



Adani Wilmar Limited

Introduction

It was August 2000. Sitting in his cabin, the Logistics Manager of Adani Wilmar Limited (AWL), Mr. Pakarashi, was working on the distribution network for the new brand of edible oil to be launched by the company.

Edible oil was still a commodity in India. Since there was little difference in the costs of raw material and processing costs for different companies, one of the major areas where one could get a competitive advantage was in managing the supply chain. Transportation accounted for approximately 70% of the total logistics cost. This meant that setting up of an optimal distribution network focused on transportation costs was important for success in this business.

AWL was setting up a refinery of 600 tons per day (tpd) capacity at Mundra, a port on the Gulf of Kutch, Gujarat. This was the largest in the country, and expected to be fully operational by September 2000. (The National Dairy Development Board (NDDB), a cooperative, currently owned the biggest edible oil refinery with a capacity of 250 tons per day). The refined stocks would have to be distributed to dealers in the markets selected initially in western and northern India. Issues under consideration were the location of warehouses, allocation of dealers to warehouses and transportation mode choice from the refinery to the warehouse.

Company Background

The Adani group started as a trading company, mainly into export of commodities. After a fast growth over 10 years, it had a turnover (value of goods traded) of Rs 35 billion in 1999-00, with net profit of Rs 1.2 billion. It had recently entered into the infrastructure sector, with the building of the Mundra port through a 50-50 joint venture with the Government of Gujarat (represented by Gujarat Port Infrastructure Development Company Limited, promoted by Gujarat Maritime Board and Gujarat Industrial Investment Corporation Limited). The port was built with an investment of Rs 3.9 billion and was designed for a throughput of 1.7 million tons per annum (mtpa). The port started operations in October 1998 and handled a cargo of 293,000 tons in 1999-00 and 122,000 tons during April to June, 2000. A further investment of Rs 4 billion was being made to increase the port capacity, along with a 57 km railway siding for evacuation.

The group had formed a 50-50 joint venture (AWL) with Wilmar Trading Private Limited (WTPL) of Singapore in June 1999 to enter into the edible oil business. WTPL had a turnover of US\$ 2.1 billion in 1999. It was the world's second largest player in edible oil trade, having its own plantations in Malaysia and Indonesia, and also owned a fleet of vessels to transport the products to different countries. Under this joint venture, crude edible oil was to be sourced and imported from Indonesia and Malaysia, refined at Mundra and marketed for domestic consumption. The main aim of the joint venture was to exploit the synergies offered by the port ownership (Adani) and understanding of the international edible oil markets (WTPL). In fact, WTPL had approached Adani for the joint venture, as it had suitable infrastructure in the form of private captive port.

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Market and Competition

AWL was planning to market its refined edible oil in ~~eastern~~^{western} and northern India, since it would give the company an advantage in logistics because of the ease of servicing from Mundra port. The company would find it difficult to service the eastern India markets, since higher road freight (with respect to ocean freight) would not make it competitive, especially if a competitor sought to access this market through an East Coast port. For example, road freight from Mundra to Calcutta was around Rs 3000/ton, while ocean freight was approximately Rs 500/ton from Singapore to West Coast India. (The ocean freight to the East Coast was only marginally less). For the same reason, reaching the western and northern India markets through an East Coast port (even though the edible oil was being sourced from countries located to the east of India) would not be competitive.

Consumption patterns of edible oils in India differed from one region to the other depending on the taste preferences of the people. For example, in the north, a large variety of oils were used like soya, mustard, rapeseed, and sunflower while in the west, groundnut, cottonseed and soya were consumed. In the south, coconut oil and to a lesser extent sesame oil were the main cooking media. Mustard oil was the primary oil in the east. The edible oil consumption was price elastic. Geographical demand patterns of various edible oils are explained in Exhibit 1.

The company was planning to have various edible oils in its portfolio. In the short term, it would consist of 50% soya, 20% cottonseed and 30% others (palmolein, rapeseed etc) because the demand of these oils was mainly in the northern and the western India.

The total market size for edible oils was estimated to be 13 mtpa in 2000 (www.indiancommodities.com). In terms of competition, in the organized sector the main players were ITC, NDDDB, Ruchi Soya and Marico. In recent times, the market share of the national brands like Godrej Sunflower, Sreekar, Saffola etc had decreased and the regional brands had gained from them. The main reason was their lower price. The sales of various players in the edible oil market are shown in Exhibit 2. However the Edible Oils Packaging (Regulations) Order, 1998 (The Hindu on Indiaserver.com, 2nd August 1999) made it obligatory for the edible oil companies to sell only packed oil. Given that the packing machines would require significant investment, the players in the unorganized sector would in future be at a disadvantage as compared to the established brands.

AWL chose to focus on importing crude edible oil due to a differential duty favorable to crude oil over refined oil. This duty structure (Exhibit 3) was to encourage the import of crude oil in order to boost the capacity utilization of domestic refineries. On the other hand, the duty structure did not favour further backward integration to include crushing by importing oilseeds, though the seed crushing units were running at 30% capacity utilization. The high duties on oilseeds were due to the domestic farmer lobby, which felt that it would affect oilseed prices. (Rakesh Jain, background paper on Edible Oil Industry in India, www.madhyabharat.com/sopa/theme). Given the transient nature of import duties over the past five years, AWL was open to either importing refined oil or oilseeds, if it made economic sense. (The cost of the refinery and a seed crushing plant was estimated at Rs 1.5 billion (www.expressindia.com, 25th January 2000)).

Operations

The state of the art 600 tpd refinery was being set up in Mundra with technical know-how from the Wilmar group. The company intended to run the refinery at full capacity. After the refining, almost half of the oil would be sold as bulk. In that case, the buyer would take care of the logistics. The other half would be sold through the distribution network to be set up by the company in the regions mentioned above.

Prior to the refinery, AWL was importing and trading in both crude and refined edible oil. The crude edible oil was sold to refiners in Gujarat and Rajasthan. The refined edible oil was sold to the oil companies in bulk. Most of the oil was handled at Mundra port. A large part of the imported oil was sold on high seas basis. Even after the refinery, trading in both crude and refined edible oil imports was expected to continue. (Total imports were expected to be about 0.5 mtpa, while the refining would be around 0.2 mtpa).

Distribution Network

For the packed stocks, the company was thinking of setting up a network, which would consist of three parallel channels, dealing in consumer and bulk packs. The various consumer packs were 1L poly pouch, 1L bottle, 5L bottle, 5L jerry cans, and 15L jerry cans. The bulk packs were 15L tins and 15kg tins.

The three parallel channels were:

1. *Distributors*: These would deal in all consumer packs upto 15L jerry cans. They would supply the stock to the retailers.
2. *Institutional buyers*: These would be customers with large demand, like canteens, restaurants, messes etc. They would be serviced directly from the company depots, bypassing the distributors and the retailers.
3. *Super-stockists*: They would be traders dealing in 15L and 15kg tins. The responsibility of the company would end once the stock reached the super-stockists. Since these stocks would be traded, the prices would be determined daily, based on the demand and supply position. The super-stockists would sell to smaller institutional buyers, typically not serviced directly by the companies.

To service the distribution network, one of the major decision areas was the location of warehouses. The main aim of the distribution network would be to distribute about 300 tons of edible oils per day, in a timely and cost effective manner. Considering this, the company had begun to set up warehouses in Ahmedabad, Rajkot, Udaipur, Jaipur, Delhi, Karnal, Ludhiana, Ghaziabad, Kanpur and Varanasi. In other places like Nashik, Jalgaon, Nagpur, Indore, Gurgaon, Solan and Chandigarh where the off-take was not expected to be high, they planned to outsource the warehouse management to Carrying and Forwarding Agents (C&FAs). Exhibit 4 gives the product wise expected demand through these warehouses for the consumer and bulk packs. The company did not see any significant cost savings in outsourcing, as long as there was a reasonable throughput. On the other hand they preferred managing their warehouses because of the control they could exercise. These locations were being considered based on geographic intuition of the market spread and reasonable transport availability.

Also the mode of transport and routing was to be decided upon. Various modes of transport that could be considered were:

1. Road (standard trucks or containers)
2. Railways (containers i.e. multimodal transport)

In the case of road transport, freight rates were such that direct movement from Mundra to a warehouse location may not always be the best. For example, the freight rate from Mundra to Kanpur was more than the sum of the freight rates from Mundra to Indore and from Indore to Kanpur. The freight rates were influenced by various factors including return load availability. This would be important in the decision of location of warehouses and the routing of the loads from Mundra to different locations. One of the possible architectures suggested by Mr. Pakarashi was the 'hub and spoke' arrangement.

Rail transport would be by container, handled by CONCOR, the container transport company under the Indian Railways. The rates provided by CONCOR were from the refinery to warehouse

locations that could be serviced by them. CONCOR would probably move the containers by road from Mundra to the inland container depots in Kandla or Ahmedabad and then dispatch it as a part of a trainload to the warehouse.

Apart from timeliness and cost, extent of transit losses would influence the choice of mode and route. The transit losses could occur wherever there was direct handling of the packs. The company had experienced losses of about 0.1% per handling, especially if not properly supervised. The average selling price would be about Rs 30 per litre.

To understand the tradeoffs and implications of some of the choices in the distribution network, Mr. Pakrashi decided to do an analysis for the UP market.

Distribution to UP

The UP market was the second largest in terms of size, after Gujarat, for AWL. The total monthly off-take was expected to be about 2200 tons. The district-wise demand forecast for AWL, along with the dealer locations are given in Exhibit 5. To service these dealers, seven potential warehouse locations were considered. Keeping in view the service time considerations for the secondary movement, the dealers who could be serviced by a warehouse was restricted to a distance of 500 kilometers. Exhibit 6 gives the dealer locations, which could be serviced by a warehouse, along with the distances. The secondary transportation cost, along with other elements of the logistics cost are given in Exhibit 7. Exhibit 8 gives a map of UP showing the potential warehouse locations and districts. In terms of primary movement, the transportation cost from Mundra to various warehouse locations (including those in UP), from other warehouse locations to those in UP and by container movement through CONCOR are given in Exhibit 9. Exhibit 10 gives a map of India showing Mundra and warehouse locations of interest.

Mr Pakrashi needed to select the warehouse locations out of the seven proposed, and assign the dealers to the warehouses. It would also be important to ensure that there weren't imbalances in the workload of the warehouses, if they were to be managed by the company. Smaller volume warehouses could be candidates for outsourcing to a C&FAs. He also needed to decide on the mode choice and routing from Mundra.

The company was open to postponing the packing to locations closer to demand points. While this would enable better servicing of demand, the refined oil would need to be transported in tankers, which had a higher freight rate. Currently, the packing facility was planned at the refinery itself.

Exhibit 1

Edible Oil Consumption Patterns and Growth

The per capita consumption of oil in India had been increasing over the years. It increased from 6.8 kg per year in 1991 to about 10 kg per year in 1999-00. Though this growth had been high in the recent years, the average was lower than most other countries of the world. The annual per capita consumption was 24.4 kg in USA and 29.4 kg in Greece in 1997, while the world average was estimated to be more than 12.0 kg per year¹.

The edible oil consumption was price elastic, tending to increase with a decrease in price². This indicated that the consumption of oil was set to increase with increase in incomes, though its share in total consumption would decrease, as its elasticity was only 0.90. In the base scenario of per capita income growing by four per cent annually, an average Indian's yearly edible oil requirement was slated to rise from 9.81 kg in 1999-00 to 16 kg by 2015³. If the per capita income growth was going to be six per cent, the edible oil consumption would go up to 20.60 kg, ie twice the current level over the next 15 years.

In the recent years, the Indian edible oil market had seen a lot of changes, especially in terms of integration with the world markets. A study showed that the correlation coefficient between Indian and world edible oil prices was as low as 0.65 till 1995, when edible oil was put on OGL. After 1995, the Indian prices generally moved in tandem with the world prices, the differences being mainly due to varying import duties.

India being a vast country, there were specific regional preferences for certain edible oils, depending largely upon the oils available in the region. For example, people in the West and South preferred groundnut oil, while those in the East and North used mustard seed or rapeseed oil. Likewise several pockets in the South had a preference for coconut or sesame oil

Preferences had also changed over time. Groundnut accounted for about three fourth of consumption in the early sixties followed by rapeseed and mustard. Demand increased with increase in population and incomes. Initially, increased demand was met by domestic production. However with the emphasis of the policy of food grain self sufficiency, the area under oilseed cultivation shifted to wheat and rice. India started importing edible oils. With increasing prices and decreasing supplies of these oils, the consumer was exposed to other oils like soybean and sunflower. Groundnut oil now accounted for only about one third of the total oil consumption in India. Soybean oil and sunflower together accounted for one fourth of the oil consumption.

Edible oils were consumed in three forms, non refined (or filtered) oils, vanaspati (partially hydrogenated edible oil mixture) and refined oils. The non-refined oils were mainly made from groundnut and mustard seeds. Traditional customers preferred the strong and distinctive taste of these oils. Inhabitants of the northern plains had a preference for hard fat and used vanaspati for special items like sweets, etc. Its production was about 1.3 mtpa for the oil year (Nov '98 to Oct '99). It had the ability to absorb a heterogeneous variety of oils which did not generally find direct marketing opportunities because of consumers' preference for traditional oils such as groundnut oil, mustard oil, sesame oil, etc.

Newer oils like soybean, sunflower, ricebran, cottonseed, and oils from tree and forest sources had found their way to the edible pool largely through the vanaspati route. As a result of price,

¹ <http://www.mpopc.org.my/newsapril2000.htm>

² Rakesh Jain, Background paper on Edible Oil Industry in India, at www.madhyabharat.com/sopa/theme

³ <http://www.indiancommodities.com/shb.htm>

availability, and even health consciousness, refined edible oils had gained increasing acceptance with the Indian consumer. Through technological means such as refining, bleaching and deodorization, all oils could be made practically colorless, odorless and taste free. These oils could be made from a variety of sources like cottonseed, sunflower, palm oil (or its liquid fraction palmolein), soybean, ricebran, etc, whose availability was in plenty. The share of raw oil, vanaspati and refined oil in the total edible oil market was respectively 42.0%, 13.4% and 42.7% (during Nov '97 to Oct '98).⁴

⁴ http://fcamin.nic.in/sugar_edbl.htm#Consumption Pattern

Exhibit 2
Sales of Leading Edible Oil Companies

(Rs Crores)

Companies	1995-96	1996-97	1997-98	1998-99
Ruchi Soya Inds.	347.03	499.54	703.5	1210.21
ITC Agro-Tech	364.36	552.36	562.94	851.78
Marico Industries	309.37	393.12	468.15	521.69
Godrej Foods	140.88	217.25	233.56	399.96
Madhya Pradesh Glychem Inds.	116.99	129.41	119.40	354.08
K S Oils	140.20	90.30	141.08	246.50
Vippy Industries	96.12	124.05	157.76	211.81
Navcom Industries	187.5	167.15	186.70	186.7
N K Industries	110.79	189.95	182.99	182.99
Jayant Vegoils & Chemicals	-	-	151.24	181.05
Chawla Brothers	-	-	90.21	132.42
Vimal Oils and Foods	81.45	110.41	111.70	111.70
Sarvottam Industries	29.84	65.04	109.42	109.42
Rishi Oil and Fats	67.75	82.25	105.00	105.00
S M Dyechem	64.53	37.39	44.57	99.37
Surya Agroils	96.53	72.89	91.54	91.54
Gujarat Ambuja Exports	13.40	22.05	76.76	91.41
Amrit Enterprises	21.44	21.44	40.16	89.37
Amrit Banaspati Co.	54.61	64.35	68.30	86.37
Prestige Foods	91.78	57.31	89.70	79.92

Source: CMIE Database, August 2000

Exhibit 3
Import Duty Structure

Type of oil	1994-95	1995-96	1996- Dec 1999	Dec 1999- June 2000	After June 2000
Refined edible oils other than coconut, RBD palm, RBD palm kernel	65%	30%	20%	15%	35%
Other refined edible oils	65%	30%	20%	15%	45%
Crude palm oil for manufacture of vanaspati	65%	30%	20%	15%	15%
Other crude oils	65%	30%	20%	15%	25%

Exhibit 4
Forecast of Sales Through Own Warehouses

Branch	Sunflower		Soybean		Cottonseed		Rapeseed		Vanaspoti		TOTAL	
	Cons	Bulk [#]	Cons	Bulk	Cons	Bulk	Cons	Bulk	Cons	Bulk	Cons	Bulk
Ahmedabad	80	150	30	800	350	1500	0	0	50	300	510	2750
Rajkot	20	50	20	200	150	500	0	0	25	125	215	875
Udaipur	25	25	50	400	0	0	20	40	25	100	120	565
Jaipur	35	50	100	800	0	0	30	60	50	300	215	1210
Kanpur	30	40	35	350	0	0	30	30	50	200	145	620
Varanasi	15	20	30	300	0	0	15	50	50	200	110	570
Ghaziabad	30	40	35	350	0	0	30	50	50	200	145	640
Delhi	250	200	50	500	0	0	50	50	50	250	400	1000
Karnal	20	20	20	175	0	0	20	20	50	150	110	365
Ludhiana	30	30	30	125	0	0	30	50	50	250	140	455
TOTAL	535	625	400	4000	500	2000	225	350	450	2075	2110	9050

Forecast of Sales Through C&Fas

Branch	Sunflower		Soybean		Rapeseed		TOTAL	
	Cons	Bulk	Cons	Bulk	Cons	Bulk	Cons	Bulk
Nashik	30	40	0	50	0	0	30	90
Jalgaon	0	30	0	50	0	0	0	80
Nagpur	30	40	30	100	0	0	60	140
Indore	30	40	0	100	0	0	30	140
Gurgaon	20	40	20	100	0	50	40	190
Solan	10	20	30	150	0	50	40	220
Chandigarh	10	40	20	50	0	0	30	90
TOTAL	130	250	150	1350	0	300	280	1900

Bulk refers to sale through super-stockists

Exhibit 6

Distance of Dealer Locations from Potential Warehouse Locations

(kms)

Sl No	Dealer	Bareilly	Ghaziabad	Gorakhpur	Jhansi	Kanpur	Lucknow	Varanasi
1	Agra	210	220	-	220	285	365	-
2	Aligarh	165	115	-	305	275	370	-
3	Allahabad	480	-	300	400	195	240	125
4	Azamgarh	-	-	120	-	370	290	100
5	Badaun	50	110	-	-	250	220	-
6	Bareilly	0	235	-	435	325	245	-
7	Bijnor	100	150	-	-	-	-	-
8	Dehradun	340	215	-	-	-	-	-
9	Farrukhabad	140	240	-	240	150	230	-
10	Fatehpur	345	470	-	270	80	100	245
11	Firozabad	180	140	-	255	225	305	-
12	Ghaziabad	235	0	-	445	390	480	-
13	Ghazipur	-	-	140	-	390	350	75
14	Gonda	365	-	140	420	200	120	280
15	Gorakhpur	-	-	0	-	340	265	210
16	Haldwani	105	255	-	-	430	350	-
17	Jaunpur	-	-	160	450	265	260	60
18	Jhansi	435	445	-	0	220	300	-
19	Kanpur	325	390	340	220	0	80	320
20	Kheri	130	370	265	320	200	120	420
21	Lucknow	245	480	265	300	80	0	300
22	Maharajganj	-	-	50	-	380	300	260
23	Mirzapur	-	-	290	480	275	320	80
24	Moradabad	95	140	-	490	420	340	-
25	Saharanpur	330	170	-	-	-	-	-
26	Sitapur	160	395	265	385	155	85	385
27	Sultanpur	410	-	175	380	220	140	160
28	Varanasi	-	-	210	-	320	300	0

Exhibit 7
Logistics Costs

- Primary transportation cost (As per exhibit 9)
- Secondary transportation cost Rs 1.50 ton/km
- Warehousing Costs

(Rs/month)

	< 200 tons/month	200-400 tons/month	400-600 tons/month	>600 tons/month
Rent	10,000	20,000	30,000	40,000
Manpower	15,000	20,000	25,000	30,000
Electricity	2,000	3,000	4,000	5,000
Documentation	2,000	3,000	4,000	5,000
Equipment	2,000	3,000	4,000	5,000
Miscellaneous	4,000	6,000	8,000	10,000
	35,000	55,000	75,000	85,000

- Inventory holding cost was Rs 0.23 per kg (assuming 15 days inventory, and 18% annual cost, and Rs 30 per kg).
- C&FA charges were Rs 0.15 per kg

Exhibit 8

District Map of UP Showing Warehouse Locations

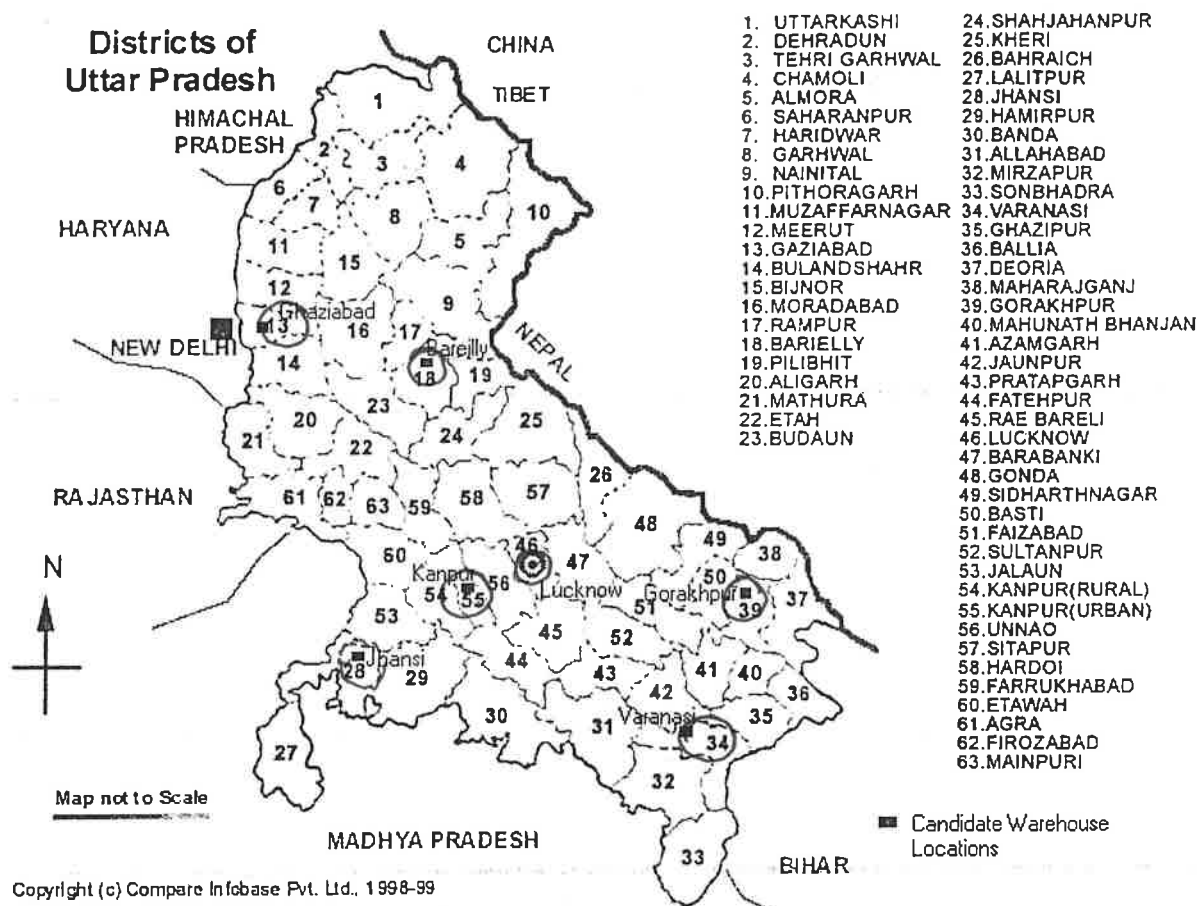


Exhibit 9
Relevant Primary Transportation Cost

	Ahmedabad	Udaipur	Jaipur	Indore	Jabalpur	Raipur	Bareilly	Ghaziabad	Gorakhpur	Jhansi	Kanpur	Lucknow	Varanasi	CONCOR (ex Mundra)
Mundra	400	750	975	750	1450	1200	1550	1300	1900	1500	1600	1700	1800	
Ahmedabad		180	800	400		1000		900		850				
Udaipur			550				900	700						
Jaipur								500			700			
Indore					500	700	850		1100	750	700		1000	
Jabalpur						300			650		500		500	
Raipur									950				850	
Bareilly									500				550	
Ghaziabad							300		800		450		700	950
Gorakhpur													250	
Jhansi									550		250	300	500	
Kanpur									400			125	350	1135
Lucknow									300	300	150		300	
Varanasi									250					

Exhibit 10
Location of AWL Facilities

