### SMEDG - 28<sup>th</sup> Feb 2013

"OLD ROCKS NEW TRICKS" Surprises from the Canowindra Line of Workings (CLW) in Central Western NSW.

A presentation by Tully Richards C/- Gold and Copper Resources Pty Limited (G&C)

#### Location of G&C Project



# Location of G&C Project showing EL's (red) and ELA's (stipple)



#### Location of G&C Project – Min Occ with EL's



#### Location of G&C Project – Min Occ,EL's & Canowindra Volcanics (CV)





# Host Rocks and Setting

- CLW hosted within the Canowindra Volcanic's (CV's)
- CV's ~430Myo & part of the Cudal Group
  - 180kms in strike from sth of Cowra to Geurie



#### CUDAL GROUP

Brown, maroon and green shale; sandstone Lithic, feldspathic and quartz sandstone; conglomerate; limestone; tuffaceous shale Coarse, lithic sandstone; siltstone; shale; chert Grey to brown, quartzose shale; siltstone; minor Andesite, porphyritic in plagioclase, augite and rare orthopyroxene: sericitised andesite Red, green and brown shale; buff siltstone; shale with concretions Grey to brown shale; minor lithic sandstone Massive fossiliferous limestone Shale, siliceous sandstone, coarse guartzo-feldspathic sandstone: minor laminated chert Garnetiferous quartz feldspar cordierite porphyry, ashstone, mass flow deposits

# Host Rocks and Setting

- CV = S-Type, massive rhyolitic/rhyo-dacitic qtz-feld porph
- Chemical and petrographic characteristics of the CV and Cowra Granodiorite (CG) suggest the CV are the extrusive eq. of the CG



# Host Rocks and Setting

 CV's folded during Late Devonian Tabberabberan Orogeny



### **Other Deposits**



# **Other Deposits**

- Other deposits hosted within the meridional extents of the discussed Silurian S-Type volcanics include..
  - Rye ParkW(Mo,Bi,Sn,mt,fluorite)
  - Kangiara Pb,Zn,Cu,Ag(Au,Bi)
  - Red Hill Cu,Au(Ag,Pb,Zn,mt,talc)
  - Murrumbateman Au(Bi, Ag)

# Sig. Previous Exploration

- 1980's at Sams Reef included
  - limited geochem (incl 304g/t Au from 'mullock dump'
  - 5 RC holes totalling 462m
  - Best intersection SRP2, 9m @ 2.1g/t Au
  - Work by Eastern Gold NL across selected parts of the CLW

# Eastern Gold NL



10/01/20Sydney, New South Wales 2000 (Members of The Sydney Stock Exchange Limited)

# Exploration by G&C

# G&C – early sampling 2005

SAMPLE	AREA	ROCK	COORDINATES	SAMPLE						ANALY	TICAL R	ESULTS	5				
NO.	PROSPECT	DESCRIPTION	MGA 94	DESCRIPTION	Au (ppm)	Ag (ppm)	As (ppm)	Ba (ppm)	Bi (ppm)	Cu (ppm)	Hg (ppm)	K (%)	Mo (ppm)	Pb (ppm)	Sb (ppm)	W (ppm)	Zn (ppm
7339	Gospel Oak Quarry	Rhyolitic tuff, sericitised and chloritised, scattered quartz-limonite veining.	659 012E 6 280 545N	4 pieces of angular float from 10m across rubble face E side upper bench	0.015	<0.2	25	70	<2	98	<1	0.31	1	44	<2	<10	80
7340	Gospel Oak Quarry	Rhyolitic tuff, sericitised, quartz- limonite veined.	658 977E 6 280 467N	Chips from several large boulders at S end of upper bench	0.011	<0.2	16	50	2	86	<1	0.24	1	25	<2	<10	45
7341	Gospel Oak Quarry	Rhyolite, sericitised, with quartz- geothite veining (some coarse and vuggy).	658 960E 6 280 489N	Pieces of rubble from 3m radius W batter of upper bench	0.010	0.2	18	50	3	198	<1	0.24	1	112	<2	<10	262
7342	Gospel Oak Quarry	Rhyolite, strongly silica-sericite- carbonate altered, with pyrite and quartz-carbonate-limonite veining.	658 969E 6 280 504N	Chips from boulders in pile (2 x 3m)	0.030	0.2	22	40	2	156	<1	0.18	1	57	<2	<10	64
7343	Gospel Oak Quarry	Rhyolite, sericitised, with quartz- limonite veining, some Cp in and close to veins.	658 952E 6 280 519N	Chips from rubble pile	0.005	1.1	19	60	6	382	<1	0.29	2	275	<2	<10	114
7344	Gospel Oak Quarry	Rhyolite, clay-carbonate-sericite altered, weathered, variably sheared, with some quartz-limonite veining.	658 946E 6 280 574N	Gouge from 1m wide N-S fault zone. N end of upper bench	0.002	<0.2	29	70	<2	24	4	0.30	1	22	<2	<10	56
7345	Gospel Oal Qualry	Rhyolite, silica-sericite-carbonate altered, partly fresh, splashy disseminated Cp, Py, Ca very minor Gn, Sp, Cc and (?)stibnite. Some sulphide stockwork. (Petrology - Sample 9049)	658 917E 6 280 615N	S end of lower bench. Chips from rubble pile (5 x 2m area)	0.010	1.7	33	70	6	2930	<1	0.37	2	350	<2	<10	68
7346	Gospel Oak Quarry 10/01/20	Argillised tuff, sheared, goethitic, with calcite veinlets and vein quartz. 05	658 922E 6 280 625N	Several fragments from E end of intermediate flitch	0.005	<0.2	68	150	<2	269	<1	0.15	1	47	<2	<10 15	51

#### Exploration by G&C

#### focused elsewhere on EL's

Concerns included scale, apparent structural complexity, and lack of guidance from geophys. etc

until decision to drill ...

# CLW – Sam's Reef drilling 2011



### Sams Reef – Long Section



#### CLW – M'chester Mine & Specimen Hill



# CLW – Gospel Oak Quarry (GOQ) Overview

- Sampling from Quarry face returned up to 1% Cu
- 2 x diamond holes completed
  - Returned significant chalcopyrite
  - Copper grades up to 3x background, but not ore grade
- Mapping and XRF soil survey
- Costeans revealed trace malachite and extensive quartz veining
- Veining and Cu mineralisation over >700m strike length
- Previously unrecognised Cu occurrence not in any Dept databases.



# CLW – Gospel Oak Quarry (GOQ)



### CLW - GOQ



# CLW – GOQ, 1.13% Cu (cpy)



# CLW – drilled GOQD001 (456.8m)





 150m+ chalcopyrite from first diamond hole at Gospel Oak Quarry

# CLW – mapped GOQ



# CLW – drilled GOQD002 (444.8m)



# CLW – Gospel Oak Quarry Gold Mine 25g/t Au





10/01/2005



10/01/2005





# Spectral Work by Scott Halley

#### Sams Reef, ASD Mineralogy; Plan View



Sam's Reef, Sericite Composition; Wavelength of sericite 2200nm feature; Blue<2200nm (acid) Red>2215nm (alkaline)



#### Sam's Reef, Gold Assays Blue<0.05ppm, Red>0.5ppm Note how most of the gold is located in the transition from acid to alkaline.



#### **Gospel Oak Quarry, ASD Mineralogy;** View looking to the NNE



Gospel Oak Quarry, Sericite Composition; Wavelength of sericite 2200nm feature; Blue<2200nm (acid) Red>2215nm (alkaline)



# CLW – Nth Canowindra frequent Cu in small number of more

# 'mafic' samples...



# CLW – Lady Burdett



# CLW – Lady Burdett

OR122577	31	Au-AA22 M	E-ICP41 N	E-ICP41 M	AE-ICP41 M	E-ICP41 M	E-ICP41 M	E-ICP41 N	E-ICP41 M	E-ICP41 N	AE-ICP41 N	IE-ICP41 M	E-ICP41	ME-ICP41	ME-ICP41 M	ME-ICP41	VE-ICP41	AE-ICP41	AE-ICP41 N	E-ICP41 N	AE-ICP41 N	AE-ICP41 M	E-ICP41 M	E-ICP41 M	E-ICP41 M	E-ICP41 MI	E-ICP41 M	E-ICP41 N	E-ICP41								
SAMPLE	COMMENT	Au	Ag	Al	As	Б	Ба	Бе	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	s	Sb	Sc	Sr	Th	Ti	Tİ	U	٧	w	Zn
		ppm	ppm	96	ppm	ppm	ppm	ppm	ppm	96	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm	96	ppm	ppm	%	ppm	ppm	ppm	96	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
203587	sil-ser+/-py host (fn grain) with milky qtz vns +py	0.095	0.6	1.06	80	<10	70	0.5	2	2.67	<0.5	11	15	486	2.49	<10	<1	0.36	20	1.18	783	<1	0.04	20	410	12	0.22	<2	7	164	<20	< 0.01	<10	<10	15	<10	56
203588	sil-ser+/-py host (ie sample of host rock only)	0.268	0.4	0.84	349	<10	30	<0.5	<2	2.63	<0.5	11	13	64	3.15	<10	<1	0.26	10	1.19	728	<1	0.04	20	440	13	1.4	<2	6	168	<20	< 0.01	<10	<10	12	<10	33
203589	milky qtz vns +py (ie sample of qtz only)	0.443	0.2	0.47	192	<10	30	< 0.5	<2	1.47	<0.5	6	11	291	2.12	<10	<1	0.18	<10	0.63	485	<1	0.03	9	120	20	0.74	<2	2	115	<20	< 0.01	<10	<10	8	<10	110
203590	sil-ser+/-py host (med grain) with complex milky qtz vns +py	0.838	0.5	1.57	180	<10	60	0.6	2	2.02	<0.5	9	15	810	2.43	<10	<1	0.41	10	D.88	699	<1	0.01	14	320	18	1.03	2	5	36	<20	< 0.01	<10	<10	16	<10	81
			low	15	reak el ev								ar	nomalous												low											



# Observations

- Au without Cu in the Sth
- Cu without Au in the middle
- Au/Cu together in the Nth
  - Cu >> in mafic/dioritic material
- ?multiple events
- Simple metallurgy
- Some events Orogenic
- Some events hydrothermal
- Features indicate high level "epithermal" re: geol environment
  - Some placer gold, not large field(s)
  - Implications include prospectivity below, ie gold still in the ground
  - Interestingly old timers ?missed ore grade material at shallow depths
- Min occ NOT in the 'classically' described gn-cord-bi felsics  $_{^{10/01/2005}}$

# Comments

- Drill out small resources that could be trucked to local plants...or
- Seek cash/resources to explore thoroughly and lift the lid on a potentially large/complex Au/Cu mineral belt..
- Maintain an open mind, these rocks were left for a long time without much exploration, seemingly due to a dogma that existed re: their apparent lack of prospectivity..

# Ongoing/Future Work

- Follow up geochem
  - XRF increase resolution
  - Aircore (look for mafics)
- GA-IP (look for sulphide systems)
- Drilling
  - Increase level of data about min occ (ie drill to nth of GOQ
- Hons Thesis via UoW



### Marking out the next hole at Sam's Reef



# Acknowledgments SMEDG for inviting G&C to talk, The Locke Bros for giving me something to talk about landowners for access colleagues for their help and enthusia