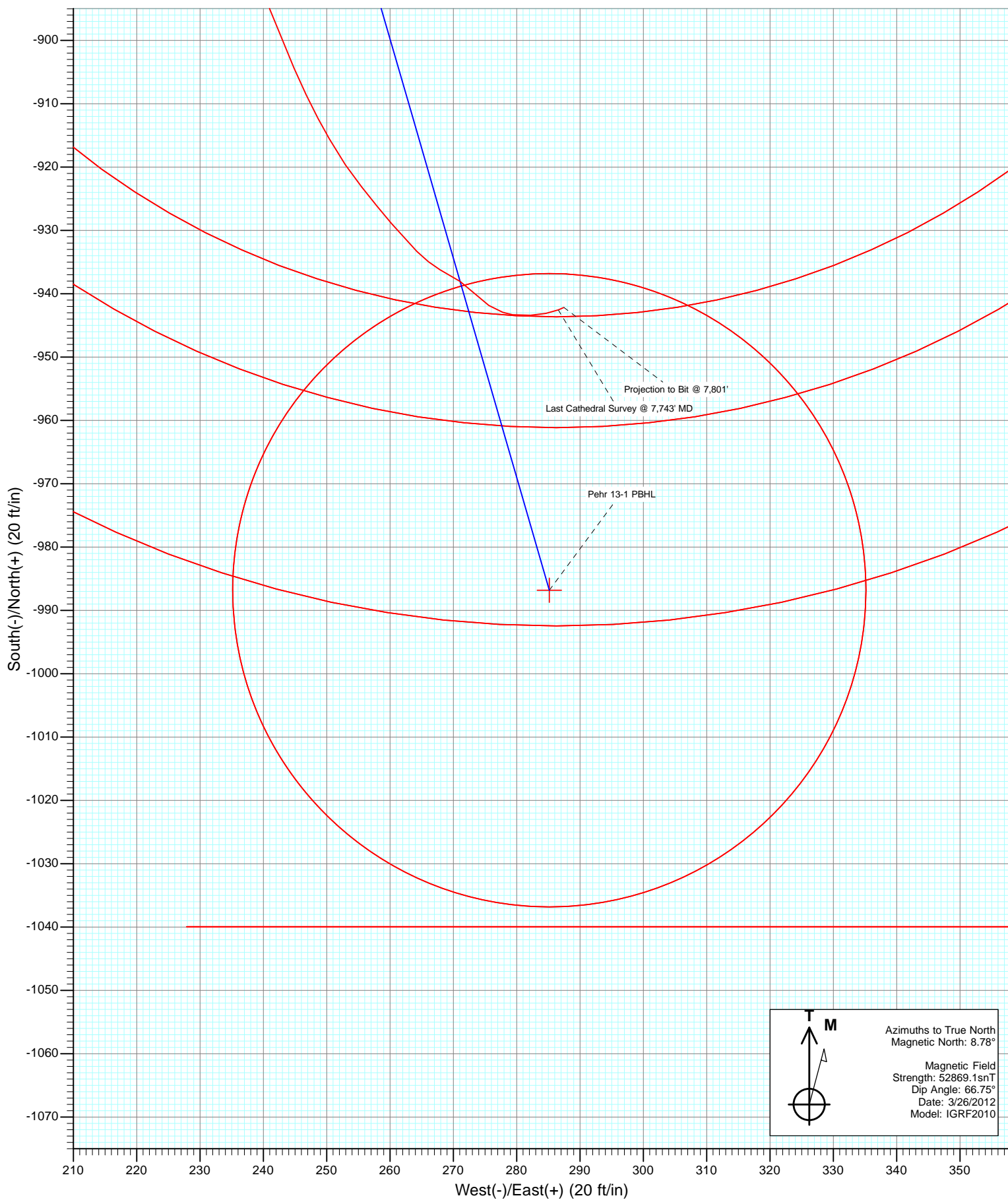


Magnetic Field  
Strength: 52869.1nT  
Dip Angle: 66.75°  
Date: 3/26/2012  
Model: IGRF2010

Type	Target	Azimuth	Origin	N/S	E/W	From	TVD
Target	Pehr 13-1 PBHL	163.88	Type 13-1	0.0	0.0		0.0
		TVD	+N/-S	+E/-W	Latitude		Longitude
Legal Box #13		-5000.0		-427.01	40.074557	-104.8463857	
Pehr 13-1 PBHL		7696.0	-986.8	285.2	40.074154	-104.846895	



# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Anadarko Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Pehr 13-1
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	KB=15' @ 4959.0ft (Xtreme 15)
<b>Site:</b>	NWSW Sec1-T1N-R67W (Pehr 33-1)	<b>MD Reference:</b>	KB=15' @ 4959.0ft (Xtreme 15)
<b>Well:</b>	Pehr 13-1	<b>North Reference:</b>	True
<b>Wellbore:</b>	DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	DD	<b>Database:</b>	USA EDM 5000 Multi Users DB

<b>Project</b>	DJ Wattenberg		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

Site		NWSW Sec1-T1N-R67W (Pehr 33-1)			
Site Position:		Northing:	1,271,518.81 ft	Latitude:	40.076861
From:	Lat/Long	Easting:	3,182,472.99 ft	Longitude:	-104.847950
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence:	0.42 °

Well	Pehr 13-1					
Well Position	+N/-S	0.0 ft	Northing:	1,271,519.59 ft	Latitude:	40.076863
	+E/-W	0.0 ft	Easting:	3,182,483.06 ft	Longitude:	-104.847914
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,944.0 ft

<b>Wellbore</b>	DD				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	3/26/2012	8.78	66.75	52,869

<b>Design</b>	DD				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	163.88	

<b>Survey Program</b>	<b>Date</b>	9/22/2012			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
77.0	7,801.0	Survey #1 (DD)	MWD	Geolink MWD	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Formations / Comments</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00		
77.0	0.70	112.10	77.0	-0.2	0.4	0.3	0.91	0.91		
164.0	0.50	117.50	164.0	-0.6	1.3	0.9	0.24	-0.23		
253.0	0.70	118.90	253.0	-1.0	2.1	1.5	0.23	0.22		
340.0	0.90	25.50	340.0	-0.6	2.8	1.4	1.35	0.23		
417.0	1.80	339.40	417.0	1.0	2.7	-0.3	1.74	1.17		
507.0	1.80	300.10	506.9	3.1	1.0	-2.7	1.34	0.00		
598.0	1.20	264.20	597.9	3.7	-1.2	-3.9	1.19	-0.66		
688.0	1.50	250.70	687.9	3.2	-3.3	-4.0	0.48	0.33		
779.0	1.30	218.20	778.8	2.0	-5.0	-3.3	0.89	-0.22		
870.0	1.00	176.00	869.8	0.4	-5.6	-1.9	0.96	-0.33		
890.0	0.90	169.00	889.8	0.1	-5.6	-1.6	0.77	-0.50		
978.0	0.60	182.00	977.8	-1.1	-5.5	-0.5	0.39	-0.34		

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Anadarko Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Pehr 13-1
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	KB=15' @ 4959.0ft (Xtreme 15)
<b>Site:</b>	NWSW Sec1-T1N-R67W (Pehr 33-1)	<b>MD Reference:</b>	KB=15' @ 4959.0ft (Xtreme 15)
<b>Well:</b>	Pehr 13-1	<b>North Reference:</b>	True
<b>Wellbore:</b>	DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	DD	<b>Database:</b>	USA EDM 5000 Multi Users DB

### Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
1,067.0	4.00	170.50	1,066.7	-4.6	-5.0	3.0	3.84	3.82	
1,158.0	5.50	178.90	1,157.4	-12.1	-4.4	10.4	1.81	1.65	
1,249.0	5.90	159.00	1,248.0	-20.8	-2.6	19.3	2.20	0.44	
1,340.0	7.40	147.80	1,338.4	-30.1	2.2	29.6	2.17	1.65	
1,430.0	7.20	152.90	1,427.6	-40.1	7.9	40.7	0.75	-0.22	
1,521.0	8.50	163.50	1,517.8	-51.6	12.4	53.0	2.13	1.43	
1,612.0	9.80	165.20	1,607.6	-65.5	16.3	67.5	1.46	1.43	
1,703.0	9.10	163.60	1,697.4	-79.9	20.3	82.4	0.82	-0.77	
1,794.0	10.40	162.40	1,787.1	-94.6	24.8	97.8	1.45	1.43	
1,930.0	8.70	164.80	1,921.2	-116.3	31.2	120.4	1.28	-1.25	
2,021.0	9.80	156.40	2,011.0	-130.0	36.1	134.9	1.91	1.21	
2,111.0	11.00	158.00	2,099.5	-145.0	42.4	151.1	1.37	1.33	
2,202.0	9.70	156.90	2,189.0	-160.1	48.6	167.3	1.44	-1.43	
2,293.0	10.20	164.20	2,278.7	-174.9	53.8	183.0	1.49	0.55	
2,384.0	10.70	164.50	2,368.2	-190.8	58.3	199.5	0.55	0.55	
2,474.0	12.70	169.40	2,456.3	-208.6	62.3	217.7	2.48	2.22	
2,565.0	11.30	164.90	2,545.3	-227.0	66.5	236.6	1.85	-1.54	
2,656.0	11.50	163.00	2,634.5	-244.3	71.5	254.5	0.47	0.22	
2,747.0	9.70	162.90	2,724.0	-260.3	76.4	271.3	1.98	-1.98	
2,838.0	10.90	163.80	2,813.5	-275.9	81.0	287.5	1.33	1.32	
2,928.0	9.80	163.00	2,902.0	-291.4	85.7	303.7	1.23	-1.22	
3,019.0	10.80	169.50	2,991.6	-307.2	89.5	319.9	1.68	1.10	
3,110.0	9.60	169.00	3,081.1	-323.0	92.5	336.0	1.32	-1.32	
3,201.0	10.90	164.90	3,170.7	-338.8	96.2	352.2	1.64	1.43	
3,292.0	9.80	161.80	3,260.2	-354.4	100.8	368.5	1.35	-1.21	
3,428.0	9.30	162.70	3,394.3	-375.9	107.7	391.0	0.38	-0.37	
3,519.0	8.30	166.20	3,484.2	-389.3	111.5	405.0	1.25	-1.10	
3,609.0	10.30	158.10	3,573.0	-403.1	116.0	419.5	2.65	2.22	
3,700.0	10.20	156.50	3,662.6	-418.0	122.3	435.5	0.33	-0.11	
3,791.0	11.30	166.80	3,752.0	-434.1	127.5	452.4	2.43	1.21	
3,836.0	10.30	165.10	3,796.2	-442.3	129.6	460.9	2.33	-2.22	
3,927.0	10.20	168.60	3,885.7	-458.0	133.2	477.0	0.69	-0.11	
4,018.0	12.00	163.00	3,975.0	-475.0	137.6	494.5	2.30	1.98	
4,109.0	9.60	161.10	4,064.4	-491.2	142.8	511.6	2.67	-2.64	
4,200.0	10.00	168.50	4,154.1	-506.1	146.9	527.0	1.45	0.44	
4,289.0	10.50	170.30	4,241.7	-521.7	149.8	542.8	0.67	0.56	
4,381.0	11.00	171.60	4,332.1	-538.7	152.5	559.8	0.60	0.54	
4,472.0	11.10	153.60	4,421.4	-555.1	157.6	577.0	3.78	0.11	
4,563.0	8.50	151.10	4,511.1	-568.8	164.8	592.2	2.89	-2.86	
4,654.0	9.90	160.10	4,600.9	-582.1	170.7	606.6	2.20	1.54	
4,745.0	10.20	173.90	4,690.5	-597.4	174.2	622.3	2.66	0.33	
4,835.0	10.80	177.60	4,779.0	-613.8	175.4	638.4	1.00	0.67	
4,926.0	9.70	178.20	4,868.6	-630.0	176.0	654.1	1.21	-1.21	
5,017.0	11.40	174.10	4,958.0	-646.6	177.2	670.4	2.04	1.87	
5,108.0	11.50	174.40	5,047.2	-664.6	179.0	688.1	0.13	0.11	
5,199.0	11.70	160.40	5,136.4	-682.3	183.0	706.3	3.09	0.22	
5,289.0	10.80	161.40	5,224.6	-698.9	188.7	723.8	1.02	-1.00	
5,380.0	11.30	155.50	5,314.0	-715.1	195.1	741.1	1.36	0.55	
5,471.0	9.00	156.00	5,403.5	-729.7	201.7	757.0	2.53	-2.53	
5,561.0	8.70	155.60	5,492.5	-742.3	207.4	770.7	0.34	-0.33	
5,652.0	7.60	167.00	5,582.5	-754.4	211.6	783.5	2.14	-1.21	
5,743.0	8.00	172.80	5,672.7	-766.6	213.7	795.8	0.97	0.44	
5,834.0	7.40	168.90	5,762.9	-778.6	215.7	807.9	0.87	-0.66	

# Cathedral Energy Services

## Survey Report

<b>Company:</b>	Anadarko Petroleum Corporation	<b>Local Co-ordinate Reference:</b>	Well Pehr 13-1
<b>Project:</b>	DJ Wattenberg	<b>TVD Reference:</b>	KB=15' @ 4959.0ft (Xtreme 15)
<b>Site:</b>	NWSW Sec1-T1N-R67W (Pehr 33-1)	<b>MD Reference:</b>	KB=15' @ 4959.0ft (Xtreme 15)
<b>Well:</b>	Pehr 13-1	<b>North Reference:</b>	True
<b>Wellbore:</b>	DD	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	DD	<b>Database:</b>	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Formations / Comments
5,925.0	8.00	166.70	5,853.1	-790.5	218.2	820.1	0.73	0.66	
6,015.0	7.80	162.00	5,942.2	-802.4	221.6	832.4	0.75	-0.22	
6,106.0	9.80	168.40	6,032.1	-815.9	225.0	846.3	2.44	2.20	
6,197.0	11.10	174.10	6,121.6	-832.2	227.5	862.6	1.82	1.43	
6,288.0	10.70	170.50	6,211.0	-849.2	229.8	879.7	0.87	-0.44	
6,378.0	9.00	166.00	6,299.7	-864.3	232.9	895.0	2.07	-1.89	
6,469.0	8.30	170.30	6,389.6	-877.7	235.7	908.6	1.05	-0.77	
6,560.0	9.10	159.40	6,479.6	-890.9	239.3	922.3	2.01	0.88	
6,651.0	9.30	156.10	6,569.4	-904.4	244.8	936.8	0.62	0.22	
6,742.0	6.50	149.80	6,659.5	-915.5	250.4	949.1	3.22	-3.08	
6,832.0	5.20	141.40	6,749.1	-923.1	255.5	957.8	1.73	-1.44	
6,923.0	4.20	139.70	6,839.8	-928.9	260.3	964.6	1.11	-1.10	
7,014.0	3.30	135.30	6,930.6	-933.3	264.3	970.0	1.04	-0.99	
7,105.0	2.60	119.40	7,021.4	-936.2	267.9	973.8	1.18	-0.77	
7,195.0	2.10	122.00	7,111.4	-938.1	271.1	976.4	0.57	-0.56	
7,286.0	2.20	136.90	7,202.3	-940.2	273.7	979.2	0.62	0.11	
7,422.0	2.10	109.10	7,338.2	-942.9	277.8	983.0	0.76	-0.07	
7,468.0	1.90	97.10	7,384.2	-943.3	279.4	983.8	1.01	-0.43	
7,558.0	1.70	85.30	7,474.1	-943.4	282.2	984.6	0.47	-0.22	
7,649.0	1.40	80.20	7,565.1	-943.1	284.6	985.0	0.36	-0.33	
7,743.0	1.10	68.30	7,659.1	-942.6	286.6	985.1	0.42	-0.32	Last Cathedral Survey @ 7,743' MD
7,801.0	0.80	63.70	7,717.1	-942.2	287.5	984.9	0.53	-0.52	Projection to Bit @ 7,801'

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
Legal Box #13	0.00	0.00	-5,000.0	-840.0	427.9	1,270,682.80	3,182,917.16	40.074557	-104.846385
- actual wellpath misses target center by 5088.1ft at 0.0ft MD (0.0 TVD, 0.0 N, 0.0 E)									
- Rectangle (sides W400.0 H400.0 D0.0)									
Pehr 13-1 PBHL	0.00	0.00	7,696.0	-986.8	285.2	1,270,534.91	3,182,775.47	40.074154	-104.846895
- actual wellpath misses target center by 44.6ft at 7779.6ft MD (7695.7 TVD, -942.3 N, 287.2 E)									
- Circle (radius 50.0)									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
7,743.0	7,659.1	-942.6	286.6	Last Cathedral Survey @ 7,743' MD	
7,801.0	7,717.1	-942.2	287.5	Projection to Bit @ 7,801'	

Checked By: _____	Approved By: _____	Date: _____
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