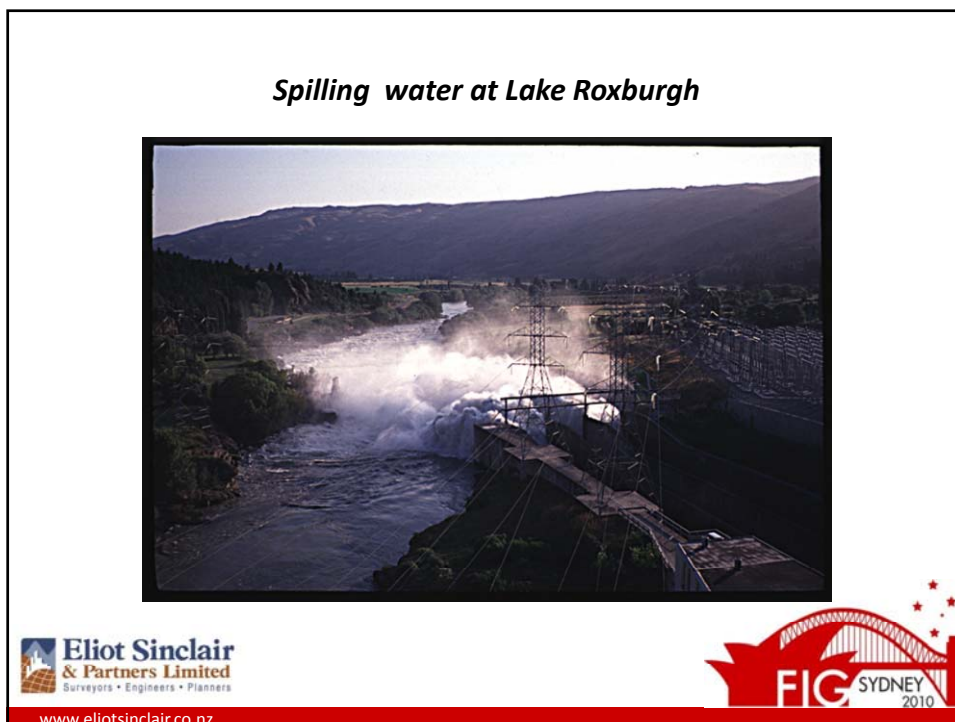
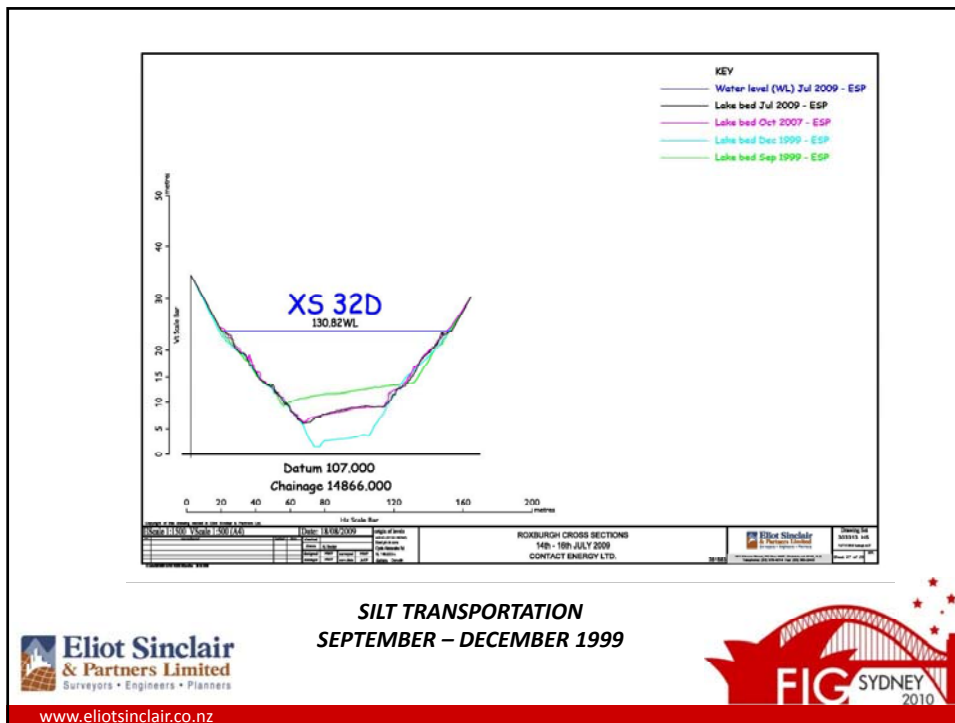
**WATER LEVEL BY RTK-GPS-OTF ON BOAT & SHORE**

**1993**

**TRANSFERING LEVELS BENCH MARK – WATER LEVEL**

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- ECHOSOUNDER & TRANSDUCERS
- RTK GPS RECEIVERS
- SOFTWARE KEY & LAPTOPS



- SURVEY GEAR
- SOLAR PANEL
- SNOW CHAINS
- LEVEL & STAFF
- BATTERIES & CHARGERS

**'THE GEAR'**  
**SERIOUS LOGISTICS**  
**FOR HYDRO &**  
**GEODETTIC SURVEY**



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## CONCLUSIONS

- GEOIDAL MODELS ARE POWERFUL
- CHECK OBSERVATIONS BY INDEPENDENT METHODS
- COMPILING PROJECTS IS COST EFFECTIVE
- UPDATING PROJECTS IS EASY
- WATER LEVELS DERIVED FROM GPS/GNSS CAN BE VERY ACCURATE IN REAL TIME



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*Thank You  
&  
Questions?*



