

The story of Arsenic (50 tonnes) ending up in a paddock . DBDSI file;- MAL38

Relevant DSDBI files Part 1 -> 2000 MAL 38 (Mining Area License 38 granted 16/11/89)
Part2 -> 2000 -> Min 5364

The story begins in 1985 when Western Mining Incorporation Ltd. purchased 140 hectares of land 13 km Nor Nor West of Bendigo's CBD. The land was adjacent a creek Sydney creek at New Moon which was some 5 Km closer to Bendigo above the Garden Gully line of reef. It was proposed to de-water the Bendigo Goldfield by pumping water into the garden gully line which under gravity water flowed to New Moon the mining operations could be de-watered.

Western Mining's Bendigo Gold EES document states Section 3 page 7:-

*"Inserting standard definitions of mining, identical to those proposed in the Planning and Environment Act 1987, into the four Council planning instruments;
A one-step planning approval for mineral prospecting/exploration and mineral utilities (ventilation shafts and pipelines) throughout the four Council areas, and for five specific sites and mining activities as follows: Mineral production (North New Chum) - Borough of Eaglehawk. Mineral Production (Carshalton) - Shire of Strathfieldsaye. Mineral Production (South Nell Gwynne) - Shire of Strathfieldsaye. Mineral Production (New Moon) - Shire of Marong (treatment facilities). Evaporation Ponds (Woodvale) - Shire of Marong. The one-step approval mechanism would authorise the development and use for mining activities and minimize or obviate the need for consequential planning permits from Council; authorising the development of the five specific sites on a conceptual site development plan basis, with any further development to require the lodging of an amended plan to the satisfaction of Council; that development and use be required to comply with a balanced framework of detailed planning provisions and development controls. These controls would preserve the amenity of the existing environment and ensure that appropriate environmental management techniques are implemented. The planning controls have been framed to complement other regulations and approvals required by other authorities. **Where specific aspects of the proposal are adequately covered by the other approvals (for example, EPA Works Approval), the amendments seek to avoid unnecessary duplication of detailed controls and conditions; balancing the need to provide certainty and security as to the manner in which land may be developed against the need to retain sufficient flexibility in the planning controls to allow for alterations in design and layout which may be required from time to time. The amendments have been designed to ensure that flexibility has not been introduced at the expense of general environmental objectives, nor at the diminution of residential amenity."***

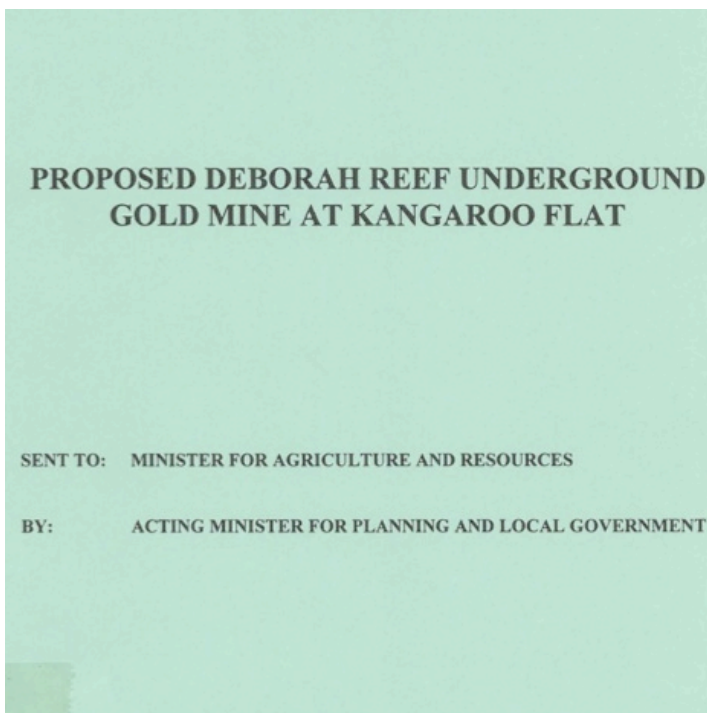
The bold typeface above meant that neither Woodvale Ponds nor New Moon were "required to be examined" in this 1988 EES process. Despite this, Bendigo Mining NL repeatedly claimed it was "dealt with" in the Western Mining Bendigo Gold Project EES of 1988. There has been a more than FOUR FOLD increase in discharge allowance of Water (and by implication Arsenic & Salt) to Woodvale Ponds that has occurred since the original EPA license (EX 219/2) was granted in Oct'1986. There has also been a 6 FOLD increase in Arsenic concentration allowed in that mine water discharge to the Woodvale Ponds.

The story of Arsenic (50 tonnes) ending up in a paddock . DBDSI file;- MAL38

At the Williams United EES, Sept. 1997, the EPA stated in their submission that Woodvale permits should be “revisited” in any future EES process. This suggestion by a “Responsible Authority” was ignored 8 months later at the Deborah Underground EES process of 1998. The Woodvale Evaporation Ponds could have been considered in any of the 5 EES’s;-

- i) Western Mining Bendigo Gold Project 1988
- ii) Bendigo Mining NLs Deborah Reef Gold Mining Project 1989
- iii) Bendigo Mining NL’s Williams United Gold Project 1997
- vi) Bendigo Mining NL’s Deborah Reef underground Gold mine at Kangaroo Flat 1998
- v) Bendigo Mining’s NL’s New Gold Project expansion at Carlsharlton 2004

ANALYSIS OF THE the Panel Report for the Deborah Reef EES (PRfDEES) JUNE 1998 WITH REGARD TO THE WOODVALE EVAPORATIVE PONDS.



On page 80 of the above Panel Report (undertaken on behalf of the Minister for Planning) for the Deborah EES (PRfDEES), the panel makes the following observation;-

“A number of regulatory bodies sought additional information on water management for the project. Submitters also expressed concern that insufficient information had been provided on this aspect despite numerous requests for such information during the consultative committee process”

Several community members, including Ms Shelley Cohn on behalf of the Bendigo & District Environment Council (BDEC), had also asked for information on Woodvale at the EES consultative committee stage and were informed it was not relevant. No information was forthcoming. Some even wrote letters to the minister for planning requesting the EES to examine Woodvale and New Moon, PRIOR to the Panel Hearing. Their request was refused.

On Page 121 of the PRfDEES in Section 5.24 the panel goes on to state the following :-

The story of Arsenic (50 tonnes) ending up in a paddock . DBDSI file;- MAL38

“5.24 Woodvale & New Moon sites.

The use of the New Moon sites and the Woodvale sites came under scrutiny in 6 submissions. It was also subject to discussion by the Panel during the course of the Panel hearing and the Panel inspected the New Moon site. A concern was expressed by submitters at the use of those sites as part of the project and also that the EES did not embrace these sites in its analysis. The Bendigo & District Environmental Council Inc. per Ms. S.Cohn raised a number of issues on this aspect.”

The proponent was given the right of reply during that Panel hearing in **February 1998**. *“The proponent replied;- The proponent indicated that it was relying upon rights which were set out the City of Greater Bendigo Planning Scheme for the New Moon site and in EPA Licence No.**EX 219/2** (my emphasis in bold) for evaporative ponds at Woodvale.”*

The license requirements of **EPA Licence No.EX 219/2** limit Water discharge to Woodvale to 0.77 ML /day (ie 281ML /year.) . However on page 81 of the PRIDEES :-

“The Panel sought a broadening of details from the proponent on water balance, with a particular emphasis upon the relationship of any water balance program with the Woodvale evaporative ponds. The proponent provided a series of water balance charts to illustrate the manner in which the water balance program would be implemented. The charts dealt with Years 1 and 2, which covered the major portion of the construction program and Year 4 onwards which would relate to the development program. These charts are showing on the following pages. Details were also provided on the Woodvale current evaporative capacity and the permitted expanded configuration which could be achieved under the existing planning approval. These details are set out in Fig. 1 below;

Fig 1

Woodvale current configuration.

Available volume 680 ML
 With freeboard 418 ML
 Area 52.4 ha
 Evaporative capacity 270 ML/annum

	Input ML	Output ML	Volume Requirement ML
Year 1	358	270	88
Year 2	279	270	97
Year 3	390	270	217
Year 4	500	270	447

Woodvale - permitted configuration

Available volume 1526 ML
 With freeboard 841 ML
 Area 137 ha
 Evaporative capacity 704 ML/annum
 Disposal requirement 500 ML/annum

As can be seen at the time of the Panel hearing the company was already admitting it needed to almost double the scope of its Woodvale operations (Disposal Requirement 500ML/annum), whilst still claiming it was able to operate under the conditions of Ex 219/2 (281 ML Input) with licensed Arsenic discharge to Woodvale of 562 Kg per annum.

The story of Arsenic (50 tonnes) ending up in a paddock . DBDSI file;- MAL38

Water discharge on the company's supplied figures would increase by at least 25% in year 1, and by 2001 (year 4, a doubling of volumes and by implication a doubling Arsenic load at Woodvale. By July 1999 (~18 months later) EPA license Ex 219/10 (That is AMENDMENT 10!) was discharged and control of the site was handed over to NRE now DBDSI.

License Ex219/10 had quadrupled to allow **1300 ML /annum** to be discharged to Woodvale with no change in the Arsenic concentration that could be delivered. This license effectively allowed an additional 2,600 Kgs of Arsenic (~4.5 fold increase) to be discharged. This increase had occurred without any public review but with the clandestine permission of the "Responsible Authorities". The "Responsible Authorities" as outlined in the PRfDEES are the Greater City of Bendigo Council, NRE (now DBDSI) & the EPA.

If the company had kept to its discharge license under the license parameters stated at public hearings, the amount of Arsenic at Woodvale could not exceed 37 tonnes. The current mine owner, Unity Mining, concedes there is in excess of 40 tonnes of Arsenic at Woodvale. Calculating backwards that would suggest an additional 5,000 ML or 330MLper annum over past 15 years has been discharged at Woodvale above those 2 license volumes or an increase in Arsenic concentration deliverable.

On page 122 of the Panel Report for the Deborah EES the panel continued "their reply" to Ms. Cohn's comments;-

"5.24.2 Panel commentary"

"Appendix F of the EES supporting documentation provides complete details on a Land Use Planning Study. In the introduction of that study a clear statement is made that the EES deals with all uses associated with the proposed mine's operation with the exception of the operation of the New Moon Treatment Plant and the water disposal facilities at Woodvale.

Appended to the Land Use Planning Study was an extract of the City of Greater Bendigo Planning Scheme as it related to the New Moon Site. At the commencement of the hearing, as indicated in Section 5.11 of the Panel report (see Fig. 1 above), some details on water balance were outstanding and this information was provided to indicate that the water balance program could be managed in accordance within the requirements of the licence through the use of the evaporative ponds.

An appraisal of the Woodvale license clearly indicates that it enables the discharging of waters into evaporative ponds by means of groundwater extracted from the Garden Gully line of reef and such medium is proposed in the proponent's water balance plan - refer to Section 5.11 of the Panel report where a water balance chart clearly illustrates such principle. No discharge rate was specified in regard to discharge to land.

A discharge control did exist if it was proposed to discharge to water to Dead Horse Gully but this right was due to be extinguished on 30 June 1996 and obviously was now not available to the proponent. The EPA extended commentary on options which would be available to the proponent if it wished to pursue a reinstallation of rights to discharge to Dead Horse Gully."

The story of Arsenic (50 tonnes) ending up in a paddock . DBDSI file;- MAL38

The report goes on.... page 123;-

"In addition she (Ms. Cohn) further sought commentary from the Panel on the perceived lack of environmental considerations and community considerations.

"The Panel stresses that, in the introduction of the Victorian Planning Provisions, it is not intended to take way rights which have been achieved in earlier site specific amendments. Conversions to a Ministerial permit will observe this principle. In regard to ventilation shafts comments have been made on this matter in Section 22 of the Panel report."

*"The Panel has noted comments upon the use of the Woodvale and New Moon sites. The use of these sites by the proponent is available through licensing provisions in the instance of Woodvale and by licensing and planning provisions in the case of the New Moon site. The Panel considers that **no action** is required on those matters that were raised by the Bendigo and District Environment Council Inc ."*

Despite these comments about Ms Cohn's submissions, and those of others, on page 84 (Section 5.11.3) this statement appears (apparently Ms. Cohn and BDEC had not demonstrated an "interest" in this aspect of the mining proposal);-

"5.11.3 Panel commentary"

"The water table information was distributed to the interested bodies, namely the City of Greater Bendigo, the EPA and the DNRE. No supplementary commentary was made by those bodies following the presented information."

It is worth noting the interested bodies are also the "**Responsible Authorities**" and they had "NO COMMENT" to this additional information which was obviously going to require a major change to discharge to the Woodvale site.

Simple arithmetic suggests there appears to have been at least a 4+ fold, increase in discharge of Arsenic to Woodvale Ponds at some stage in the past 15 years, compared the original EPA licence EX 219/2, but the "Responsible Authorities" did not feel it necessary to inform the public or those living in close proximity of the ponds or allow public scrutiny of this escalation of carcinogen deposition. Should this increase in an environmental carcinogen not triggered an EES in its' own right?

In the same Panel report the Panel accepts the EPA recommendation that Woodvale is not "scheduled" (Fig. 2, below) therefore NRE should assume full responsibility for licensing and monitoring discharge and be brought into the ERC monitoring domain.

Despite stating throughout the EES hearings that Woodvale falls under EPA licensing and therefore is not subject to the EES. The Panel and proponents were happy for Woodvale to become a part of the mining license AFTER the EES, when serious scrutiny is effectively impossible.

Fig.2

In regard to possible impacts on water tanks the proponent was prepared to implement a monitoring program.

5.11.2 EPA comments.

The EPA had sought additional information on the water balance and on receipt of the information that was provided to the Panel as outlined above no further commentary was made on this aspect.

The EPA drew to the attention of the proponent that legal interpretation revealed that Woodvale came under the jurisdiction of the *Extractive Industries Development Act 1995* or the *Mineral Resources Development Act 1990* and as a result it may not be scheduled and not subject to EPA Works Approval/licensing.

The EPA suggested that the proponent could put a case to be exempt. If exemption was not achieved then it would be necessary for the proponent to recognise the requirements of Section 19A(2)(b) of the *Environment Protection Act 1970* whereby it would be necessary to gain a licence for discharge of waters in a waterway.

When was the proponent granted that exemption and who licensed that exemption?

An interesting anomaly becomes evident in the original Western Mining’s Bendigo Gold Project EES

Western Mining’s EES 1988 supplied table 5.3 (Fig. 3 below) listed ground water analysis from reef lines but did not supply Primary data sheets. Without primary data sheets the community would never be given the opportunity to detect errors of omission or commission. Were these same misleading data sheets given to the EPA to obtain the original EPA discharge license?

Charsharlton which required minor de-watering at, WMC’s proposal, is listed as having an Arsenic concentration of 12mg/L.

Fig.3.

Table 5.3 Typical analyses of groundwater in the area of proposed operations and comparison with drinking water criteria (all concentrations in mg/L)

	Line of reef				EPA 1983 Recommended drinking water criteria **
	New Chum	Charsharlton	Neil Gwynne*	Garden Gully	
Total dissolved solids	7000	4200	2920	5200	1500/500
Calcium	260	95	74	90	200/75
Magnesium	520	310	220	270	150/50
Potassium	40	17	16	35	-
Sodium	1240	800	660	1450	270
Chloride	2150	1500	1200	2200	600/200
Bicarbonate	2500	600	650	1770	-
Sulphate	900	870	110	50	400/200
Arsenic	2	12	0.02	2	A
Cadmium	0.0001	<0.0001	0.002	0.8	0.05
Chromium	0.001	<0.001-0.01+	0.002	0.0001	0.01
Copper	0.005	<0.001-0.035+	0.25	<0.001	0.05
Iron	3	15	1.3	0.5	1.5/0.05
Lead	0.002	0.002	0.04	0.001	0.05
Manganese	1.5	0.5	0.4	0.7	0.5/0.05
Mercury	0.0004	0.0004	0.0006	0.0003	0.001
Nickel	0.010	0.01	0.02	0.007	T
Zinc	0.04	0.045	1.15	0.04	15/5

* Single sample only.
 ** Water quality criteria for raw waters subject to no treatment
 - T refers to criteria based on toxicant properties
 - A refers to criteria based on aesthetic properties
 - where two figures given, first is 'current acceptable', second is 'long term desirable'.
 - Highly variable - range given

Ten years later at the 1998 EES the primary data (individual bore sampling) is supplied which reveals Nell Gwynne with the high Arsenic levels. In 1988 Western mining wished to gain access to Nell Gwynne beneath the Spring Gully reservoir. Western mining reported Nell Gwynne, in their EES documents, which had large volumes of mine water, to have an Arsenic concentration of 0.02mg/L see Figure 3 above.

Figure 4 below reveals Test bore BRC 3001 as belonging to Nell Gwynne.

Fig.4.

Table 2-1 - Register of Representative Groundwater Observation Points and Water Levels (from Meyer and Forbes, 1985)

Hydrological Area (Reef Line)	Bore or Shaft	Collar RL (AHD)	Vert. Depth to water prior to pump tests (assumed to be Natural level)	Reduced Water level (RWL)
Carsharlton	BRC 3050	258.19	19.75	238.44
	BRC 3054	274.80	36.54	238.16
	BRC 3057	288.41	32.82	235.59
	BRC 3061	273.23	36.02	236.76
Napoleon	BRC 3096	275.48	37.40	238.08
	BRC 3064	248.30	6.54	239.76
	BRC 3065	251.84	13.60	238.24
	BRC 3066	250.46	18.18	244.30
	BRC 3067	251.09	16.46	244.63
Nell Gwynne	BD 2007	278.44	8.01	268.43
	BRC 2027	289.69	18.12	268.57
	BRC 2038	280.54	12.31	268.33
	BRC 3001	286.63	20.46	266.17
New Chum	BD 4011	240.99	12.89*	228.02
	BD 4013	244.56	18.1	228.46
	BRC 5002	273.62	47.90	225.72
	BRC 7044	242.32	17.51	224.81
Sheephead	BD 4009	251.17	22.81*	228.4
Deborah	Central Deborah			approx 218
	BD4	250.06	31.14	218.92
	BD 4005	250.19	21.96*	228.23
Garden Gully	BD 4002	247.88	24.75	223.13

When correlated with Appendix 1 bore results listed under "Groundwater Quality Carsharlton" from the 1988 Western Mining EES an Arsenic concentration averaging 12mg/L refers to bore 3001 ie. Nell Gwynne see Fig 5.

This original 1988 primary data was not provided until the 1998 EES. Could this have been deliberate attempt to mislead the EES panel at the 1988 EES or the EPA prior to that?

It would certainly be an unfortunate typographic error when dealing with decisions concerning the open deposition of a potent carcinogen. If not deliberate, at best reflects a lassitude regarding a public toxicological hazard in the pursuit of profit.. Why were these tables not presented in 1988.

Fig.5.

Appendix 1
Groundwater Quality (Carsharlton)
(from Meyer and Forbes, 1985)

Location	Date Sampled	Conductivity (µs/cm)	T.D.S (mg/L)	pH (at 25°C)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Na (mg/L)	Cl (mg/L)	HCO ₃ (mg/L)	CO ₃ (mg/L)	SO ₄ (mg/L)	As (mg/L)	Cd (mg/L)	Cr (mg/L)	Cu (mg/L)	Zn (mg/L)	Pb (mg/L)	Mn (mg/L)	Hg (mg/L)	Ni (mg/L)	
Carsharlton N.Y.																						
(BRC 3001)	29/02/85	-	4100	8.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(BRC 3001)	8/03/85	6600	4270	8.4	55	310	17	810	1470	600	-	860	11.2	0.1	2	<1	14790	2	770	1.2	8	
(BRC 3001)	8/03/85	6580	4190	7.9	95	310	17	800	1490	590	-	870	12.2	0.1	11	35	15290	1	810	0.2	10	
(BRC 3001)	1/03/85	6630	4280	8.4	94	310	17	790	1510	570	-	860	13.7	0.1	<1	<1	15500	2	800	0.4	12	
(BRC 3001)	12/03/85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carsharlton N.Y.																						
(BRC 3062)	7/02/85	9600	6660	8.4	150	550	34	1320	2480	560	0	620	0.108	-	-	-	-	-	-	-	-	-
(BRC 3062)	28/04/85	9940	7120	7.8	130	530	28	1300	2700	830	0	840	0.048	-	-	-	183	-	-	0.2	-	

It is not immediately clear as to the implications of such an error until one considers the volume of mine dewatering that will be required. ie Volume and Arsenic content of that water going to Woodvale evaporation ponds.

No volume estimate is given in the Deborah EES 1998 for Nell Gwynne but Western Mining figures from 1985 suggest about 1,000 ML (see below). If bore BRC 3001 is correct, Nell Gwynne contains 12mg/L Arsenic, or 12kg per ML or 12 tonnes of Arsenic from this one line alone which would eventually be discharged to Woodvale. It would be difficult to perform this de-watering without breaching some part of EPA license EX912/2. Perhaps it may have been difficult to obtain that License at all if that amount of Arsenic deposition had been originally declared by Western Mining.

It is clear the the Woodvale aspect of the WMC proposal was not examined under the Bendigo Gold EES of 1988. In the“Preface” to the 1988 Bendigo Gold Project EES document, Western Mining states in that EES;-

“In addition to the planning instrument amendments and EES, a Works Approval is required from the Environment Protection Authority (EPA) for expansion and long term use of the Woodvale water management system. A separate Application for Works Approval is to be made to the EPA, with public exhibition finishing in February 1988. Works Notifications to the EPA in respect to noise, <e emissions will also he required prior to the commencement of new, or enlargement of existing, operations at defined sites.”

The EPA license was presented, a water balance table and a plan of the ponds design given, but no serious examination of the proposal was undertaken. The following was presented by the 1988 Panel to the Minister for planning;-

“The amendments to the Eaglehawk, Marong and Strathfieldsaye Planning Schemes define various reserved mining areas which cover the mines at North New Chum, Carshalton and South Nell Gwynne, the treatment plant at New Moon and the evaporation ponds at Woodvale. New clauses are introduced which allow for the use and development of these reserved mining areas for mineral evaluation/development and mineral production without permits and subject to an extensive list of conditions to the satisfaction of the responsible authority. In the case of the Reserved Mining Area (Woodvale Water Management), this allows for the use and development of the reserved mining area for evaporation ponds without further permits and subject to an extensive list of conditions to the satisfaction of the responsible authority. The essence of each of these reserved mining areas is that buildings and works cannot commence until a site plan is approved by the responsible authority. The site plan must be generally in accordance with the concept plans which form part of the amendments. This limits future buildings and works on the site. These clauses are similar but by no means identical.”

This Reserved Ming Area (Woodvale Water Managment) still does not appear to be documented in any planning scheme. Yet this private land is estimated to contain 60 tonnes of the carcinogen Arsenic and 300,000 tonnes of salt as mining waste disposal.

The above constitutes the much repeated “approval” for Woodvale Evaporation Ponds as subsequently been claimed as “ongoing approval” in the following 4 EES’s over this mining license. The community was NEVER been given the opportunity to examine the Woodvale Ponds for which the whole project was critically dependent. The relaxation of license discharge conditions have NEVER been explained in a public forum by any responsible authorities. All requests for review since its inception have been refused, as illustrated in Fig 6. below (page 134, Deborah EES 1998).

Fig 6

Woodvale & New Moon sites	5.24	5.18). Use of these available through past planning schemes and licence approvals and therefore do not need to seek approval through the EES process. Some Panel commentary made and reference made to possible contribution to rehabilitation at New Moon and Woodvale.	No constraint on approval
---------------------------	------	--	---------------------------

Woodvale Evaporation Ponds have now repeatedly escaped scrutiny by all Responsible Authorities and evaded or refused scrutiny by Woodvale residents and interested local environment groups. It now poses a toxic hazard for current and future residents of Woodvale and downstream users of the Loddon River catchment. Arsenic is both are carcinogen and is known to increase coronary artery disease even at low concentration. See following extract as an example of the “Ponds” exemption from review. It is difficult to imagine the effects of that amount of salt being mobilized in flood conditions.

On page 134 of the Deborah panel report, the panel excluded Woodvale on basis of planning scheme approval despite not being gazetted. In the 2004 supplementary EES an EPA license was claimed to be active, but no longer applied since responsibility was transferred to NRE in July 2000. This incidental fact appeared to escape the 2004 Panel’s attention and presumably the attention of the responsible authorities who did not correct the assertion.

In the representations to the Williams United EES (May 1997) the Dept. for Natural Resources and Environment confirmed *they had consulted* the EPA and confirming Woodvale was operating under license EX 219/2. License EX 219/2 was again nominated in November 1997 by at the Deborah EES as the operating license for Woodvale and therefore did not require examination.

That license allowed for the deposition of 281 megalitres per annum containing no more than 2mg/ml or 2Kg/ML ie 562Kg Arsenic per annum. By September 1999 that permit had expanded to allow 1300ML/annum or 2600 Kg Arsenic per annum.

The story of Arsenic (50 tonnes) ending up in a paddock . DBDSI file;- MAL38

A 4 fold increase in Arsenic discharge had been licenced by the EPA without public scrutiny with 2 EES processes in close temporal proximity that could have easily examined the Woodvale “Issue”.

Indeed the EPA itself recommended in May 1997 that Woodvale should be examined at the very next EES 1998. This did not happen.

Even with expanded EPA discharge license Bendigo Mining NL were breaching their license conditions 1 out of every 3 months according to ERC documents from that time.

Again at the Supplementary EEES 2004 for proposed expansion of the New Bendigo Gold Project Carshalton Mine site. The following is seen in Panel report *Fig. 7*:-

Should we be concerned that the deposition of massive amounts of a carcinogen in an open paddock in a flood zone was “beyond the scope of EES”?

Fig.7

In response to the issues raised by EPA and DSE, BML's consultants, SKM, provided the following information:-

Table 14-2 SKM responses to issues raised by agencies

Issue	Response
Movement of arsenic in rainfall leaching from dry disposal areas.	The external drainage/seepage interception systems have been included to collect run-off from the slopes of the by-product emplacement areas and any water seepage (that may or may not contain enhanced concentrations of arsenic or other chemicals). All water collected will be retained in silt traps and returned for use in the above ground mine workings
Extra water being extracted at the New Moon and Woodvale sites	Outside scope of SEES
Alluvium at the Mandurang South site could alter groundwater flows	Mandurang South is not included in Bendigo Mining's preferred development proposal. Were works to proceed on site, alluvial material would be removed as part of the soil stockpiling process. DPI Guidelines on the Management of Tailings Storage facilities (referred to in SKM report) also recommend that the emplacement be underlain by a low layer on low hydraulic conductivity to reduce the potential for vertical drainage into underlying material, which in this case is the alluvium.

INQUIRY PANEL REPORT ON SEES TO DEBORAH REEF EES, AUGUST, 2004

At the time of the Deborah EES 0.77 ML (Megalitres) per day of mine water was licensed for discharge at Woodvale. However it was claimed that this figure was actually 1.7 ML. See fig 8 page 116 Supplementary EES 2004;-

Fig.

8

A further number of submissions presented information relating to the performance of the evaporation ponds at Woodvale ponds and the potential for leachate to contaminate local waterways, such as Lake Neanger. Original approval of this process under the Deborah Reef EES allowed for the pumping of approximately 1.7 megalitres per day of saline mine water from old mine workings to the water treatment plant at New Moon and disposal at evaporation ponds at Woodvale, where the water was to be treated to remove salt and other contaminants. From there the treated water is discharged to Lake Neanger. A pipeline from the water treatment plant to the Eaglehawk North Primary School and to a standpipe for public use was also proposed to make water available for non-potable uses.

INQUIRY PANEL REPORT ON SEES TO DEBORAH REEF EES, AUGUST, 2004

Page 117

Although it was recognised that these issues were not part of the SEES, submitters contended that it provided background to the existing environmental performance of BML and as such, attested to the overall environmental commitment of the company.

This simple error of fact, concerning a potent carcinogen with public health implications, was not detected by the “expert” panel, re-affirming a lack of scrutiny of BML & the woodvale site.

At 4 EES panel hearings (1987,1989,1997,1998) the mining license holder operating Woodvale claimed to be able to explicitly operate within EPA license EX219 / 2. Under that license 281 ML of mine water containing 572 Kg of Arsenic could be delivered to Woodvale per annum. Over 25 years that would amount to 14 tonnes of Arsenic at Woodvale.

As stated previously the EPA increased that entitlement in 1999 (just before a state election) to over 4 times that original determination without any public review, allowing 1300 ML of mine water per annum, containing 2,600 Kg of Arsenic per annum to be delivered to Woodvale. If operated continuously at that level, without breeches, this would amount to 37 tonnes of Arsenic at the Woodvale site over the 25 year period of the site's operation.

If the license was 620 ML per annum (1.7ML/day), as expressed to the Supplementary EES in 2004, the amount of Arsenic would be 25.6 tonnes cumulative total, over those 25 years. Unless Arsenic concentration of 2 mg/l in original EPA license had been relaxed, breeched or volumes delivered exceeded.

The multiple undeclared variations of this license through would render it impossible for any community ERC member to know exactly what was permitted at any given time let alone detect any breeches that might be occurring with Arsenic deposition at Woodvale.

The story of Arsenic (50 tonnes) ending up in a paddock . DBDSI file;- MAL38

As it transpired BML discharge license at the time of this 2004 EES was 1300ML/ annum with [As] limited to 13mg/L. This equates to 16 tonnes of Arsenic per annum that could be sent to Woodvale, 30 times the original carefully crafted license. A limit set at this level was impossible for the company to breach by volume or concentration of Arsenic.

Analysis of ERC reports reveals:-

During the 20 months between Dec'98 and July '00 the holder of the mining license breached its EPA license on at least 8 occasions DESPITE that 4 fold increase of Arsenic allowed Arsenic input to Woodvale by the EPA either by exceeding limitations imposed or by failure to monitor and/or report as required by its license.

In the 12 months following transfer of the responsible authority for Woodvale to NRE / DSE that enhanced allocation to Woodvale was exceeded The EPA912/10 on 12 occasions.

It is clear that the company holding the license to discharge at Woodvale have knowingly breached that license on MULTIPLE occasions or chose not to engage in preventative action to prevent license breaches. The company AND the responsible authorities either did not present the breaches or license changes to the ERC or did not explain the profound significance for Woodvale. The presence of a leak at the Woodvale Ponds is not denied. The difficulty is quantifying the extent of that leak.

At the Williams United EES in 1997 the EPA requested/ suggested that at any future EES the Woodvale site should be re-assessed. Why did the EPA as the Responsible Regulatory Authority not insist that that recommendation not be instituted at the Deborah EES 1997/98 Consultative Committee stage some 6 months later? The company operating Woodvale when pushed by the Deborah Panel could only submit a water balance that would involve a quadrupling of the Arsenic delivered to Woodvale. See page 3, Figure1 of this analysis

The Deborah panel 1998 suggested that NRE now/DBDSI assume control over Woodvale with "input" from the other RESPONSIBLE authorities - City of Greater Bendigo Council and the EPA. Was that advice ever sought or offered?

My question is to the Dept responsible for mining and the company holding the license to discharge at the Woodvale site. In view of above breaches, what reason, can either party give, that this site should not be returned (at the companies own expense) (independent of bond estimates)to the condition that would have prevailed had the company not breached its 4 EES proclamations. Which would necessitate removal from site of 75% of Arsenic at its own expense?

The story of Arsenic (50 tonnes) ending up in a paddock . DBDSI file;- MAL38

Appendix 1: Original EPA License for Woodvale EX 219/2

APPENDIX 2 ENVIRONMENT PROTECTION AUTHORITY LICENCE FOR
ROUNDWATER MANAGEMENT SYSTEM BASED ON
WOODVALE EVAPORATION PONDS

Amendments between 2 October 1986 and 19 November 1987 included.

STATE OF VICTORIA

Environment Protection Act 1970

WASTE DISCHARGE LICENCE

Pursuant to Section 2 of the *Environment Protection Act 1970*, a licence is hereby granted to Western Mining Corporation Limited 360 Collins Street MELBOURNE 3000 to discharge waste to the land and water environment at Beelzebub Gully Road, Sailors Gully and Crown Allotment 13, Section 3, Parish of Nerring - Raywood Road, Woodvale, as described on the plans attached as Appendix 1. subject to the attached conditions.

Licence Number EX 219/2

Date of Issue 18 August 1986

WASTE DISCHARGE POINTS

1. Waste shall be discharged only at the following points -

(a) to water: via a constructed channel from the ground water pumps located adjacent to the North New Moon Shaft to Dead Horse Gully and then to Sydney Creek.

(b) to land: into the evaporation ponds located on that part of Crown Allotment 13, Section B, Parish of Werring,

County of Bendigo which is stippled on the plan attached as Appendix 1.

WASTE DISCHARGE RATE

2. The rate of discharge shall not be greater than -

(a) to Dead Horse Gully via the discharge point described in Condition 1(a)

(b) to land unspecified

(c) to Sydney Creek downstream of the licensee's diversion weir.

WASTE DISCHARGE COMPONENTS

(i) 5 megalitres per day until 30 December 1989 **

(ii) 0.77 megalitres per day after 30 December 1989. **

(i) 0.77 megalitres Per day during the months of April to October inclusive.

(ii) Zero during the months of November to March inclusive.

(iii) unspecified when the flow in Sydney Creek is affected by stormwater and the total dissolved solids concentration of the creek at the diversion weir does not exceed 500 g/m³ (as measured by electrical conductivity)

3. The waste shall consist only of groundwater extracted from the Garden Gully line of reef.

** Amended date by EPA licence variation of 31 August 1987

The story of Arsenic (50 tonnes) ending up in a paddock . DBDSI file;- MAL38

FLOW MEASUREMENT

4. The licensee shall maintain a device at the discharge point referred to in Condition 1(a) to measure:

- (a) the total volume of ground water extracted from the Garden Gully line of reef.
- (b) the daily volume of groundwater discharged at this discharge point.

Instantaneous Flow Rate

5. The licensee shall maintain a device to measure the instantaneous rate of flow of waste to Sydney Creek downstream of the licensee's diversion weir.

6. The device referred to in Condition 5 shall:

- (a) at all times be accessible to authorised officers of the Environment Protection Authority;
- (b) be of such design that measurements of the rate of flow of waste to Sydney Creek in litres per minute may be readily made by authorised officers of the Environment Protection Authority.

WASTE QUALITY REQUIREMENTS

7. The concentration of the following components and characteristics of the waste as sampled at the discharge point referred to in Condition 1(a) shall not exceed the following values:

Total dissolved solids (g/m³) 7000

Total arsenic (g/m³) 2.0

Total iron (g/m³) 3.0

Total manganese (g/m³) 1.5

FURTHER REQUIREMENTS

Diversion Weir and Pump Pond

8. The licensee shall maintain at least one stand-by pump at the pumppond shown in Appendix 2 at all times.

9. The licensee shall maintain a freeboard in the pump pond of not less than 0.5 metres at all times.

10. The licensee shall maintain an alarm system to alert operators of the dewatering pumps of any failure in the pumps serving the pump pond.

Evaporation Ponds

11. The licensee shall control mosquito breeding in the ponds shown in Appendix 1.

12. The licensee shall make weekly inspections of all pond walls and drains servicing the ponds shown in Appendix 1 to check for evidence of seepage.

Storm Events

13 •. During storm events when the licensee wishes to cease pumping wastewater to Dead Horse Gully the shutdown shall follow the following sequence of events:

- (i) the licensee shall cease pumping from the Garden Gully line of reef;
- (ii) when the total dissolved solids concentration of the receiving waters at the diversion weir decreases to 500 g/m³ (as measured by electrical conductivity) the licensee may cease pumping from the diversion pump pond.

14. Before restarting the dewatering pumps the licensee shall conduct an inspection of the diversion weir and pump pond.

15. The dewatering pumps and pumps serving the pump pond shall be started either simultaneously or when the total dissolved solids in concentration of the receiving waters at the diversion weir reaches 500 g/m³ (as measured by electrical conductivity).

The story of Arsenic (50 tonnes) ending up in a paddock . DBDSI file;- MAL38

Monitoring Bores

16. The licensee shall maintain the ten monitoring bores located to the north, south, east and west of the evaporation pond site.
17. The monitoring bores described in Condition 16 shall be provided with lockable caps and a key to these caps shall be left with the Authority's Bendigo Regional Inspector.
18. The licensee shall make measurements of the water levels and total dissolved solids concentrations (as measured by electrical conductivity) of water from the bores as given in the following:
- (i) daily for a period of 30 days after commencement of discharges to each pond.
 - (ii) thereafter weekly for the period during which wastewater is discharged to the ponds, and for nine months after the discharge of wastewater to the ponds ceases.
19. All samples pertaining to the following Condition 20 shall be obtained from the bores referred to in Condition 16.
20. Should the results of the measurements described in Condition 18 indicate that saline water has leaked from the ponds, the licensee shall:
- (i) immediately inform the Environment, Protection Authority;
 - (ii) take immediate action to identify the source of the saline water;
 - (iii) seal the flow path at the pond wall or construct a trench to collect the seepage and pump the collected water back to the ponds or take other remedial action as required by the Environment Protection Authority.
 - (iv) Project Rehabilitation
21. The licensee shall cease discharging ground water to the evaporation pond by 30 December 1989.**
22. The licensee shall remove the diversion weir constructed on Sydney Creek by 30 December 1989.**
23. The licensee shall collect the final liquors from the evaporation ponds into the borrow pit in pond number 1 as shown in Appendix 1 for final evaporation to dryness.
24. The licensee shall allow at least one winter to pass to enable the soils on the site to be leached of remaining salts before rehabilitating the site.
- 25.(a) At the completion of the project the licensee shall notify officers of the Environment Protection Authority, who will direct that the residual salt be disposed of by either
- (i) clay capping and mounding the borrow pit in pond no. 1 containing the remaining salts, or
 - (ii) removal of the salt mass to an alternative disposal site.
- (b) Clay capping and mounding as described in Condition
- (c) 25(a)(i) shall be the preferred disposal option, unless there is evidence of significant leakage of salt from the ponds over the life of the project.
- 26. MONITORING AND REPORTING PROGRAM**
- The licensee shall cause a monitoring program to be undertaken in accordance with Conditions 26, 27 and 28.
- ** Amended date by EPA licence variation of 19 November 1987
27. Weekly Monitoring
- (a) A grab sample or samples of the waste shall be obtained at the discharge point referred to in Condition 1(a) on at least one occasion in every week during which a discharge occurs to Dead Horse Gully.
 - (b) The samples referred to in Condition 27(a) shall be analysed for:
 - (i) total dissolved solids (as measured by electrical conductivity)
 - (ii) **arsenic**
 - (iii) **iron**
 - (iv) **manganese**

The story of Arsenic (50 tonnes) ending up in a paddock . DBDSI file;- MAL38

Soil Monitoring Program

28. During the rehabilitation of the site the licensee shall take not less than 20 soil samples from the evaporation pond site and analyse those samples for the following components:

- (i) electrical conductivity
- (ii) acid extractable arsenic
- (iii) acid extractable iron
- (iv) acid extractable manganese

in accordance with the Environment Protection Authority publication No 139 "Chemical Analyses of Polluted Soils".

General Monitoring Requirements . ,

- 29. (a) All samples shall be obtained by Or under the instruction of a qualified analyst.
- (b) All samples shall be obtained, preserved and analysed as specified in the most recent edition of the Environment Protection Authority publication "A Guide to the Sampling and Analysis of Water and Wastewater", or by other methods approved by the Authority.
- (c) In situ or on-site measurements or analyses shall be made for a component or characteristic if so recommended in the above publication.
- (d) All samples for analysis shall be submitted to a laboratory accredited by the National Association of Testing Authorities to undertake the analyses specified in this licence.

Recording Requirements

30. The licensee shall, with regard to the monitoring program described by Conditions 27, 28 and 29;

- (a) cause the results of all analyses, observations, measurements or estimates, to be accurately recorded in writing;
- (b) cause the date and time of sampling to be recorded;
- (c) cause the record of analysis results to bear a National Association of Testing Authorities. stamp of endorsement;
- (d) sign the record of all analyses, measurements and observations or arrange for the said record to be signed by a responsible officer; and
- (e) make the results of the monitoring program available to an authorized officer of the Environment Protection Authority on receipt of any request to do so.

The story of Arsenic (50 tonnes) ending up in a paddock . DBDSI file;- MAL38

Appendix 2: EPA License EX 219 at time of discharge 20/7/2000

EPA LICENSE EX 219/10 - EX219 at time of discharge

issued under Section 20 of the Environment Protection Act 1970

This licence allows the licence holder to discharge waste to the environment from the premises subject to the attached conditions.

LICENCE HOLDER:	BENDIGO MINING NL
REGISTERED ADDRESS:	61-65 BULL STREET BENDIGO VIC 3550
PREMISES ADDRESS:	CA 13 SECTION 3 PARISH OF NERRING
LICENCE NUMBER:	EX219
DATE OF ISSUE:	8 AUGUST 1986
DATE OF AMENDMENT:	28 SEPTEMBER 1999

.....
SELLATHURAI NAREN NARENTHIRAN
DELEGATE OF THE
ENVIRONMENT PROTECTION AUTHORITY

Page 1 of 6

**Plant
Activities**

This licence applies to a gold mine groundwater evaporation ponds system.

**Licence
Objectives**

The licence holder shall adopt the following objectives for the protection of the environment:

- meet environmental quality requirements for all segments of the environment. This includes meeting the general provisions of the *Environment Protection Act (1970)*, State environment protection policies, and Industrial waste management policies. In particular,
 - ◆ *Industrial waste management policy (Waste Minimisation);*
 - ◆ *State environment protection policy (Waters of Victoria);*
 - ◆ *State environment protection policy (Groundwaters of Victoria); and*
 - ◆ *State environment protection policy (Air Quality Management);*
- operate in accordance with good environmental practice at all times; and
- take opportunities to minimise waste and continuously improve environmental performance.

**Licence
Structure**

The licence consists of the following parts.

1. *Waste Discharge and Management*
 - specifies wastes which may be discharged at the premises and the treatment or disposal methods that may be used
2. *Operational Controls*
 - includes the operating requirements to ensure protection of the environment under both normal and plant extreme conditions.
3. *Performance Monitoring and Reporting*
 - specifies the scope of the performance monitoring programme required to demonstrate environmental performance; and
 - specifies the arrangements for submission of performance monitoring reports and other reports to EPA.
4. *Plan of Premises*
 - plan of the premises covered by this licence, including discharge points.

1 WASTE DISCHARGE AND MANAGEMENT

- 1.1 Wastes may be discharged onto land from the premises to the evaporation ponds as shown on the Premises Plan of this licence.
- 1.2 Wastes may be discharged through sprinkler sprays to increase evaporation.
- 1.3 No detectable spray drift must be discharged beyond the boundaries of the premises.
- 1.4 Waste discharged onto the premises must consist only of groundwater extracted from the Garden Gully line of reef and must not contain visible floating oil, grease, scum, litter or other objectionable floating matter.
- 1.5 The discharge of waste must not exceed 1,300 megalitres per annum.
- 1.6 The discharge of waste must not exceed the limits indicated in Table 1 below:

Table 1

<i>Indicator</i>	<i>Unit</i>	<i>Median</i> <i>See Note 1</i>	<i>Maximum</i> <i>See Note 2</i>
Total Dissolved Solids	mg/L	5,000	6,000
Arsenic	mg/L	Not Specified	2.0
Mercury	mg/L	Not specified	0.0001

Notes 1. "Median" means the median value of the twelve months monitoring data obtained in any financial year.

2. 90th % discharge quality limits may apply where more than 10 samples are taken in any one year

- 1.7 Odours offensive to the senses of human beings must not be discharged beyond the boundaries of the premises.

2 ENVIRONMENT MANAGEMENT PLAN AND OPERATIONAL CONTROLS

- 2.1 The licence holder must provide and maintain a device to measure the daily volume flow of waste into the evaporation ponds.
- 2.2 The waste collection and disposal facilities must be regularly inspected and maintained by the licence holder or a nominated person, to ensure their efficient operation.
- 2.3 All fences and gates surrounding the evaporation ponds must be maintained to prevent uncontrolled access by livestock or people.
- 2.4 Waste must not be allowed to overflow from the evaporation ponds.
- 2.5 Waste must not be discharged beyond the evaporation ponds
- 2.6 The evaporation ponds must be maintained in a way which ensures that no seepage occurs through the beds or banks such that the beneficial uses of the groundwater or surface waters are adversely affected.
- 2.7 The evaporation ponds shall be maintained such that:
 - a) the inner batters are clear of grass and weed growth;
 - b) mosquito breeding is suppressed; and
 - c) a minimum freeboard of 500 millimetres is available at all times.

3 PERFORMANCE MONITORING AND REPORTING

- 3.1 By 30 September each year the licence holder must submit a report to EPA which includes all results of the performance monitoring program in accordance with Appendix A and Condition 3.3 for the previous financial year.
- 3.2 The licence holder must notify EPA in writing as soon as practicable of any performance monitoring result which indicates a breach of any condition of this licence.
- 3.3 *The wastes discharged to the evaporation ponds must be tested in accordance with EPA Publication No 441 "A Guide to the Sampling and Analysis of Water and Wastewater" at a frequency of once a month for Total Dissolved Solids, Arsenic and Mercury.*
- 3.4 All samples must be obtained by or under the instruction of a suitably qualified consultant.
- 3.5 All samples for analysis must be submitted to an analytical laboratory accredited by the National Association of Testing Authorities (NATA) to undertake the analyses specified in this licence.
- 3.6 The licence holder must ensure that the record of analysis results bears a NATA stamp endorsement.

4. PLAN OF PREMISES

Appendix 3: Discharge Record for EPA License for Woodvale EX 219/2

Licence EX219

Client: **BENDIGO MINING NL** Action Officer: **DOYLER**
Premises Address: **C/a 13 Section 3 Parish Of Nerring Raywood Rd, Woodvale Vic 3556**

General Details	Key Contact	Fee	Site Assessments	EIPs	Monitoring Details	Monitoring Due Dates	Waste	Attachments
------------------------	-------------	-----	------------------	------	--------------------	----------------------	-------	-------------

Status: **Surrendered** CARMS Nbr: **11710**

Client	Important Dates
Legal Name: BENDIGO MINING NL	Issue Date: 08/08/1986
Trading As: WEST CITY OIL	Last Action Date: 24/07/2000

Appendix 4: Stated & Licensed Groundwater Conditions

Licensed Groundwater extraction at Garden Gully line , New Moon

	Onset	Vol/day	vol/ month	Vol/ year	[As] mg/L	As kg per month	total As tonnes annum	Years in operat.
EX912/ 2	Oct'86	0.77ML	23.4ML	281ML	2.0	46.8 kg	0.562	12
EES 1998	Mar98	0.77ML	23.4ML	281ML	2.0	46.8 kg	0.562	
EX219/ 10	May98	3.56ML	108ML	1300 ML	2.0	216 kg	2.6 t	3
Work plan	2001	3.56ML	108ML	1300 ML	13.1	1,404 kg	16.8 t	5
EES 2004	2004	1.7ML	51.7ML	1,241 ML	2.0	248 kg	4.96 t **	1**
Work Plan	Feb 2005	1.7ML	51.7ML	621 ML	7.6	312 kg	4,719 kg	10

Original licence $0.562 \times 25 = 14$ kg @ Woodvale

With licence revision under EPA $0.562 \times 12 + 2.6 \times 12 = 40.5$

With licence revision under work plan $0.562 \times 12 + 2.6 \times 3 + 16.8 \times 9 = 165.7$ tonnes @ Woodvale

30 fold increase by licence in arsenic deposition at Woodvale from one half tonne per annum to 16 tonnes per annum without public review, input or environmental review.

How much Arsenic is at Woodvale?

- i) 1986 -> 1998 $560\text{kg/annum} \times 12 \text{ years} = 6.72\text{tonnes} +$**
- ii) Oct 1998 -> Oct 2001 $2.6 \text{ t/annum} \times 3\text{years} = 7.8 \text{ tonnes} +$**
- iii) Nov 2001 -> 2011 $10 \times 4.7 + = 47 \text{ tonnes years}$**

These figures would suggest somewhere of the order of 60 tonnes of Arsenic lies in the paddocks of Woodvale with a range of 40 -> 100 tonnes. The ponds may contain up to 200,000 tonnes of salt.

Appendix 5: Original rehabilitation estimate for Woodvale

In the 1998 Deborah EES panel report p.114. The panel appear to be accepting Mr. Wylie's estimates for rehabilitation of New Moon, Pipeline and Woodvale would be \$5.4M. Just a tad over what is currently estimated <\$2M for those sites. Add 15 years "inflation" makes it about \$8M in today's money. I believe Mr. Wylie's estimate predates the pond's expansion.

Deborah Reef EES.

114

This is a completely separate licence to those over the Bendigo field and was granted specifically for the purpose of construction and use of evaporation ponds for water disposal.

5.21.2 DNRE bond requirements.

DNRE provided the details on a preliminary rehabilitation bond assessment. The specific details were as follows:-

Preliminary rehabilitation
bond assessment

Item	Cost
Portal & box cut	\$201,000
Barren rock dump	\$10,000
Plant site	\$52,000
Sundry	\$17,000
Contingency	\$28,000
Management	\$31,000
Total	\$339,000

The Department representative stressed that this assessment was based upon preliminary information and that it would almost certainly change.

No commentary was offered on the estimate which was provided by Mr. Wylie.

5.21.3 Panel commentary.

The Panel has reviewed the estimate provided by Mr. Wylie. The rehabilitation of the New Moon site and the Woodvale site have not been a matter for consideration in the proposal before the Panel and these aspects, together with the removal of the pipe line, which is also not an item considered by DNRE, constitute some \$5.4m of Mr. Wylie's estimates.

In addition rehabilitation to areas which were deemed to be impacted by exploration activities cannot be part of the bond which is to deal with all works which flow from an approval that may be given to the EES proposal.

The Panel has noted that the figures provided by DNRE are preliminary at this juncture. The Panel has noted that no reference is made to the bond rehabilitation or to rehabilitation which may occur at the ventilation site or North Deborah site.

The Panel has noted the details in Section 5.21.1 above which relates to bonds as they currently exist in regard to the New Moon and Woodvale sites. It is further noted that a review of the bond for existing Exploration Licence 3327 and Mining Licence 1345 is pending the outcome of the EES before the Panel.