

FOUR ARROWS ETHANOL PTY LTD : Vehicle movements generated by development



VEHICLES TRANSPORTING RESOURCES AND STAFF ONTO SITE PER YEAR

Ethanol Inputs/ year

Product	Tonnes/year	Vehicle type	Tonnes/load	Numbers
Wheat	326,250 t	heavy	38 t	8,586
Barley	253,750 t	heavy	38 t	6,678
Corn	145,000 t	heavy	38 t	3,816
Citrus pulp	0 t	heavy	38 t	0
Winegrape marc	0 t	heavy	38 t	0
Rice hulls	0 t	heavy	38 t	0
Sugar beet	0 t	heavy	38 t	0
Additives	1,973 t	heavy	38 t	52
Total	726,973			19,131

Dairy Inputs/ year

Product	Tonnes/year	Vehicle type	Tonnes/load	Numbers
Grain	16,759 t	heavy	38 t	441
Silage	89,956 t	heavy	38 t	2,367
Cotton seed	6,841 t	heavy	38 t	180
Molasses	1,747 t	heavy	38 t	46
Sundries	2,263 t	heavy	38 t	60
Total				3,094

Others

Product	Tonnes/year	Vehicle type	Tonnes/load	Numbers
Replacement stock	0 heifers	heavy	90 head	0
Totals				0

Ethanol and Dairy Staff

Numbers
100 staff @ 1.0 person/ light vehicle 365 days 36,500
Total 36,500

VEHICLES TRANSPORTING PRODUCT, WASTE & STAFF OFFSITE PER YEAR

Ethanol outputs/ year

Product	Measurement	Vehicle type	Measurement	Numbers
Wet distillers grain	931,130 t	heavy	40 t	23,278
Ethanol production	305 ML	heavy	30,000 litres	10,167
CO2 production	240,697 t	heavy	39 t	6,252
Total				39,697

Dairy outputs/ year

Product	Measurement	Vehicle type	Measurement	Numbers
Manure	29,952 t	heavy	40 t	749
Culled cattle	3,009 head	heavy	90 head	33
Milk	76,650,000 litres	heavy	30,000 litres	2,555
Total				3,337

D	Trucks required to pick-up product & waste	43,034
E	Less 50% backloads	11,112
F	Total	31,922

Ethanol and Dairy Staff

Numbers
100 staff @ 1.0 people / light vehicle 365 days 36,500
Total 36,500

SPREADSHEET RESULTS (worst case scenario)

		60% vehicles north per/day	40% vehicles south per/day
Total vehicle movement per year	203,517		
Total heavy vehicle movement per year	130,517		
Total light vehicle movement per year	73,000		
Average annual daily heavy vehicle movement	358	215	143
Average annual daily light vehicle movement	200	120	80
Total daily vehicle movements	558	335	223
Average heavy vehicle movements per hour over 15 hour perio	24	14	10

SPREADSHEET ASSUMPTIONS

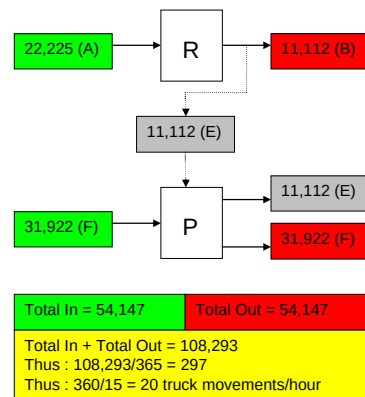
Heavy vehicle movements will be over a fifteen (15) hour period between 7am and 10pm
 6000 milkers will be in production 365 days of the year producing 35 litres/day/cow
 Only a percentage of trucks will be back-loading output from the site
 The largest capacity trucks possible will be utilised for all transporting
 100 people will be employed 365 days of the year in both ethanol production and dairy enterprise
 There is no public transport option available to the site
 50% of trucks that deliver grain and resources can be back-loaded with wet brewers grain etc
 60% of all vehicles will be to and from a northerly direction whilst 40% of vehicles will be to and from a southerly direction

SCENARIO AT 50% BACKLOAD WITH CARPOOLING (improved vehicle efficiency)

Heavy vehicles moving onsite loaded with resources	22,225	A		
Heavy vehicles moving offsite empty after unloading i.e. 50% will remain for backload	11,112	B		
Total	33,337	(A+B)=C		
Heavy vehicles required to move onsite to pickup product & waste	43,034	D		
Heavy vehicles remaining onsite from resource delivery back-loaded with product	11,112	(A-B)=E		
Total	31,922	(D-E)=F		
Heavy vehicles moving onto site empty to pick-up product & waste	31,922	F		
Heavy vehicles moving offsite loaded with product and waste	43,034	D		
Total	74,956	(F+D)=G		
Total heavy vehicle movements per year	108,293	(G+C)=H		
Average annual daily heavy vehicle movement	297	(H/365 days)=I		
Average annual staff vehicle movements i.e.. carpooling 2 passengers/vehicl	100	J		
Total daily vehicle movement	397	I+J		
If the heavy vehicle movements are conducted over the 15 hour period between 7am and 10pm which allows the maximum daily noise goal being 55dBA				
Truck movements per hou	20	I/15		
			60% vehicles north per/hour	40% vehicles south per/hour
			12	8

GRAPHICAL REPRESENTATION OF TRUCK MOVEMENTS (50% BACKLOAD)

- = Trucks On Site
- = Trucks Off Site
- = Trucks Backloaded
- R = Resource Delivery Onsite
- P = Product/Waste Offsite
- = Summary



FOUR ARROWS ETHANOL PTY LTD : Daily % increase of total vehicles due to development utilising AADT figures



Station Number	Roadway	Position	Recording year	Counts axle pairs	Counts vehicles	AADT
95.317	Kidman Way	Willbriggie-at rail crossing	2003	no	yes	1927
97.162	Kidman Way	Darlington Pt - at Murrumbidgee River	2003	no	yes	2517
97.119	Kidman Way	Darlington Pt - 0.4km South SH14, Sturt Hwy	2003	yes	no	1516
97.246	Kidman Way	Coleambally - South MR 596, Morundah Rd	2003	no	yes	1075
97.035	Newell Hwy	Jerilderie - North MR 59, Urana Road	2003	no	yes	3114
97.112	Sturt Hwy	Carrathool - East Conargo Road	2003	no	yes	1418
95.021	Sturt Hwy	At Murrumbidgee Shire boundary	2003	no	yes	1651

AADT source : RTA Traffic volume data 2003

ASSUMPTIONS

Traffic counts comprise of total vehicles heading in either direction along the thoroughfare.

Northerly and southerly split values of 60%/40% give a more accurate indication of actual vehicles that will be travelling past stations.

Northerly and southerly split values have been calculated by assuming all inputs to the enterprise are arriving primarily from a northerly direction and product and derivative movement is approx. equal north and south.

Values for station 97.119 are not included in the comparison text as it is the only station counting axle pairs and not vehicles as do the other stations.

% INCREASE IN VEHICLES

	Traffic movements north 60% total volume	Traffic movements south 40% total volume	Increased vehicle numbers/day
<i>Using non-scenario results from spreadsheet "vehicle movements"</i>			
Willbriggie-at rail crossing	17%	N/A	335
Darlington Pt - at Murrumbidgee River	13%	N/A	335
Darlington Pt - 0.4km South SH14, Sturt Hwy	22%	N/A	335
Coleambally - South MR 596, Morundah Rd	N/A	21%	223
Jerilderie - North MR 59, Urana Road	N/A	7%	223
Carrathool - East Conargo Road	24%	N/A	335
At Murrumbidgee Shire boundary	20%	N/A	335
<i>Using scenario results from spreadsheet "vehicle movements" incorporating Improved vehicle efficiencies</i>			
Willbriggie-at rail crossing	12%	N/A	238
Darlington Pt - at Murrumbidgee River	9%	N/A	238
Darlington Pt - 0.4km South SH14, Sturt Hwy	16%	N/A	238
Coleambally - South MR 596, Morundah Rd	N/A	15%	159
Jerilderie - North MR 59, Urana Road	N/A	5%	159
Carrathool - East Conargo Road	17%	N/A	238
At Murrumbidgee Shire boundary	14%	N/A	238

N/A : Not Applicable

FOUR ARROWS ETHANOL PTY LTD : Daily % increase of vehicle classes due to development by extrapolating vehicle counts

Location	Vehicle class	Description	Sensing period	Number days	Total Vehicles	Vehicles/day
Between Hogan Lane & Cattnach Road	Class 1	Light short vehicle	27/06/2005-11/07/2005	14	9,240	660
	Class 2	Light short towing	27/06/2005-11/07/2005	14	675	48
	Class 3	Heavy 2 axle truck or bus	27/06/2005-11/07/2005	14	635	45
	Class 4	Heavy 3 axle truck or bus	27/06/2005-11/07/2005	14	165	12
	Class 5	Heavy 4 axle truck	27/06/2005-11/07/2005	14	18	1
	Class 6	Heavy 3 axle articulated	27/06/2005-11/07/2005	14	34	2
	Class 7	Heavy 4 axle articulated	27/06/2005-11/07/2005	14	79	6
	Class 8	Heavy 5 axle articulated	27/06/2005-11/07/2005	14	231	17
	Class 9	Heavy 6 axle articulated	27/06/2005-11/07/2005	14	601	43
	Class 10	B Double	27/06/2005-11/07/2005	14	601	43
	Class 11	Double road train	27/06/2005-11/07/2005	14	126	9
	Class 12	Triple road train	27/06/2005-11/07/2005	14	3	0
	Class 13	N/A	27/06/2005-11/07/2005	14	202	14
Kidman Way, north of Gumview café	Class 1	Light short vehicle	27/04/2004-11/05/2004	14	18,993	1,357
	Class 2	Light short towing	27/04/2004-11/05/2004	14	957	68
	Class 3	Heavy 2 axle truck or bus	27/04/2004-11/05/2004	14	833	60
	Class 4	Heavy 3 axle truck or bus	27/04/2004-11/05/2004	14	1,297	93
	Class 5	Heavy 4 axle truck	27/04/2004-11/05/2004	14	144	10
	Class 6	Heavy 3 axle articulated	27/04/2004-11/05/2004	14	34	2
	Class 7	Heavy 4 axle articulated	27/04/2004-11/05/2004	14	113	8
	Class 8	Heavy 5 axle articulated	27/04/2004-11/05/2004	14	132	9
	Class 9	Heavy 6 axle articulated	27/04/2004-11/05/2004	14	1,856	133
	Class 10	B Double	27/04/2004-11/05/2004	14	1,448	103
	Class 11	Double road train	27/04/2004-11/05/2004	14	174	12
	Class 12	Triple road train	27/04/2004-11/05/2004	14	10	1
	Class 13	N/A	27/04/2004-11/05/2004	14	1,265	90
Kidman way, North side of Darlington Point	Class 1	Light short vehicle	01/02/05 - 14/02/2005	13	16,897	1,300
	Class 2	Light short towing	01/02/05 - 14/02/2005	13	667	51
	Class 3	Heavy 2 axle truck or bus	01/02/05 - 14/02/2005	13	718	55
	Class 4	Heavy 3 axle truck or bus	01/02/05 - 14/02/2005	13	239	18
	Class 5	Heavy 4 axle truck	01/02/05 - 14/02/2005	13	26	2
	Class 6	Heavy 3 axle articulated	01/02/05 - 14/02/2005	13	34	3
	Class 7	Heavy 4 axle articulated	01/02/05 - 14/02/2005	13	105	8
	Class 8	Heavy 5 axle articulated	01/02/05 - 14/02/2005	13	367	28
	Class 9	Heavy 6 axle articulated	01/02/05 - 14/02/2005	13	1,070	82
	Class 10	B Double	01/02/05 - 14/02/2005	13	1,395	107
	Class 11	Double road train	01/02/05 - 14/02/2005	13	344	26
	Class 12	Triple road train	01/02/05 - 14/02/2005	13	8	1
	Class 13	N/A	01/02/05 - 14/02/2005	13	106	8
North side, heading into Griffith	Class 1	Light short vehicle	06/09/2005 - 20/09/2005	14	138	10
	Class 2	Light short towing	06/09/2005 - 20/09/2005	14	18,571	1,327
	Class 3	Heavy 2 axle truck or bus	06/09/2005 - 20/09/2005	14	750	54
	Class 4	Heavy 3 axle truck or bus	06/09/2005 - 20/09/2005	14	107	8
	Class 5	Heavy 4 axle truck	06/09/2005 - 20/09/2005	14	334	24
	Class 6	Heavy 3 axle articulated	06/09/2005 - 20/09/2005	14	334	24
	Class 7	Heavy 4 axle articulated	06/09/2005 - 20/09/2005	14	13	1
	Class 8	Heavy 5 axle articulated	06/09/2005 - 20/09/2005	14	225	16
	Class 9	Heavy 6 axle articulated	06/09/2005 - 20/09/2005	14	279	20
	Class 10	B Double	06/09/2005 - 20/09/2005	14	2,141	153
	Class 11	Double road train	06/09/2005 - 20/09/2005	14	75	5
	Class 12	Triple road train	06/09/2005 - 20/09/2005	14	2	0
	Class 13	N/A	06/09/2005 - 20/09/2005	14	72	5

ASSUMPTIONS

Traffic counts comprise of total vehicles heading in either direction along the thoroughfare.

Traffic considered entering and exiting the site for the purpose of this Traffic Impact Study will include .
B-doubles and light short vehicles only.

Southerly and northerly split values give a more accurate indication of actual vehicles traveling past stations.

Southerly and northerly split values have been calculated by assuming all inputs to the enterprise are arriving from a northerly direction and product and derivative movement approx. equal north and south.

Values for vehicles heading into Griffith will not be commented upon as heavy vehicle and light vehicle movement would have depleted considerably by this point.

% INCREASE OF HEAVY AND LIGHT VEHICLE CLASSES

	Traffic north of egress 60% total volume	Traffic south of egress 40% total volume
<i>Using non-scenario results from spreadsheet "vehicle movements"</i>		
% increase for heavy vehicles between Hog.Ln & Catt.Rd per day	N/A	74%
% increase for light vehicles between Hog.Ln & Catt.Rd per day	N/A	11%
% increase for heavy vehicles north of Gumview café	41%	N/A
% increase for light vehicles north of Gum view café	8%	N/A
% increase heavy vehicles north side, Darlington Point	63%	N/A
% increase light vehicles north side, Darlington Point	9%	N/A
% increase heavy vehicles, heading into Griffith	69%	N/A
% increase light vehicles, heading into Griffith	9%	N/A

Using scenario results from spreadsheet "vehicle movements" incorporating Improved vehicle efficiencies

% increase for heavy vehicles between Hog.Ln & Catt.Rd per day	N/A	62%
% increase for light vehicles between Hog.Ln & Catt.Rd per day	N/A	6%
% increase for heavy vehicles north of Gumview café per day	34%	N/A
% increase for light vehicles north of Gumview café per day	4%	N/A
% increase heavy vehicles north side, Darlington Point per day	52%	N/A
% increase light vehicles north side, Darlington Point per day	4%	N/A
% increase heavy vehicles, heading into Griffith per day	58%	N/A
% increase light vehicles, heading into Griffith per day	4%	N/A