

# APPENDIX E - CALCULATION OF 'FIRST PRINCIPLES' TRAFFIC DEMAND

## TRAFFIC FLOW CALCULATIONS SLEAFORD RENEWABLE ENERGY PLANT

### ASSUMPTIONS

#### Operating regime

Operating hours	h/d	24	
Operating days	d/week	7	
Operating weeks	week/y	50	Annual shutdown for 2 weeks during summer
Delivery days	d/week	5.5	
Availability, excluding a	%hours	94%	

#### Material inputs

Straw	t/h	30.21
Lime reagent	t/h	0.20

#### Material exports

Total ash	%mass	5.80%	
Of which: bottom ash	%total ash	75%	Remainder of ash goes to fly ash
Char with bottom ash	%mass	10%	In addition to basic mass of ash
Char with fly ash	%mass	5%	In addition to basic mass of ash
Moisture in botttom ash	%mass	50%	

#### Vehicle carrying capacities

Straw lorry	tonnes	20	Typically 3 layers of 12 bales; each 0.55 tonnes
Bottom ash lorry	tonnes	26	
Fly ash lorry	tonnes	13	Lower capacity assumed - may be volume limited due to low density
Lime reagent	tonnes	30	Lower capacity assumed - may be volume limited due to low density

#### Staff levels

Day staff	#	10	
Shift workers/shift	#	4	12h shifts; 5 shift system

### CALCULATIONS

		annual (t)	weekly (t)	del day (t)	non del day (t)	
<b>Performance</b>						
Straw input	tonnes	238,538	4,771	867	0	
Lime input	tonnes	1,579	32	6	0	
Bottom ash export	tonnes	21,790	436	79	0	
Fly ash export	tonnes	3,632	73	13	0	
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		annual	weekly	del day	non del day	Delivery Hours Per Day
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<b>HGVs (one way)</b>						
Straw	trips	11927	239	44	0	Trips per hour
Lime Input	trips	53	2	0.2	0	
Bottom ash	trips	839	17	4	0	
Fly ash	trips	280	6	2	0	
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<b>Totals</b>						
HGVs (one way)	trips	13099	264	50	0	HGV's
Cars (one way)	trips			18	18	

66

3.62  
0.03  
0.26  
0.09  
3.97