creating solutions for today's environment

VIA EMAIL

July 9, 2012

Mr. Darrin Mehr
Air Quality Analyst
Idaho Department of Environmental Quality
1410 North Hilton
Boise, Idaho 83706-1255

Re: Dynamis Energy, LLC, Boise
Response to Modeling Discussion Issues – July 3, 2012

The purpose of this letter is to provide JBR's proposed path forward to rectify issues associated with the air dispersion modeling submitted to DEQ in support of the PTC application for the Dynamis Energy, LLC Ada County WTE Facility. These issues were discussed during a meeting between IDEQ and JBR on July 3, 2012, and also outlined in the document titled "Dynamis Energy Modeling Discussion Issues – July 3, 2012", prepared by IDEQ. Each issue and proposed resolution is outlined below.

Item #1: *The coordinate system used to establish elevations for receptors is not consistent with the coordinate system used for the site boundary and the base elevation.*

Property boundary and source location coordinates were provided to JBR by another consulting firm. It was indicated that the coordinates were provided in the NAD83 datum; however, upon further review and import of the modeled domain into Google Earth, it was determined that coordinates were not provided in NAD83 datum. Using Google Earth imagery and scaled site plans (as provided in the permit application), the property boundary, buildings, and sources were shifted to be consistent with the correct NAD83 locations.

In addition, the receptor network developed for the modeling analysis is based on a grid system extending outward from the property boundary. Therefore, a revised receptor grid was generated based on the revised property boundary location. Revised NED was downloaded from the USGS website, and AERMAP was re-run to

JBR Environmental Consultants, Inc.
7669 W. Riverside Dr., Ste. 101
Boise, Idaho 83714
[p] 208.853.0883
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www.jbrenv.com

determine receptor elevation and terrain max for the revised receptor locations.

The QUADDATE (the most recent revision date) of the NED data for the areas covering the receptor network ranges from 1999 to 2002. Based on a review of historical images in Google Earth, significant grading, road construction and topographical changes occurred at the landfill between 2002 and the present. Imagery shown in Google Earth is from 2011; however, elevations given by Google Earth appear to be consistent with the 2002 NED data elevations.

JBR will use the Dynamis site grading plan to manually adjust receptor elevations where data is available in the immediate vicinity of the Dynamis property, as shown on the plan. Updated grading information for the landfill property is not available; therefore, the NED elevations will not be adjusted for receptors outside of the extent of the Dynamis grading plan. The exception to this will be where the NED receptor elevation of a receptor adjacent to an adjusted Dynamis receptor differs by more than 25 feet. These instances will be addressed on a case-by-case basis, and the NED elevation will be adjusted in order to 'smooth' the transition between receptors. This will be done to ensure that no plume impacts are missed due to a large discrete receptor elevation change.

As shown on the grading plan, the finished floor elevation of the facility buildings, as well as the ground elevation will be 3175 feet; building and source base elevations in the model reflect this value.

Item #2: *Nickel emission rates - UNITPEAK was modeled at 1.51E-03 lb/hr; the emissions inventory spreadsheet places UNITPEAK emissions at 1.51E-02 lb/hr.*

The nickel emission rate will be corrected to be consistent with the emissions inventory. Revised model files will be submitted to IDEQ.

Item #3: *Additional modeling scenarios must be run if different levels of operation greater or less than already modeled are requested for the facility.*

Per the contract between Dynamis and Idaho Power, Dynamis will provide 22 MW of power to Idaho Power continually during peak hours (7am to 11pm). Based on system design, and estimated fuel heat value, this will be achieved by operating the system consistent with the temperatures and exhaust flow rates indicated in the modeling analysis for the UNITPEAK operation. The system will be 'turned down' between the hours of 11pm and 7am, such that it will continue to run, however, power generated during these hours will be used to power the facility. Due to the contracted power output requirements, Dynamis does not reasonably expect to operate the facility at any other level of operation greater or less than already modeled.

Item #4: *Confirm that the exhaust stack for the ash baghouse will be vertically oriented and not horizontal or equipped with a rain cap or downturned outlet and this stack will terminate at a height of 55 ft above grade.*

The exhaust stack for the ash baghouse will be fabricated by one of Dynamis' contractors. Donaldson Filtration will not manufacture the exhaust stack. Included as an attachment to this letter are two figures showing the configuration and location of the ash baghouse exhaust stack and diameter. In addition, fan curves have been provided for two fans similar to those proposed for the baghouse. The system will be operating between 12 and 16 inches WC static pressure. The blower discharge points are rectangular and have a larger area then the 1.5-foot diameter stack, so there will be a transition from rectangular to round and likely a nozzle on the stack top to accelerate the air. The stack will not be equipped with a raincap or downturned outlet. Based on the height and diameter of the stack as proposed by the Dynamis designs and attached fan curves, the exit velocities represented in the model are achievable and accurate.

Sincerely,

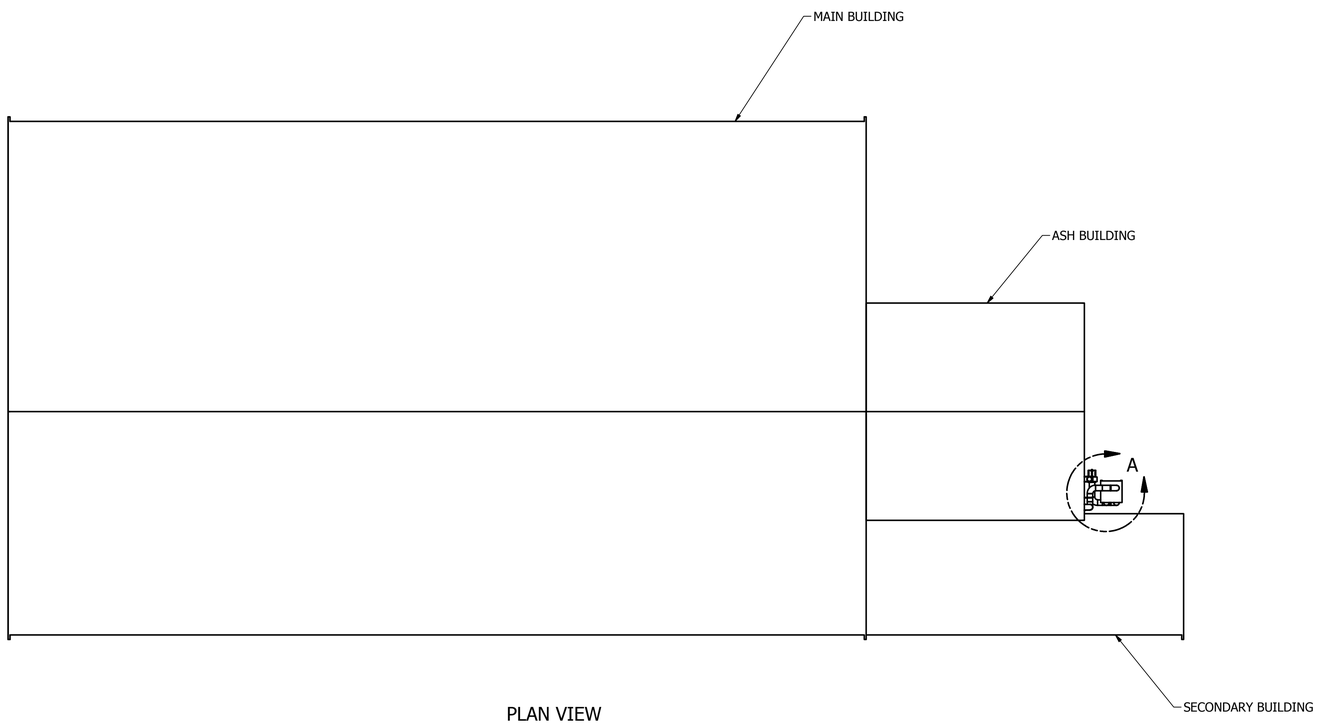
Shannon Manoulian, P.E.

Enclosures

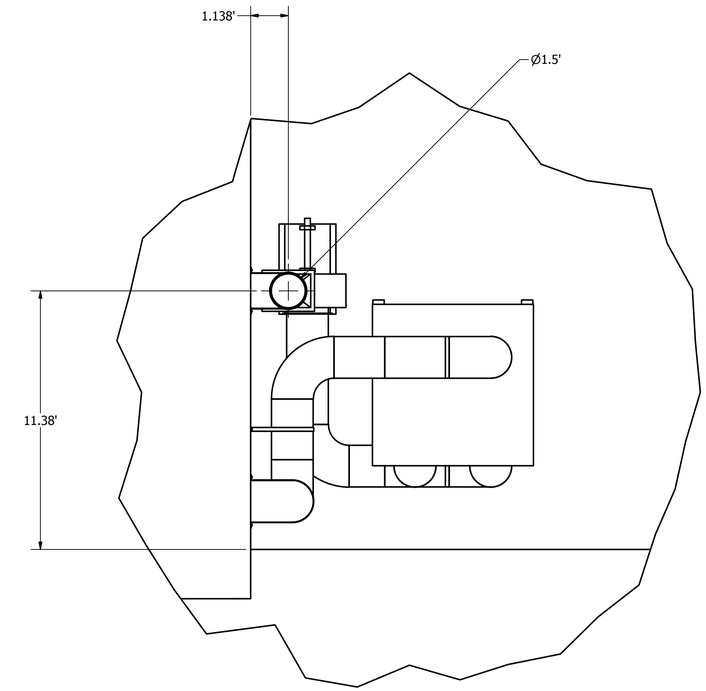
Cc: Kevin Schilling, IDEQ
David Strohm, JBR

ATTACHMENT 1

Ash System Stack and Fan Curves



PLAN VIEW



DETAIL A
SCALE 1 / 40
(ASH SYSTEM BAGHOUSE)

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		DRAWN KS	7/3/2012
DECIMAL	WELD ± 1/32	CHECKED	
.X ±.1	CHAMFERS ±5°	QA	
.XX ±.02	ANGLES ±1°	MFG	
.XXX ±.005	CAST ±1/8	APPROVED	
FRACTIONS ±1/16			
THIRD ANGLE PROJECTION		MATERIAL N/A	FINISH N/A

DYNAMIS ENERGY

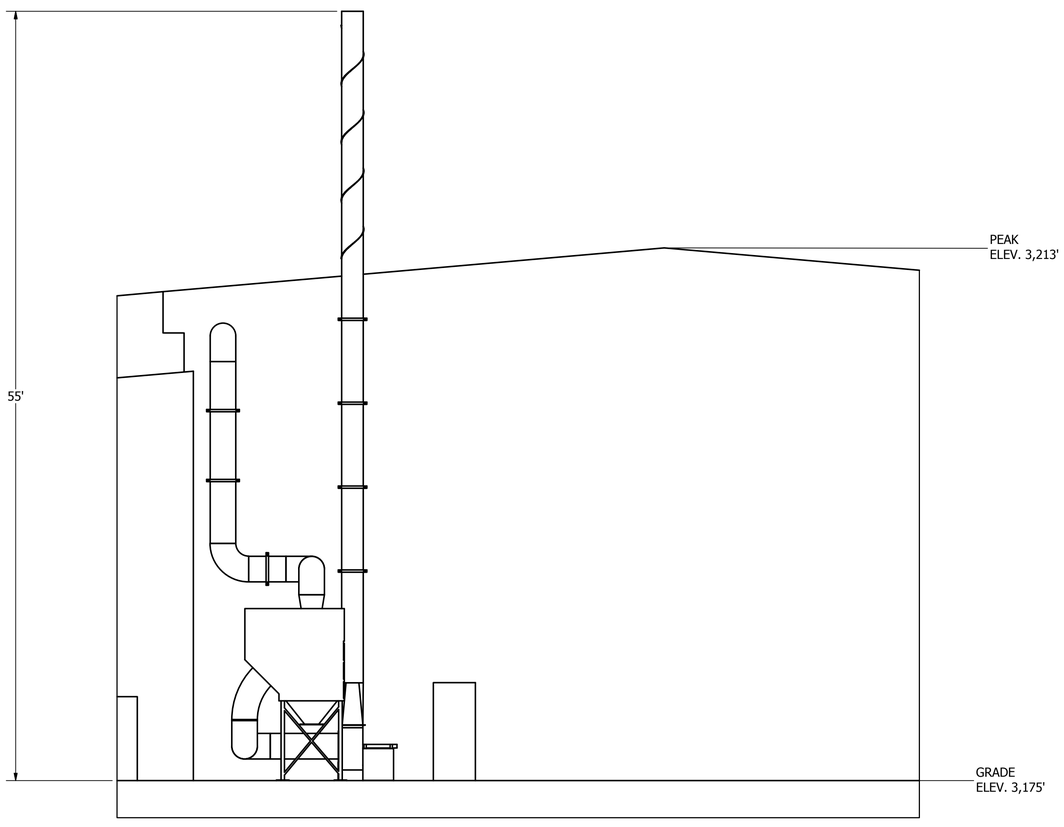
Dynamis Energy LLC,
776 E. Riverside Dr. Ste. 150
Eagle, ID 83616

TITLE
ASH ROOM, BAGHOUSE, STACK, ADA COUNTY

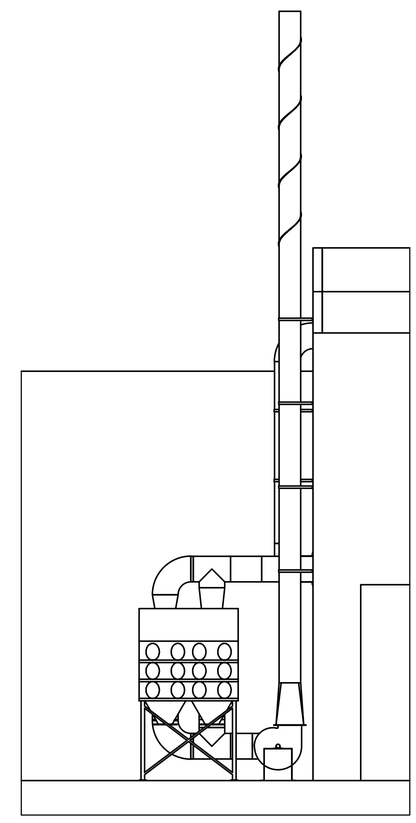
SIZE	DWG NO	REV
D	1003202	-

SCALE: NTS

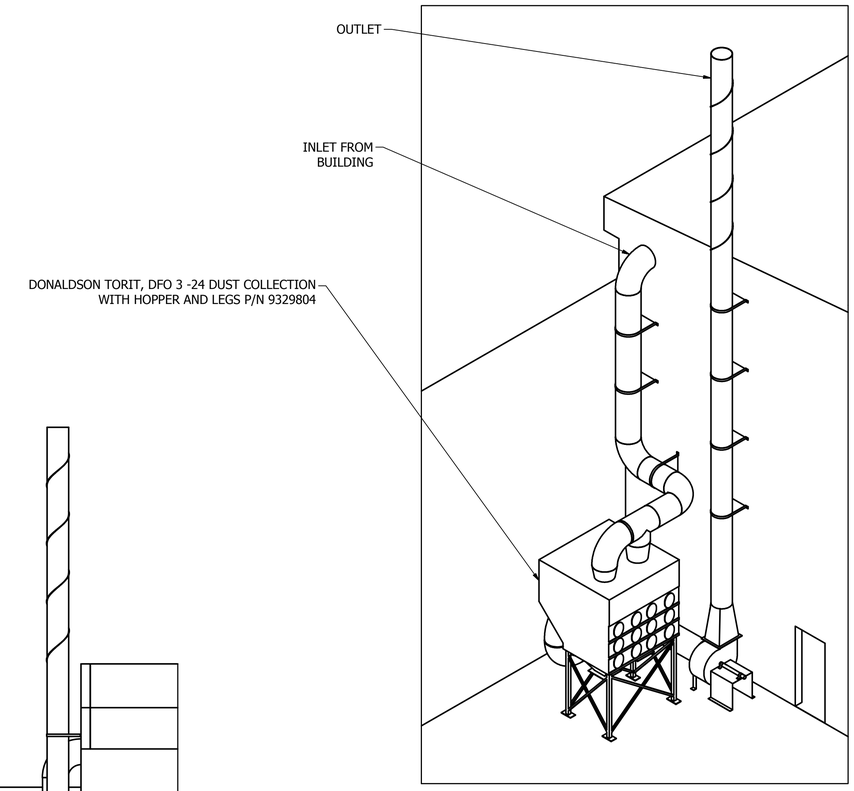
SHEET 1 OF 2



ELEVATION VIEW (EAST SIDE)



ELEVATION VIEW (NORTH SIDE)



DRAWN KS	7/3/2012	DYNAMIS ENERGY	Dynamis Energy LLC, 776 E. Riverside Dr. Ste, 150 Eagle, ID 83616
CHECKED		SIZE D	DWG NO 1003202 — REV -
		SCALE: NTS	SHEET 2 OF 2

24 BISW

Wheel Diameter = 24½ in.
Outlet Area = 3.45 ft.^{2}
Tip Speed = 6.41 x RPM
Maximum BHP = (RPM/750)^3

Minimum Starting HP = ½
Maximum RPM Class I = 1570
Maximum RPM Class II = 2048
Maximum RPM Class III = 2580
Maximum RPM Class IV = 3110

Maximum Open Motor Frame Size

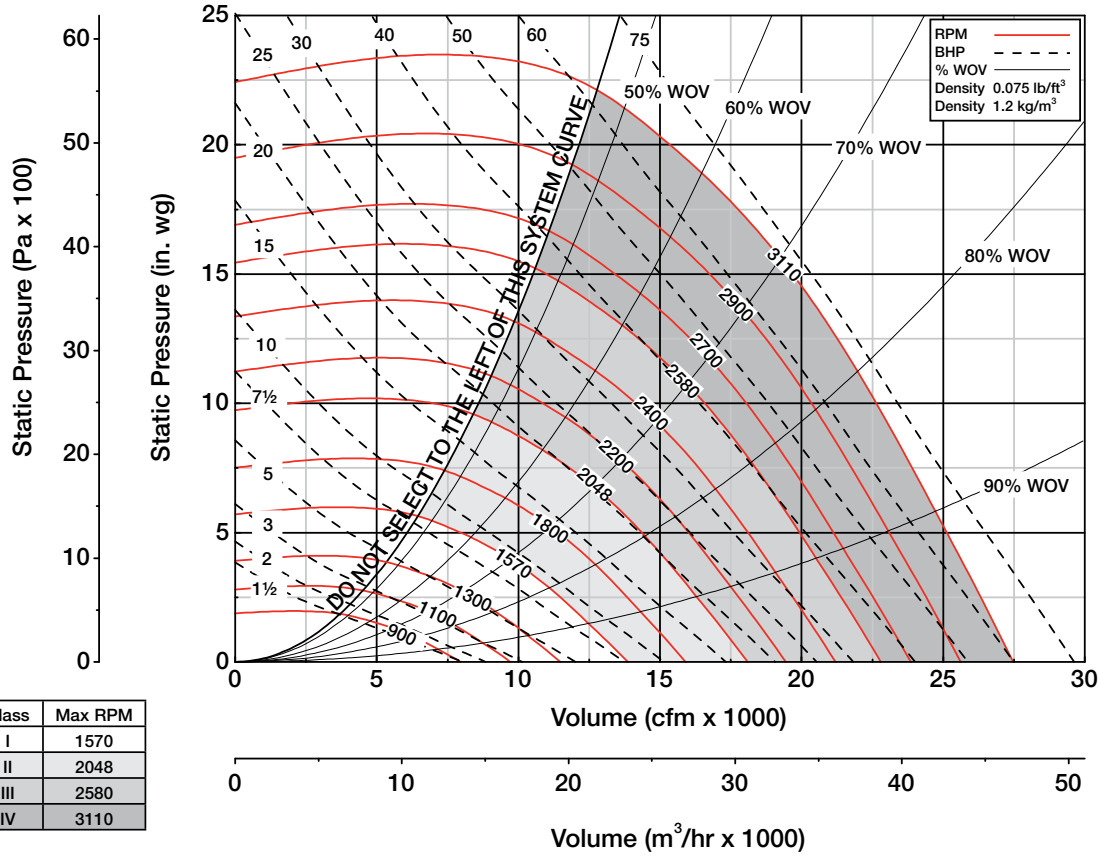
Class	I	II	III	IV
Arr. 9	284T	284T	286T	NA
Arr. 10	215T	284T	NA	NA

CFM	OV	STATIC PRESSURE (in. wg)																			
		0.50		1.00		1.50		2.00		2.50		3.00		3.50		4.00		4.50		5.00	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2800	811	513	0.31	665	0.62																
3230	936	541	0.37	686	0.71																
3660	1060	574	0.45	707	0.81	826	1.20														
4090	1185	608	0.53	734	0.92	846	1.35	947	1.80												
4520	1310	646	0.63	762	1.04	868	1.50	967	1.98	1056	2.48										
4950	1434	685	0.75	794	1.18	895	1.66	988	2.18	1076	2.71	1157	3.27								
5380	1559	726	0.89	828	1.34	923	1.85	1012	2.38	1097	2.95	1177	3.54	1251	4.14						
5810	1684	767	1.04	862	1.52	953	2.05	1040	2.61	1120	3.21	1198	3.83	1271	4.46	1340	5.11	1405	5.77		
6240	1808	810	1.21	900	1.72	986	2.27	1068	2.86	1146	3.47	1220	4.12	1292	4.79	1361	5.47	1425	6.17	1487	6.87
6670	1933	853	1.40	939	1.94	1020	2.51	1097	3.13	1174	3.77	1244	4.44	1314	5.14	1381	5.86	1446	6.58	1507	7.32
7100	2057	896	1.61	978	2.18	1055	2.78	1130	3.42	1202	4.09	1272	4.78	1338	5.50	1403	6.25	1466	7.01	1527	7.78
7530	2182	940	1.84	1019	2.45	1093	3.07	1164	3.73	1232	4.43	1301	5.15	1365	5.89	1427	6.66	1488	7.46	1548	8.27
7960	2307	985	2.10	1060	2.75	1131	3.40	1198	4.07	1266	4.80	1329	5.54	1393	6.31	1453	7.10	1512	7.92	1570	8.76
8390	2431	1030	2.38	1102	3.07	1169	3.75	1235	4.45	1299	5.19	1361	5.96	1422	6.76	1482	7.58	1538	8.41	1594	9.28
8820	2556	1075	2.69	1145	3.41	1210	4.13	1273	4.85	1333	5.61	1394	6.41	1451	7.23	1510	8.08	1566	8.94	1620	9.82
9250	2681	1120	3.02	1188	3.78	1250	4.54	1311	5.29	1369	6.07	1428	6.89	1484	7.74	1539	8.61	1595	9.50	1648	10.4

CFM	OV	STATIC PRESSURE (in. wg)																			
		5.00		5.50		6.00		6.50		7.00		7.50		8.00		8.50		9.00		10.00	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6200	1797	1485	6.83																		
6690	1939	1508	7.34	1566	8.09	1622	8.86														
7180	2081	1531	7.87	1589	8.66	1645	9.46	1698	10.3												
7670	2223	1554	8.43	1612	9.25	1668	10.1	1721	10.9	1772	11.8	1822	12.7								
8160	2365	1581	9.0	1636	9.87	1691	10.7	1744	11.6	1795	12.5	1845	13.4	1893	14.4	1940	15.3	1985	16.2		
8650	2507	1610	9.6	1664	10.5	1716	11.4	1768	12.4	1819	13.3	1868	14.2	1916	15.2	1962	16.1	2008	17.1	2087	19.0
9140	2649	1641	10.3	1692	11.2	1744	12.1	1794	13.1	1842	14.1	1891	15.0	1939	16.0	1985	17.0	2031	18.0	2109	20.0
9630	2791	1673	10.9	1724	11.9	1772	12.9	1821	13.9	1870	14.9	1916	15.9	1963	16.9	2009	18.0	2054	19.0	2132	21.0
10120	2933	1706	11.7	1756	12.7	1804	13.7	1851	14.7	1897	15.7	1944	16.8	1989	17.8	2033	18.9	2077	20.0	2155	22.0
10610	3075	1740	12.5	1789	13.5	1837	14.5	1883	15.5	1928	16.6	1973	17.7	2017	18.8	2060	19.9	2103	21.0	2178	23.1
11100	3217	1778	13.3	1823	14.3	1870	15.4	1916	16.5	1960	17.5	2003	18.6	2046	19.7	2088	20.9	2130	22.1	2203	24.3
11590	3359	1816	14.2	1860	15.2	1903	16.3	1948	17.4	1993	18.5	2036	19.7	2077	20.8	2118	22.0	2159	23.1	2230	25.4
12080	3501	1854	15.1	1898	16.2	1941	17.3	1982	18.4	2025	19.6	2068	20.8	2110	21.9	2150	23.1	2189	24.3	2257	26.6
12570	3643	1893	16.1	1937	17.2	1979	18.4	2020	19.5	2060	20.7	2101	21.9	2142	23.1	2182	24.3	2221	25.5	2286	27.8
13060	3785	1935	17.1	1976	18.3	2018	19.4	2058	20.6	2098	21.8	2136	23.1	2175	24.3	2215	25.6	2254	26.8	2318	29.1
13550	3927	1977	18.2	2016	19.4	2057	20.6	2097	21.8	2136	23.1	2174	24.3	2211	25.6	2248	26.8	2287	28.1	2350	30.5

CFM	OV	STATIC PRESSURE (in. wg)																			
		10.00		11.00		12.00		13.00		14.00		15.00		16.00		17.00		18.00		20.00	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
11000	3188	2197	24.0	2277	26.4	2354	28.7	2428	31.1	2500	33.5	2568	36.0	2635	38.4						
11530	3342	2227	25.3	2303	27.7	2379	30.1	2453	32.6	2524	35.1	2593	37.6	2659	40.1	2724	42.7	2786	45.3		
12060	3495	2256	26.5	2332	29.0	2405	31.6	2478	34.1	2549	36.7	2617	39.3	2684	41.9	2748	44.5	2810	47.2		
12590	3649	2287	27.9	2362	30.4	2434	33.0	2504	35.7	2574	38.3	2642	41.0	2708	43.7	2772	46.4	2834	49.1	2954	54.7
13120	3802	2322	29.3	2392	31.9	2464	34.5	2533	37.3	2600	40.0	2667	42.8	2733	45.5	2797	48.3	2859	51.1	2978	56.8
13650	3956	2357	30.8	2427	33.5	2493	36.1	2563	38.9	2629	41.7	2694	44.6	2756	47.4	2821	50.3	2883	53.2	3002	59.0
14180	4110	2392	32.4	2462	35.1	2529	37.8	2593	40.6	2659	43.5	2723	46.4	2785	49.3	2846	52.3	2908	55.3	3027	61.3
14710	4263	2427	34.0	2496	36.8	2563	39.6	2627	42.4	2689	45.3	2753	48.3	2815	51.3	2875	54.4	2933	57.4	3051	63.6
15240	4417	2466	35.7	2532	38.6	2598	41.4	2662	44.4	2722	47.3	2782	50.3	2844	53.4	2904	56.5	2962	59.6	3074	66.0
15770	4571	2506	37.5	2568	40.4	2633	43.4	2696	46.3	2757	49.3	2816	52.4	2873	55.4	2933	58.6	2992	61.9		
16300	4724	2547	39.4	2608	42.3	2668	45.3	2731	48.4	2792	51.5	2851	54.6	2907	57.7	2963	60.9	3021	64.2		
16830	4878	2588	41.3	2649	44.4	2708	47.4	2766	50.5	2827	53.7	2886	56.8	2942	60.0	2997	63.3	3051	66.5		
17360	5031	2630	43.4	2690	46.5	2748	49.6	2805	52.7	2862	55.9	2920	59.2	2977	62.4	3032	65.7				
17890	5185	2671	45.5	2731	48.6	2789	51.8	2845	55.0	2899	58.3	2955	61.6	3012	64.9	3067	68.3				
18420	5339	2715	47.7	2773	50.9	2830	54.1	2886	57.4	2939	60.8	2992	64.1	3047	67.5						
18950	5492	2761	50.1	2814	53.2	2872	56.6	2927	59.9	2980	63.3	3032	66.7	3082	70.2						

Performance certified is for model BISW Arrangement 1, Installation Type B: free inlet, ducted outlet.
Performance ratings do not include the effects of appurtenances (accessories).
Power rating (Bhp) does not include transmission losses.



Class	Max RPM
I	1570
II	2048
III	2580
IV	3110

% WOV = (CFM X 100) / (RPM X 8.84)

Sound Power [dB Ref 10^{-12} watts]

RPM	%WOV	Inlet Sound Power, L_{Wi} 1	2	3	4	5	6	7	8	L_{Wi}A
450	100	81	76	71	64	58	51	44	38	67
	80	74	68	64	57	51	45	38	32	60
	60	73	65	60	54	51	44	36	31	57
	50	71	64	59	54	53	45	38	32	58
	40	71	63	58	54	53	45	38	32	57
900	100	88	89	86	81	78	74	64	58	84
	80	84	86	83	78	74	69	62	57	80
	60	83	87	82	76	74	68	64	60	80
	50	84	84	80	75	73	68	65	61	78
	40	85	83	79	75	73	68	66	62	78
1300	100	91	91	98	90	85	86	77	70	94
	80	88	88	96	87	81	80	74	68	91
	60	88	86	93	84	80	78	74	71	88
	50	88	85	91	82	79	76	75	72	87
	40	88	85	93	82	80	77	75	72	88
1800	100	98	95	104	97	94	96	92	82	102
	80	94	91	102	93	89	89	85	78	97
	60	94	87	97	89	87	86	84	80	94
	50	95	88	98	87	86	85	84	82	94
	40	98	93	100	89	86	86	85	82	95
2580	100	105	106	109	110	103	103	102	95	111
	80	101	102	106	106	99	97	95	90	107
	60	101	100	101	102	96	94	93	90	103
	50	102	101	102	102	94	93	93	91	103
	40	105	105	106	104	96	94	93	91	104
3110	100	108	111	113	113	109	107	106	101	115
	80	104	107	109	110	105	102	99	95	111
	60	104	105	105	105	101	99	97	95	107
	50	105	106	107	105	100	98	97	95	107
	40	108	110	110	107	102	98	97	96	109

RPM	%WOV	Outlet Sound Power, L_{Wo} 1	2	3	4	5	6	7	8	L_{Wo}A
450	100	84	78	71	67	62	54	47	40	69
	80	84	77	69	62	58	50	43	37	67
	60	83	74	66	59	57	49	44	38	64
	50	81	73	64	58	56	48	45	39	63
	40	80	72	64	58	56	48	45	39	63
900	100	95	94	86	82	82	77	68	61	86
	80	94	91	82	78	77	71	64	59	82
	60	90	89	80	75	74	67	63	60	79
	50	91	88	79	74	73	67	64	64	79
	40	91	88	78	74	72	67	64	64	78
1300	100	102	99	98	92	90	89	82	73	96
	80	99	97	98	89	87	84	77	71	94
	60	96	94	97	86	84	79	74	71	91
	50	95	94	96	85	82	77	73	72	90
	40	95	94	95	84	81	77	74	72	89
1800	100	108	105	107	100	99	99	95	86	105
	80	103	102	104	97	96	94	90	82	101
	60	101	99	101	94	93	89	85	81	99
	50	101	99	99	93	91	87	84	81	97
	40	101	99	98	92	90	86	84	82	96
2580	100	114	114	114	112	107	107	105	99	114
	80	109	110	110	109	104	103	100	94	111
	60	107	108	108	106	102	99	95	91	108
	50	108	108	106	104	100	97	94	91	106
	40	108	108	106	103	99	96	93	91	105
3110	100	118	118	118	115	112	111	109	104	118
	80	113	114	114	112	109	107	105	100	115
	60	111	112	112	109	107	104	100	96	112
	50	111	112	111	107	105	102	99	96	110
	40	111	112	111	107	104	101	98	95	110

The sound power level ratings shown are in decibels, referred to 10^{-12} watts calculated per AMCA Standard 301. Values shown are for inlet L_{Wi}, L_{Wi}A and outlet L_{Wo}, L_{Wo}A sound power levels for Installation Type B: free inlet, ducted outlet. Outlet ratings include the effects of duct end correction. The A-weighted sound ratings shown have been calculated per AMCA International Standard 301.

27 BISW

Wheel Diameter = 27 in.
Outlet Area = 4.19 ft.^{2}
Tip Speed = 7.09 x RPM
Maximum BHP = (RPM/638)^3

Minimum Starting HP = ¾
Maximum RPM Class I = 1425
Maximum RPM Class II = 1859
Maximum RPM Class III = 2342
Maximum RPM Class IV = 2823

Maximum Open Motor Frame Size

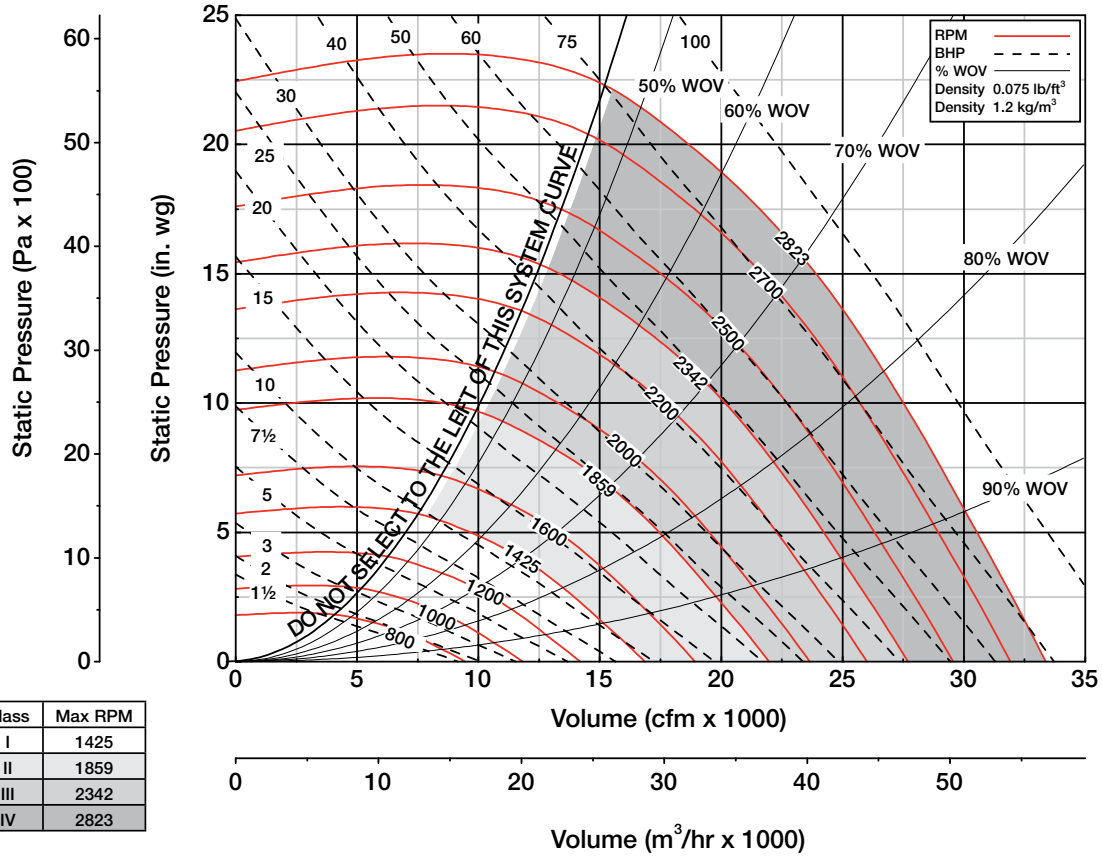
Class	I	II	III	IV
Arr. 9	284T	284T	286T	NA
Arr. 10	254T	284T	NA	NA

CFM	OV	STATIC PRESSURE (in. wg)																			
		0.50		1.00		1.50		2.00		2.50		3.00		3.50		4.00		4.50		5.00	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3400	811	465	0.38	604	0.75																
3930	937	492	0.46	622	0.86																
4460	1064	522	0.55	642	0.98	750	1.47														
4990	1190	553	0.65	667	1.12	769	1.64	860	2.19												
5520	1317	588	0.78	693	1.28	789	1.83	879	2.42	960	3.03										
6050	1443	624	0.92	723	1.45	814	2.03	898	2.66	978	3.32	1051	3.99								
6580	1570	662	1.09	754	1.65	840	2.26	920	2.92	996	3.62	1070	4.33	1137	5.06						
7110	1696	700	1.28	786	1.87	868	2.51	946	3.20	1019	3.93	1089	4.68	1156	5.46	1218	6.25	1277	7.05		
7640	1823	739	1.49	821	2.12	898	2.79	972	3.51	1043	4.26	1110	5.05	1175	5.87	1237	6.70	1296	7.55	1351	8.41
8170	1949	779	1.73	856	2.39	930	3.09	1000	3.84	1069	4.63	1133	5.44	1195	6.30	1256	7.18	1314	8.06	1370	8.96
8700	2076	819	1.99	893	2.70	962	3.42	1030	4.21	1095	5.03	1158	5.87	1218	6.75	1276	7.67	1333	8.60	1388	9.54
9230	2202	860	2.28	931	3.04	997	3.79	1061	4.60	1123	5.45	1185	6.33	1243	7.24	1299	8.18	1354	9.15	1407	10.1
9760	2329	901	2.61	968	3.41	1032	4.20	1093	5.02	1154	5.91	1211	6.82	1269	7.76	1323	8.72	1376	9.72	1428	10.8
10290	2455	942	2.96	1007	3.80	1068	4.64	1127	5.49	1185	6.40	1241	7.35	1295	8.32	1350	9.32	1401	10.3	1451	11.4
10820	2582	984	3.34	1047	4.23	1105	5.11	1162	6.00	1216	6.92	1271	7.91	1323	8.91	1376	9.95	1427	11.0	1475	12.1
11350	2708	1026	3.77	1087	4.70	1143	5.63	1197	6.55	1250	7.50	1303	8.50	1354	9.54	1403	10.6	1453	11.7	1501	12.8

CFM	OV	STATIC PRESSURE (in. wg)																			
		5.00		5.50		6.00		6.50		7.00		7.50		8.00		8.50		9.00		10.00	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
7500	1789	1346	8.27																		
8090	1930	1367	8.88	1420	9.79	1470	10.7														
8680	2071	1388	9.52	1441	10.5	1491	11.4	1540	12.4												
9270	2212	1408	10.2	1461	11.2	1512	12.2	1560	13.2	1607	14.3	1652	15.3								
9860	2353	1433	10.9	1482	11.9	1533	13.0	1581	14.1	1628	15.1	1672	16.2	1716	17.3	1758	18.5				
10450	2494	1458	11.6	1507	12.7	1555	13.8	1602	14.9	1648	16.0	1693	17.2	1737	18.3	1779	19.5	1820	20.7	1892	22.9
11040	2634	1486	12.4	1533	13.5	1580	14.6	1625	15.8	1669	17.0	1714	18.2	1758	19.4	1800	20.6	1840	21.8	1913	24.1
11630	2775	1515	13.2	1561	14.3	1606	15.5	1650	16.7	1694	17.9	1736	19.2	1779	20.4	1821	21.7	1861	22.9	1933	25.4
12220	2916	1544	14.1	1590	15.3	1634	16.5	1676	17.7	1719	18.9	1761	20.2	1802	21.5	1842	22.8	1882	24.1	1954	26.6
12810	3057	1574	15.0	1620	16.2	1663	17.5	1705	18.7	1746	20.0	1786	21.3	1827	22.7	1866	24.0	1905	25.4	1974	27.9
13400	3198	1608	16.0	1649	17.3	1693	18.5	1734	19.8	1775	21.1	1814	22.5	1853	23.8	1891	25.2	1930	26.6	1996	29.3
13990	3338	1643	17.1	1683	18.3	1722	19.7	1764	21.0	1804	22.3	1843	23.7	1881	25.1	1918	26.5	1955	27.9	2020	30.7
14580	3479	1677	18.2	1717	19.5	1756	20.8	1794	22.2	1833	23.6	1872	25.0	1910	26.4	1947	27.9	1982	29.3	2045	32.1
15170	3620	1712	19.3	1752	20.7	1790	22.1	1828	23.5	1864	24.9	1902	26.3	1939	27.8	1976	29.3	2011	30.8	2070	33.5
15760	3761	1749	20.6	1787	22.0	1825	23.4	1862	24.8	1898	26.3	1932	27.8	1969	29.3	2005	30.8	2040	32.3	2099	35.1
16350	3902	1787	21.9	1823	23.3	1860	24.8	1896	26.2	1932	27.7	1966	29.2	2000	30.8	2035	32.3	2070	33.9	2128	36.8

CFM	OV	STATIC PRESSURE (in. wg)																			
		10.00		11.00		12.00		13.00		14.00		15.00		16.00		17.00		18.00		20.00	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
13400	3198	1996	29.3	2068	32.1	2138	35.0	2206	37.9	2270	40.8	2333	43.8	2393	46.8						
14040	3350	2022	30.8	2092	33.7	2161	36.7	2228	39.7	2292	42.7	2355	45.8	2415	48.9	2473	52.0	2530	55.2		
14680	3503	2049	32.3	2118	35.4	2184	38.4	2250	41.5	2315	44.7	2377	47.8	2437	51.0	2495	54.2	2552	57.5		
15320	3656	2077	33.9	2145	37.0	2211	40.2	2274	43.4	2337	46.7	2399	49.9	2459	53.2	2517	56.5	2574	59.8	2682	66.6
15960	3809	2109	35.7	2172	38.8	2237	42.1	2300	45.4	2361	48.7	2422	52.0	2481	55.4	2539	58.8	2596	62.2	2704	69.2
16600	3961	2140	37.5	2204	40.7	2264	44.0	2327	47.3	2388	50.8	2446	54.2	2503	57.7	2562	61.2	2618	64.7	2726	71.8
17240	4114	2172	39.4	2235	42.7	2296	46.0	2354	49.4	2414	52.9	2472	56.5	2529	60.0	2584	63.7	2640	67.3	2748	74.5
17880	4267	2204	41.4	2267	44.8	2327	48.2	2385	51.6	2441	55.1	2499	58.8	2555	62.4	2610	66.1	2663	69.9	2770	77.3
18520	4420	2239	43.4	2298	46.9	2358	50.4	2416	53.9	2471	57.5	2526	61.1	2582	64.9	2636	68.7	2689	72.5	2791	80.2
19160	4572	2275	45.6	2331	49.1	2390	52.7	2448	56.3	2503	60.0	2556	63.7	2608	67.4	2663	71.3	2716	75.2		
19800	4725	2312	47.9	2368	51.5	2422	55.1	2479	58.8	2534	62.5	2588	66.3	2639	70.1	2689	74.0	2742	78.0		
20440	4878	2349	50.2	2405	53.9	2458	57.6	2511	61.4	2566	65.2	2619	69.1	2671	73.0	2720	76.9	2769	80.8		
21080	5031	2387	52.7	2441	56.4	2494	60.2	2545	64.0	2598	67.9	2651	71.9	2702	75.9	2752	79.9				
21720	5183	2424	55.2	2479	59.0	2531	62.9	2582	66.8	2631	70.8	2682	74.8	2733	78.9	2783	83.0				
22360	5336	2464	57.9	2516	61.8	2568	65.7	2619	69.7	2667	73.8	2715	77.8	2765	82.0						
23000	5489	2505	60.8	2554	64.6	2606	68.7	2656	72.7	2704	76.8	2751	81.0	2797	85.2						

Performance certified is for model BISW Arrangement 1, Installation Type B: free inlet, ducted outlet.
Performance ratings do not include the effects of appurtenances (accessories).
Power rating (Bhp) does not include transmission losses.



Class	Max RPM
I	1425
II	1859
III	2342
IV	2823

% WOV = (CFM X 100) / (RPM X 11.8)

Sound Power [dB Ref 10^{-12} watts]

RPM	%WOV	Inlet Sound Power, L_{Wi} 1	2	3	4	5	6	7	8	L_{Wi}A
400	100	83	75	71	63	58	51	43	37	67
	80	76	67	63	56	51	44	37	32	60
	60	75	63	59	53	51	43	36	30	57
	50	73	63	58	54	53	44	37	32	57
	40	72	61	58	54	53	44	38	31	57
800	100	89	89	86	81	78	73	63	58	83
	80	86	87	82	78	74	68	61	56	80
	60	85	88	81	76	73	68	64	60	80
	50	84	84	79	75	73	68	65	61	78
	40	86	84	78	75	73	68	66	62	78
1200	100	93	94	99	91	86	86	78	71	94
	80	90	90	97	87	82	81	74	69	91
	60	89	88	93	84	80	78	75	71	88
	50	90	87	92	83	80	77	76	73	87
	40	89	88	93	83	81	78	76	73	88
1700	100	100	98	106	99	96	97	92	83	103
	80	96	94	104	94	91	90	86	79	99
	60	95	90	99	90	88	87	85	82	96
	50	96	91	100	89	87	87	86	83	96
	40	99	96	102	91	88	87	86	84	97
2342	100	107	106	111	109	104	104	102	94	111
	80	103	102	108	106	99	98	95	89	107
	60	103	100	103	101	96	95	93	90	103
	50	104	101	104	101	95	94	93	91	103
	40	107	105	107	103	96	95	94	92	105
2823	100	110	112	114	115	109	108	107	100	116
	80	106	108	111	112	105	102	100	95	112
	60	107	106	107	108	101	99	98	95	109
	50	107	107	108	108	100	98	98	96	108
	40	110	111	111	110	102	99	98	96	111

RPM	%WOV	Outlet Sound Power, L_{Wo} 1	2	3	4	5	6	7	8	L_{Wo}A
400	100	85	77	70	66	62	53	46	40	69
	80	85	76	68	61	58	49	42	36	66
	60	84	73	65	58	57	47	44	38	64
	50	82	71	63	58	57	47	44	39	63
	40	81	71	63	58	57	47	45	39	63
800	100	95	94	85	82	81	76	67	60	86
	80	94	91	82	78	77	71	64	58	82
	60	91	89	79	75	73	67	63	60	79
	50	91	87	78	74	72	67	64	64	78
	40	91	88	77	74	72	67	64	64	78
1200	100	103	100	98	92	91	89	82	73	97
	80	100	98	98	90	88	84	77	71	94
	60	97	96	97	87	84	79	75	72	92
	50	96	95	96	85	82	78	74	73	90
	40	97	95	95	84	82	78	75	73	90
1700	100	109	107	109	101	100	100	96	87	107
	80	104	104	105	98	97	95	91	83	103
	60	102	101	103	96	95	91	86	83	100
	50	103	100	101	94	92	89	86	83	98
	40	103	100	100	93	91	88	86	83	97
2342	100	116	114	115	111	108	107	105	98	115
	80	111	111	111	108	105	103	100	94	111
	60	109	108	109	106	102	99	95	91	108
	50	109	108	107	104	100	97	94	91	106
	40	109	108	107	103	99	96	94	91	106
2823	100	119	119	119	118	113	112	110	104	120
	80	114	115	115	115	110	108	105	100	116
	60	112	112	113	112	107	104	100	96	114
	50	113	113	112	111	105	102	99	96	112
	40	112	113	111	110	104	101	98	96	111

The sound power level ratings shown are in decibels, referred to 10^{-12} watts calculated per AMCA Standard 301. Values shown are for inlet L_{Wi}, L_{Wi}A and outlet L_{Wo}, L_{Wo}A sound power levels for Installation Type B: free inlet, ducted outlet. Outlet ratings include the effects of duct end correction. The A-weighted sound ratings shown have been calculated per AMCA International Standard 301.