

7) Simulación analítica del tránsito de la avenida para un vertedor controlado con compuertas, cresta vertedora a la elevación 1 109,00 msnm y con longitud efectiva de 30 m.

VERTEDOR DEL PROYECTO: PRESA ARCEDIANO (Vertedor Controlado)

INTERVALO DE TIEMPO DEL CÁLCULO	6 horas
NÚMERO DE INTERVALOS	120 m
GASTO POR TURBINAS	0 m ³ /s
NIVEL DE LA CRESTA	1109 msnm
TIPO DE OPERACIÓN	2
COEFICIENTE DE DESCARGA	2
LONGITUD EFECTIVA	30 m
NIVEL INICIAL	1120 msnm
NIVEL FINAL DE CONSERVACIÓN	1120 msnm

NO.	TIEMPO		HIDROGRAMAS		GASTO	EVOLUCIÓN DEL VASO	
	DIA	HORA	ENTRADA	SALIDA	TURBINADO	ELEVACIÓN	VOLUMEN
			m ³ /s	m ³ /s	m ³ /s	msnm	Mill.m ³
1	1	0	900.5	900.5	0	1120.00	538.3
2	1	6	903.4	903.4	0	1120.00	538.3
3	1	12	906.3	906.3	0	1120.00	538.3
4	1	18	909.2	909.2	0	1120.00	538.3
5	2	0	912.2	912.2	0	1120.00	538.3
6	2	6	894.0	894.0	0	1120.00	538.3
7	2	12	875.9	875.9	0	1120.00	538.3
8	2	18	857.7	857.7	0	1120.00	538.3
9	3	0	839.6	839.6	0	1120.00	538.3
10	3	6	853.7	853.7	0	1120.00	538.3
11	3	12	867.9	867.9	0	1120.00	538.3
12	3	18	882.0	882.0	0	1120.00	538.3
13	4	0	896.2	896.2	0	1120.00	538.3
14	4	6	897.5	897.5	0	1120.00	538.3
15	4	12	898.8	898.8	0	1120.00	538.3
16	4	18	900.1	900.1	0	1120.00	538.3
17	5	0	901.5	901.5	0	1120.00	538.3
18	5	6	898.2	898.2	0	1120.00	538.3
19	5	12	894.9	894.9	0	1120.00	538.3
20	5	18	891.6	891.6	0	1120.00	538.3
21	6	0	888.3	888.3	0	1120.00	538.3
22	6	6	871.0	871.0	0	1120.00	538.3
23	6	12	853.7	853.7	0	1120.00	538.3
24	6	18	836.4	836.4	0	1120.00	538.3
25	7	0	819.1	819.1	0	1120.00	538.3
26	7	6	842.9	842.9	0	1120.00	538.3
27	7	12	866.7	866.7	0	1120.00	538.3
28	7	18	890.5	890.5	0	1120.00	538.3
29	8	0	914.3	914.3	0	1120.00	538.3
30	8	6	1043.5	1043.5	0	1120.00	538.3
31	8	12	1172.8	1172.8	0	1120.00	538.3
32	8	18	1302.0	1302.0	0	1120.00	538.3
33	9	0	1431.2	1431.2	0	1120.00	538.3
34	9	6	1680.1	1680.1	0	1120.00	538.3
35	9	12	1928.9	1928.9	0	1120.00	538.3
36	9	18	2177.8	2177.8	0	1120.00	538.3
37	10	0	2426.6	2245.9	0	1120.19	540.3
38	10	6	2077.6	2248.9	0	1120.20	540.4
39	10	12	1728.5	1747.3	0	1120.00	538.3
40	10	18	1379.5	1379.5	0	1120.00	538.3
41	11	0	1030.4	1030.4	0	1120.00	538.3

NO.	TIEMPO		HIDROGRAMAS		GASTO	EVOLUCIÓN DEL VASO	
	DIA	HORA	ENTRADA	SALIDA	TURBINADO	ELEVACIÓN	VOLUMEN
			m ³ /s	m ³ /s	m ³ /s	msnm	Mill.m ³
42	11	6	1004.0	1004.0	0	1120.00	538.3
43	11	12	977.6	977.6	0	1120.00	538.3
44	11	18	951.1	951.1	0	1120.00	538.3
45	12	0	924.7	924.7	0	1120.00	538.3
46	12	6	1096.3	1096.3	0	1120.00	538.3
47	12	12	1267.9	1267.9	0	1120.00	538.3
48	12	18	1439.4	1439.4	0	1120.00	538.3
49	13	0	1611.0	1611.0	0	1120.00	538.3
50	13	6	1771.6	1771.6	0	1120.00	538.3
51	13	12	1932.2	1932.2	0	1120.00	538.3
52	13	18	2092.8	2092.8	0	1120.00	538.3
53	14	0	2253.4	2204.4	0	1120.05	538.9
54	14	6	2145.8	2202.1	0	1120.04	538.8
55	14	12	2038.2	2038.2	0	1120.00	538.3
56	14	18	1930.6	1930.6	0	1120.00	538.3
57	15	0	1822.9	1822.9	0	1120.00	538.3
58	15	6	2287.1	2212.4	0	1120.08	539.1
59	15	12	2751.2	2360.5	0	1120.57	544.2
60	15	18	3215.4	2668.3	0	1121.55	554.3
61	16	0	3679.5	3066.2	0	1122.77	566.8
62	16	6	3758.4	3409.8	0	1123.78	577.2
63	16	12	3837.3	3618.2	0	1124.38	583.3
64	16	18	3916.2	3758.7	0	1124.77	587.4
65	17	0	3995.1	3866.6	0	1125.07	590.5
66	17	6	3585.3	3824.7	0	1124.96	589.3
67	17	12	3175.6	3583.0	0	1124.28	582.3
68	17	18	2765.9	3256.4	0	1123.33	572.6
69	18	0	2356.1	2895.0	0	1122.25	561.5
70	18	6	2360.5	2623.5	0	1121.41	552.8
71	18	12	2364.8	2494.0	0	1121.00	548.6
72	18	18	2369.2	2431.5	0	1120.80	546.5
73	19	0	2373.5	2402.1	0	1120.70	545.6
74	19	6	2195.3	2344.7	0	1120.52	543.6
75	19	12	2017.2	2229.6	0	1120.14	539.7
76	19	18	1839.0	1839.0	0	1120.00	538.3
77	20	0	1660.8	1660.8	0	1120.00	538.3
78	20	6	1638.8	1638.8	0	1120.00	538.3
79	20	12	1616.7	1616.7	0	1120.00	538.3
80	20	18	1594.7	1594.7	0	1120.00	538.3
81	21	0	1572.6	1572.6	0	1120.00	538.3
82	21	6	1587.5	1587.5	0	1120.00	538.3
83	21	12	1602.4	1602.4	0	1120.00	538.3
84	21	18	1617.4	1617.4	0	1120.00	538.3
85	22	0	1632.3	1632.3	0	1120.00	538.3
86	22	6	1631.3	1631.3	0	1120.00	538.3
87	22	12	1630.4	1630.4	0	1120.00	538.3
88	22	18	1629.4	1629.4	0	1120.00	538.3
89	23	0	1628.5	1628.5	0	1120.00	538.3
90	23	6	1632.1	1632.1	0	1120.00	538.3
91	23	12	1635.8	1635.8	0	1120.00	538.3
92	23	18	1639.4	1639.4	0	1120.00	538.3
93	24	0	1643.1	1643.1	0	1120.00	538.3
94	24	6	1634.6	1634.6	0	1120.00	538.3
95	24	12	1626.1	1626.1	0	1120.00	538.3
96	24	18	1617.6	1617.6	0	1120.00	538.3
97	25	0	1609.2	1609.2	0	1120.00	538.3
98	25	6	1587.4	1587.4	0	1120.00	538.3
99	25	12	1565.7	1565.7	0	1120.00	538.3

NO.	TIEMPO		HIDROGRAMAS		GASTO	EVOLUCIÓN DEL VASO	
	DIA	HORA	ENTRADA	SALIDA	TURBINADO	ELEVACIÓN	VOLUMEN
			m ³ /s	m ³ /s	m ³ /s	msnm	Mill.m ³
100	25	18	1544.0	1544.0	0	1120.00	538.3
101	26	0	1522.3	1522.3	0	1120.00	538.3
102	26	6	1536.5	1536.5	0	1120.00	538.3
103	26	12	1550.7	1550.7	0	1120.00	538.3
104	26	18	1564.9	1564.9	0	1120.00	538.3
105	27	0	1579.1	1579.1	0	1120.00	538.3
106	27	6	1588.8	1588.8	0	1120.00	538.3
107	27	12	1598.4	1598.4	0	1120.00	538.3
108	27	18	1608.1	1608.1	0	1120.00	538.3
109	28	0	1617.8	1617.8	0	1120.00	538.3
110	28	6	1614.4	1614.4	0	1120.00	538.3
111	28	12	1611.1	1611.1	0	1120.00	538.3
112	28	18	1607.7	1607.7	0	1120.00	538.3
113	29	0	1604.4	1604.4	0	1120.00	538.3
114	29	6	1607.2	1607.2	0	1120.00	538.3
115	29	12	1610.0	1610.0	0	1120.00	538.3
116	29	18	1612.8	1612.8	0	1120.00	538.3
117	30	0	1615.6	1615.6	0	1120.00	538.3
118	30	6	1615.6	1615.6	0	1120.00	538.3
119	30	12	1615.6	1615.6	0	1120.00	538.3
120	30	18	1615.6	1615.6	0	1120.00	538.3

El volumen de la avenida es 4134.559 Mill. m³
 El gasto máximo del hidrograma de entrada es 3995.085 m³/s
 El gasto máximo descagado es 3866.573 m³/s
 La elevación máxima alcanzada es 1125.074 msnm

8) Simulación analítica del tránsito de la avenida para un vertedor controlado con compuertas, cresta vertedora a la elevación 1 109,00 msnm y con longitud efectiva de 40 m.

VERTEDOR DEL PROYECTO: PRESA ARCEDIANO (Vertedor Controlado)

INTERVALO DE TIEMPO DEL CÁLCULO	6 horas
NÚMERO DE INTERVALOS	120
GASTO POR TURBINAS	0 m ³ /s
NIVEL DE LA CRESTA	1109 msnm
TIPO DE OPERACIÓN	2
COEFICIENTE DE DESCARGA	2
LONGITUD EFECTIVA	40 m
NIVEL INICIAL	1120 msnm
NIVEL FINAL DE CONSERVACIÓN	1120 msnm

NO.	TIEMPO		HIDROGRAMAS		GASTO	EVOLUCIÓN DEL VASO	
	DIA	HORA	ENTRADA	SALIDA	TURBINADO	ELEVACIÓN	VOLUMEN
			m ³ /s	m ³ /s	m ³ /s	msnm	Mill.m ³
1	1	0	900.5	900.5	0	1120.00	538.3
2	1	6	903.4	903.4	0	1120.00	538.3
3	1	12	906.3	906.3	0	1120.00	538.3
4	1	18	909.2	909.2	0	1120.00	538.3
5	2	0	912.2	912.2	0	1120.00	538.3
6	2	6	894.0	894.0	0	1120.00	538.3
7	2	12	875.9	875.9	0	1120.00	538.3
8	2	18	857.7	857.7	0	1120.00	538.3
9	3	0	839.6	839.6	0	1120.00	538.3
10	3	6	853.7	853.7	0	1120.00	538.3
11	3	12	867.9	867.9	0	1120.00	538.3
12	3	18	882.0	882.0	0	1120.00	538.3
13	4	0	896.2	896.2	0	1120.00	538.3
14	4	6	897.5	897.5	0	1120.00	538.3
15	4	12	898.8	898.8	0	1120.00	538.3
16	4	18	900.1	900.1	0	1120.00	538.3
17	5	0	901.5	901.5	0	1120.00	538.3
18	5	6	898.2	898.2	0	1120.00	538.3
19	5	12	894.9	894.9	0	1120.00	538.3
20	5	18	891.6	891.6	0	1120.00	538.3
21	6	0	888.3	888.3	0	1120.00	538.3
22	6	6	871.0	871.0	0	1120.00	538.3
23	6	12	853.7	853.7	0	1120.00	538.3
24	6	18	836.4	836.4	0	1120.00	538.3
25	7	0	819.1	819.1	0	1120.00	538.3
26	7	6	842.9	842.9	0	1120.00	538.3
27	7	12	866.7	866.7	0	1120.00	538.3
28	7	18	890.5	890.5	0	1120.00	538.3
29	8	0	914.3	914.3	0	1120.00	538.3
30	8	6	1043.5	1043.5	0	1120.00	538.3
31	8	12	1172.8	1172.8	0	1120.00	538.3
32	8	18	1302.0	1302.0	0	1120.00	538.3
33	9	0	1431.2	1431.2	0	1120.00	538.3
34	9	6	1680.1	1680.1	0	1120.00	538.3
35	9	12	1928.9	1928.9	0	1120.00	538.3
36	9	18	2177.8	2177.8	0	1120.00	538.3
37	10	0	2426.6	2426.6	0	1120.00	538.3
38	10	6	2077.6	2077.6	0	1120.00	538.3
39	10	12	1728.5	1728.5	0	1120.00	538.3
40	10	18	1379.5	1379.5	0	1120.00	538.3
41	11	0	1030.4	1030.4	0	1120.00	538.3
42	11	6	1004.0	1004.0	0	1120.00	538.3
43	11	12	977.6	977.6	0	1120.00	538.3
44	11	18	951.1	951.1	0	1120.00	538.3
45	12	0	924.7	924.7	0	1120.00	538.3
46	12	6	1096.3	1096.3	0	1120.00	538.3

NO.	TIEMPO		HIDROGRAMAS		GASTO	EVOLUCIÓN DEL VASO	
	DIA	HORA	ENTRADA	SALIDA	TURBINADO	ELEVACIÓN	VOLUMEN
			m ³ /s	m ³ /s	m ³ /s	msnm	Mill.m ³
47	12	12	1267.9	1267.9	0	1120.00	538.3
48	12	18	1439.4	1439.4	0	1120.00	538.3
49	13	0	1611.0	1611.0	0	1120.00	538.3
50	13	6	1771.6	1771.6	0	1120.00	538.3
51	13	12	1932.2	1932.2	0	1120.00	538.3
52	13	18	2092.8	2092.8	0	1120.00	538.3
53	14	0	2253.4	2253.4	0	1120.00	538.3
54	14	6	2145.8	2145.8	0	1120.00	538.3
55	14	12	2038.2	2038.2	0	1120.00	538.3
56	14	18	1930.6	1930.6	0	1120.00	538.3
57	15	0	1822.9	1822.9	0	1120.00	538.3
58	15	6	2287.1	2287.1	0	1120.00	538.3
59	15	12	2751.2	2751.2	0	1120.00	538.3
60	15	18	3215.4	3006.5	0	1120.22	540.6
61	16	0	3679.5	3270.9	0	1120.87	547.3
62	16	6	3758.4	3544.7	0	1121.52	554
63	16	12	3837.3	3701.7	0	1121.89	557.7
64	16	18	3916.2	3811.1	0	1122.14	560.3
65	17	0	3995.1	3902.0	0	1122.35	562.5
66	17	6	3585.3	3831.7	0	1122.19	560.8
67	17	12	3175.6	3550.8	0	1121.54	554.1
68	17	18	2765.9	3197.0	0	1120.69	545.4
69	18	0	2356.1	2580.8	0	1120.00	538.3
70	18	6	2360.5	2360.5	0	1120.00	538.3
71	18	12	2364.8	2364.8	0	1120.00	538.3
72	18	18	2369.2	2369.2	0	1120.00	538.3
73	19	0	2373.5	2373.5	0	1120.00	538.3
74	19	6	2195.3	2195.3	0	1120.00	538.3
75	19	12	2017.2	2017.2	0	1120.00	538.3
76	19	18	1839.0	1839.0	0	1120.00	538.3
77	20	0	1660.8	1660.8	0	1120.00	538.3
78	20	6	1638.8	1638.8	0	1120.00	538.3
79	20	12	1616.7	1616.7	0	1120.00	538.3
80	20	18	1594.7	1594.7	0	1120.00	538.3
81	21	0	1572.6	1572.6	0	1120.00	538.3
82	21	6	1587.5	1587.5	0	1120.00	538.3
83	21	12	1602.4	1602.4	0	1120.00	538.3
84	21	18	1617.4	1617.4	0	1120.00	538.3
85	22	0	1632.3	1632.3	0	1120.00	538.3
86	22	6	1631.3	1631.3	0	1120.00	538.3
87	22	12	1630.4	1630.4	0	1120.00	538.3
88	22	18	1629.4	1629.4	0	1120.00	538.3
89	23	0	1628.5	1628.5	0	1120.00	538.3
90	23	6	1632.1	1632.1	0	1120.00	538.3
91	23	12	1635.8	1635.8	0	1120.00	538.3
92	23	18	1639.4	1639.4	0	1120.00	538.3
93	24	0	1643.1	1643.1	0	1120.00	538.3
94	24	6	1634.6	1634.6	0	1120.00	538.3
95	24	12	1626.1	1626.1	0	1120.00	538.3
96	24	18	1617.6	1617.6	0	1120.00	538.3
97	25	0	1609.2	1609.2	0	1120.00	538.3
98	25	6	1587.4	1587.4	0	1120.00	538.3
99	25	12	1565.7	1565.7	0	1120.00	538.3
100	25	18	1544.0	1544.0	0	1120.00	538.3
101	26	0	1522.3	1522.3	0	1120.00	538.3
102	26	6	1536.5	1536.5	0	1120.00	538.3
103	26	12	1550.7	1550.7	0	1120.00	538.3
104	26	18	1564.9	1564.9	0	1120.00	538.3
105	27	0	1579.1	1579.1	0	1120.00	538.3
106	27	6	1588.8	1588.8	0	1120.00	538.3
107	27	12	1598.4	1598.4	0	1120.00	538.3
108	27	18	1608.1	1608.1	0	1120.00	538.3
109	28	0	1617.8	1617.8	0	1120.00	538.3
110	28	6	1614.4	1614.4	0	1120.00	538.3
111	28	12	1611.1	1611.1	0	1120.00	538.3

NO.	TIEMPO		HIDROGRAMAS		GASTO	EVOLUCIÓN DEL VASO	
	DIA	HORA	ENTRADA	SALIDA	TURBINADO	ELEVACIÓN	VOLUMEN
			m ³ /s	m ³ /s	m ³ /s	msnm	Mill.m ³
112	28	18	1607.7	1607.7	0	1120.00	538.3
113	29	0	1604.4	1604.4	0	1120.00	538.3
114	29	6	1607.2	1607.2	0	1120.00	538.3
115	29	12	1610.0	1610.0	0	1120.00	538.3
116	29	18	1612.8	1612.8	0	1120.00	538.3
117	30	0	1615.6	1615.6	0	1120.00	538.3
118	30	6	1615.6	1615.6	0	1120.00	538.3
119	30	12	1615.6	1615.6	0	1120.00	538.3
120	30	18	1615.6	1615.6	0	1120.00	538.3

El volumen de la avenida es 4134.559 Mill. m³
 El gasto máximo del hidrograma de entrada es 3995.085 m³/s
 El gasto máximo descagado es 3901.996 m³/s
 La elevación máxima alcanzada es 1122.35 msnm