DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

HEAD OFFICE
HACKETT DRIVE CRAWLEY
WESTERN AUSTRALIA
Phone (09) 3868811
Telex AA94585
Facsimile (09) 3861578

STATE OPERATIONS HEADQUARTERS
50 HAYMAN ROAD COMO
WESTERN AUSTRALIA
Phone (09) 367 0333
Telex AA 94616
Facsimile (09) 367 0466

Please address all correspondence to Executive Director, P.O. Box 104, COMO W.A. 6152

Your Ref: 170/80
Our Ref: FHMcK:SE
Enquiries: Dr McKinnell
Phone: 367 0202

CHAIRMAN
ENVIRONMENTAL PROTECTION AUTHORITY

SILICON SMELTER ERMP

Your memo of 25 March 1987 concerning the above project has been considered and the following comments are made in response to the points you have raised.

1. Accountability for CALM actions in State forest

CALM is accountable for its actions to the Hon Minister for Conservation and Land Management, and through him, to the Government. CALM's actions are governed by the CALM Act on the one hand and Government policies on the other.

The CALM Act requires the production of land management plans for all categories of land under the control of the Department. These plans set out the issues in each particular area and how CALM proposes to address them, together with the management guidelines and policies currently in use. Accountability for field performance is the responsibility of the Operations Directorate of the Department. No other arrangements for monitoring are necessary.

The area of forest operations for the proposed silicon smelter is covered by two CALM regional land management plans - for the Northern Forest Region and for the Central Forest Region - and a timber strategy, copies of which I enclose.

A feature of the last two overall management plans covering the State forests - the Forests Department's General Working Plan No 86 of 1977 and No 87 of 1982 - was the large resource of timber below sawlog specification which was an impediment to efficient forest management. The regional plans show a similar picture.

2. Preservation of the jarrah forest ecosystem in the long-term

The preservation of the jarrah forest as a viable ecosystem in the long-term is assured from two directions:

(a) The setting aside by CALM of 34% of the area of the forest in reserves which will not be logged. These reserves represent one of the best and most comprehensive scientifically based ecosystem reserve systems to be found anywhere in the world.

(b) The specific requirements under the CALM Act, which require the sustained yield of the resource. Section 56 of the Act states, inter alia,

> ".... management plans shall be designed -
>
> (a) in the case of indigenous State forest or timber reserves, to ensure the multiple use and sustained yield of that resource ...."

Sustained yield of that resource implies sustaining the ecosystem itself.

Some changes to the ecosystem are clearly in progress where dieback disease has had a severe impact on the forests, but apart from this factor, there is no evidence to suggest any past management actions have had a long-term adverse effect on the ecosystem as a whole.

3. Specific impacts on the forest

3.1 Potential for the spread of dieback disease

All logging operations in the jarrah forest are planned and carried out around the requirements for dieback hygiene. The Department has an ongoing commitment to research on dieback disease and the field operational specifications are updated as soon as new results come forward. The requirements for field control are spelt out in a number of documents, such as "Code of Hardwood Logging Practice" and "Manual of Specifications for Control of Hardwood Logging Operations in the Northern Jarrah Forest". Copies of these documents are attached for your information.

It has always been CALM's intention that supply of timber for the charcoal production facility would be integrated with other logging operations. To the

extent that requirements for the Silicon Trust can be met from forest which would have been cutover in any case to supply the sawmill industry, there would be no additional impact on the forest in respect of risk of disease spread.

However, the requirement set out in page 28 of the ERMP for the timber to be supplied in the past five years' operations to be dry imposes quite different operational procedures. The existing sawlog operations will not be able to provide sufficient dry wood to maintain the required input to the charcoal plant.

It will therefore be necessary to mount a separate logging operation for at least the first five years, located in severely dieback-affected forest where the proportion of dead trees is much higher.

Against this, the second (dieback forest) operation could be permitted to operate all year round in dieback-affected forest, using appropriate hygiene procedures. No logging operations are permitted in dieback-free areas under moist soil conditions except on low impact sites and under very strict control.

The requirement for 24 000 tonnes per year of green firewood (page 28) for direct feed to furnaces at Wundowie could be obtained most economically from the thinning of high quality regrowth jarrah forest in the Mundaring area. Thus, there could be three separate operations supplying wood to the Silicon Trust.

However, the same stringent environmental control requirements would be applied there as for any other harvesting activity. It has been made quite clear to representatives of the Silicon Trust in discussions with CALM staff, that this proposed industry will receive no concessions at all in this respect and that it must accept the environmental control specifications which are applied to other forest users.

There is no concern in CALM that properly controlled logging operations represent a significant threat to the long-term viability of the jarrah forest in respect of spread of dieback disease. Extensive logging trials, undertaken in a variety of seasons and on a variety of sites, give every confidence that this is so.

3.2 Level of firewood resource

CALM carries out periodic broad scale Resource Level Inventories (RLI) over the jarrah forest. The inventory is, as the name suggests, a stocktake of the forest, recording volume of mill logs, firewood and regrowth material by species. Although based on a small sample, about 0.6% of the area of the forest, the sample is statistically valid over the forest as a whole.

When the five year rolling logging plans are produced, individual logging coupes for the first year are re-examined using a Management Level Inventory (MLI). Actual volumes harvested are always checked against the yield predicted by the MLI to monitor the accuracy of predictions and to provide continual adjustment to utilisation factors. The MLI is much more precise than the RLI for any individual logging coupe, but the RLI is of acceptable precision for overall management planning. It is of some concern to CALM that the resource data in the ERMP are largely based on RLI which is several years old and which did not assess the resource according to precise specifications for firewood products. It is therefore impossible, in the light of ongoing debate as to firewood specification (see below), to give a precise estimate of the resource available to the Silicon Trust.

Despite this, CALM believes there is at least 20 million cubic metres of what CALM classes as jarrah residue in forest allocated to wood production in the Northern and Central Forest Regions. In the Harvey and Dwellingup forest districts there are believed to be about 5.7 million cubic metres of firewood available. What proportion of this is acceptable for charcoal making can really only be proven by experience.

A large part of this resource is in older trees which have been considered in the past to be too poor in quality to be acceptable to the sawmill industry. It is CALM's experience that the availability of a residue market enables the logging contractor to fell and prove sub-marginal trees. A percentage of those trees turn out to be acceptable sawlogs once felled. To this degree, the charcoal industry will assist in the utilisation of logs in the forest and will actually increase the resource available to at least two mills.

In the Dwellingup and Harvey districts there are about 38 000 hectares of jarrah regrowth arising from logging in the early part of the century. A programme of thinning these regrowth forests in the last three years has been constrained by the costs of the operation, which produces very small quantities of marketable small logs, posts and rails. After the first five years, the charcoal production facility will be partly supplied from this regrowth. It is expected that this integrated firewood operation, and that at Mundaring referred to above, will be self-financing and will permit a major expansion of the thinning programme. Without such a thinning the crop trees will grow very slowly indeed. The potential to thin this high quality regrowth forest economically is a major benefit to the forest accruing from the silicon project, but the full potential will not be realised for five years.

There is an area of uncertainty still of concern to CALM involving the specification for the firewood. The specification given in the ERMP is completely unrealistic, being equivalent to that used for a sawlog. It has been made quite clear to representatives of the Silicon Trust that CALM will only sell for firewood that quality of material which cannot be used for anything better. The material to be supplied will certainly be of poorer quality and will include a proportion of logs of much smaller size than envisaged in the ERMP.

If, in the operation of the Contract of Sale under which CALM will supply firewood to the charcoal facility, difficulties arise with the quality of the material supplied, the EPA can be assured CALM will not compromise on the principle of directing timber to its appropriate end use. It is clearly not in the interests of efficient use of timber, nor of maximising the income to the Government, to sell logs for firewood if they are capable of being used for higher royalty sawlogs.

It is important to note that the availability of a firewood market does not imply that all dead or otherwise unutilisable standing trees will be felled. A significant proportion of dead trees and trees with hollow butts cannot be felled for safety reasons.

A mater which has been of great concern to CALM in negotiations with Silicon Trust representatives has been the provision of an adequate resource of firewood for domestic use in the metropolitan area. It has been made clear that no "old" dead wood will be available from any area north of the north boundary of the Dwellingup district. This will be reserved for domestic use.

3.3 The effect of export of nutrients from the forest

A possible long-term loss in forest productivity due to the export from the forest of the nutrients contained in the wood is often raised as an argument against intensive forest management. The argument has stimulated a great deal of research in Australia in the last 10 to 15 years, some of it in the jarrah forest.

Research published by Hingston et al from CSIRO gives estimates of the available nutrient pool on typical jarrah forest sites and confirms what was already well known, that jarrah grows on extremely infertile sites. It is able to do this because it has low requirements for the essential nutrient elements and because it efficiently recycles what is available. These are confirmed by the low nutrient element content of the timber and is the very reason why jarrah charcoal is attractive for the production of high grade silicon metal - it contains very low levels of chemical "impurities".

The data obtained by Hingston et al are consistent with similar research by the same group in the karri forest and other workers studying nutrient recycling in Eastern States eucalypt forests. As a generalisation it can be said that there is a risk of progressive site depauperation with continual cropping on a short rotation of, say, 50 years. With a rotation of 100 years there is generally believed to be little risk of a significant reduction in soil fertility. In jarrah forest the physical rotation is 200 years or more, so there is adequate margin for error in this regard.

In any case, the question is a hypothetical one. Should at any time a decline in productivity due to nutrient removal be detected, it would be readily and economically corrected by the administration of the required nutrients in fertiliser.

3.4 Likelihood of increasing saline run-off from cutover forest

The removal of dead standing trees or logs on the floor of the forest can have no possible influence on sale movement into streams. The overriding priority for management of all jarrah forest north of Collie is protection of catchment values, not timber production. No operation is permitted if it would compromise that objective, and all operations are carefully controlled to avoid water turbidity or stream sedimentation.

In the western (non saline) zone of the jarrah forest, thinning of regrowth forest or slightly heavier cutting in mature forest will result in a temporary increase in run-off, but no extra salt movement. In the eastern part of the jarrah forest, silvicultural prescriptions ensure that an adequate basal area of live, healthy growing stock is retained to ensure that there is no detectable mobilisation of the soil salt store.

Guidelines for forest management in the salt-sensitive zone are under continual review by CALM and the WA Water Authority.

3.5 Impact on flora and fauna

As the provision of firewood for the charcoal production facility will largely utilise dead or defective standing trees and logs already on the ground, there will undoubtedly be a decline in the availability of nest sites for hole nesting fauna and of cover for fauna requiring logs on the ground. However, as noted previously, not all standing dead trees nor all trees with hollow butts can be felled. Further, a proportion of the logs on the ground, mainly the older ones, will be too rotten or too heavily attacked by termites to be worth using for firewood.

The jarrah forest - because of the incidence of wildfire and jarrah dieback - has large numbers of dead and defective trees. This means that the number of nest holes and log habitats is greatly in excess of that which would have been present in the 'natural forest'. This together with the fact that not all nest hole and log habitats will be removed would ensure that these projects would not have a signiicant impact on fauna habitats.

Abbott and van Heurck studied the bird population in jarrah and yarri (E. patens) forest in unlogged forest and in forest where half the trees had been removed. They found the number of bird species and total bird populations were similar in both areas, suggesting that most bird species will tolerate a high level of disturbance in the forest. By dispersing the logging coupes, in a manner similar to that used in the karri forest, any detrimental effect can be minimised.

It should also be remembered the silicon project will not utilise marri trees, which are a minor, but still significant component of the northern jarrah forest. Old marri provide, in fact, better hole nest sites than jarrah. For example, they tend to be the preferred nest trees for possums.

The intention of the Silicon Trust to fund a research project to examine these aspects is welcome. If the project is undertaken within the CALM research organisation, any worthwhile results can be rapidly incorporated nto field practice. No problems are foreseen if it becomes necessary to exclude from logging particular trees which have obvious high value as nest sites, so long as no more than two or three trees per hectare are involved.

The operation of the firewood harvest is not expected to have a significant impact on flora, since no other aspect of forest management will be different.

No adverse impact on the beekeeping industry is expected. More jarrah trees will be harvested, but those removed will be dead, or in poor condition, or in dense regrowth stands. In the latter two instances the trees to be remove will be making very little contribution to nectar production due to either poor health or competition. The generally healthier, more vigorous forest which will follow any harvesting operation will improve the potential for nectar production, especially if the large marri are not affected by harvesting.

4. Consequences of unacceptable levels of impact

Should any significant adverse environmental effects of the wood supply operation appear during the course of the project, the operation will be modified as required to minimise the observed effects.

Summary

CALM has confidence that its 10 years of experience with another residue-using industry in southern forests enables it to make accurate assessments of the impacts of this project and it firmly believes the project will have no serious environmental impact.

Syd Shea
EXECUTIVE DIRECTOR

14 April 1987

Enclosures:

1. Land management plan for the Northern Forest Region.
2. Land management plan for the Central Forest Region.
3. A Strategy to take WA's Forests into the 21st Century.
4. Code of Hardwood Logging Practice.
5. Manual of Specifications for Control of Hardwood Logging Operations in the Northern Jarrah Forest.
6. Hingston, F J, Dimmock,G M and Turton, A G (1980). 'Nutrient distribution in a jarrah (Eucalyptus marginata Donn. ex sm.) ecosystem in South-West Western Australia.'
7. Abbott I and Van Heurck P. 'Response of bird populations in jarrah and yarri forest in Western Australia following removal of half the canopy of the jarrah forest.'