

BALLOT NO. 255A

BACKOUT MODEL AND BACKOUT PROCEDURES

I. RECITALS

1. Ballot No. 255 entitled "Kuparuk Satellite Facility Sharing Ballot" (hereinafter "Ballot No. 255") requires that on or before September 1, 1997, the KPA Owners shall approve, by an 88% affirmative vote, a model to determine the volumes of KPA oil production that are backed out as a result of producing Satellite wells through KPA facilities (hereinafter "Backout Model") and procedures for modifying the Backout Model ("Backout Procedures").
2. The KPA Owners desire to adopt the Backout Model and the Backout Procedures set forth below as of September 1, 1997.

II. AGREEMENT

A. Introduction.

1. In accordance with Ballot No. 255, the KPA Owners hereby adopt the Backout Model and Backout Procedures set forth in this Ballot Agreement.
2. The Backout Model and Backout Procedures set forth herein shall become effective September 1, 1997 upon an 88% affirmative vote of the KPA Owners.
3. This Ballot No. 255A may be executed in counterparts which will be deemed and be treated as a single original instrument.
4. If the provisions of this Ballot No. 255A conflict with provisions of Ballot No. 255, the provisions of this Ballot No. 255A shall prevail. If the provisions of this Agreement conflict with the provisions of the Kuparuk River Unit Operating Agreement, the provisions of the Kuparuk River Unit Operating Agreement shall prevail.
5. Generally, where terms are capitalized in this Ballot No. 255A, they shall have the meaning given them in the KRUA, the KRUAOA and Ballot No. 255 unless provided otherwise in this Ballot No. 255A.
6. Attachments:
 - Attachment 1 – Summary Flowchart
 - Attachment 2 – Example Calculations – Gas and Produced Water Backout
 - Attachment 3 – Example Calculations – Water Injection Backout
 - Attachment 4 – Initial Injection Water Backout Curves
 - Attachment 5 – Example Calculations – Electrical Power Backout
 - Attachment 6 – Example Calculations – Proration Adjustments
 - Attachment 7 – Example Backout Summary Report
 - Attachment 8 – Joint Facility Expansion Capacities

B. General Concepts.

In accordance with Article 8.0 of Ballot No. 255 and in accordance with this Ballot No. 255A, the Satellite Owners shall allocate a volume of oil production to the KPA Owners to compensate the KPA Owners for any deferral of KPA oil production caused by Satellite production or injection. The total volume of KPA oil production backed out by each individual Satellite shall be determined in accordance with this Ballot No. 255A. A backout modification factor described in Section 8.3 of Ballot No. 255 shall be applied to the backout volumes to determine the volume of oil production to be allocated by each of the Satellites to the KPA Owners. These volumes shall be further adjusted to account for production taxes and royalties in accordance with Section 8.5 of Ballot No. 255.

Following are several general concepts that will apply throughout the backout calculation process:

1. The backout calculations will be performed monthly.
2. The basis of the calculations will be the average monthly allocated production and injection for that month (at a well level) as filed by the operator with the AOGCC, the average facility capacities for that month, and other pertinent operations data for that month on the field automation system.
3. The backout calculations for any given month will take place early in the subsequent month when the final allocated production data is available.
4. To the extent possible, the backout calculations will make use of logic that follows the optimization logic used in actual field operations. Details of the optimization procedures used in the backout calculations will be modified to reflect any significant changes in field optimization procedures.
5. The automation and allocation systems will include features to identify and segregate well data by reservoir (KPA, West Sak, Tarn, etc.)
6. Adjustments will be made in the backout calculations for Satellites that participate in funding Joint Capital Projects that enhance KPA facility capacities involved in these calculations. Only actual Satellite usage rates in excess of the Satellite's nominal share of all Joint Capital Project(s) that enhance the capacity of the subject system will be involved in the calculations. A Satellite's share of an expansion project's capacity will be derived by that Satellite's cost participation in the project multiplied by the nominal capacity increase associated with the project (Attachment 8). These calculations are used for backout calculation purposes only and do not imply the Satellite has preferential access to any Joint Equipment.
7. These backout calculations only reflect the current, or near term deferral of KPA production. They do not reflect the long term KPA production performance which may involve a positive payback stream. As such, these backout calculations should not be viewed as a precedent for determination of long term Satellite project impacts on KPA production.
8. Summary results from these backout calculations will be passed forward to other business systems for application of the Backout Modification Factor (Section 8.3 of Ballot No. 255), royalty and severance tax adjustments (Section 8.5 of Ballot No. 255), and final reporting to KPA and Satellite owner companies.
9. The Operator will recommend and implement changes in methodology as appropriate to ensure the results reasonably reflect production adjustments necessary to compensate the KPA owners for KPA production deferred as a result of Satellite production and injection operations.

C. Backout Model Calculation Elements.

This Ballot No. 255A modifies and supersedes Section 8.2 of Ballot No. 255 which provides for a single Total KPA Backout Run which determines the total amount of KPA oil production backed out as a result of all Satellite operations. Section 8.2 further provides for Backout Allocation Runs to allocate the Total KPA Backout among the individual Satellites. This Ballot No. 255A does not provide for a single Total KPA Backout Run. Instead, calculations for each of the following four major elements (Attachment 1) shall be made to separately determine the volume of KPA production backed out by each Satellite because of each of the four elements. The total amount of backed out KPA oil production attributable to a Satellite is the sum of that Satellite's backout volumes for each of these four elements:

1. "Gas and Produced Water Backout" - KPA oil production backed out because of Satellite produced gas, lift gas usage, and produced water.
2. "Injection Water Backout" - KPA oil production backed out because of Satellite water injection.
3. "Electrical Power Backout" - In the event that electrical power becomes a production limiting resource in the Greater Kuparuk Area ("GKA"), KPA oil production backed out because of electrical power rationing.
4. "Proration Adjustments Backout" - In the event that common carrier pipeline prorations occur, and the KPA takes a disproportionate share of the production reduction, the volume of KPA oil production backed out because of the proration reduction. (Note: Production line hydraulics are not taken into consideration at this time since the optimization tools used in daily operations do not have this feature. Upgrades to GASOPT are being developed that will address this and if/when they are implemented, these features will be added to the Backout Model calculations)

D. Gas and Produced Water Backout Calculations.

The Gas and Produced Water Backout calculations are founded upon logic and algorithms from the gas optimization routine (GASOPT) currently used in the GKA for day to day operations. The base GASOPT algorithms have been modified to allow well level forecasts of production for gas lifted wells as a function of lift gas rate, to allow calibration factors to be applied to the input data, and to add produced water facility limits.

Primary inputs to the Gas and Produced Water Backout calculations are monthly average allocated production and gas lift usage at a well level, monthly average gas and water facility capacities, and a tabulation of each Satellite's allocated share of Joint Capital Projects for gas and/or produced water expansion.

Following are brief descriptions of the major steps in the Gas and Produced Water Backout calculations.

1. Precalibration Run - Uses well level gas lift rate, GASOPT gas lift curves, and well availability (all extracted from the field data gathering system on the date of the model run) to estimate production rates. This run shall be called the "Precalibration Run."
2. Derive Calibration Factors - Results of Precalibration Run shall be compared against actual total allocated oil, water, gas, and gas lift values for the month being evaluated and "calibration factors" shall be calculated for each of these components.
3. Calibration Check - The calibration factors shall be used to adjust the GASOPT Gas lift curves and re-estimate production values. The total GKA oil rate forecast from this

calibration check must be within 5% of actual total GKA oil production for the subject. Further model calibration will be necessary if this condition is not initially met.

4. Calibrated Optimization Run – In prior steps, production estimates were driven by actual gas lift usage and well availability. In this step, the GASOPT optimization logic enabled to theoretical production levels are estimated based upon the GASOPT recommendations of gas lift rate and GOR. The total KPA production from this run becomes the basis for backout comparisons since rigorous GASOPT optimization logic will be used in all subsequent runs. At this point (and in all subsequent steps) logic is also employed to check against produced water limits. The only assumed initial produced water constraint is at CPF-1. This is set at the actual CPF-1 produced water rate for the month being evaluated. Other produced water limits will be included when they come into effect.
5. Total Satellite Backout Run - All Satellite production is "turned off" in the calculations and the production potential from the KPA is determined (taking into account gas and produced water facility limits). In this step the gas and produced water facility limits are reduced from the actual values for the subject month to reflect all Satellites' funded shares of applicable facility expansions (see General Approach – Point 6). The difference in KPA production in this step and in Step 4 is the total volume of KPA backout that is assumed to have occurred due to gas and produced water impacts.
6. Backout Allocation Runs - A series of runs is made with one Satellite turned off at a time. For each run, gas and produced water facility limits are adjusted downward to reflect the subject shut-in Satellite's share of any pertinent facility expansions in which they participated. The KPA production in each of these runs is compared to the results of Step 4 to come up with an estimate of the KPA backout resulting from each individual Satellite and the water oil ratio (WOR) of the backed out KPA oil.
7. Backout Allocation - There is a chance that the sum of the KPA backout from individual Satellites being turned off one at a time may not match the total Satellite backout determined in Step 4. To address this, each Satellite's percentage of total backout from the sum of all the backouts in Step 6 is determined. This percentage is then applied against the total backout value from Step 5 to determine the final backout volume attributable to the gas and produced water impacts from each Satellite.

E. Water Injection Backout Calculations.

The primary inputs to the Water Injection Backout calculations are the actual average allocated water injection rates for all Satellite wells, predetermined relationships of KPA oil rate backed out as a result of reduced KPA water injection for each CPF (Water Injection Backout Curves), and a tabulation of each Satellite's allocated share of Jointly funded water injection expansion projects

The initial Water Injection Backout Curves are depicted on Attachment 4. These curves were generated by using the current GKA water optimization program (WATOPT). A series of WATOPT runs were made with reduced water injection rates going to the injection system's most marginal KPA wells at each CPF. For each run, the change in water injection rate at each CPF from the initial base rate and the associated change in "pseudo oil rate" was noted. The "pseudo oil rate" calculation in WATOPT is based upon pattern level estimates of oil production per reservoir barrel of injection (injection efficiency - based upon last 45 days of actual production and injection) multiplied by the WATOPT allocated water injection volume in that run. Ranges of reduced KPA injection of 0 to approximately 50,000 BWPD were evaluated for each CPF. This data was graphed and curve fit in the form of "Delta KPA Oil Rate" as a function of "Delta KPA Injection Rate."

The Water Injection Backout Curves for each CPF will be re-examined at a minimum of once per year with first update due July 1, 1999.

Due to compressibility effects in the reservoir, the production impacts from changes in water injection rates are not seen instantaneously. To account for this, the Water Injection Backout Calculations include the application of a simple one-year discount factor at an arbitrary 10% interest rate.

An adjustment is made in the Water Injection Backout calculations to minimize double counting of backed out KPA production between the Gas and Produced Water Backout calculations and the Water Injection Backout Calculations (see Step 2 below.) The adjustment will be equal to the estimated KPA water injection volume that would have been associated with a Satellite's deferred KPA oil volume (and associated produced gas and produced water volumes) resulting from the Gas and Produced Water Backout calculations. The following equation will be used to calculate the adjustment for each Satellite:

$$\text{Adjustment to Satellite, Injection Water Usage for Gas/Produced Water} = (\text{Satellite, Allocated Backout Volume from Gas and Produced Water}) * (1.2 + \text{Kuparuk WOR}).$$

The 1.2 factor represents the Kuparuk Oil Formation Volume Factor, and the Kuparuk WOR is the water/oil ratio for the deferred Kuparuk oil production associated with the Satellite as estimated in the Backout Allocation Runs described in Section D-6. The magnitude of this adjustment for any Satellite will be limited to no more than 75% of the actual water injection for the month for that Satellite (after adjustments for participation in joint projects).

Following are brief descriptions of the major steps in Water Injection Backout calculations.

1. Actual monthly water injection volumes for each Satellite are tabulated by the CPF from which they take injection water and adjustments are made for the Satellite's participation in any Joint Capital Projects that resulted in increased water injection capacities.
2. The Satellites' water injection volumes are further modified for purposes of these calculations to account for KPA injection water "freed up" from the Gas and Produced Water Backout volumes. Note – the adjustment for any individual Satellite in this step can be not be larger than 75% of that Satellite's injection volume from Step 1 of the Water Injection Backout calculations.
3. At each CPF, the total Water Injection Backout for each Satellite is estimated by using the Water Injection Backout Curve for that CPF. The input water injection rate for these calculations will be the sum of the Step 2 results for each CPF.
4. At each CPF, the "Base Water Injection Backout" allocated to each Satellite is determined by multiplying the total Water Injection Backout at that CPF (Step 3) by the fraction of that CPF's total Satellite water injection (Step 2) associated with that Satellite.
5. The Base Water Injection Backout is then summed for each Satellite across all CPFs.
6. A one-year discount factor is applied to the each Satellite's Base Water Injection Backout value to determine the Water Injection Backout for that Satellite. For purposes of this agreement, a simple one year instantaneous discount factor is calculated using an arbitrary 10% interest rate.

F. Electrical Power Backout Calculations.

Electrical power generation capacity is not currently a constraint to production in the GKA, however, it may be at some point in the future. If this happens, it is envisioned that high water cut KPA wells being lifted with electric submersible pumps may be shut in to free up electrical capacity for more effective use in other reservoirs. To account for this possibility, the following procedure will be in place to estimate the Electrical Power Backout.

1. At the close of each month, the production events data base will be checked to see if any electrical power related production deferrals events occurred in KPA wells in that month. If none occurred, no Electrical Power Backout calculations are necessary. (A new shut-in code will be defined to log these events)
2. The total estimated KPA oil volume backout due to power shortage will be determined from the production events data base and an estimate will be made of additional power that would have been necessary to totally avoid the production backout ("KPA Power Shortfall").
3. The total electrical power used directly by Satellites will be tabulated. This will include power used for Satellite wells and Satellite specific facilities, but will not include any allocated share of power used in KPA or Joint Facilities. The Satellites' power usage will be adjusted to only include power usage in excess of each Satellite's share of funded electrical power generation Joint Capital Projects ("Adjusted Satellite Power Usage").
4. A calculation is made to see what fraction of the total KPA oil volume backed out due to power shortage could have been expected to have been produced if the Satellites were not on-line. If the total KPA Power Shortfall is greater than the total Adjusted Satellite Power Usage, adjust the total KPA oil volume backed out due to power shortage by multiplying it by the ratio of the total Adjusted Satellite Power Usage to the KPA Power Shortfall. If the total KPA Power Shortfall is less than or equal to the total Adjusted Satellite Power Usage, the adjusted KPA oil volume backed out due to power shortage is equal to the base value.
5. The adjusted KPA oil volume backed out due to power shortfall (Step 4) is allocated to the Satellites based upon the each Satellite's percentage of Adjusted Satellite Power Usage (Step 3).

G. Proration Adjustment Backout Calculations.

Section 3.4.2 of Ballot No. 255 provides that production impacts caused by common carrier or marine capacity prorations are to be shared in equal percentages by the KPA and each producing Kuparuk Satellite ("Producing Streams") in proportion to their pre-proration production rates and that if the KPA is disproportionately prorated, adjustments will be made to compensate the KPA. To achieve this objective, the following steps will be taken:

1. At the close of each month, the production events data base will be checked to see if any common carrier pipeline, Valdez tankage, or marine related production prorations ("Proration Events") occurred in that month. If none of these events occurred, no Proration Adjustment Backout calculations are necessary.
2. A tabulation showing each Producing Stream's actual production and estimated production losses ("Estimated Production Losses") from Proration Events will be constructed. For each Producing Stream, the sum of the actual production and the Estimated Production Losses from Proration Events shall be the Producing Stream's "Full Production Potential" for the month. The percentage that the KPA's Full Production Potential bears to the sum of all Producing Streams' Full Production Potential will be deemed the "Target KPA Share" of any proration impacts.
3. The percentage that KPA's actual Estimated Production Losses from Proration Events bears to the total of all Estimated Production Losses from Proration events will be calculated.
4. If KPA's percentage of total Estimated Production Losses from Proration events is less than or equal to the Target KPA Share, no further calculations or adjustments are necessary.

5. If KPA's percentage of total Estimated Production Losses from Proration events is greater than the Target KPA Share, volume adjustments will be necessary. The volume adjustments for each Satellite stream will be determined by first calculating each Satellites' "Target Percentage" (the percentage that Satellite's Full Production Potential (Step 2) bears to the total of all Producing Streams' Full Production Potential). Each Satellite's "Target Volume" then will be calculated by multiplying the Target Percentage by the sum of all Producing Streams' Estimated Production Losses from Proration Events. Each Satellite's actual Estimated Production Losses from Proration Events will be subtracted from the Target Volume for Proration Events to determine that Satellite's "Proration Adjustment." The sum of all Satellites' Proration Adjustment volumes will equal the volume of oil to be allocated to the KPA. Any Satellite with a negative Proration Adjustment volume will receive that volume from the Satellites with positive Proration Adjustment volumes. Note that adjustment of proration volumes between Satellites will not occur if the results of Step 4 dictate that a KPA adjustment is not necessary.

H. Net Satellite Backout and Net Backout Share.

1. Upon completion of the backout calculations specified in Sections D, E, F and G above, the total amount of backed out KPA oil production attributable to each of the Kuparuk Satellites shall be determined in accordance with this Section H. For the purposes of this Ballot No. 255A, this determination shall be called the Net Satellite Backout.
2. The Net Satellite Backout for each Kuparuk Satellite shall be determined by adding together the Gas and Produced Water Backout for that Satellite, the Water Injection Backout for that Satellite, the Electrical Power Backout for that Satellite, and the Proration Adjustment Backout for that Satellite. (See part of Attachment 7 labeled "Overall Backout Summary.")
3. The Net Satellite Backout for each Satellite shall be multiplied by a Backout Modification Factor in accordance with Section 8.3 of Ballot No. 255.
4. The Net Backout Share allocated by each Satellite to the KPA Owners shall be adjusted in accordance with Section 8.52 of Ballot No. 255 to account for severance taxes and royalties.

I. Backout Model Modification Procedures.

1. Water Injection Backout Curves – As noted in Section E, the relationships describing the KPA oil impacts as a function of changing KPA water injection rates will be updated at least annually. The Operator may choose to use a WATOPT based methodology (as used in the initial curves), or choose a different technique if in the Operator's judgement this will yield a more accurate result. The Operator will notify the KPA owners of the new relationships and method of analysis, however, no KPA approval is required so long as the year-to-year change is less than 20% at all points within the range of rates investigated at each CPF. If the change is greater than 20%, an 88% KPA vote is required to implement the new relationships. The first update is due by July 1, 1999. Updates are due on July 1 of each succeeding year.
2. Modifications to Match Optimization Techniques Used in the Field – From time to time, new tools and methods are implemented to better optimize daily production and injection operations. The Operator may update the detailed calculations in the Backout Model to match the new field optimization techniques without KPA approval, so long as the overall logic of the model is not changed (as described in Attachment 1).

3. Other Minor Modifications – Other minor changes to correct errors or improve results may be implemented by the Operator without KPA approval so long as the overall logic is not affected.
4. Modifications to the Overall Logic – Any modifications to the overall logic as described in this ballot and summarized in Attachment 1 requires an 88% vote of the KPA owners.

ARCO ALASKA, INC.

JMR By: Scott Jess Date: 3/9/88
Title: Superior Development Manager

BP EXPLORATION (ALASKA) INC.

By: _____ Date: _____
Title: _____

CHEVRON U.S.A. INC.

By: _____ Date: _____
Title: _____

EXXON CORPORATION

By: _____ Date: _____
Title: _____

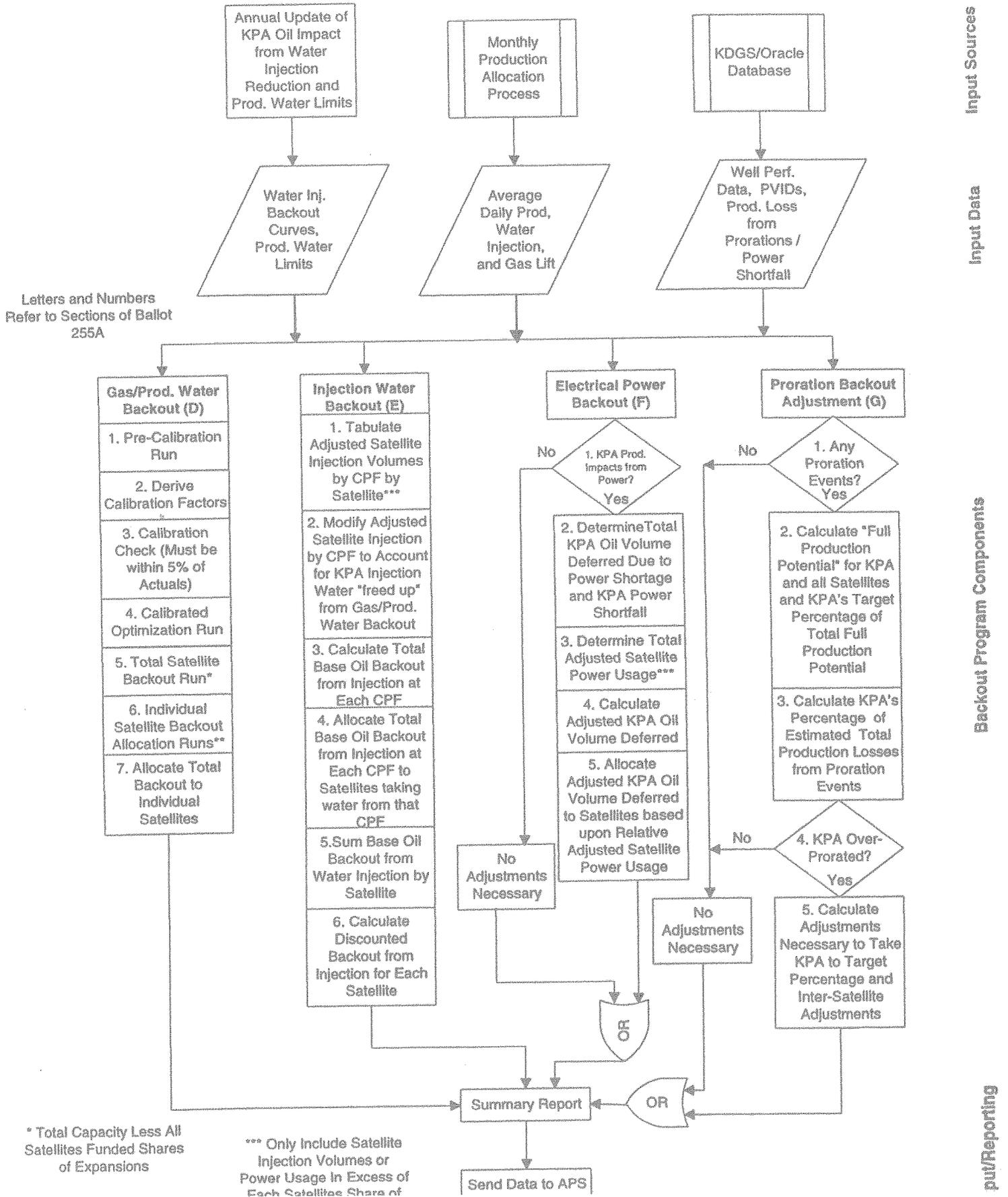
MOBIL OIL CORPORATION

By: _____ Date: _____
Title: _____

UNION OIL COMPANY OF CALIFORNIA

By: _____ Date: _____
Title: _____

Attachment 1 - Ballot 255A Production Backout Model Summary Flowchart



Input Sources

Input Data

Backout Program Components

put/Reporting

Attachment 2 - Ballot 255A
 Example Calculations - Gas and Produced Water Backout
 October, 1997 Data

Actual Allocated Production	<u>BOPD</u>	<u>BWPD (p)</u>	<u>MCFD (p)</u>	<u>MCFD (lift)</u>
Kuparuk Reservoir	262025	495923	303121	221736
Satellite 1	3857	8359	5873	6532
Satellite 2	1150	518	857	2400
Satellite 3	4705	5817	3699	5592
Total	271737	510617	313550	236260

Gas Meters	MCFD
CPF-1 Injection	97847
CPF-2 Injection	132837
CPF-1 Lift Gas Compr	174972
CPF-2 Lift Gas Compr	209354
CPF-3 Lift Gas Compr	118765

Pre Calibration Run	<u>BOPD</u>	<u>BWPD (p)</u>	<u>MCFD (p)</u>	<u>MCFD (lift)</u>
Kuparuk Reservoir	259708	448712	282135	219521
Satellite 1	3981	8056	4961	6532
Satellite 2	1204	598	873	2400
Satellite 3	5160	5036	2590	5592
Total	270052	462402	290558	234045

Gas and Produced Water Model Calibration Factors	
Oil	1.0062
Water	1.1043
Produced Gas	1.0791
Lift Gas	1.0095

Calibration Run	<u>BOPD</u>	<u>BWPD (p)</u>	<u>MCFD (p)</u>	<u>MCFD (lift)</u>
Kuparuk Reservoir	261503	497016	305312	219521
Satellite 1	3998	8879	5346	6532
Satellite 2	1206	658	940	2400
Satellite 3	5181	5549	2789	5592
Total	271890	512102	314387	234045

Calibrated Optimization Run	<u>BOPD</u>	<u>BWPD (p)</u>	<u>MCFD (p)</u>	<u>MCFD (lift)</u>
Kuparuk Reservoir	260015	469044	299547	252313
Satellite 1	4434	10528	5757	9895
Satellite 2	1246	698	957	2641
Satellite 3	4757	4358	2555	4138
Total	270452	484628	298816	268987

Total Satellite Backout Run	<u>BOPD</u>	<u>BWPD (p)</u>	<u>MCFD (p)</u>	<u>MCFD (lift)</u>
Kuparuk Reservoir	263025	482704	293014	264828
Satellite 1	0	0	0	0
Satellite 2	0	0	0	0
Satellite 3	0	0	0	0
Total	263025	482704	293014	264828

Backout Allocation Run 1	<u>BOPD</u>	<u>BWPD (p)</u>	<u>MCFD (p)</u>	<u>MCFD (lift)</u>
Kuparuk Reservoir	261088	480068	291254	256296
Satellite 1 (off)	0	0	0	0
Satellite 2	1246	698	957	2641
Satellite 3	4757	4358	2555	4138
Total	267090	485124	294766	263075

Backout Allocation Run 2	<u>BOPD</u>	<u>BWPD (p)</u>	<u>MCFD (p)</u>	<u>MCFD (lift)</u>
Kuparuk Reservoir	260196	469436	289798	255662
Satellite 1	4434	10528	5757	9895
Satellite 2 (off)	0	0	0	0
Satellite 3	4757	4358	2555	4138
Total	269387	484322	298110	269695

Backout Allocation Run 3	<u>BOPD</u>	<u>BWPD (p)</u>	<u>MCFD (p)</u>	<u>MCFD (lift)</u>
Kuparuk Reservoir	261771	471289	291057	257496
Satellite 1	4434	10528	5757	9895
Satellite 2	1246	698	957	2641
Satellite 3	0	0	0	0
Total	267451	482514	297771	270039

Gas/ PW Backout Summary	<u>% total</u>	<u>BOPD</u>	<u>BBLs</u>	<u>BO WOR</u>
Satellite 1	36	1073	33263	10.3
Satellite 2	6	181	5611	2.2
Satellite 3	58	1756	54436	1.3
Total	100	3010	93310	

Attachment 3 - Ballot 255A
Example Calculations - Water Injection Backout
 (October 1997 Data with 1F, 2E, and 3Q Assumed to be Satellites)

Note (4) Calculations				
	Gas/PW Backout BOPD	WOR of Gas/PW BO	Average KPA Bo RVB/STB	WI Adjustment BWIPD
Satellite 1	1073	10.3	1.2	12312
Satellite 2	181	2.2	1.2	609
Satellite 3	1756	1.3	1.2	4352

Calculate Disc. Factor (13)	10%
Dis. Rate	0.909090909
Dis Fact.	

Satellite Reservoir	(12) Raw Alloc Backout MBOD	(14) Discounted Alloc BO MBOD
1	0.142	0.129
2	0.159	0.145
3	0.964	0.876
Total	1.265	1.150

- Notes:
- (1) Input average injection rates for all Satellite Reservoirs
 - (2) Input each satellite's share of capacity from WI expansion projects
 - (3) Calculate adjusted injection for each satellite at each CPF (usage less expansion) (Adjusted injection set to greater of 0 or actual usage less share of expansion capacity)
 - (4) Potential WI Adjustment from Gas/PW Backout
 - (5) Specified Maximum % Reduction from Gas/PW Adjustment to Injection
 - (6) Calculate Final Adjusted WI by Satellite Including Limit on Max Reduction
 - (7) Calculate % Reduction (Column 6 vs. Column 5)
 - (8) Sum All Adjusted Satellite Injection by CPF
 - (9) Calculate total raw backout from equations by CPF using total satellite inj. At each CPF
 - (10) Calculate % of Satellite injection at each CPF attributable to each satellite reservoir
 - (11) Apply %'s to each reservoir at each CPF against total raw backout to get raw allocated backout
 - (12) Sum the raw allocated backouts by satellite reservoir
 - (13) Calculate Discount Factor
 - (14) Multiply discount factor by each satellite reservoir's raw allocated backout volume

	(1) Act. Inj BWIPD	(2) Expansion BWIPD	(3) Adj 1 BWIPD	(4) PW/Gas Adj BWIPD	(6) Adj 2 BWIPD	(7) % Reduction of Adj 1
Satellite 1	12984	0	12984	12312	3248	75%
Satellite 2	4557	0	4557	609	3948	13%
Satellite 3	7936	0	7936	4352	3584	55%

Maximum Gas/PW Reduction= 75% (5)

Assumed Satellite DS	CPF	(8) Satellite Reservoir	Adjusted MEWIPD	(10) % CPF Sat Injection	(11) Alloc. Backout MBOD
1F	CPF-1	1	3.249	1.00	0.142
	CPF-1			0.00	0.000
	CPF-1			0.00	0.000
CPF-1 Total			3.249		0.142
CPF-1 Total Backout(MBOD)				0.142 (9)	
2E	CPF-2	2	3.948	1	0.159
CPF-2 Total			3.948		
CPF-2 Total Backout(MBOD)				0.159 (9)	
3Q	CPF-3	3	3.584	1	0.964
CPF-3 Total			3.584		
CPF-3 Total Backout(MBOD)				0.964 (9)	
Total					1.265

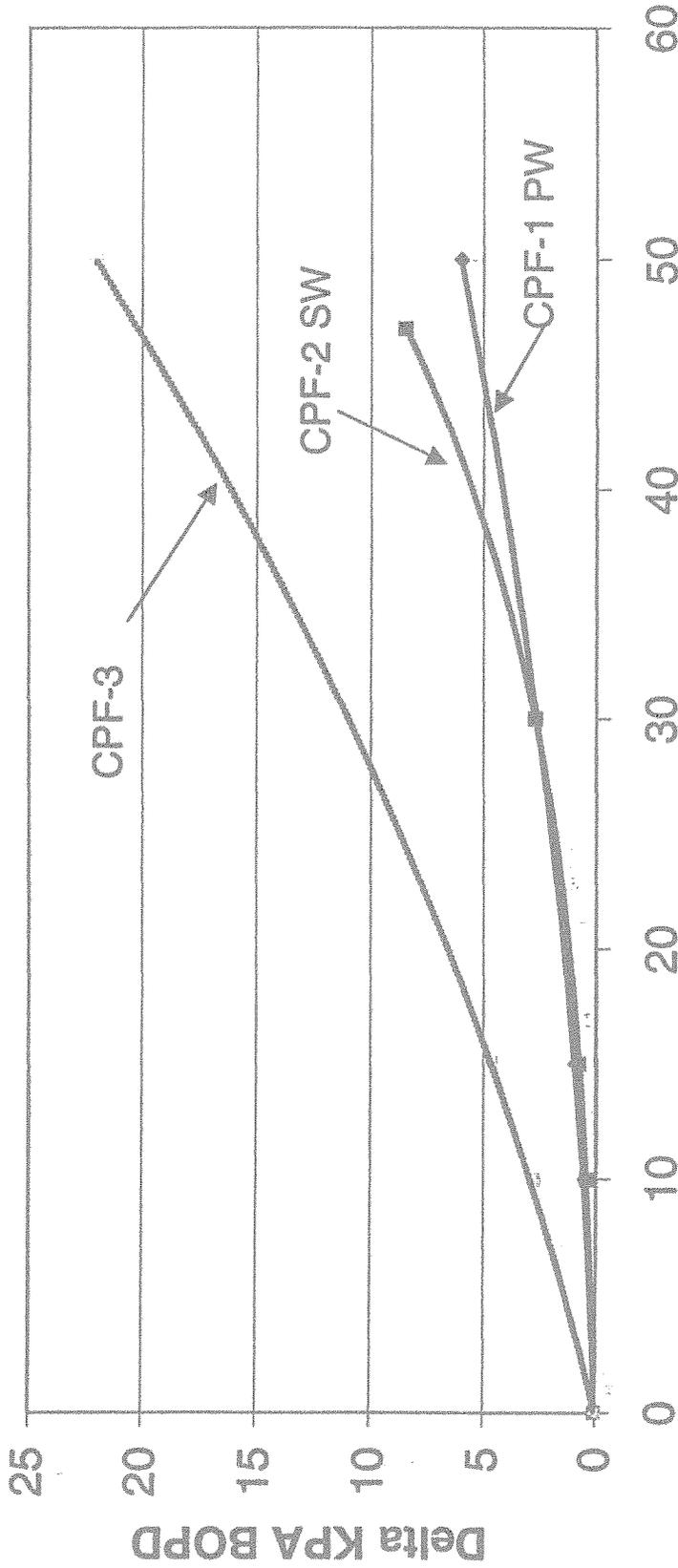
Initial Equations (1/297)

$CPF-1 \quad y = 0.0016x^2 + 0.0394x$
 $CPF-2 \quad y = 8E-05x^3 - 0.0007x^2 + 0.0418x$
 $CPF-3 \quad y = 0.0037x^2 + 0.2557x$

$y =$ MBOD Oil Backout; $x =$ MBOD Injection Water taken from KPA
 (or both can be in BOPD)

Attachment 4 - Ballot 255A
Initial Water Injection Backout Curves by CPF

Injection Water Backout By CPF



Delta BWPD (Injection)

CPF-1:

$$y = 0.0016x^2 + 0.0384x$$

$$R^2 = 0.9996$$

CPF-3:

$$y = 0.0037x^2 + 0.2557x$$

$$R^2 = 0.9999$$

CPF-2:

$$y = 8E-05x^3 - 0.0007x^2 + 0.0418x$$

$$R^2 = 1$$

Attachment 5 - Ballot 255A
Example Calculations for Electrical Power Backout
 (Example Data Only)

(1)	(2)	(3)	(4)	(5)	(6)
MW Used	Share of Expansion MW	MW Used - Share Exp	Adjusted Sat. Power	Alloc. Ratio	Allocated Sat. Backout
Satellite 1	5	5	0	0.00	0
Satellite 2	10	5	5	0.83	0
Satellite 3	1	0	1	0.17	0
Total	16	10	6	1	0

Total KPA Oil Volume Deferred from Power Shortfall = 0 BOPD (7)
 KPA Power Shortfall = 0 MW (8)

Calculate KPA Volume Adjustment Fraction = 1 (9)

Adjusted KPA Oil Volume Deferred from Power Shortfall = 0 BOPD (10)

Notes

- (1) Actual Satellite Power Usage
- (2) Each Satellites' Proportionate Share of any Power Expansion Projects that have been completed
 (Based upon satellites cost participation fraction * nominal expansion capacity)
- (3) (1) - (2)
- (4) 0 or Column (3), whichever is greater
 (To cover cases where a satellite is using less than the capacity it has funded)
- (5) Ratio of (4) to Total Adjusted Satellite Power
- (6) Column (5) times Adjusted KPA Oil Volume(10) - These Values Carried forward to Summary
- (7) Total Kuparuk Oil Rate Shut in due to Power Shortfall
- (8) Additional Power needed to produce Oil Rate in (7)
- (9) Equal to the lesser of 1.0 or ratio of Total of Column (4)/KPA Power Shortfall (8)
 (To adjust for possibility that KPA needed more Power than Total Adjusted Satellites Usage)
- (10) Total Adjusted KPA Oil Volume Deferred from Power Shortfall (7)* (9)

Attachment 6 - Ballot 255A

Example Calculations -Proration Backout Adjustments
October 1997 Production Data/August 1997 Proration Data
(1F, 2E, and 3Q are assumed to be satellites)

	Alloc Prod. BBLs (1)	Actual PL Proration BBLs (2)	Potential Production BBLs (3)	Fraction of Potential Production (4)	Target Proration BBLs (5)	Theoretical Adjustment BBLs (6)	Actual Adjustment BBLs (7)
Kuparuk	8,117,248	57,742	8,174,990	96.43%	57,115	-627	-627
Sat 1 (1F)	119,554	1,486	121,040	1.43%	846	-640	-640
Sat 2 (2E)	35,656	0	35,656	0.42%	249	249	249
Sat 3 (3Q)	145,799	0	145,799	1.72%	1,019	1,019	1,019
Total	8,418,257	59228	8477485	1	59228	0.00000	0.00000

Notes

- (1) Actual allocated production
- (2) Reported SI average BBLs from Pipeline and Marine Events (SI codes 48,82, and 46)
- (3) Potential Production = Sum of actual production plus proration
- (4) KPA or Satellite fraction of total potential production
- (5) Estimated proration if proportionately applied to all producers. Equal to Fraction of Potential Prod. * Total Actual Proration
- (6) Theoretical Adjustment = Target Proration - Actual Proration (if it's a positive number, it means that entity was under-prorated)
- (7) Actual Adjustment - Zero unless the KPA was over-prorated. If KPA over-prorated, then it's equal to the Theoretical Adjustment

Adjustment Occurs only if KPA is over-prorated. No provisions in Alignment agreement for any adjustments between satellites other than as necessary to come up with a volume necessary to compensate the KPA for backout.

If there are no pipeline related prortions in a given month, then we do not have to do this calculation at all

**Attachment 7 - Ballot 255A
Example Backout Summary Report**

Gas and Produced Water Backout Results

	<u>%</u>	<u>BOPD</u>	<u>BBLs</u>	<u>WOR</u>
Satellite 1	36	1073	33263	10
Satellite 2	6	181	5611	2
Satellite 3	58	1756	54436	1
Total	100	3010	93310	

Injection Water Backout Results

	<u>Actual</u>	<u>Adjusted</u>	<u>Discounted Backout</u>	
	<u>BWIPD</u>	<u>BWIPD</u>	<u>BOPD</u>	<u>BBLs</u>
Satellite 1	12994	3249	129	3991
Satellite 2	4557	3948	145	4482
Satellite 3	7936	3584	876	27164
Total	25487	10780	1150	35638

Pipeline (PL) Proration Backout Adjustment Results

	<u>Proration</u>	<u>%</u>	<u>Production</u>	<u>Total</u>	<u>%</u>
	<u>BBLs</u>	<u>Proration</u>	<u>BBLs</u>	<u>BOPD</u>	<u>Total</u>
Kuparuk R.	57,742	97.49%	8,117,248	8174990	96.43%
Satellite 1	1,486	2.51%	119,554	121040	1.43%
Satellite 2	0	0.00%	35,656	35656	0.42%
Satellite 3	0	0.00%	145,799	145799	1.72%
Total	59228		8418257	8477485	

	<u>Backout</u>	
	<u>BBLs</u>	<u>BOPD</u>
Satellite 1	-640	-21 (- means receive)
Satellite 2	249	8 (+ means give)
Satellite 3	1019	33
Total(To KPA)	627	20

Electrical Power Backout Output

KPA Production Impact	0 BOPD
KPA Power Shortfall	0 MW
Adjusted KPA Prod Impact	0 BOPD

	<u>Total</u>	<u>Adjusted</u>	<u>Backout</u>	<u>Backout</u>
	<u>Power</u>	<u>Power</u>	<u>BOPD</u>	<u>BBLs</u>
Satellite 1	5	0	0	0
Satellite 2	10	5	0	0
Satellite 3	1	1	0	0
Total	16	6	0	0

Overall Backout Summary

	<u>Gas/PW</u>	<u>WI</u>	<u>BOPD</u>	<u>Power</u>	<u>Total</u>
			<u>Proration</u>		
Satellite 1	1073	129	-21	0	1181
Satellite 2	181	145	8	0	334
Satellite 3	1756	876	33	0	2665
Total	3010	1150	20	0	4180

	<u>Gas/PW</u>	<u>WI</u>	<u>BBLs</u>	<u>Power</u>	<u>Total</u>
			<u>Proration</u>		
Satellite 1	33263	3991	-640	0	36614
Satellite 2	5611	4482	249	0	10342
Satellite 3	54436	27164	1019	0	82619
Total	93310	35638	627	0	129575

	<u>Produced</u>	<u>Backout</u>	<u>Backout</u>
	<u>BOPD</u>	<u>BOPD</u>	<u>%</u>
Satellite 1	3,856	1181	31%
Satellite 2	1,151	334	29%
Satellite 3	4,703	2665	57%
Total	9711	4180	43%

**Attachment 8 - Ballot 255A
Joint Facility Expansion Capacities**

Tabulation of Cumulative Joint Facility Expansion Capacities (3)

	Lift Gas		Produced Water Handling		Gas Injection		Water Injection		Electrical Generation MW
	CPF-1 MMCFD	CPF-2 MMCFD	CPF-1 BWPD	CPF-2 BWPD	CPF-1 BWPD	CPF-2 BWPD	CPF-1 BWPD	CPF-2 BWPD	
Satellite	MMCFD	MMCFD	BWPD	BWPD	MMCFD	BWPD	BWPD	BWPD	
West Sak									
Tabasco									
Tam									
Other1									
Other 2									
Total									

Notes:

- (1) Calculations of this form will be completed for all Joint Facility Expansion projects that affect gas, prod. water, injection water, or electrical capacities of the KPA facilities.
- (2) The total capacity of each project will be allocated to the Satellites in the same proportion as capital costs are shared (as specified in the AFC).
- (3) A cumulative tabulation of Satellites' allocated facility expansion capacities will be maintained for use in the Backout Calculations.

**Calculations for Individual Project
(1), (2)**

Frame 6 Gen Addition	
Total Capacity 40 MW	
Cost Share	Nominal MW
Satellite	
West Sak	30.5%
Tabasco	23.4%
Tam	13.3%
Other1	0.0%
Other 2	0.0%