

EPA AUDIT REPORT – ENFIELD STATE FOREST, COMPARTMENTS 311, 312, 314, 292

Auditee:	FORESTRY CORPORATION OF NSW (FCNSW)
Audited State Forest & Cpts:	ENFIELD STATE FOREST, COMPARTMENTS 311, 312, 314, 292
Region:	Lower North-east Integrated Forestry Operations Approval (IFOA)
Date/Audit timing:	20 November 2014. Audit debrief with FCNSW staff held on 3 December 2014.
Type of audit:	Compliance
Purpose of audit:	Report on the level of compliance with conditions and environmental performance in line EPA compliance priorities.
Audit objectives:	<ol style="list-style-type: none"> 1. Assess compliance against audit criteria that reflect EPA compliance priorities. 2. Assess and categorise risk of identified non-compliance or appropriate further observations. 3. Request action plans against key audit findings so that auditee can use risk categorisation to inform timeliness and level of risk reduction control 4. Promote continuous improvement of the environmental performance of forestry operations.
Audit scope:	<ul style="list-style-type: none"> • Hollow bearing and recruitment trees • Rainforest • Koala protection measures • Wetland <p>Physical scope: This audit was limited to the physical boundaries of compartments 311, 312, 314 & 292.</p> <p>Temporal scope: The audit period adopted for assessment of compliance with operational conditions was on the days of the audit inspections (20 November 2014).</p>
Audit criteria:	<p>5.6 (b)(c)(h) 6.9(d) Hollow bearing and recruitment tree retention, selection and protection</p> <p>5.4 Rainforest protection</p> <p>5.1 (f) Marking of exclusion and buffer zones</p> <p>5.2.2 Koala mark-up searches</p> <p>5.9 Wetlands protection</p>
Summary of Operations	<p>Operation commencement date: 22 October 2014</p> <p>Stand age: Non-regrowth zone</p> <p>Silvicultural practice: All stand types within the Net Harvest Area (NHA) will be harvested using Single-tree-selection (STS).</p>

1. Audit Findings – Overview

The EPA identified 8 non-compliances and 64 compliances with the IFOA and POEO Act, including determinations of further observations.

A summary of EPAs findings are in the table below. Full details and evidence of audit findings can be found in the **Audit Findings Table** in **Attachment 1** including further observations made from the audit.

EPA Compliance Priority 14/15	Audit Scope	Compliant	Non-compliant	Not Determined	Not Applicable
Exclusion Zones	Rainforest protection	0	3*	0	0
	Rainforest mark-up	0	1*	0	0
	Wetlands Protection	2	0	0	1
	Wetlands mark-up	1	0	0	0
	Further observations	1	0	0	0
Koala	Identification/search	1	0	1	0
Hollow bearing and recruitment trees	H Retention	2	0	0	0
	H Selection	13	0	0	0
	R Retention	1	0	0	0
	R Selection	6	0	0	0
	H&R Protection	36	4	0	0
	H&R Mark-up	1	0	0	0
Not applicable	Further observations	0	0	0	3
	TOTAL	64	8	0	4

* Note – four (4) matters observed during the field audit are subject to a separate investigation process. Further communications will be provided to you in the separate investigation process.

2. Audit Recommendations

Condition No.	Number of non-compliances (and sample)	Action Details	Non-compliance Code	Target/Action Date
5.6h	4/40	H&R Tree protection An action plan must be developed and implemented to ensure that retained trees are protected as per TSL condition 5.6h (i and ii).	Yellow	End of March 2015
5.1F	1/1	Rainforest & rainforest exclusion zone mark up This matter is being investigated outside the audit process	Red	This matter is being investigated outside the audit process
5.4 a b c	3/3	Rainforest & rainforest exclusion zone protection This matter is being investigated outside the audit process	Red	This matter is being investigated outside the audit process
Total	8			

3. Audit Conclusions

This audit achieved its audit objective by determining compliance with the specified criteria of the audit. The EPA issued FCNSW with the draft audit findings and FCNSW submitted actions to mitigate the non-compliances (Attachment 3). The EPA will follow up on the outcomes of these audits to ensure levels of compliance are enhanced for criteria that relate to this audit.

4. List of Attachments

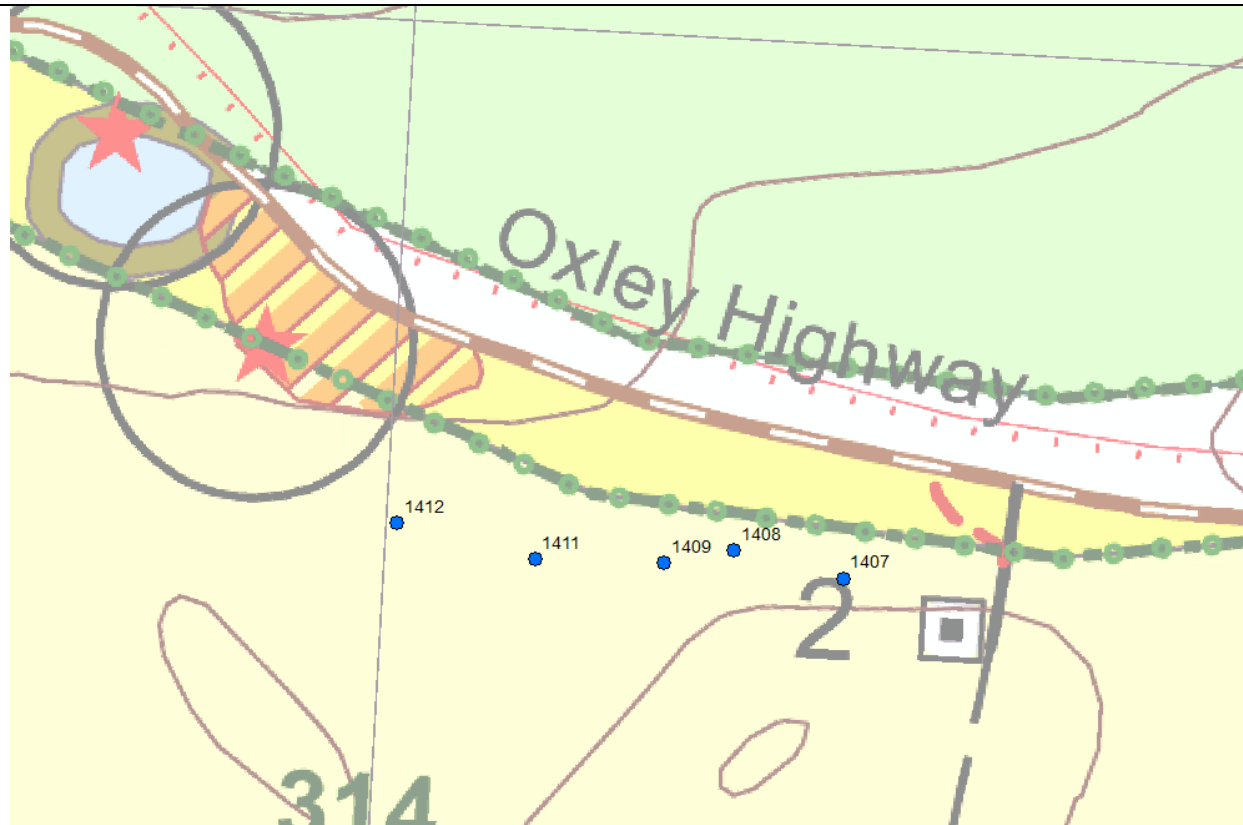
Attachment 1) Audit Findings Table

Attachment 2) EPA Risk Matrix for Non-compliances

Attachment 3) FCNSW Submission on draft audit findings

ATTACHMENT 1: EPA FINAL AUDIT FINDINGS TABLE – ENFIELD STATE FOREST COMPARTMENTS 311, 312, 314, 292

CONDITIONS RELATED TO HOLLOW BEARING TREES (NON-REGROWTH ZONE) – RETENTION							
Condition No. and Detail					Compliant? Yes/No/Not determined/ Not applicable	Number of non- compliance and (sample size)	Action required by licensee
<p>5.6(b): Within the Non-regrowth Zone the following requirements for retention of Hollow-bearing trees apply: i. A minimum of five hollow-bearing trees must be retained per hectare of net logging area. Where this density is not available, the existing hollow-bearing trees must be retained plus additional trees must be retained as hollow-bearing trees to meet the required rate.</p> <p>6.9d: Where information indicates that Greater Gliders occur at densities of more than one per hectare within any individual compartment (that is, a compartment identified by a compartment number and not a group of compartments) being planned for harvesting, and the compartment is within two kilometres of a Powerful Owl record, eight hollow-bearing trees per hectare must be retained within the net logging area of that compartment.</p>					5.6(b) YES	0/1	
					6.9(d) YES	0/1	
Comment and Evidence							
<p>EPA found that the area assessed was compliant with this condition.</p> <p>EPA Officers assessed one area throughout the net harvest area to the west of log dump 2. The total area assessed was 1.0 hectares. The total number of H trees retained was 15 which exceeded the requirement to retain 8. Refer to EPA Waypoints attached to report (and Excel)</p>							
Table 1: EPA Transect Assessments – H trees							
Location	Start EPA waypoint	End EPA waypoint	Transect	Area assessed	H trees marked	Unmarked candidate H trees	Retention rate/ha
West of log dump 2	1407	1412	Fixed area assessed	1.0ha	13	2	15H/ha (includes marked and unmarked
*EPA officers considered trees retained to be candidate H trees only where they met the TSL criteria (despite not being marked).							



Five 0.2ha H and R tree plots were undertaken to assess compliance with H&R retention, selection and marking requirements (Wpts 1407-1412)

CONDITIONS RELATED TO HOLLOW BEARING TREES (NON-REGROWTH ZONE) – SELECTION

Condition No. and Detail	Compliant? Yes/No/Not determined/Not applicable	Number of non- compliance and (sample size)	Action required by licensee
<p>5.6 b iii.</p> <p>The remaining hollow-bearing trees and any additional trees required to be retained to meet the retention rate under this condition must be selected with the objective of retaining trees having as many of the following characteristics as possible:</p> <ul style="list-style-type: none"> - belonging to a cohort of trees with the largest dbhob, - good crown development, <p>(Note: this does not restrict the selection of trees with broken limbs consistent with the hollow-bearing tree definition).</p> <ul style="list-style-type: none"> - minimal butt damage, - represent the range of hollow-bearing species that occur in the area, - located such that they result in retained trees being evenly scattered throughout the net logging area. 	Yes	0/13	
Comment and Evidence			
<p>EPA found that FCNSW selection of trees in the area assessed were compliant with this condition.</p> <p><u>Tree Characteristics Observations</u></p> <p>Retained Tree Sizes: EPA officers compared data of H tree DBHOB and stump sizes of trees removed to assess the size class of trees retained versus those removed. The EPA determined that all eight trees required to be retained per hectare belonged to cohort of trees with the largest dbhob. EPA also observed H trees size appropriate in each 0.2ha. Please refer to Table 2 below.</p> <p>Crown Development Observations: EPA officers observed that all marked H trees and candidate H trees displayed good crown developed and were not suppressed (assessed area only).</p> <p>Butt Damage Observations: EPA officers observed that one marked H tree had minor butt damage (assessed area only).</p> <p>Range of Species Retained: EPA officers observed that the marked H trees comprised of a range of species.</p> <p>Location of H trees in NHA: EPA officers observed that marked H trees were adequately retained in each plot.</p>			



Compliant marking and selecting hollow bearing tree

Appropriately selected and marked H tree at Wpt 1411 – New England Blackbutt (125cm dbh).
In this instance the marking on the tree was difficult to see. This presents a risk that harvesting contractors within machinery do not observed the marking.

Table 2: Hollow bearing tree characteristics across assessed areas

Plot	Hollow (H) Cut (C)	Tree Species	EPA waypoint	DBHOB (cm)	Crown Damage	Logging Debris >1m within 5m	Ground disturbance (5 mtrs)	Suppressed	Tree growth stage (Jacobs)	Used as a bumper
1	H	New England Blackbutt	1407	130	No	No	No	No	over- mature	No
1	H candidate	New England Blackbutt	1407	128	No	Yes (low)	No	No	late-mature	No
1	H	New England Blackbutt	1407	102	No	No	No	No	late-mature	No

1	C	New England Blackbutt	1407	88, 65, 58, 57							
2	H	New England Blackbutt	1408	85	No	No	No	No	late-mature	No	
2	C	New England Blackbutt	1408	85, 75, 67, 65, 65, 62, 55, 55							
2	C	Manna Gum	1408	62							
3	H	New England Blackbutt	1409	95	No	No	No	No	late-mature	No	
3	H	New England Blackbutt	1409	89	No	No	No	No	late-mature	No	
3	H	New England Blackbutt	1409	89	No	No	No	No	late-mature	No	
3	C	New England Blackbutt	1409	63, 60							
4	H	New England Blackbutt	1411	125	No	No	No	No	over-mature	No	
4	H candidate	Unknown	1411	95	No	No	No	No	late-mature	No	
4	H	Unknown	1411	81	No	No	No	No	late-mature	No	
4	H	New England Blackbutt	1411	80	No	No	No	No	over-mature	No	
4	H	New England Blackbutt	1411	62	No	No	No	No	late-mature	No	
4	C	Smooth Barked	1411	75							
4	C	New England Blackbutt	1411	55, 53, 50, 50							
5	H	Unknown	1412	84	No	No	No	No	mature	No	
5	H	Unknown	1412	76	No	No	No	No	mature	Yes (Minor)	
5	C	New England Blackbutt	1412	72, 50							
5	C	Unknown	1412	71							
5	C	Manna Gum	1412	55							

CONDITIONS RELATED TO RECRUITMENT TREES (NON-REGROWTH ZONE) – RETENTION

Condition No. and Detail	Compliant? Yes/No/Not determined/No t applicable	Number of non- compliance and (sample size)	Action required by licensee
5.6c) Within the Non-regrowth Zone the following requirements for retention of Recruitment trees apply: i. A minimum of five recruitment trees must be retained per hectare of net logging area.	YES	0/1	

Comment and Evidence - R tree Retention

EPA found that the areas assessed were compliant with this condition.

The EPA determined that in the assessed area (1.0ha) a minimum of 5 compliant R trees were required to be retained. FCNSW retained 6. The selection of these resources is addressed in the below criteria.

Table 3: EPA Transect Assessments – R trees

Location	Start EPA waypoint	End EPA waypoint	Transect	Area assessed	R trees marked	Unmarked candidate R trees	Retention rate/ha
West of log dump 2	1407	1412	Fixed area assessed	1.0ha	6	0	6R/ha

CONDITIONS RELATED TO RECRUITMENT TREES (NON-REGROWTH ZONE) – SELECTION

Condition No. and Detail	Compliant? Yes/No/Not determined/No t applicable	Number of non- compliance and (sample size)	Action required by licensee
5.6c ii. Recruitment trees must be selected with the objective of retaining trees having as many of the following characteristics as possible: <ul style="list-style-type: none"> - belong to a cohort of trees with the largest dbhob, - located such that they result in retained trees being evenly scattered throughout the net logging area, - good crown development - minimal butt damage, - represent the range of hollow-bearing species that occur in the area. 	Yes	0/6	

Comment and Evidence – R tree Selection

EPA found that FCNSW selection of trees of the trees assessed were compliant with this condition.

EPA officers determined that 6 recruitment trees were marked and retained within the assessed area

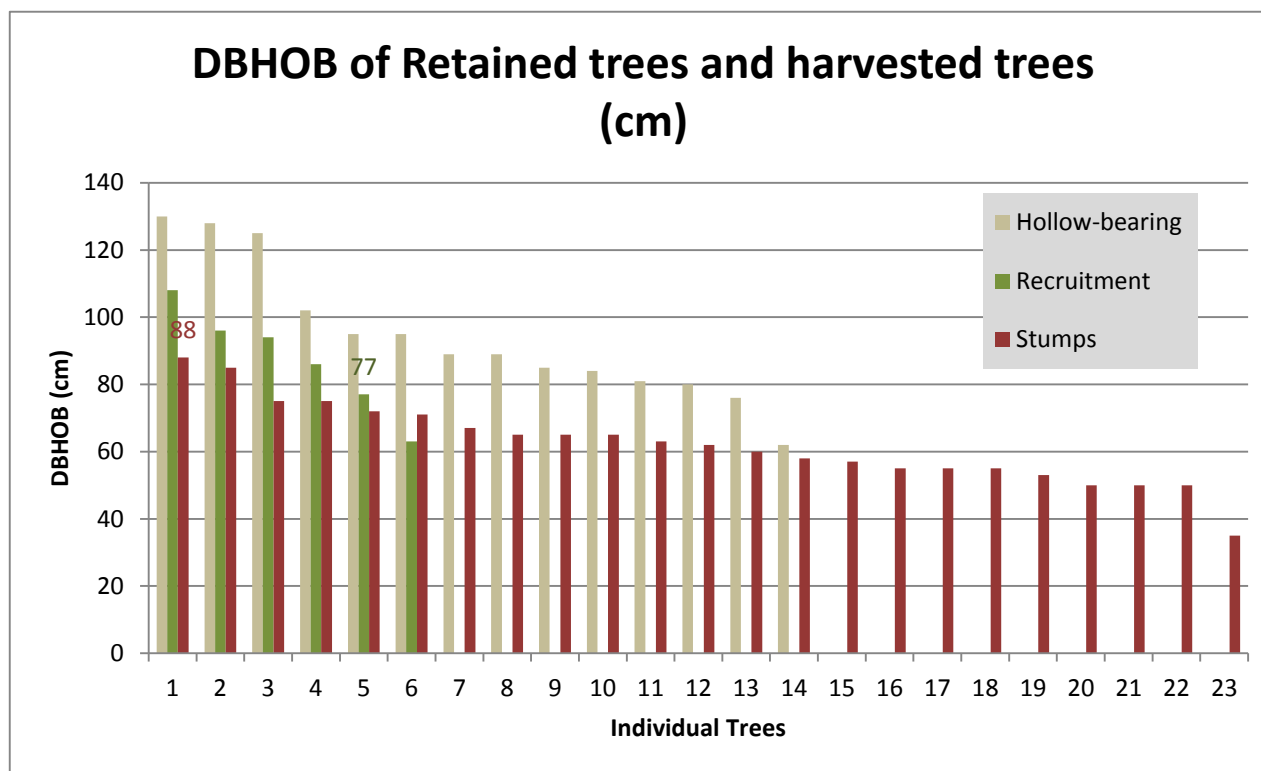
- belong to a cohort of trees with the largest dbhob,- 5 of the 6 trees R trees were considered to belong to the largest cohort of trees in the hectare.
- located such that they result in retained trees being evenly scattered throughout the net logging area – At least 1 appropriate R tree was found in 4 out of 5 plots and therefore R trees were considered to be scattered appropriately throughout the assessed area.
- good crown development – all R trees retained were considered to have good crown development (not suppressed; mature-late mature).
- minimal butt damage – no butt damage was observed.
- represent the range of hollow-bearing species that occur in the area –EPA considered R tree species to adequately represent the range of H trees in the plot.

Table 4: Recruitment tree characteristics across assessed areas

Plot	Hollow (H) Cut (c)	Tree Species	EPA waypoi nt	DBHOB (cm)	Crown Damage	Logging Debris >1m within 5m	Ground disturbance (5 mtrs)	Suppress ed	Tree growth stage (Jacobs)	Used as a bumper
Plot 1	R	New England Blackbutt	1407	108	Yes (minor)	Yes (low)	No	No	mature	No
Plot 1	R	New England Blackbutt	1407	96	No	No	No	No	mature	No
1	C	New England Blackbutt	1407	88, 65, 58, 57						
2	R	New England Blackbutt	1408	86	No	Yes	No	No	late-mature	No
2	R	New England Blackbutt	1408	77	No	No	No	No	mature	No
2	C	New England Blackbutt	1408	85, 75, 67, 65, 65, 62, 55, 55						
2	C	Manna Gum	1408	62						
3	R	New England Blackbutt	1409	94	No	No	Yes (low)	No	mature	No
3	C	New England Blackbutt	1409	63, 60						
4	C	Smooth Barked	1411	75						

4	C	New England Blackbutt	1411	55, 53, 50, 50						
5	R	Unknown	1412	63	No	No	No	No	mature	No
5	C	New England Blackbutt	1412	72, 50						
5	C	Unknown	1412	71						
5	C	Manna Gum	1412	55						

Size class comparison between retained and harvested trees



Retained Hollow bearing trees were the largest

Eight trees required to be retained in assessed area belonged to cohort of trees with the largest dbhob.

Retained Recruitment trees belonged to cohort of the largest trees

5 of the 6 marked R trees were considered to belong to a cohort of trees with the largest dbhob in the hectare. Note the smallest of the five (5) required R is 77cm and the largest cut tree is 88cm, meaning the 5th largest R tree is slightly below what EPA considers acceptable for cohort requirement. However, given the overall quality of selection EPA considers R tree retention compliant in this instance.



Appropriately selected and marked R trees

Recruitment trees selected belong to a cohort of trees with the largest dbhob

Two New England Blackbutt (108 and 96cm dbh respectively) marked R and retained at Wpt 1407. Both R were considered from the appropriate cohort based on dbh relative to harvested trees at both the plot and combined plot levels. Both R had appropriate crown health and no operator damage.

WHY IS COMPLIANCE WITH THIS TSL CONDITION IMPORTANT?

Largest Size Cohort:

The presence, abundance and size of hollows are positively correlated with tree basal diameter, which is an index of age (Lindenmayer *et al.* 1991a, Bennett *et al.* 1994, Ross 1999, Soderquist 1999, Gibbons *et al.* 2000, Shelly 2005). Tree diameter at breast height (DBH) is, in turn, a strong predictor of occupancy by vertebrate fauna (Mackowski 1984, Saunders *et al.* 1982, Smith and Lindenmayer 1988, Gibbons *et al.* 2002, Kalcounis-Rüppell *et al.* 2006). The minimum size-class at which trees consistently (>50% of trees) contain hollows varies depending on the species and environmental conditions, yet is always skewed toward the larger, more mature trees. (Reference: *Loss of Hollow-bearing Trees - key threatening process determination - NSW Scientific Committee - final determination (2007)*)

CONDITIONS RELATED TO HOLLOW BEARING & RECRUITMENT TREES – PROTECTION			
Condition No. and Detail	Compliant? Yes/No/Not determined/Not applicable	Number of non- compliance and (sample size)	Action required by licensee
5.6h) Protection of retained trees i. When conducting specified forestry activities and post-logging burning, damage to trees retained under conditions 5.6 (a), 5.6 (b), 5.6 (c), 5.6 (d), 5.6 (e) and 5.6 (f) of this licence must be minimised to the greatest extent practicable. During harvesting operations, the potential for damage to these trees must be minimised by utilising techniques of directional felling. ii. In the course of conducting specified forestry activities, logging debris must not, to the greatest extent practicable, be allowed to accumulate within five metres of a retained hollow bearing tree, recruitment tree, stag, Allocasuarina with more than 30 crushed cones beneath, eucalypt feed tree, or Yellow-bellied Glider or Squirrel Glider sap feed tree. Logging debris within a five metres radius of retained trees must be removed or flattened to a height of less than one metre. Disturbance to ground and understorey must be minimised to the greatest extent practicable within this five metres radius. Habitat and recruitment trees must not be used as bumper trees during harvesting operations.	NO	1/20 TSL 5.6h(i)	An action plan must be developed and implemented to ensure that retained trees are protected as per TSL condition 5.6h (i and ii).
	NO	3/20 TSL 5.6h(ii)	
Comment and Evidence			
EPA found that FCNSW protection of some trees in the areas assessed were not compliant with the condition.			
EPA Officers observed one incidence of damage to the crown of an R tree New England Blackbutt (108cm DBHOB) at EPA waypoint 1407. EPA officers observed one incidence butt damage of a 76cm unknown species at waypoint 1412. EPA officers recorded two incidence of logging debris that had accumulated to greater than one metre within five metres although the extent of debris were considered low severity. EPA officers did not record instances of excessive ground disturbance.			

Condition No. and Detail	Compliant? Yes/No/Not determined/Not applicable	Number of non- compliance and (sample size)	Action required by licensee
<p>5.6h) Protection of retained trees</p> <p>i. When conducting specified forestry activities and post-logging burning, damage to trees retained under conditions 5.6 (a), 5.6 (b), 5.6 (c), 5.6 (d), 5.6 (e) and 5.6 (f) of this licence must be minimised to the greatest extent practicable. During harvesting operations, the potential for damage to these trees must be minimised by utilising techniques of directional felling.</p> <p>ii. In the course of conducting specified forestry activities, logging debris must not, to the greatest extent practicable, be allowed to accumulate within five metres of a retained hollow bearing tree, recruitment tree, stag, Allocasuarina with more than 30 crushed cones beneath, eucalypt feed tree, or Yellow-bellied Glider or Squirrel Glider sap feed tree. Logging debris within a five metres radius of retained trees must be removed or flattened to a height of less than one metre. Disturbance to ground and understorey must be minimised to the greatest extent practicable within this five metres radius. Habitat and recruitment trees must not be used as bumper trees during harvesting operations.</p>	<p>NO</p> <p>NO</p>	<p>1/20 TSL 5.6h(i)</p> <p>3/20 TSL 5.6h(ii)</p>	<p>An action plan must be developed and implemented to ensure that retained trees are protected as per TSL condition 5.6h (i and ii).</p>

**Compliant?
Yes/No/Not
determined/Not
applicable**

Number of non-compliance and (sample size)

Action required by licensee

5.6h) Protection of retained trees

i. When conducting specified forestry activities and post-logging burning, damage to trees retained under conditions 5.6 (a), 5.6 (b), 5.6 (c), 5.6 (d), 5.6 (e) and 5.6 (f) of this licence must be minimised to the greatest extent practicable. During harvesting operations, the potential for damage to these trees must be minimised by utilising techniques of directional felling.

ii. In the course of conducting specified forestry activities, logging debris must not, to the greatest extent practicable, be allowed to accumulate within five metres of a retained hollow bearing tree, recruitment tree, stag, Allocasuarina with more than 30 crushed cones beneath, eucalypt feed tree, or Yellow-bellied Glider or Squirrel Glider sap feed tree. Logging debris within a five metres radius of retained trees must be removed or flattened to a height of less than one metre. Disturbance to ground and understorey must be minimised to the greatest extent practicable within this five metres radius. Habitat and recruitment trees must not be used as bumper trees during harvesting operations.

NO

1/20
TSL 5.6h(i)

An action plan must be developed and implemented to ensure that retained trees are protected as per TSL condition 5.6h (i and ii).

NO

3/20
TSL 5.6h(ii)

Comment and Evidence

EPA found that FCNSW protection of some trees in the areas assessed were not compliant with the condition.

EPA Officers observed one incidence of damage to the crown of an R tree New England Blackbutt (108cm DBHOB) at EPA waypoint 1407. EPA officers observed one incidence butt damage of a 76cm unknown species at waypoint 1412. EPA officers recorded two incidence of logging debris that had accumulated to greater than one metre within five metres although the extent of debris were considered low severity. EPA officers did not record instances of excessive ground disturbance.



Greatest extent practicable to minimise debris

In this instance, EPA found that this debris was greater than one metre and slightly within five metres from the tree. In this instance, the EPA determined logging debris was minimised to the greatest extent practicable and within five metres. Accordingly this was determined compliant with the licence condition.

Wpt 1408 – Logging debris slightly within 5m from marked R tree.

EPA found that condition 5.2.2a) was complied with in the assessed area.

EPA assessed ahead of the active operations east of log dump three. EPA officers observed that hollow bearing and recruitment trees had been marked in the field up to the furthest extent from harvesting which complied with the TSL requirements of 300m ahead. EPA officers were not able to determine if individual trees had been inspected for evidence of Koala activity as per the TSL requirements. As such 5.2.2b) was not determined.

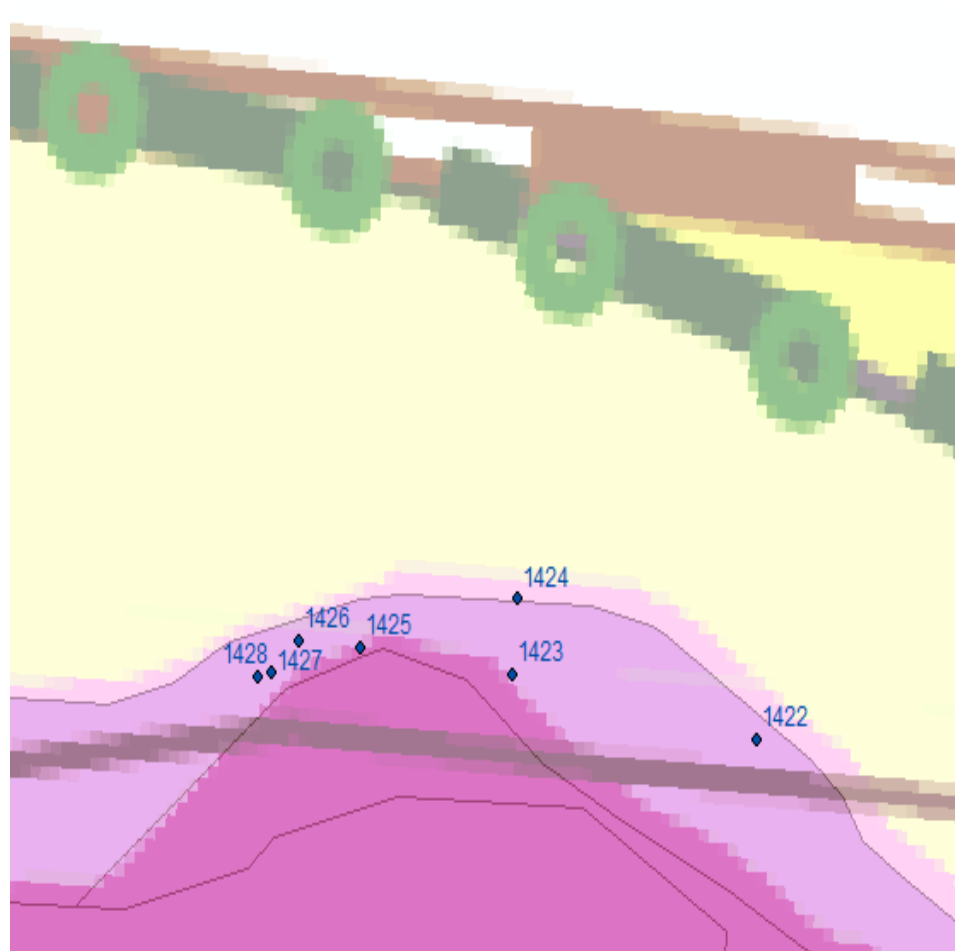
CONDITIONS RELATED TO RAINFOREST AND RAINFOREST EXCLUSION ZONES – PROTECTION

Condition No. and Detail	Compliant? Yes/No/Not determined/Not applicable	Number of non- compliance and (sample size)	Action required by licensee
<p><i>5.4 - Rainforest</i></p> <p>a) Specified forestry activities, except road and snig track construction in accordance with condition 5.4 (e), and road re-opening, are prohibited within all areas of Rainforest and exclusion zones around warm temperate Rainforest.</p> <p>b) A 20 metres wide exclusion zone must be implemented around all areas of warm temperate rainforest, as defined by RN 17 and mapped on Forestry Commission of New South Wales Forest Type maps.</p> <p>c) Trees must not be felled into Rainforest and exclusion zones around warm temperate Rainforest referred to in condition 5.4 (a) and (b) above. If a tree falls into an area of Rainforest or a Rainforest exclusion zone, then no part of that tree can be removed from that area.</p>	<p>a) No</p> <p>b) No</p> <p>c) No</p>	<p>1/1</p> <p>1/1</p> <p>1/1</p>	<p>This matter will be investigated outside audit process</p>
Comment and Evidence			
<p>* This matter will be progressed outside audit.</p> <p>A 90 metre section of rainforest was inspected. EPA found evidence of specified forestry activities, including harvesting and snig track construction, within the exclusion zone associated with warm temperate Rainforest.</p> <p>Audit Waypoints:</p> <p>Wpt 1422 – Tree felled from within exclusion zone and directed into mapped RF. Tree head and debris observed up to edge of actual RF.</p> <p>Wpt 1423 – Edge of logging debris associated with tree felled at Wpt 1424 (see photo below)</p> <p>Wpt 1424 – 65cm (cut height) New England Blackbutt felled inside exclusion and felled toward RF. Slight snig track incursion also observed.</p> <p>Wpt 1425 – 70cm (cut height) New England Blackbutt felled from within mapped exclusion.</p>			

Wpt 1426 – harvest debris

Wpt 1427 – 75cm (cut height) New England Blackbutt felled from within mapped exclusion.

Wpt 1428 – Logging debris accumulated in the rainforest exclusion zone on the boundary of the rainforest.



Waypoints along ~90m of inspected RF exclusion



Photo at Wpt1423 looking to Wpt 1424. Harvesting and debris in RF exclusion zone.

CONDITIONS RELATED TO RAINFOREST AND RAINFOREST EXCLUSION ZONES – MARKING

Condition No. and Detail	Compliant? Yes/No/Not determined/Not applicable	Number of non- compliance and (sample size)	Action required by licensee
5.1F All exclusion zone and buffer zone boundaries must be marked in the field, except where specified forestry activities will not come within 50 metres of such boundaries. The outer edge of lines shown on the map is considered to represent the boundary of the mapped feature when marking the feature in the field.	No	1/1	This matter will be investigated outside audit process
Comment and Evidence			
<p>* This matter will be progressed outside audit.</p> <p>No field marking observed in the ~90m of rainforest exclusion zone inspected.</p> <p>Discussions with contractor suggested that marking was not being conducted and reliance of GPS and a 'visual buffer' of 15m from actual Rainforest.</p>			


CONDITIONS RELATED TO WETLANDS – PROTECTION


Condition No. and Detail	Compliant? Yes/No/Not determined/Not applicable	Number of non- compliance and (sample size)	Action required by licensee
5.9 Wetlands a) Specified forestry activities, except harvesting of tea tree oil, are prohibited in all wetlands, irrespective of the size of the wetland and their surrounding exclusion zones. c) Exclusion zones of at least ten metres wide must be implemented around all wetlands less than 0.5 hectare (approx. 70 metres x 70 metres) surface area. d) Exclusion zones of at least 20 metres wide must be implemented around all wetlands between 0.5 hectare (approx. 70 metres x 70 metres) and 2.0 hectares (approx. 150 metres x 150 metres) surface area.	Yes Yes N/A	0/1 0/1 N/A	
Comment and Evidence			
<p>EPA found that condition 5.9a) and c) was complied with in the assessed area.</p> <p>EPA officers assessed approximately 100m of mapped wetland south of the Crown road reserve (Oxley Highway) within the compartment north west of log dump 2. No specified forestry activities were observed within the wetland zone.</p>			


CONDITIONS RELATED TO WETLANDS – MARKING			
Condition No. and Detail	Compliant? Yes/No/Not determined/Not applicable	Number of non- compliance and (sample size)	Action required by licensee
5.1F All exclusion zone and buffer zone boundaries must be marked in the field, except where specified forestry activities will not come within 50 metres of such boundaries. The outer edge of lines shown on the map is considered to represent the boundary of the mapped feature when marking the feature in the field.	Yes	0/1	
Comment and Evidence			
<p>EPA found that condition 5.9a) and c) was complied with in the assessed area.</p> <p>EPA officers assessed approximately 100m of mapped wetland south of the Crown road reserve (Oxley Highway) north west of log dump 2. Mark-up was observed to be accurate with the mapped boundary. Harvesting was recorded within 50m of the exclusion zone boundary. EPA Wpt's 1401 – 1403 were marked in excess of the mapped boundary and appeared to better capture the actual feature</p> <div data-bbox="741 764 1464 1319" data-label="Image"> </div> <div data-bbox="1507 743 2027 908" data-label="Text"> <p>Wetland exclusion zone boundary marked – Wetland exclusion zone protected Wetland marking with no incursion looking north from GPS 1401 toward Oxley Hwy</p> </div>			

FURTHER OBSERVATIONS TABLE – ENFIELD STATE FOREST, COMPARTMENT 311, 312, 314, 292

These are matters that were recorded during the field investigation but relate to conditions outside the audit scope

Relevant Condition	Risk Code	Details of matter	Recommendation
<i>Threatened Species Conservation Act 1995</i>		<p>ENDANGERED ECOLOGICAL COMMUNITY - MARKING & PROTECTION</p> <p>The eastern boundary of mapped EEC within the Crown land adjacent the Oxley Hwy and bound by compartments 314 was inspected. EEC marking was visible and accurately reflected EEC on the map EEC (Wpts's 1414 – 1416). Marking continued into compartment 314 and was similarly visible and accurate (eg. Wpt 1413 as pictured below) No incursions were observed within the mapped EEC on Crown or Forestry estates.</p>  <p>EEC marking at GPS Wpt 1413. No Incursions</p>	NIL

<p>5.6g (v) Significant Food Resources</p> <p>Damage to flowering or fruiting banksias and Xanthorrhoea spp. should be avoided during forestry operations.</p>		<p>BANKSIA PROTECTION</p> <p>EPA observed an area of <1ha in the vicinity of Wpt 1410 where ~15 <i>Banksia integrifolia</i> trees were standing while ~ 10 banksia were pushed over, associated with snig track construction. The EPA did not observe flowering or fruiting banksia at the time of the inspection. A similar event was also observed nearby. The number of Banksia pushed over in the area assessed is not good environmental practice. The protection of these key food resources to be important.</p>  <p>Example of Banksias pushed over during operations at Wpt 1410.</p>	N/A
N/A		<p>LOGGING WITHIN COUNCIL ROAD RESERVE</p> <p>EPA observed forestry activities in the council road reserve adjacent the Oxley Hwy and bound by compartments 311, 312, 314 and 292. EPA notes that the harvest plan states “<i>approval from Walcha Council as the consent authority has been granted</i>”</p> <p>Wetland, EEC and H&R marking was observed in association with the Crown land operation, which appeared to be an extension of operations occurring on the Forestry estate.</p> <p>EPA observed ~40 stumps, primarily New England Blackbutt, between Wpt 1417 and</p>	N/A

		<p>Wpt 1420 (~1.3ha).</p>  <p>Forest operations in Crown reserve looking east from Wpt 1419.</p>	
<p>6.18 Wombat Vombatus ursinus</p> <p>For areas north of Oxley Highway:</p> <p>a) A 20 metres radius exclusion zone must be established around all entrances to burrows where the burrow is greater than one metre in length.</p>		<p>EPA officers located an active wombat burrow within the mapped wetland area approximately 50m south of the Oxley Hwy (detailed above). The wombat burrow was protected as it was within the mapped wetland area.</p> <p>This burrow was not north of the Oxley highway therefore does not require protection under the licence. This burrow is likely to be associated with the wombat population north of the Oxley Hwy as it is about 50 metres from the highway. Protecting such wombat burrows south of the highway that are likely associated with the population north of the Oxley Highway is good environmental practice.</p>	<p>Continue to undertake compartment mark-up searches for further evidence of wombat burrows in area.</p>

		 <p>Wombat burrow located 50 metres south of Oxley Highway within mapped wetland at EPA waypoint 1404.</p>	
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ACTION PLAN – ENFIELD STATE FOREST, COMPARTMENT 311, 312, 314, 292

Condition No.	Number of non-compliances (and sample)	Action Details	Non-compliance Code	Target/Action Date
5.6h	4/40	H&R Tree protection An action plan must be developed and implemented to ensure that retained trees are protected as per TSL condition 5.6h (i and ii).	Yellow	End of March 2015
5.1F	1/1	Rainforest & rainforest exclusion zone mark up This matter is being investigated outside the audit process	Red	This matter is being investigated outside the audit process
5.4 a b c	3/3	Rainforest & rainforest exclusion zone protection This matter is being investigated outside the audit process	Red	This matter is being investigated outside the audit process
Total	8			

EPA Audit Locations

EPA Waypoint Identifier	Easting	Northing
1400	403507	6532929
1401	403759	6532827
1402	403778	6532813
1403	403792	6532803
1404	403792	6532848
1405	403767	6532927
1406	404359	6532686
1407	404295	6532665
1408	404225	6532679
1409	404181	6532669
1410	404113	6532676
1411	404099	6532666
1412	404010	6532684
1413	403992	6532743
1414	404005	6532747
1415	404014	6532759
1416	404032	6532765
1417	404066	6532757
1418	404110	6532762
1419	404138	6532752
1420	404308	6532695
1421	405008	6532733
1422	404868	6532673
1423	404836	6532678
1424	404836	6532685
1425	404816	6532679
1426	404808	6532680
1427	404805	6532676
1428	404803	6532676

ATTACHMENT 2: RISK ASSESSMENT OF NON-COMPLIANCE

The significance of any non-compliances identified during the audit process are categorised. Following risk assessment of non-compliances, an escalating response relative to the seriousness of the non-compliance is determined to ensure the non-compliance is addressed by the enterprise.

The risk assessment of non-compliances involves assessment of the non-compliance against two criteria; the likelihood of environmental harm occurring and the level of environmental impact as a result of the non-compliance. After these assessments have been made, information is transferred into the risk analysis matrix below.

	Likelihood of Environmental Harm Occurring			
Level of Environmental Impact		Certain	Likely	Less Likely
	High	Code Red	Code Red	Code Orange
	Moderate	Code Red	Code Orange	Code Yellow
	Low	Code Orange	Code Yellow	Code Yellow

The assessment of the likelihood of environmental harm occurring and the level of environmental impact allows for the risk assessment of the non-compliance via a colour coding system. A red risk assessment for non-compliance denotes that the non-compliance is of considerable environmental significance and therefore must be dealt with as a matter of priority. An orange risk assessment for non-compliance is still a significant risk of harm to the environment however can be given a lower priority than a red risk assessment. A yellow risk assessment for non-compliance indicates that the non-compliance could receive a lower priority but must be addressed.

There are also a number of licence conditions that do not have a direct environmental significance, but are still important to the integrity of the regulatory system. These conditions relate to administrative, monitoring and reporting requirements. Non-compliance of these conditions is given a blue colour code.

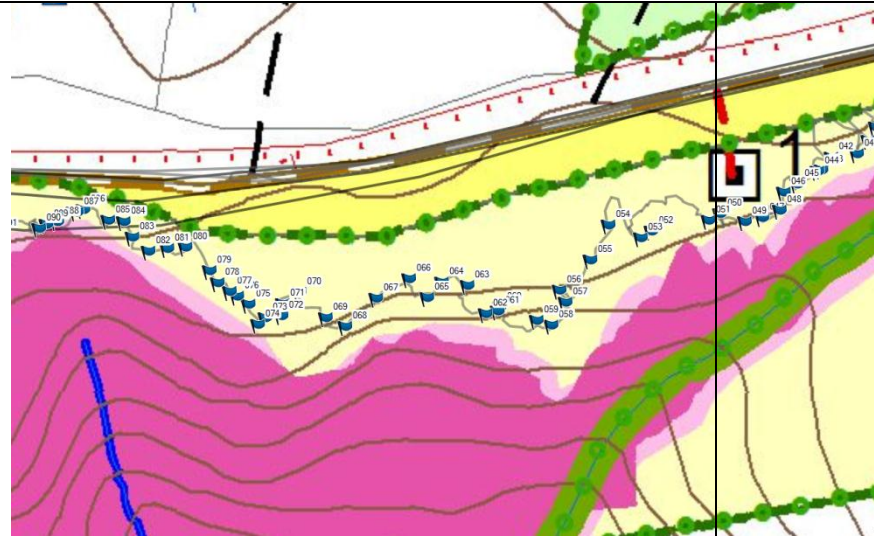
The colour code is used as the basis for deciding on the priority of remedial action required by the licensee and the timeframe within which the non-compliance needs to be addressed. This information is presented in the action program alongside the target/action date for the noncompliance to be addressed.

While the risk assessment of non-compliances is used to prioritise actions to be taken, the EPA considers all non-compliances are important and licensees must ensure that all non-compliances are addressed as soon as possible.

ATTACHMENT 3: FCNSW SUBMISSION ON DRAFT AUDIT FINDINGS

Condition No. / Page No	EPA draft finding / risk categorisation	Location – description, GPS	FCNSW submission	EPA response to FCNSW submission	EPA final finding & risk categorisation
5.6 h i	H and R tree protection Not Compliant Code: Yellow		Based on the EPA audit findings there appears to be very low levels of damage to retained trees. It is FCNSW views that this level of damage is consistent with the objective of minimising damage to the greatest extent practicable. Having said this FCNSW will continue to work with contractors to ensure best practice is being achieved.	The EPA accepts that FCNSW achieved a high compliance rate across the area assessed. Compliance rate does not determine whether a condition has been complied with. Compliance rate is not an element of the condition. There is not percentile of compliance. Accordingly, compliance rate is not considered when determining compliance (“Yes” or “No”) The EPA determines compliance based on the elements of the condition. Individual assessments on each tree are done. In this instance the tree was missing a large portion of its crown and limbs down the trunk. The EPA upholds it original decision of non-compliant. Please note: The extent of non-compliance and environmental harm is used when assigning the environmental risk category to a non-compliance. Extent is considered with the significance of the environmental receptor then combined with likelihood of environmental harm to obtain the overall risk category. The EPA upholds its original audit final and	Unchanged finding Not Compliant Code: Yellow 5.6 h i An action plan must be developed and implemented to ensure that retained trees are protected as per TSL condition 5.6h (i and ii).

				requirement for an action plan.	
5.6 h ii	H & R Debris Mgt Not Compliant Code: Yellow		Based on the EPA audit findings there were two retained trees that had logging debris accumulated to greater than one metre within five metres, however this debris was considered low severity. Given that considerably more habitat trees were retained per hectare than required, it is FCNSW view that more than 8 habitat trees have been retained per hectare without considerable debris. It is acknowledged by FCNSW that while a suitable outcome has been achieved, that strict compliance has not been achieved. As such, FCNSW will work with contractors to ensure best practice is being achieved.	The EPA considered Forestry Corporation submissions. The EPA notes that the condition associated with accumulation of debris around retained trees does not consider retention rates. The EPA notes FCNSW concurrence in its submission. The EPA upholds its original audit final and requirement for an action plan.	Unchanged finding Not Compliant Code: Yellow 5.6 h ii An action plan must be developed and implemented to ensure that retained trees are protected as per TSL condition 5.6h (i and ii).
5.1 F and 5.4 a, b and c	Rainforest protection		FCNSW agree that the rainforest buffer has been breached as outlined by the EPA The rainforest exclusion zone within these compartments was extensive. The actual location of the rainforest boundary differed significantly from the mapped location. These exclusions zones were identified in the field by a Garmin GPS unit mounted within the harvesting machine, combined with visual identification (the rainforest in these compartments is clearly visible). As a result of the inaccurate mapped boundaries, the operator needed to keep track of the GPS mapped boundary and the actual location of the rainforest extent, and keep 20m from both (where to 20m buffer applied to the Warm Temperate Rainforest). The combination of CRAFTI and Warm Temperate Rainforest increased the complexity of achieving compliance. Map 1 indicates the location of the trees (stump locations) harvested closest to the boundary. As can be seen there are significant areas of rainforest reserved beyond the mapped boundary. With the level of complexity of these boundaries the operator has achieved a high level of compliance along the extent of the boundary (excluding the isolated section identified by the EPA). Map 1 – Stump locations most adjacent to the rainforest boundary	The EPA received your response. This matter will be investigated outside the audit process.	Not Applicable.



In the section audited by the EPA (WP 1422 to WP1428), the actual location of the rainforest is not mapped accurately and is actually located approximately 20m to the south of the mapped extent. After conducting an investigation, it is FCNSW view that the operator used his GPS to locate the boundary, confirmed that the actual rainforest remained 20m from the trees that he planned to harvesting, and proceeded if this was the case. Regrettably it appears that in a small section of the boundary that GPS error resulted in trees being harvested within the mapped rainforest buffer.

While trees were harvested within the mapped rainforest buffer zone, no trees were harvested within 20m of the actual rainforest. FCNSW accepts that this is still a breach of the licence and that the buffer has been compromised for a short section on the boundary (note that the rainforest buffer in the location of the breach is less than 10 metres in depth), however minimal environmental harm has occurred to the actual extent of rainforest.

The harvesting operator, Warren Howard has had extensive experience in locating harvesting boundaries using GPS. Warren was involve in the initial trial in 2009, and is viewed as

			<p>a very competent operator. Map 1 demonstrates that there has been a genuine attempt to retain the mapped location of the rainforest, the associated buffer, and the actual extent of the actual rainforest.</p> <p><u>Corrective Actions</u></p> <ul style="list-style-type: none"> • FCNSW is implementing iPad computers, coupled with a GPS mapping application that has been developed by FCNSW for harvesting machinery to improve boundary identification accuracy. While there is no significant improvement in GPS accuracy, the increased screen size will enable operators to zoom into their location with increase resolution, while maintaining an appreciation of other exclusions. It is anticipated that this technology will improve exclusion zone boundary compliance. Additionally contractors will be able to view mapped exclusions on the iPads identified during pre harvest markup surveys. • The implementation of the iPad computers will incorporate training on the use of the iPads and the FCNSW mapping application. A specific element of this training will be use of the iPads in boundary location, data capture, and associated controls. 		
Tables 2 and 4			<p>The audit report incorrectly identifies a number of retained trees as Yellow-box. Although the area is well away from known Yellow-box stands, given Yellow-box makes up an EEC and the final audit report may become public it would be prudent to fix the error and avoid misleading people that another potential EEC was present.</p>	<p>The EPA considered Forestry Corporation submissions and has adjusted the audit accordingly.</p>	<p>Not Applicable.</p>