WHAT IS CLAIMED IS:

1. A method for producing a brightstock extract, comprising:

establishing a first correlation between

a) a fractional weight boiling temperature for a brightstock extract derived from a resid fraction, and

b) a ~~distillation cut point~~ fractional weight boiling temperature of the resid fraction, ~~for separating~~ the resid fraction comprising a vacuum resid fraction separated from a feedstock, the feedstock comprising the vacuum resid fraction and at least one distillate fraction,

where the first correlation has a linear correlation slope of ~~0.5~~ 0.95 or less;

establishing a second correlation between the fractional weight boiling temperature for a brightstock extract and a mutagenicity index value;

selecting, based on the first correlation and the second correlation, a distillation cut point temperature corresponding to a mutagenicity index for a brightstock extract of 0.5 or less;

distilling a feedstock at the selected distillation cut point temperature to separate one or more distillate fractions from a resid fraction;

deasphalting the separated resid fraction to form a deasphalted oil fraction; and

performing a solvent extraction on the deasphalted oil to form a brightstock extract fraction having the mutagenicity index of 0.5 or less.

~~2. The method of claim 1, wherein the first correlation includes:~~

~~(1) a correlation between a fractional weight boiling temperature for a vacuum resid fraction and a distillation cut point temperature for separating the vacuum resid fraction from a feedstock, and~~

~~(2) a correlation between a fractional weight boiling temperature for a brightstock extract derived from the vacuum resid fraction, and the fractional weight boiling temperature for the vacuum resid fraction.~~

2. The method of claim 1, wherein the method further comprises:

establishing a third correlation between the fractional weight boiling temperature for the resid fraction and a distillation cut point temperature for separating the resid fraction from the feedstock,

wherein selecting the distillation cut point temperature comprises selecting a distillation cut point temperature based on the first correlation, the second correlation, and the third correlation.

3. The method of claim 2, wherein the third correlation between the fractional weight boiling temperature for the resid fraction and the distillation cut point temperature for separating the resid fraction from the feedstock has a linear correlation slope of 0.60 or less.

~~3.~~4. The method of claim ~~2~~ 1, wherein the correlation between the fractional weight boiling temperature for the brightstock extract derived from the vacuum resid fraction, and the fractional weight boiling temperature for the vacuum resid fraction ~~is~~ has a linear correlation slope of 0.90 or less.

~~4.~~5. The method of claim 1, wherein the fractional weight boiling temperature for the ~~vacuum~~ resid fraction is a 5 wt% boiling temperature.

~~5.~~6. The method of claim 1, wherein the fractional weight boiling temperature for the brightstock extract derived from a resid fraction is one of a 5 wt%, a 10 wt%, or a 20 wt% boiling temperature.

~~6.~~7. The method of claim 1, wherein the distillation cut point temperature is selected to correspond to a mutagenicity index of less than 0.4.

~~7.~~8. The method of claim 1, wherein the second correlation has a linear correlation slope of at least -0.015.

~~8.~~9. The method of claim 1, wherein the second correlation also includes a correlation between a fractional weight boiling temperature for a deasphalted oil and a mutagenicity index value.

~~9.~~10. The method of claim 1, wherein the second correlation also includes a correlation between a fractional weight boiling temperature for a brightstock raffinate and a mutagenicity index value.

~~10.~~11. The method of claim 1, wherein the distillation cut point is selected based on a 95% confidence interval of the linear correlation slope for the first correlation.

~~11.~~12. The method of claim 1, wherein the distillation cut point is selected based on a 95% confidence interval of the linear correlation slope for the second correlation.

~~12.~~13. A method for producing a brightstock extract, the method comprising:

selecting a distillation cut point temperature between a resid fraction and one or more distillate fractions, the distillation cut point temperature corresponding to a mutagenicity index value of 0.5 or less for a brightstock extract formed from the resid fraction, the distillation cut point temperature being based on,

(a) a first correlation between a fractional weight boiling temperature for a vacuum resid fraction and a distillation cut point temperature for separating the vacuum resid fraction from a feedstock,

(b) a second correlation between a fractional weight boiling temperature for a brightstock extract derived from the vacuum resid fraction, and the fractional weight boiling temperature for the vacuum resid fraction, wherein the ~~first~~ second correlation has a linear correlation slope of 0.90 or less, and

(c) a third correlation between the fractional weight boiling temperature for the brightstock extract and a mutagenicity index value;

~~passing~~ distilling a feedstock ~~through a distillation tower to produce the~~ to separate one or more distillate fractions ~~and the~~ from a resid fraction at the selected

distillation cut point temperature ~~between the resid fraction and the one or more distillate fractions~~;

passing at least a portion of the separated resid fraction through a deasphalting unit to produce at least a deasphalted oil fraction; and

passing the deasphalted oil fraction through a solvent extraction unit to produce at least a brightstock extract having a mutagenicity index value of 0.5 or less.

~~13.~~14. The method of claim ~~12~~ 13, wherein the distillation cut point temperature is selected based on a mutagenicity index value for the brightstock extract of less than 0.4.

~~14.~~15. The method of claim ~~12~~ 13, wherein the third correlation has a linear correlation slope of at least -0.015.

~~15.~~16. The method of claim ~~12~~ 13, wherein the third correlation also includes a correlation between a fractional weight boiling temperature for a deasphalted oil and a mutagenicity index value.

~~16. The method of claim 12, wherein the third correlation also includes a correlation between a fractional weight boiling temperature for a deasphalted oil and a mutagenicity index value.~~

17. The method of claim ~~12~~13, wherein the third correlation also includes a correlation between a fractional weight boiling temperature for a brightstock raffinate and a mutagenicity index value.

18. The method of claim ~~12~~ 13, wherein the distillation cut point is selected based on a 95% confidence interval of the linear correlation slope for the first correlation.

19. The method of claim ~~12~~ 13, wherein the distillation cut point is selected based on a 95% confidence interval of the linear correlation slope for the third correlation.