The Jurassic Source Rock Potential of the Celtic Sea and Western Approaches

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Appendices

1. Histogram and Probability Plots

Total Organic Carbon (TOC) and Hydrogen Index data were plotted using a script in MATLAB to produce a series of histograms and probability plots. Plots were produced for all intervals with data but only the plots for the Jurassic intervals are included here.

1.1. MATLAB Scripts

1.1.1. Script 1

Script 1 was used to create histograms and probability plots for all the data.

```
%Import Source Rock Data from excel
[data]=xlsread('Full_Pyrolysis_Data_170424','Combined');

All=data(:,8);

%*************************************************************

    %Plot data where TOC > 10% between a scale of 0-10
    histogram(All(:,1),'BinMethod','fd')
    set(gca,'xlim',[0 10])
    xlabel('HI (ppm)')
    ylabel('No. Samples')
    saveas(gcf,sprintf('HistAllmax.png'))

    %Plot the a histogram of all the data with no x-axis limits
    histogram(All(:,1),'BinMethod','fd')
    xlabel('HI (ppm)')
    ylabel('No. Samples')
    saveas(gcf,sprintf('HistAll.png'))

    %Plot the a histogram of all the data with x-axis scaled between
0-3%
    %TOC
    histogram(All(:,1),'BinMethod','fd','BinLimits',[0,3])
    set(gca,'xlim',[0 3])
    xlabel('HI (ppm)')
    ylabel('No. Samples')
    saveas(gcf,sprintf('HistAlllim.png'))
```

```
%Probability plot with a normal distribution
probplot('normal',All(:,1));
xlabel('HI (ppm)')
saveas(gcf,sprintf('ProbAll.png'))
```

1.1.2. Script 2

Script 2 was used to create histograms and probability plots for bulk intervals and individual wells.

```
function SourceRockPlots170427
%Import Source Rock Data from excel
[data]=xlsread('Full_Pyrolysis_Data_170424','Matlab');
%Extract index for each plot
plot=data(:,1);
%Extract depth data
depth=data(:,8);
%Extract Organic Carbon % and store in TOC
toc=data(:,9);
%Extract Max temperature data
Tmax=data(:,10);
%Extract Hydrogen Index data
hi=data(:,15);
%Extract PI data
pi=data(:,16);
%Extract Oxygen Index data
oi=data(:,17);
%Extract depth data
potyield=data(:,19);
%Extract depth data
basin=data(:,33);

%Import Source Rock Data from excel
% [data,TXT]=xlsread('Full_Pyrolysis_Data_170424','Matlab Plots');
% code=data(:,1);
% title=TXT(:,1);

%************************************************************
A=horzcat(plot,toc);
B=horzcat(plot,hi);
```

```
% leg = char(title(:,1));

%Count each unique plot
plotU=unique(plot);
M=numel(plotU);

N=0;
[~]= PlotFunc(M,A,N);

% %Loop to produce plot for HI
%     for ind2=1:3
%     N=ind2;
N=1;
[~]=PlotFunc(M,B,N);
%     end

    function [A1,datamax]= PlotFunc(M,A,N)
        for i=1:M
            %Obtain the locations of each plotcode which are equal
to the ith plot
            ind1 = A(:,1) == i;
            A1 = A(ind1,:);
            %Set Plot Colours
            if i==31||i==35||i==36||i==43||i>48||i==46
                Co=[0, 1, 0];
            elseif
i==32||i==37||i==38||i==42||i==39||i==44||i==47||i==48
                    Co=[0, 0, 1];
            elseif i==33||i==40||i==41||i==45
                        Co=[1, 0, 1];
            elseif i==30
                            Co=[1, 1, 0];
            elseif i==34
                                Co=[0, 0, 0];
            elseif i<30
                                Co=[0, 0, 0];
            end

            %Find max data in question
            datamax=max(A1(:,2));

        %     %Set Legend info
```

```
        %     if code(:,1)==i
        %         x=1
        %     Title = title

              if N==0
                  Xstring='TOC (%)';
              else
                  Xstring='HI (ppm)';
              end

            %Plot data where TOC > 10% between a scale of 0-10
            if datamax>10
            histogram(A1(:,2),'BinMethod','fd','FaceColor',Co)
            set(gca,'xlim',[0 10])
            xlabel(Xstring)
            ylabel('No. Samples')
            saveas(gcf,sprintf('Histmax%d%d.png',N,i))
            end

            %Plot the a histogram of all the data with no x-axis
limits
            h=histogram(A1(:,2),'BinMethod','fd','FaceColor',Co);
            xlabel(Xstring)
            ylabel('No. Samples')
            saveas(gcf,sprintf('Hist%d%d.png',N,i))

            %Plot the a histogram of all the data with x-axis scaled
between 0-3% TOC

histogram(A1(:,2),'BinMethod','fd','BinLimits',[0,3],'FaceColor',Co)
            set(gca,'xlim',[0 3])
            xlabel(Xstring)
            ylabel('No. Samples')
            saveas(gcf,sprintf('Histlim%d%d.png',N,i))

            %Probability plot with a normal distribution
            probplot('normal',A1(:,2));
            xlabel(Xstring)
            ylabel('Probability')
            legend('Normal','Data')
            saveas(gcf,sprintf('Prob%d%d.png',N,i))
        end
```

```
    end
end
```

1.1.3. Script 3

Script 3 was written to create histogram and probability plots for each Basin.

```
function SourceRockPlots_Sub_basins_170526
%Import Source Rock Data from excel
[data]=xlsread('Full_Pyrolysis_Data_170424','Matlab_Sub_basins');
%Extract index for each plot
plot=data(:,1);
%Extract depth data
depth=data(:,8);
%Extract Organic Carbon % and store in TOC
toc=data(:,9);
%Extract Max temperature data
Tmax=data(:,10);
%Extract Hydrogen Index data
hi=data(:,15);
%Extract PI data
pi=data(:,16);
%Extract Oxygen Index data
oi=data(:,17);
%Extract depth data
potyield=data(:,19);

%Import Source Rock Data from excel
% [data,TXT]=xlsread('Full_Pyrolysis_Data_170424','Matlab Plots');
% code=data(:,1);
% title=TXT(:,1);

%*************************************************************
A=horzcat(plot,toc);
B=horzcat(plot,hi);
% leg = char(title(:,1));

%Count each unique plot
plotU=unique(plot);
M=numel(plotU);

N=0;
```

```
[~]= PlotFunc(M,A,N);

% %Loop to produce plot for HI
%     for ind2=1:3
%     N=ind2;
N=1;
[~]=PlotFunc(M,B,N);
%     end

    function [A1,datamax]= PlotFunc(M,A,N)
        for i=1:M
            %Obtain the locations of each plotcode which are equal
to the ith plot
            ind1 = A(:,1) == i;
            A1 = A(ind1,:);
            %Set Plot Colours
            if
i==16||i==1||i==7||i==22||i==23||i==31||i==35||i==38||i==39||i==3||i
==28||i==18
                Co=[0, 1, 0];
            elseif
i==2||i==4||i==5||i==8||i==11||i==12||i==13||i==19||i==24||i==29||i=
=32||i==36||i==40||i==41||i==42||i==45
                    Co=[0, 0, 1];
            elseif
i==9||i==14||i==15||i==20||i==25||i==26||i==30||i==33||i==37||i==43|
|i==44
                        Co=[1, 0, 1];
            elseif i==6||i==17||i==27||i==34
                            Co=[1, 1, 0];
            else
                Co=[0, 0, 0];
            end

            %Find max data in question
            datamax=max(A1(:,2));

        %     %Set Legend info
        %     if code(:,1)==i
        %         x=1
        %     Title = title
```

```
                if N==0
                    Xstring='TOC (%)';
                else
                    Xstring='HI (ppm)';
                end

            %Plot data where TOC > 10% between a scale of 0-10
            if datamax>10
            histogram(A1(:,2),'BinMethod','fd','FaceColor',Co)
            set(gca,'xlim',[0 10])
            xlabel(Xstring)
            ylabel('No. Samples')
            saveas(gcf,sprintf('Histmax%d%d.png',N,i))
            end

            %Plot the a histogram of all the data with no x-axis
limits
            h=histogram(A1(:,2),'BinMethod','fd','FaceColor',Co);
            xlabel(Xstring)
            ylabel('No. Samples')
            saveas(gcf,sprintf('Hist%d%d.png',N,i))

            %Plot the a histogram of all the data with x-axis scaled
between 0-3% TOC

histogram(A1(:,2),'BinMethod','fd','BinLimits',[0,3],'FaceColor',Co)
            set(gca,'xlim',[0 3])
            xlabel(Xstring)
            ylabel('No. Samples')
            saveas(gcf,sprintf('Histlim%d%d.png',N,i))

            %Probability plot with a normal distribution
            probplot('normal',A1(:,2));
            xlabel(Xstring)
            ylabel('Probability')
            legend('Normal','Data')
            saveas(gcf,sprintf('Prob%d%d.png',N,i))
        end
    end
end
```

1.2. Images

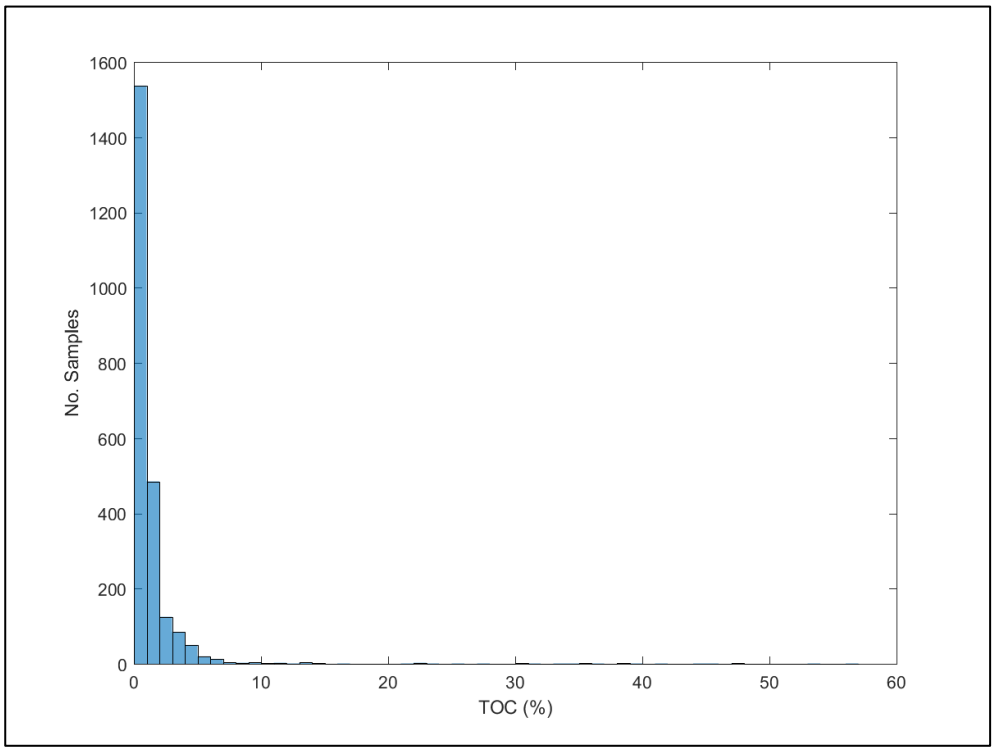

Fig 1.1. Histogram plot of all TOC data for the region of interest.

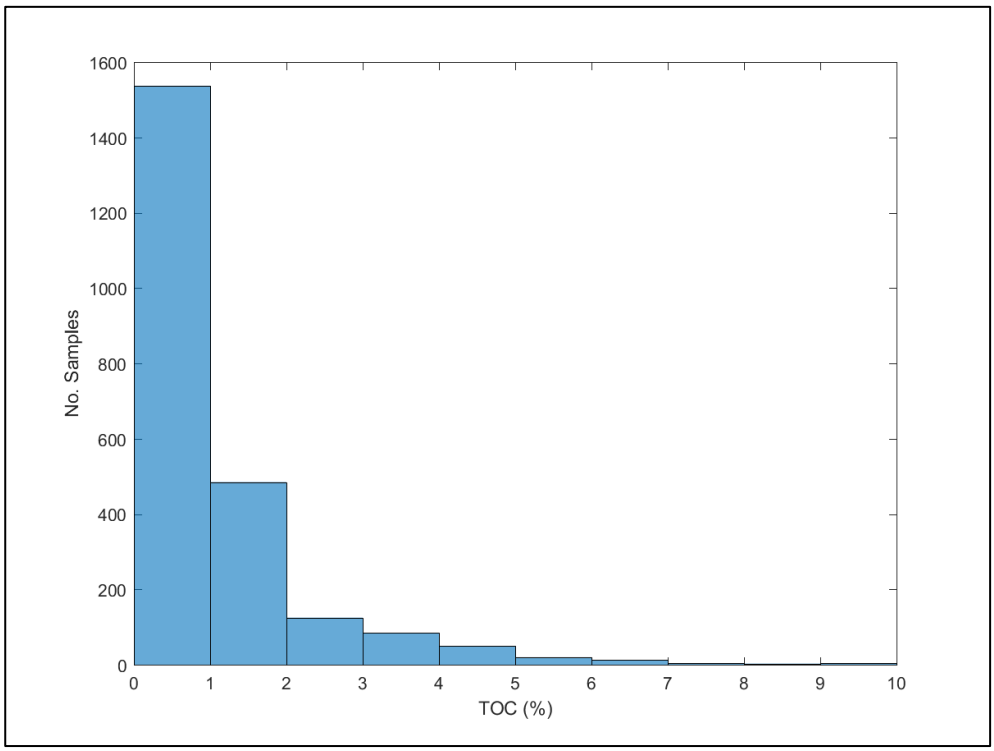

Fig 1.2. Histogram plot of all TOC data for the region of interest scaled to 0-10% TOC.

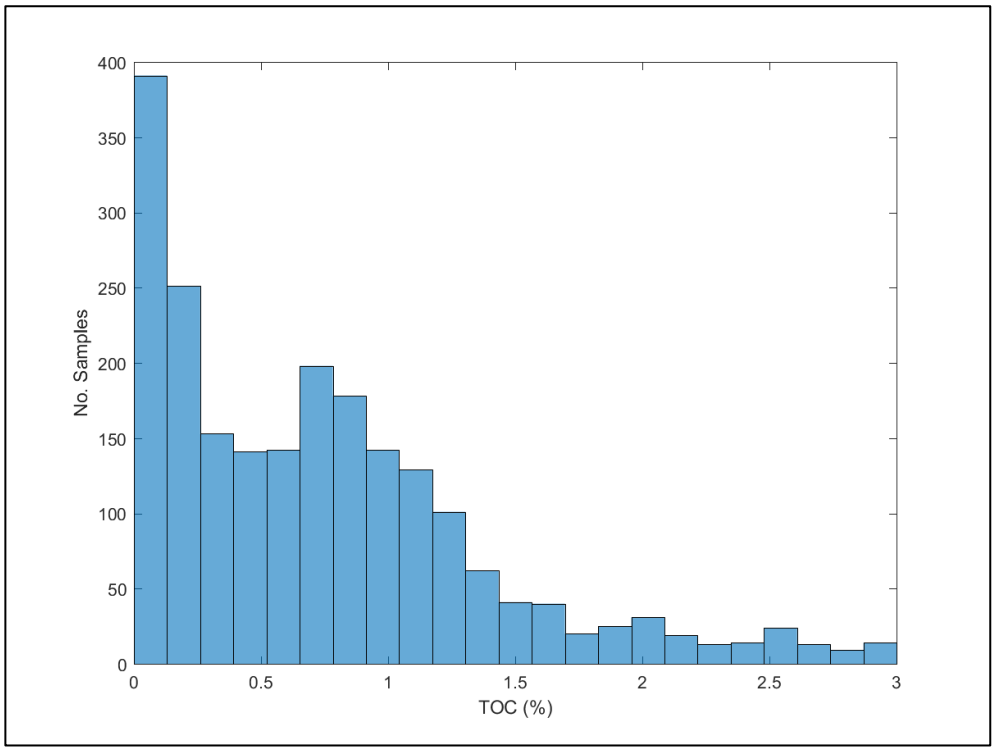

Fig 1.3. Histogram plot of all TOC data for the region of interest scaled to 0-3% TOC.

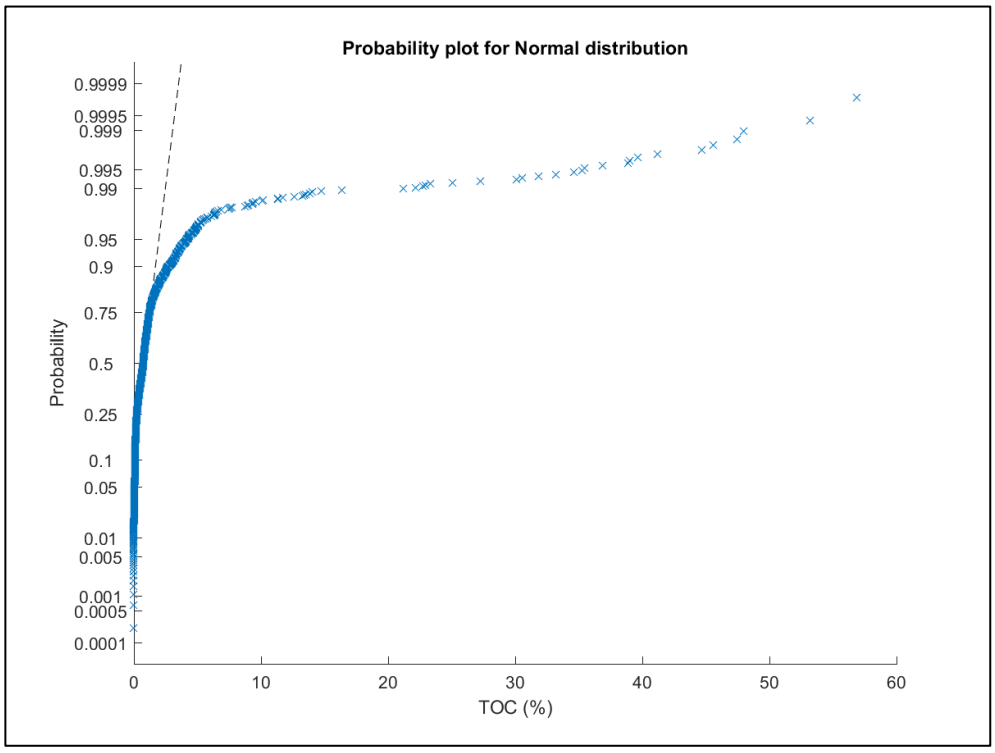

Fig 1.4. Probability plot for a normal distribution for all TOC data in the region of interest.

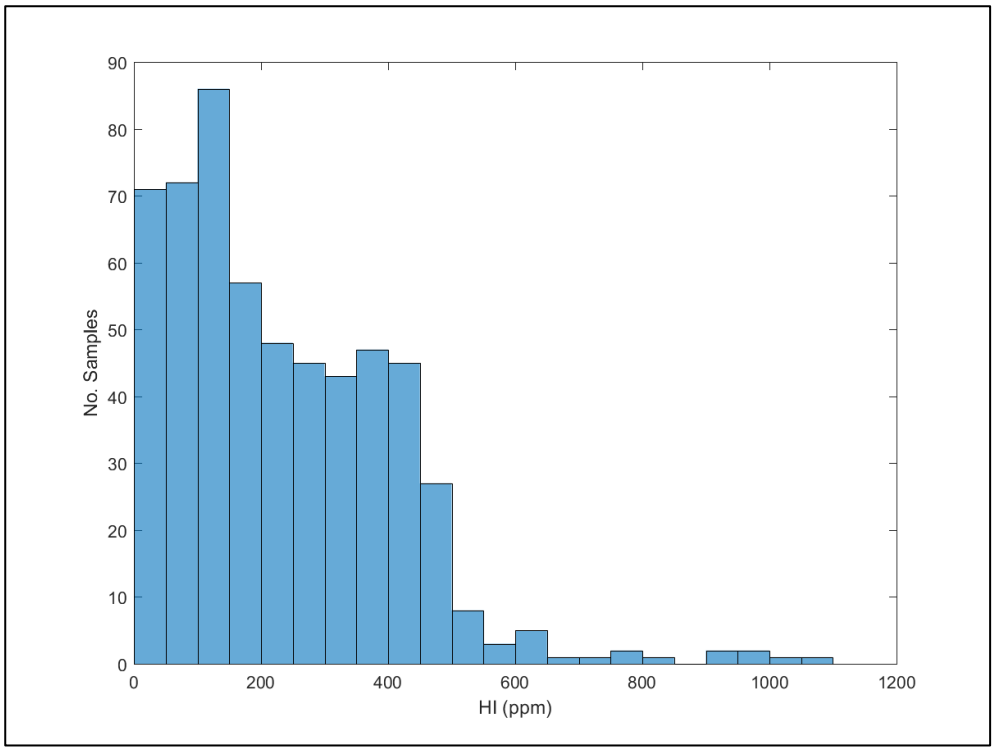

Fig 1.5. Histogram plot of all HI data for the region of interest.

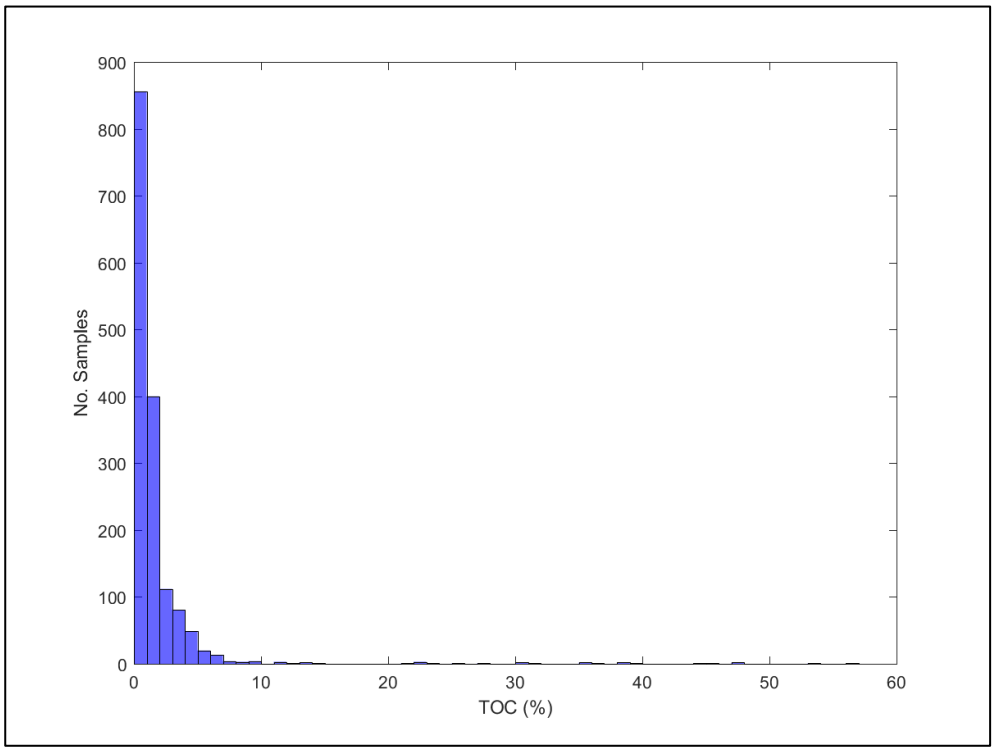

Fig 1.6. Histogram plot of all Jurassic TOC data for the region of interest.

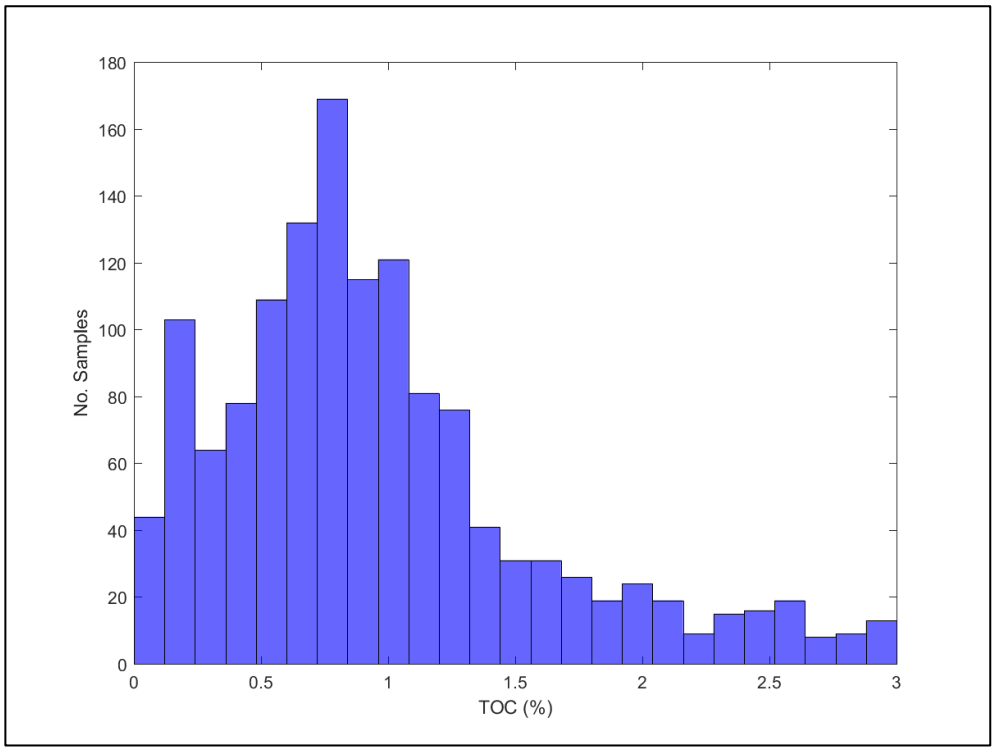

Fig 1.7. Histogram plot of all Jurassic TOC data for the region of interest scaled to 0-10% TOC.

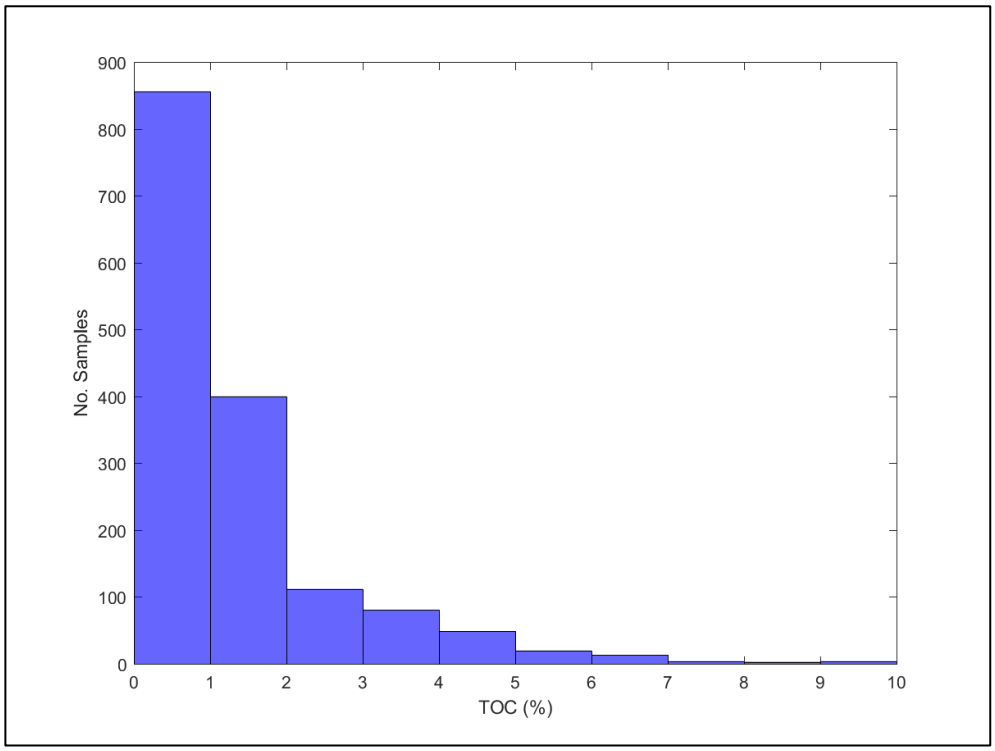

Fig 1.8. Histogram plot of all Jurassic TOC data for the region of interest scaled to 0-3% TOC.

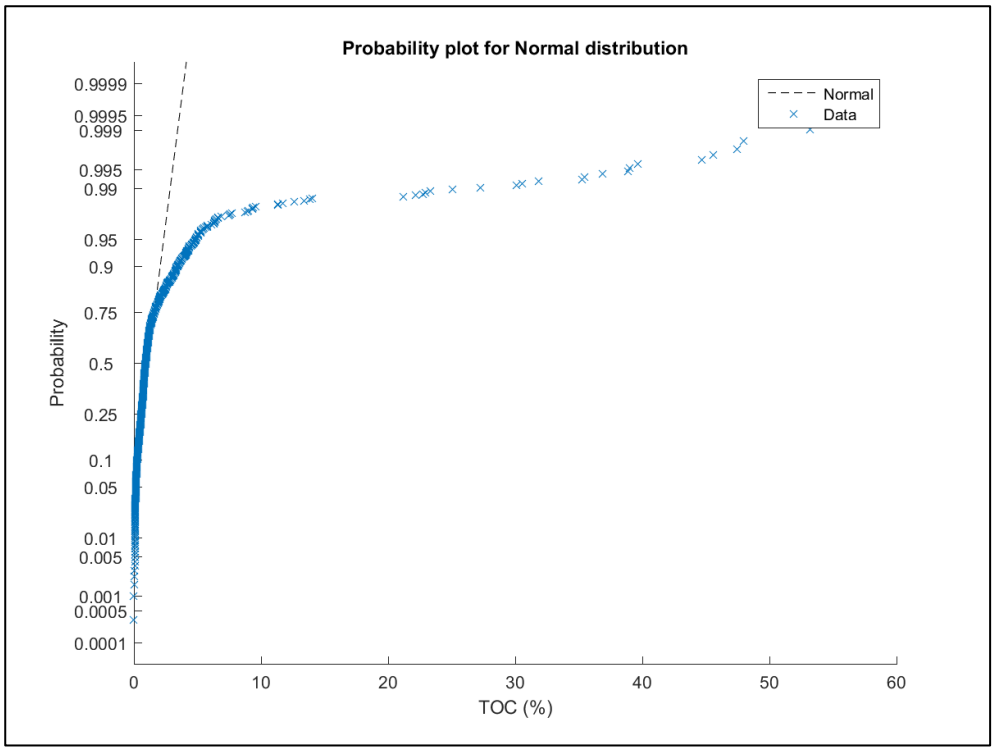

Fig 1.9. Probability plot for a normal distribution for Jurassic all TOC data in the region of interest.

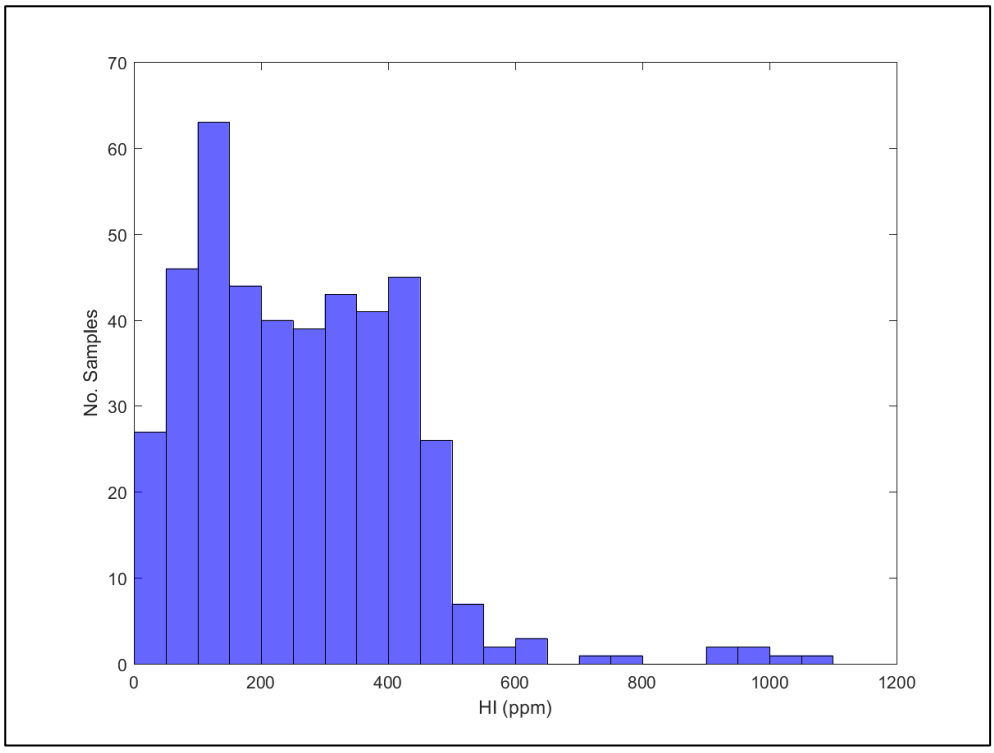

Fig 1.10. Histogram plot of all Jurassic HI data for the region of interest.

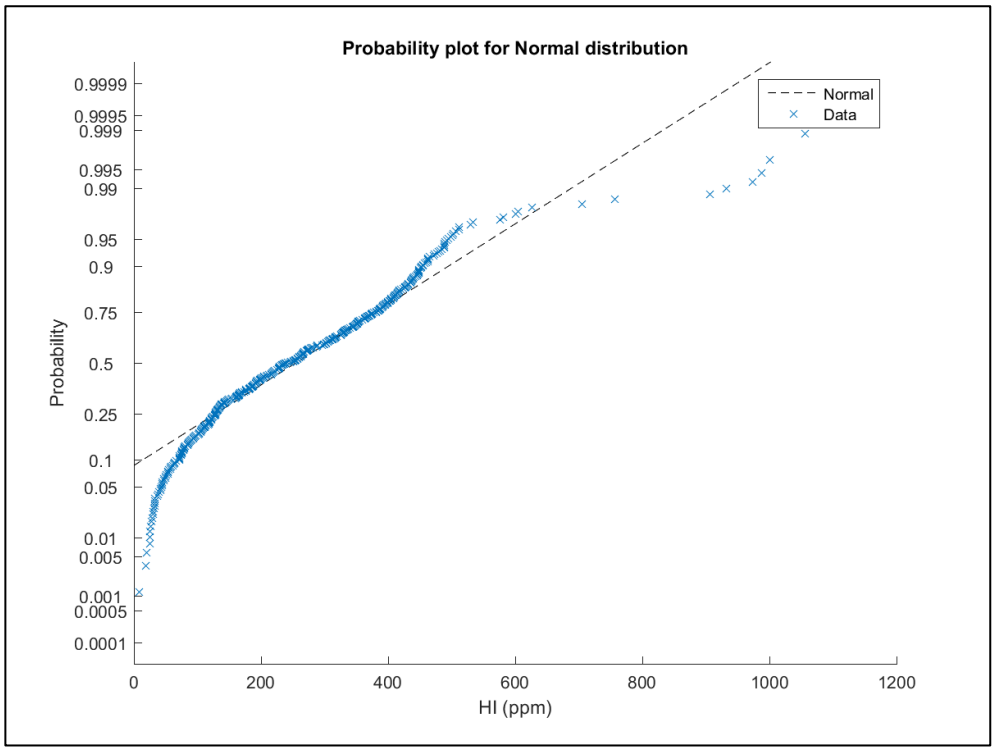

Fig 1.11. Probability plot for a normal distribution for all Jurassic HI data in the region of interest.

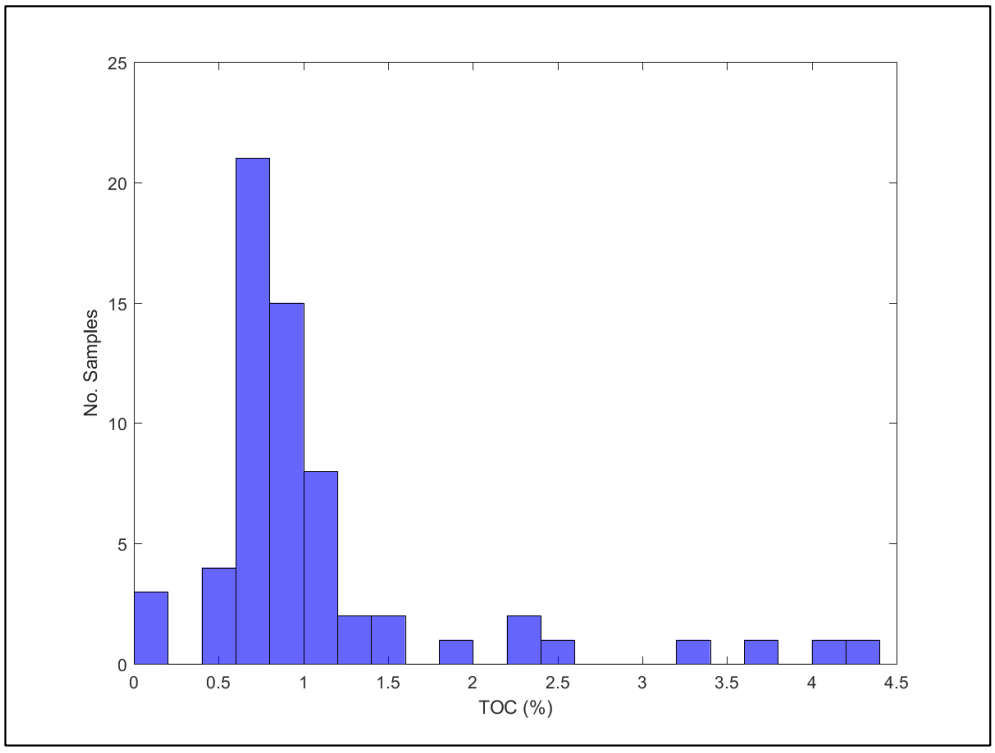

Fig 1.12. Histogram plot of all Jurassic TOC data for South Celtic Sea Basin.

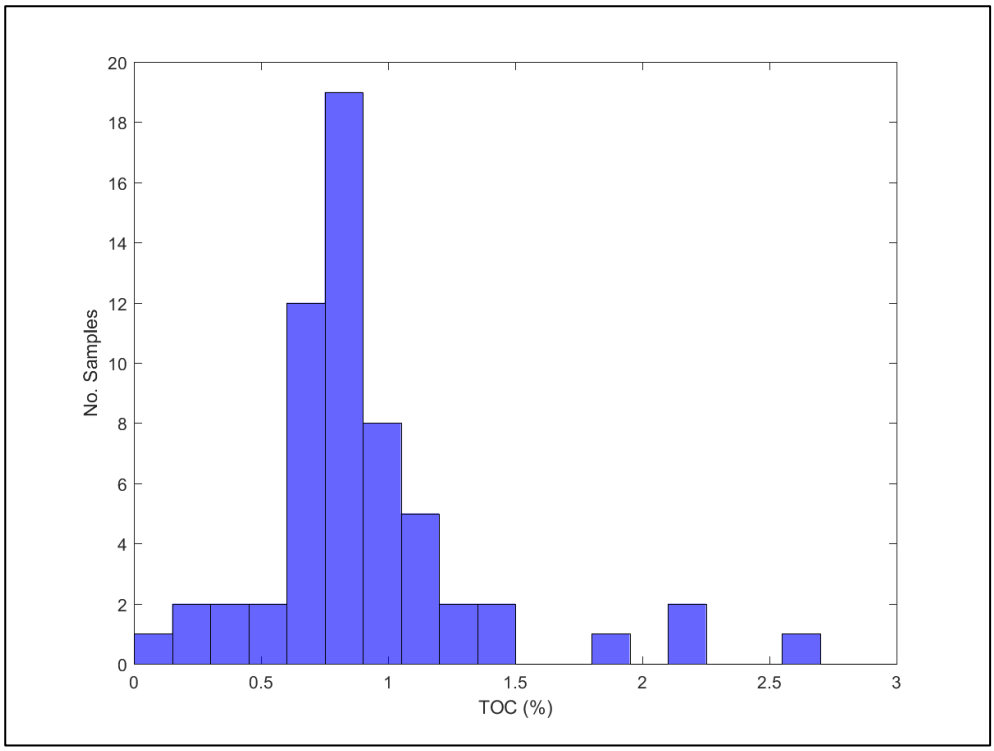

Fig 1.13. Histogram plot of all the Jurassic TOC data for the South Celtic Sea Basin scaled to 0-3% TOC.

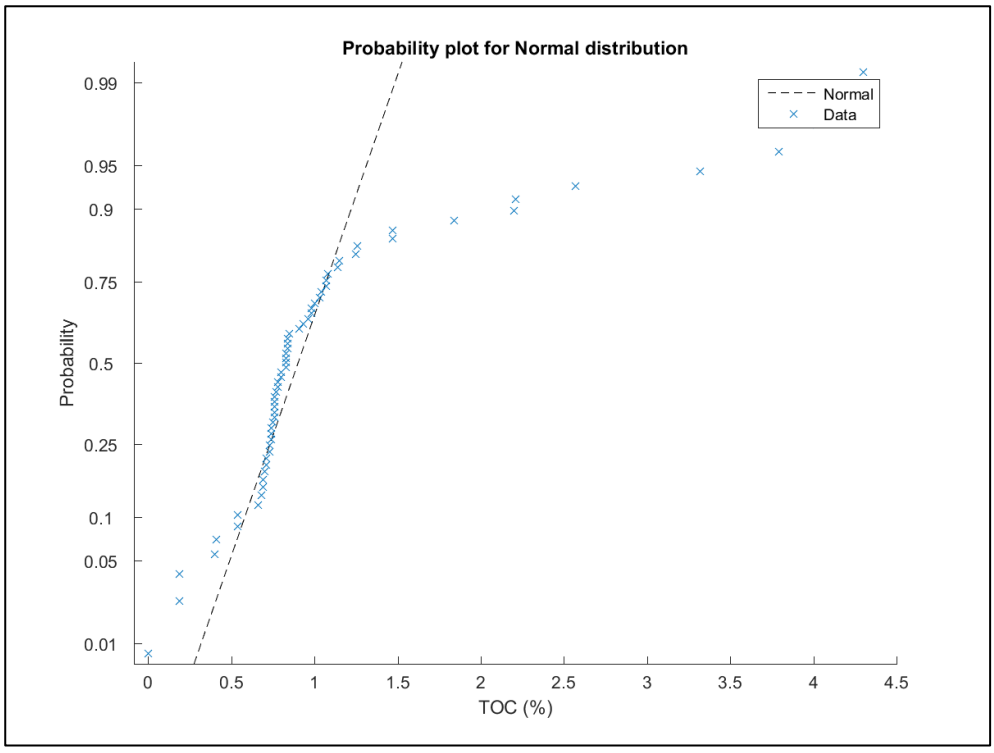

Fig 1.14. Probability plot for a normal distribution for all Jurassic TOC data in the South Celtic Sea Basin.

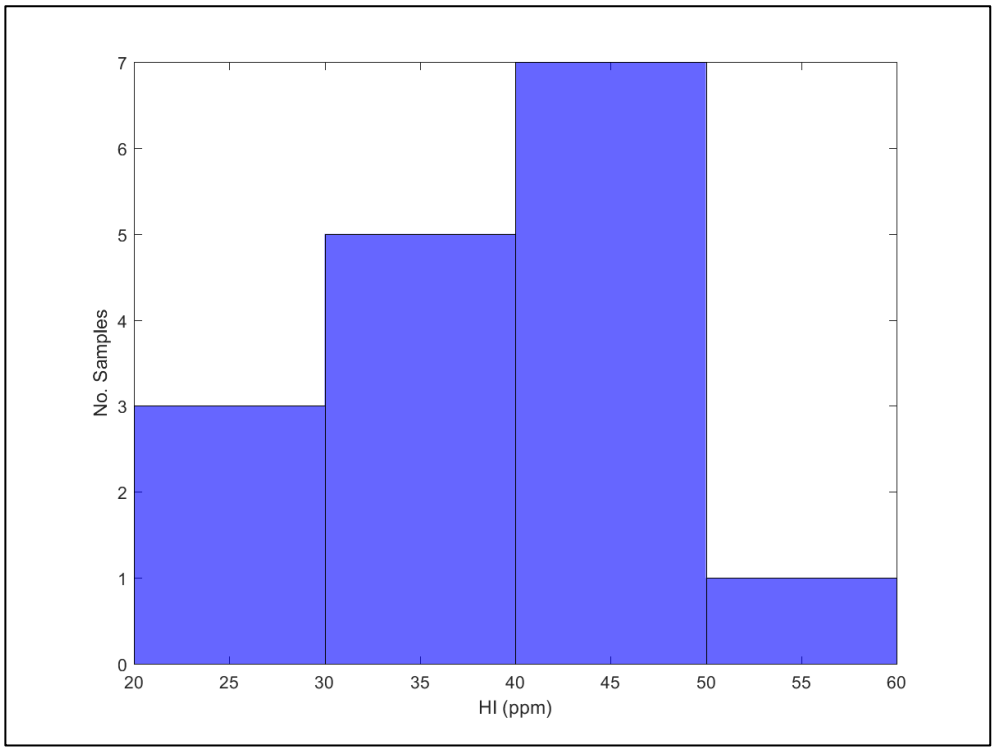

Fig 1.15. Histogram plot of all Jurassic HI data for the South Celtic Sea Basin.

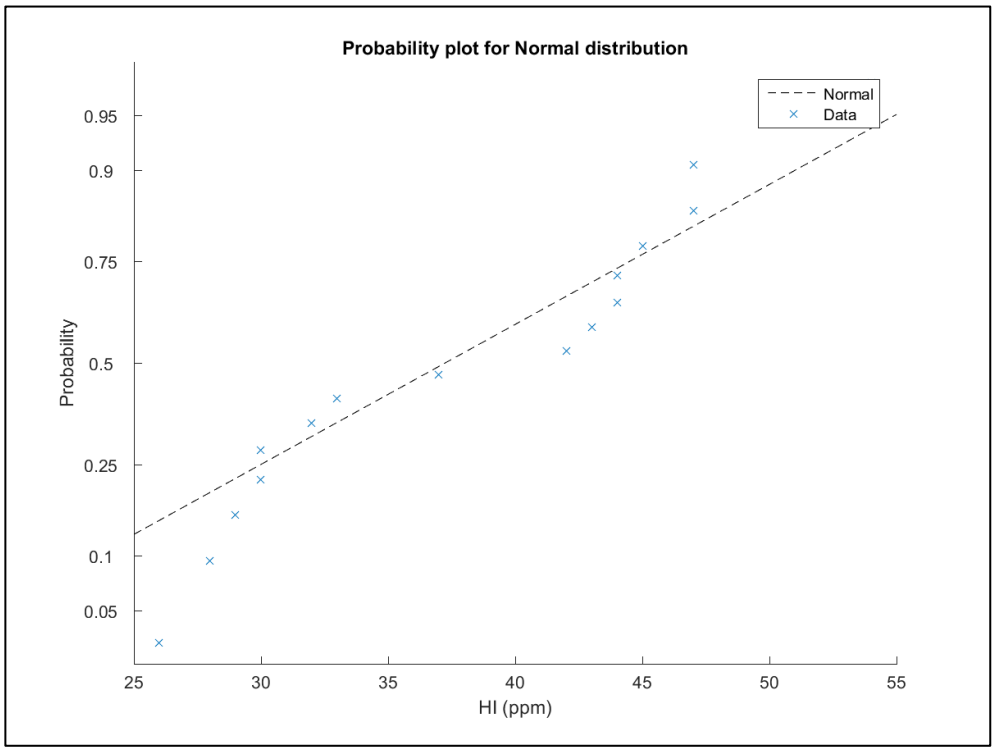

Fig 1.16. Probability plot for a normal distribution for all Jurassic HI data in the South Celtic Sea Basin.

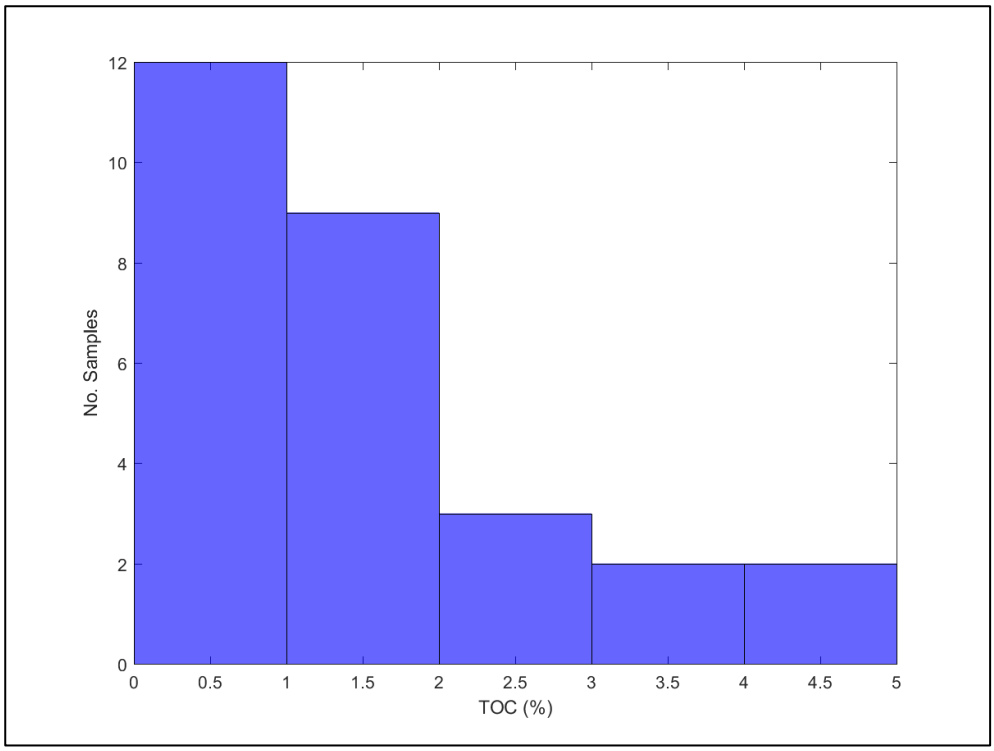

Fig 1.17. Histogram plot of all Early Jurassic TOC data for South Celtic Sea Basin.

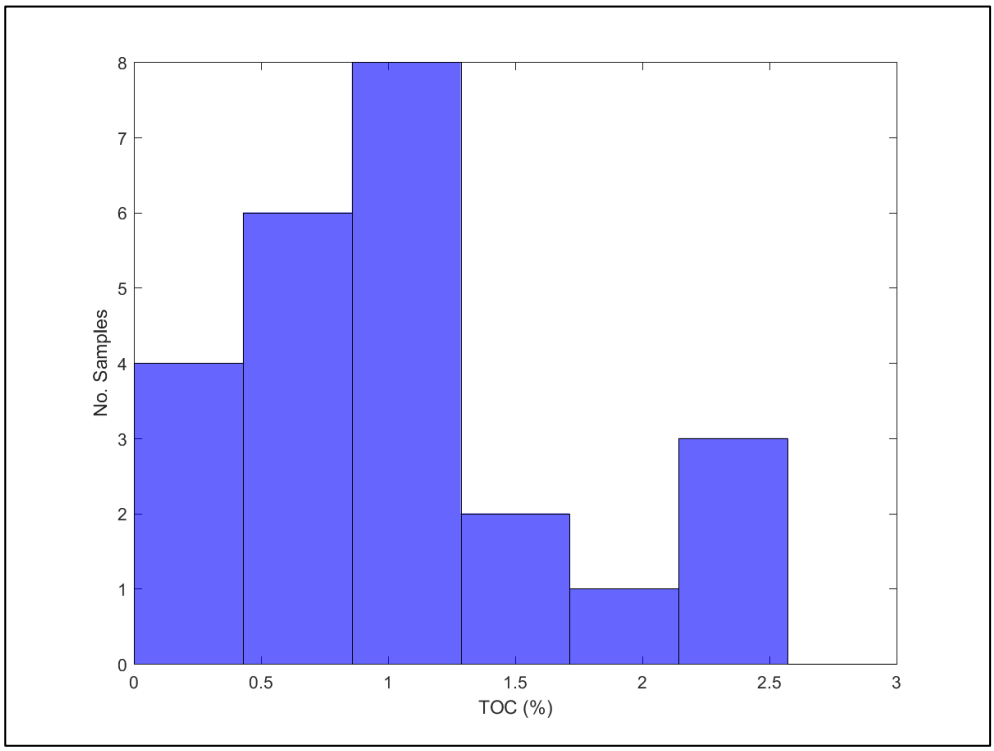

Fig 1.18. Histogram plot of all the Early Jurassic TOC data for the South Celtic Sea Basin scaled to 0-3% TOC.

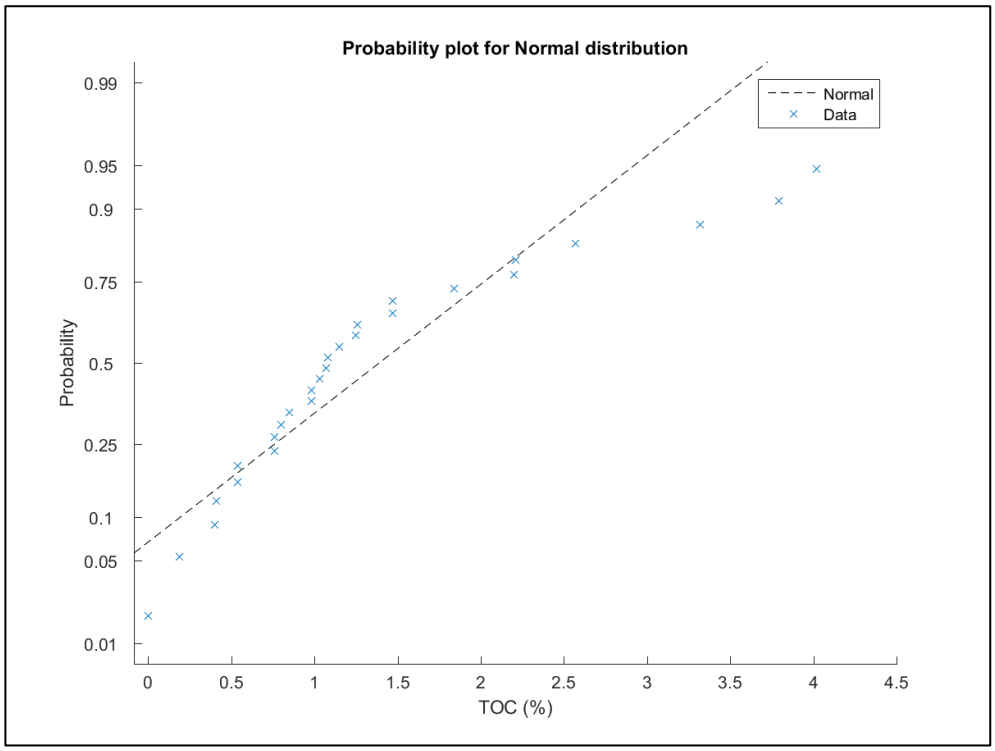

Fig 1.19. Probability plot for a normal distribution for all Early Jurassic TOC data in the South Celtic Sea Basin.

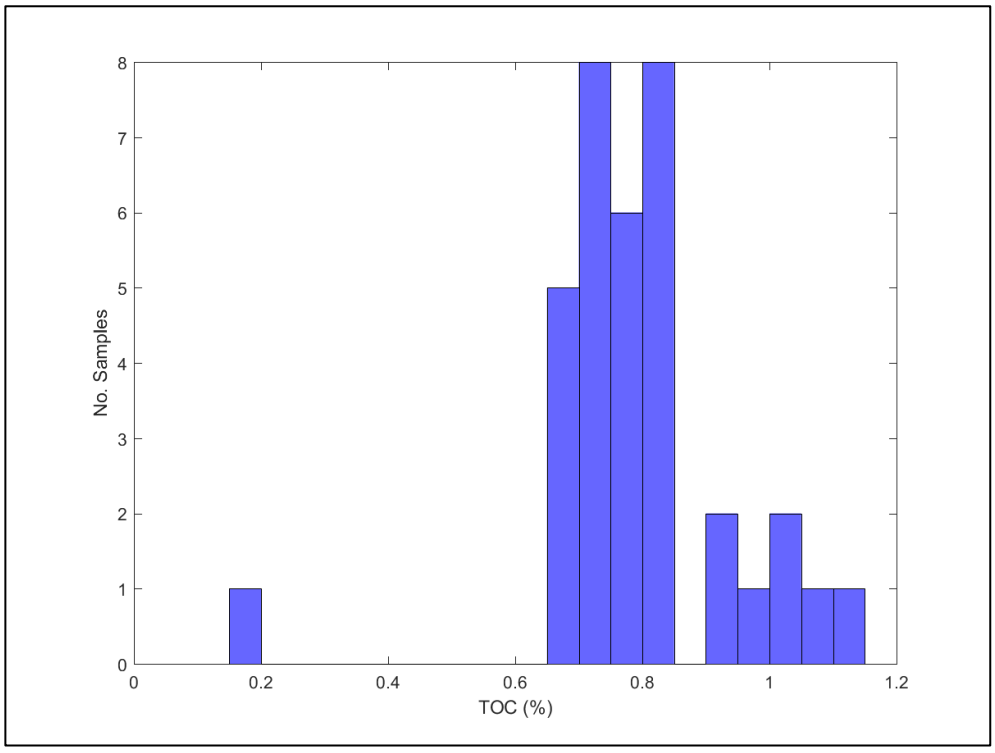

Fig 1.20. Histogram plot of all undifferentiated Jurassic TOC data for South Celtic Sea Basin.

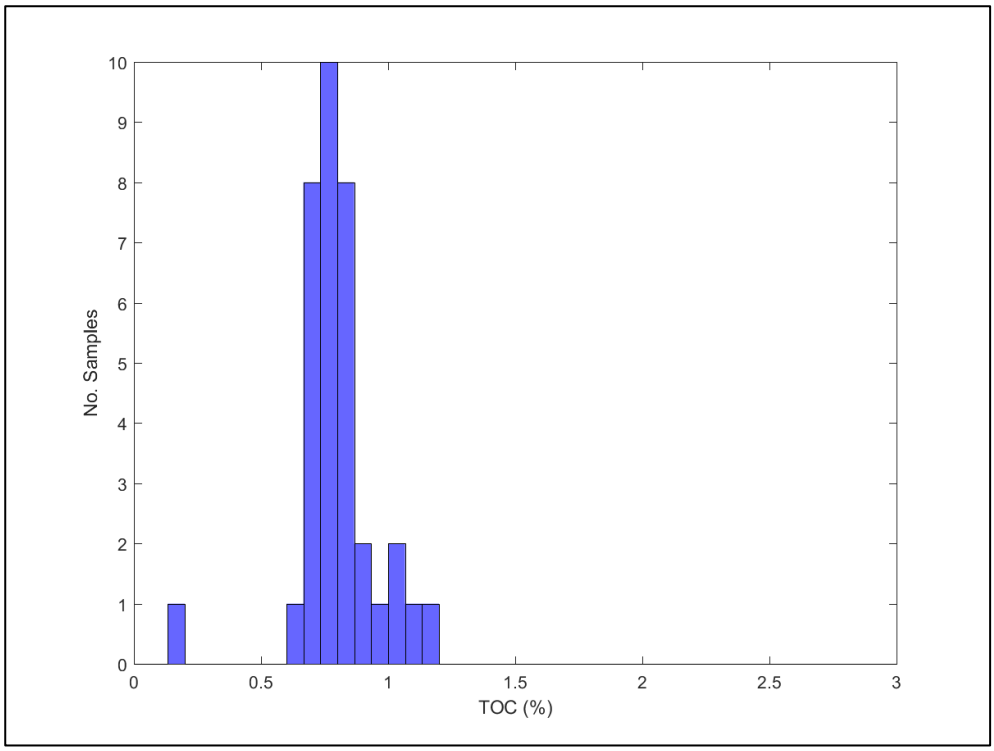

Fig 1.21. Histogram plot of all the undifferentiated Jurassic TOC data for the South Celtic Sea Basin scaled to 0-3% TOC.

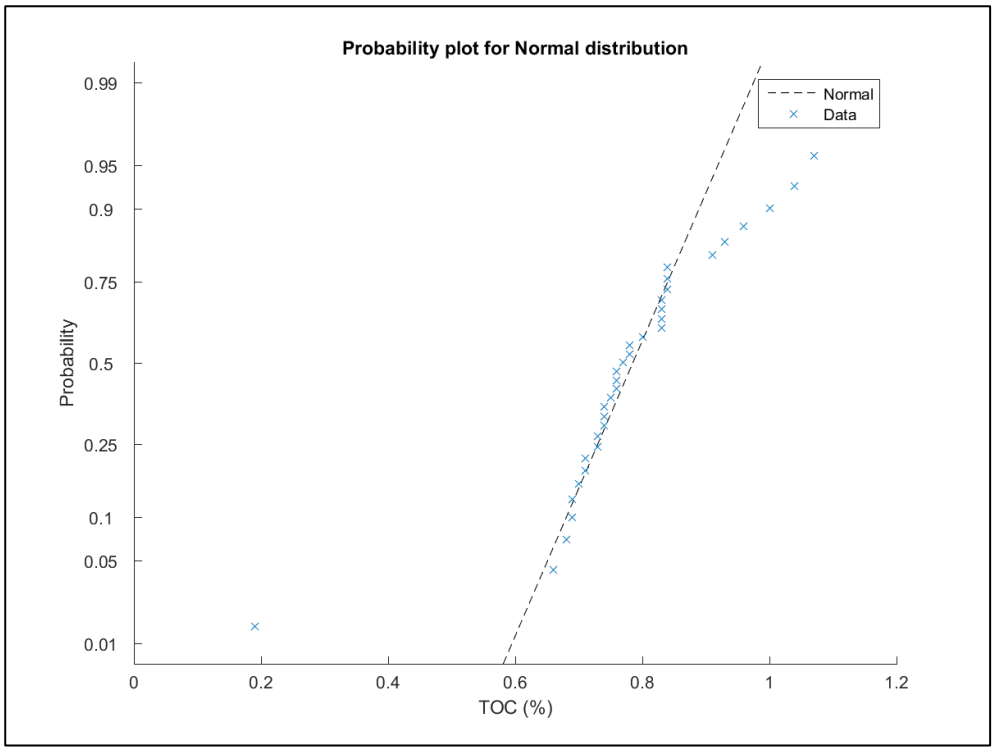

Fig 1.22. Probability plot for a normal distribution for all undifferentiated Jurassic TOC data in the South Celtic Sea Basin.

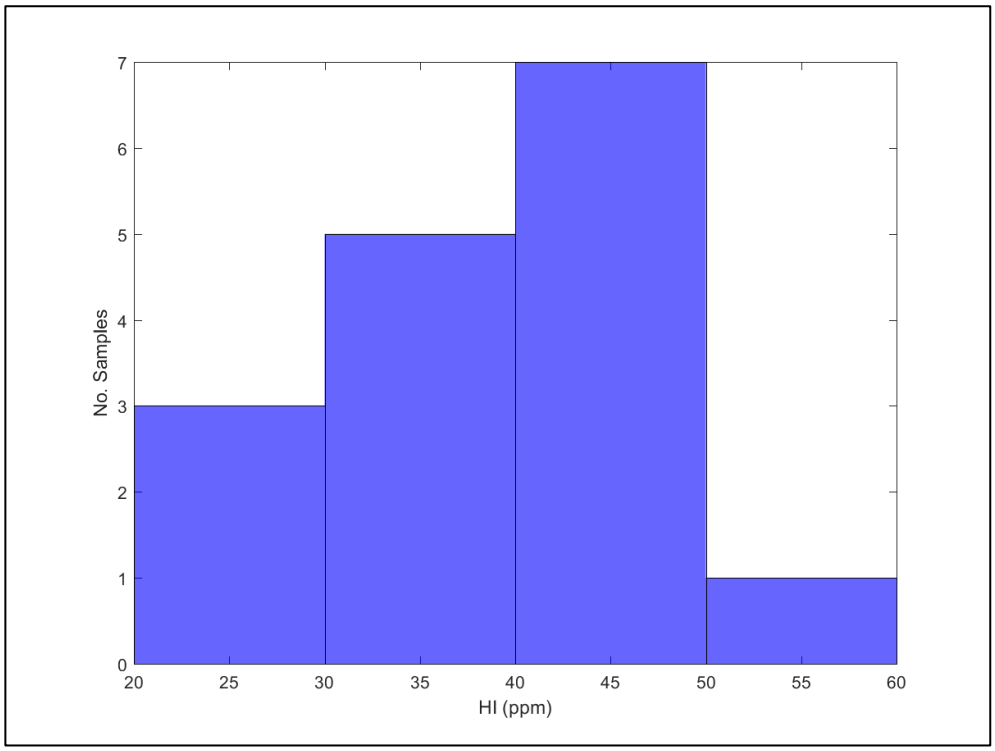

Fig 1.23. Histogram plot of all undifferentiated Jurassic HI data for the South Celtic Sea Basin.

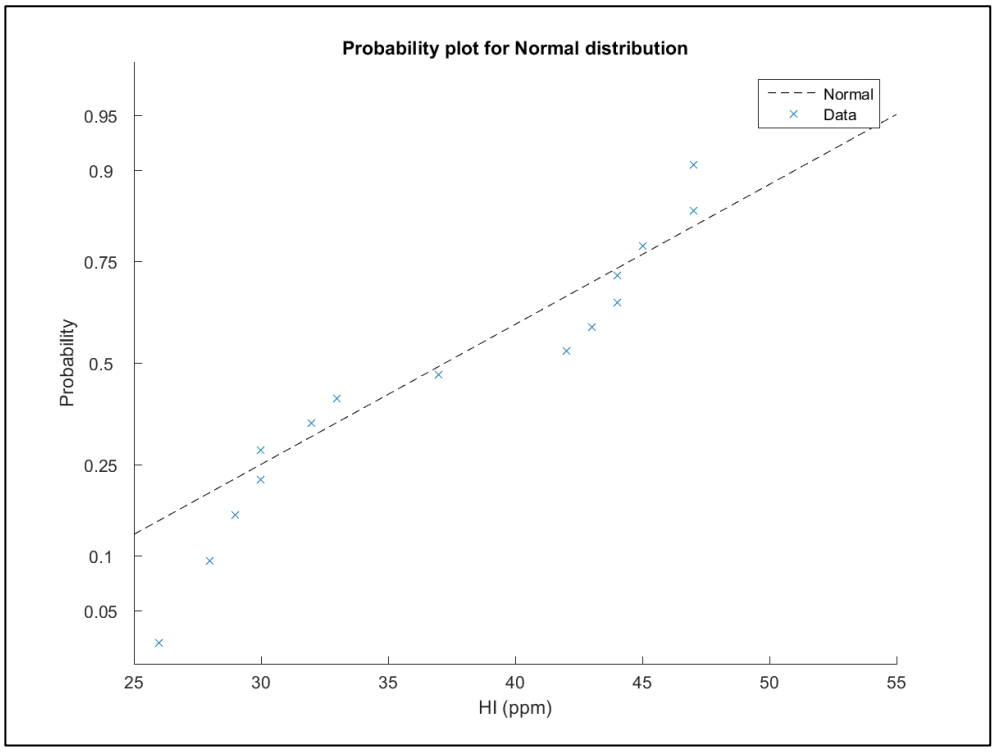

Fig 1.24. Probability plot for a normal distribution for all undifferentiated Jurassic HI data in the South Celtic Sea Basin.

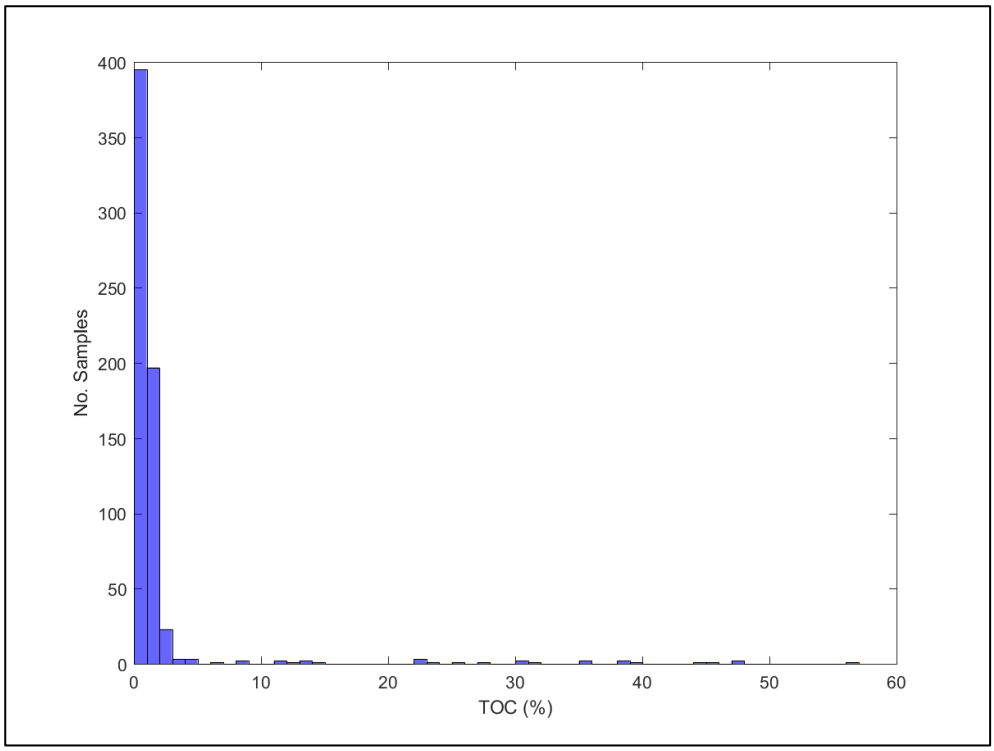

Fig 1.25. Histogram plot of all Jurassic TOC data for North Celtic Sea Basin & St George's Channel Basin.

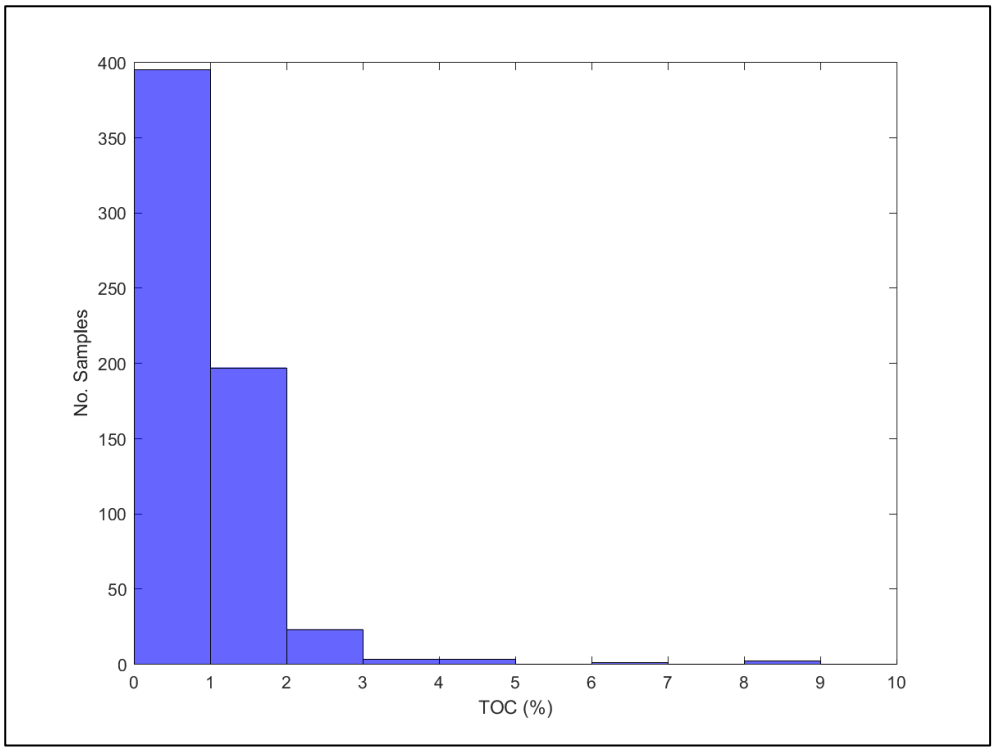

Fig 1.26. Histogram plot of all the Jurassic TOC data for the North Celtic Sea Basin & St George's Channel Basin scaled to 0-10% TOC.

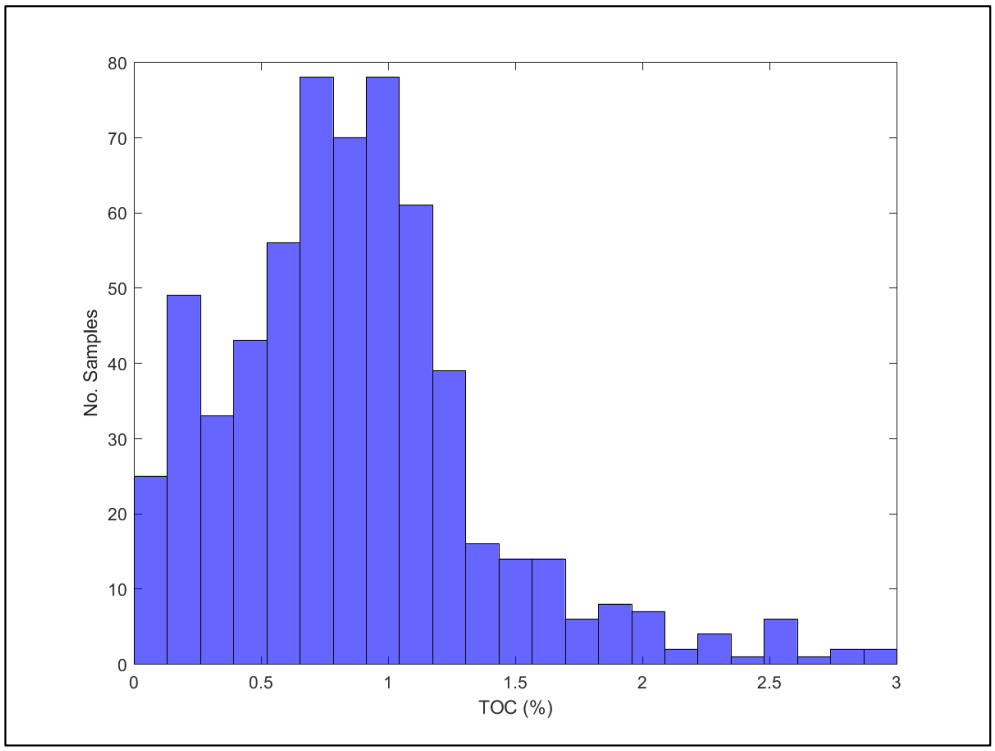

Fig 1.27. Histogram plot of all the Jurassic TOC data for the North Celtic Sea Basin & St George's Channel Basin scaled to 0-3% TOC.

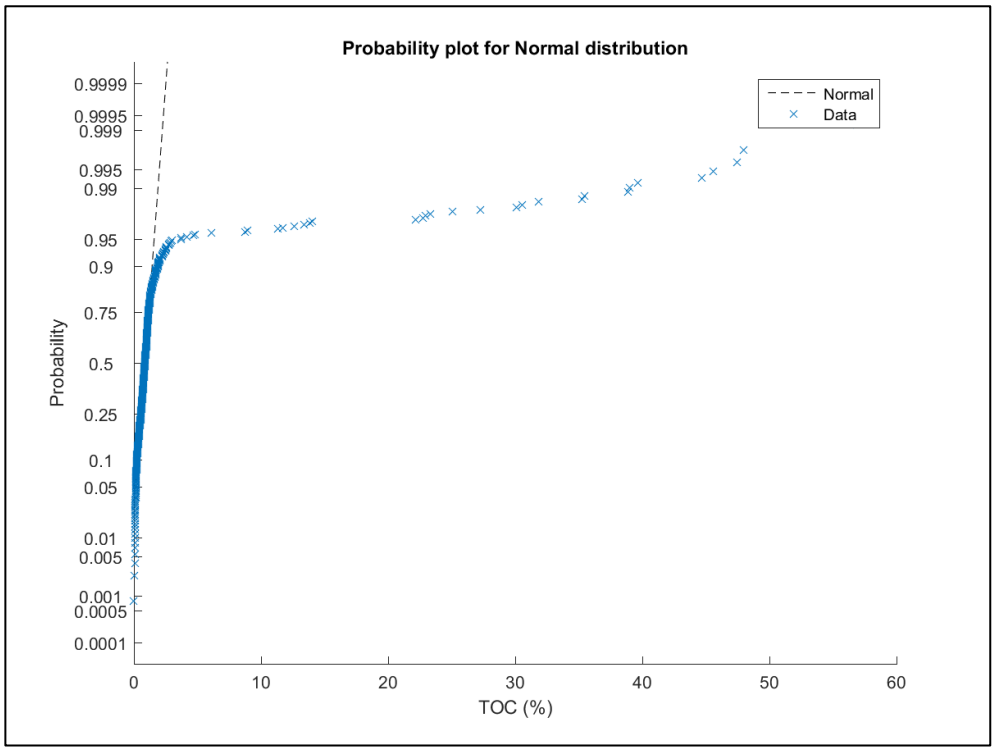

Fig 1.28. Probability plot for a normal distribution for all Jurassic TOC data in the North Celtic Sea Basin & St George's Channel Basin.

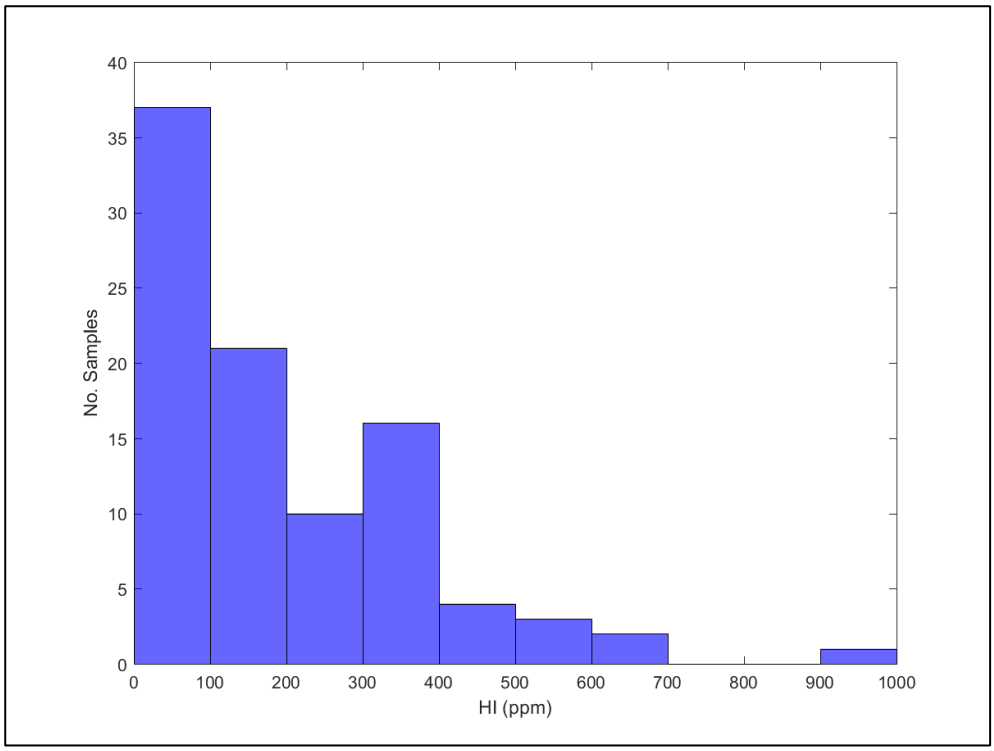

Fig 1.29. Histogram plot of all Jurassic HI data for the North Celtic Sea Basin & St George's Channel Basin.

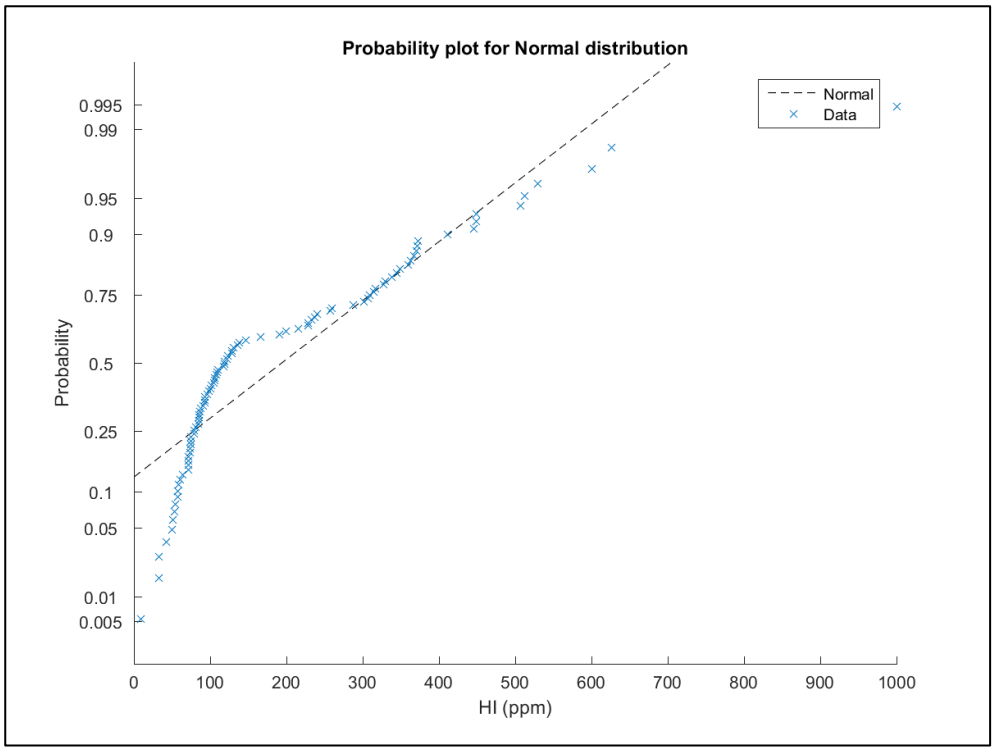

Fig 1.30. Probability plot for a normal distribution for all Jurassic HI data in the North Celtic Sea Basin & St George's Channel Basin.

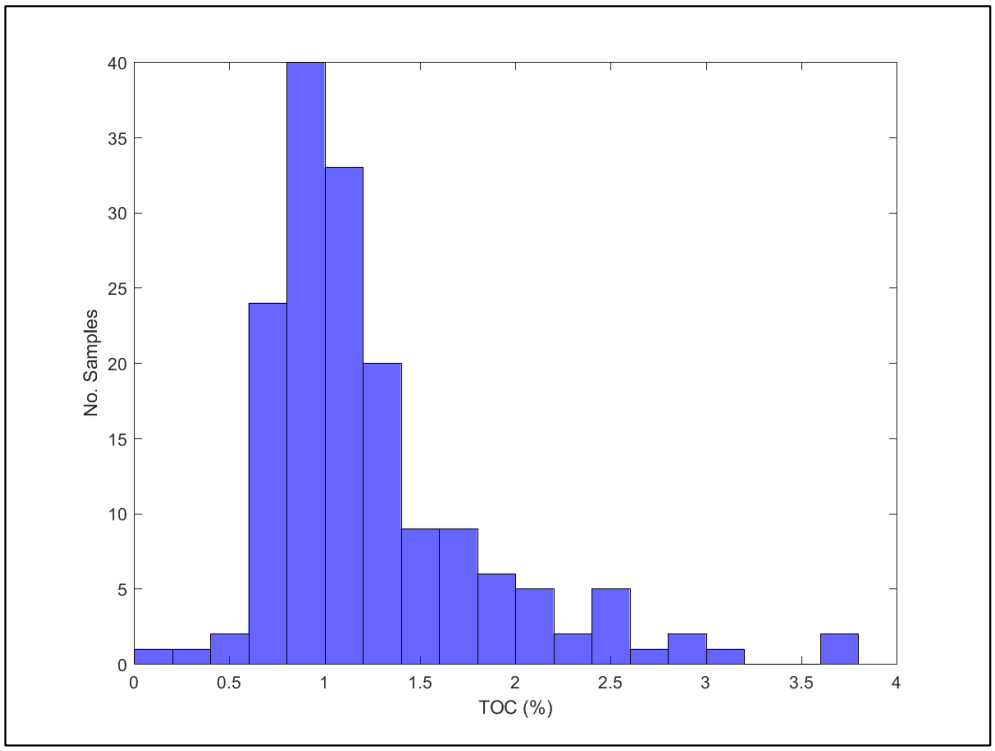

Fig 1.31. Histogram plot of all Early Jurassic TOC data for North Celtic Sea Basin & St George's Channel Basin.

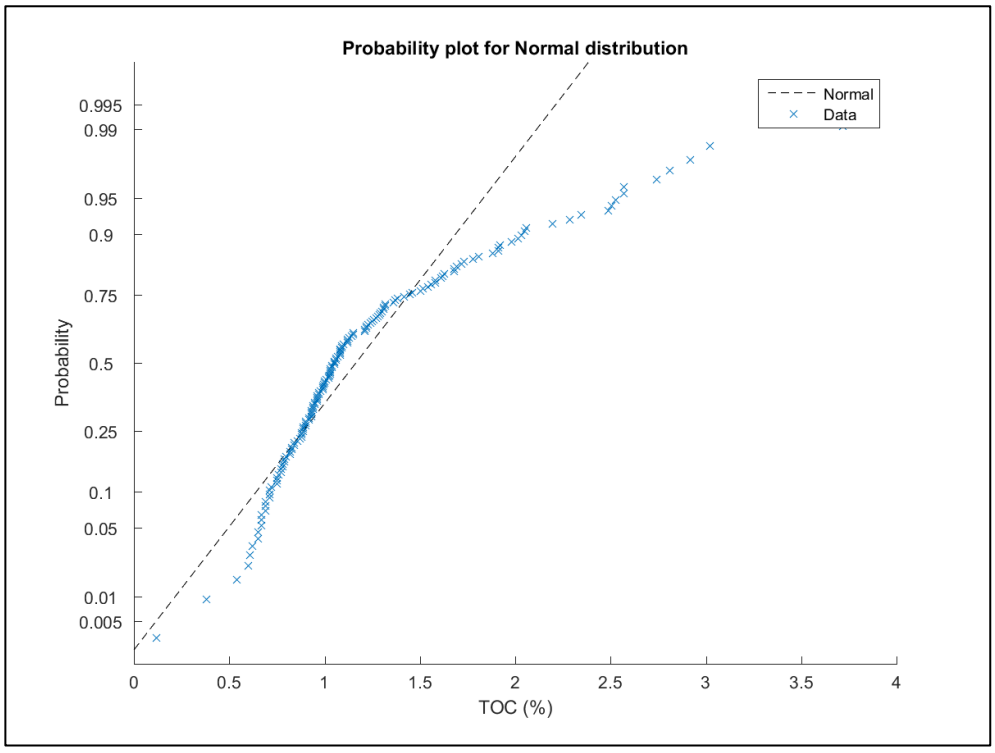

Fig 1.32 Probability plot for a normal distribution for all Early Jurassic TOC data in the North Celtic Sea Basin & St George's Channel Basin.

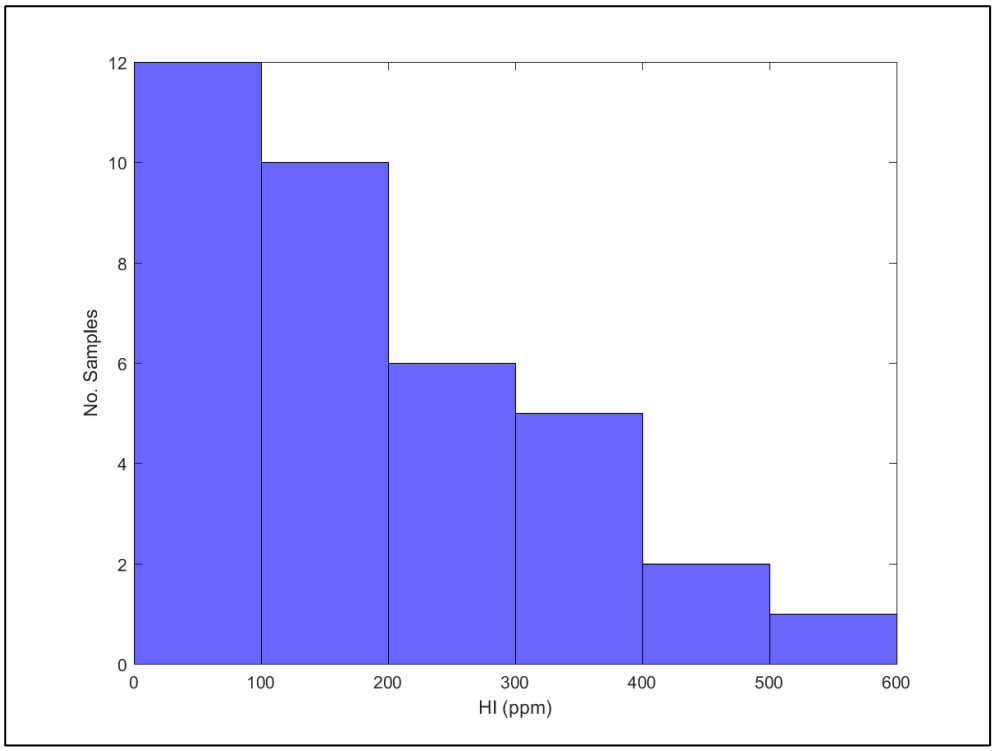

Fig 1.33. Histogram plot of all Early Jurassic HI data for the North Celtic Sea Basin & St George's Channel Basin.

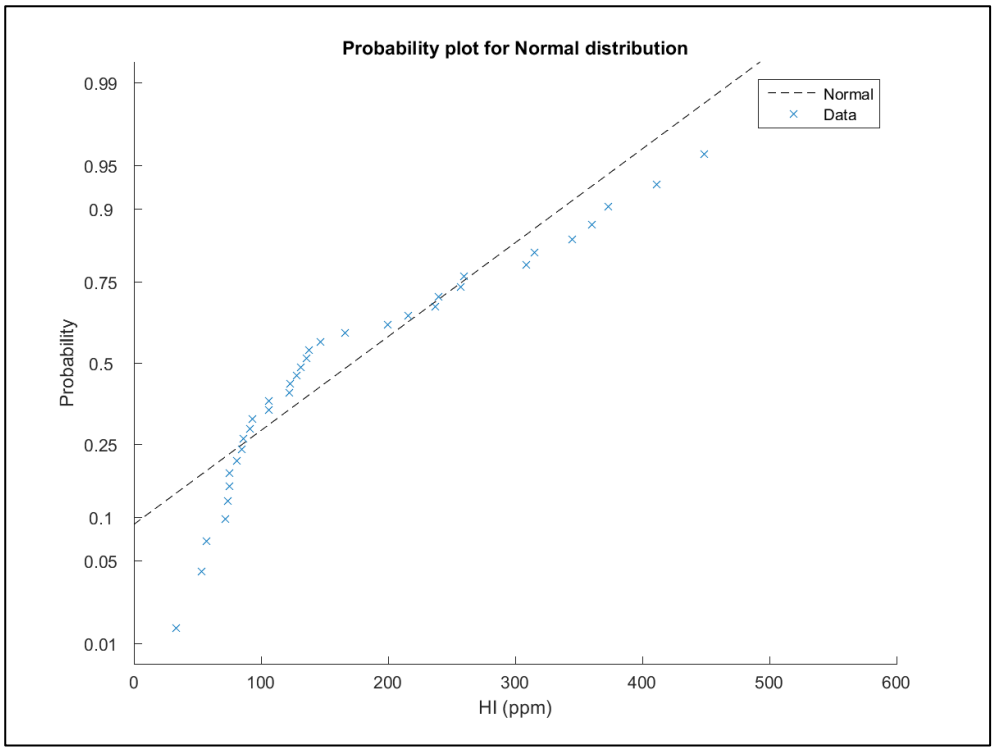

Fig 1.34. Probability plot for a normal distribution for all Early Jurassic HI data in the North Celtic Sea Basin & St George's Channel Basin.

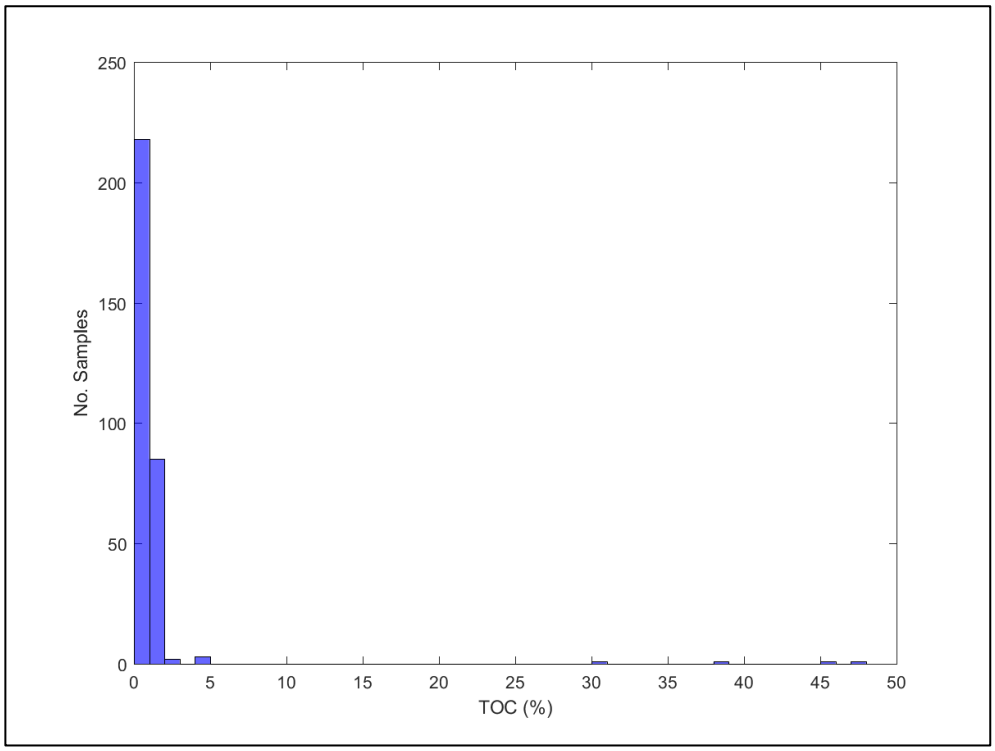

Fig 1.35. Histogram plot of all Middle Jurassic TOC data for North Celtic Sea Basin & St George's Channel Basin.

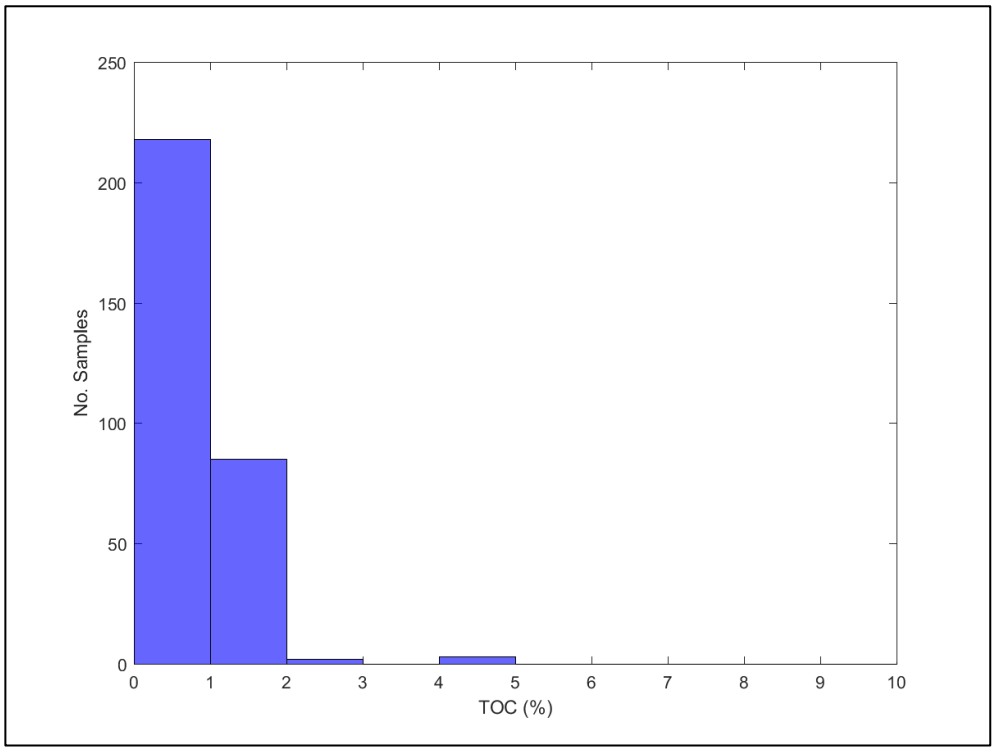

Fig 1.36. Histogram plot of all Middle Jurassic TOC data for the North Celtic Sea Basin & St George's Channel Basin scaled to 0-10% TOC.

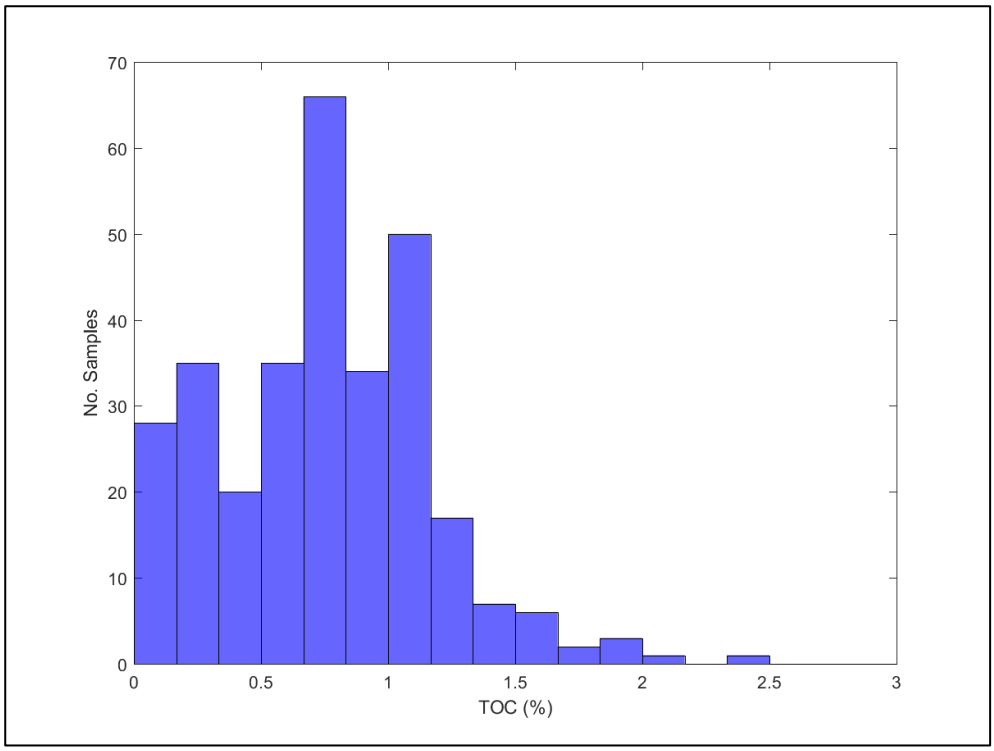

Fig 1.37. Histogram plot of all Middle Jurassic TOC data for the North Celtic Sea Basin & St George's Channel Basin scaled to 0-3% TOC.

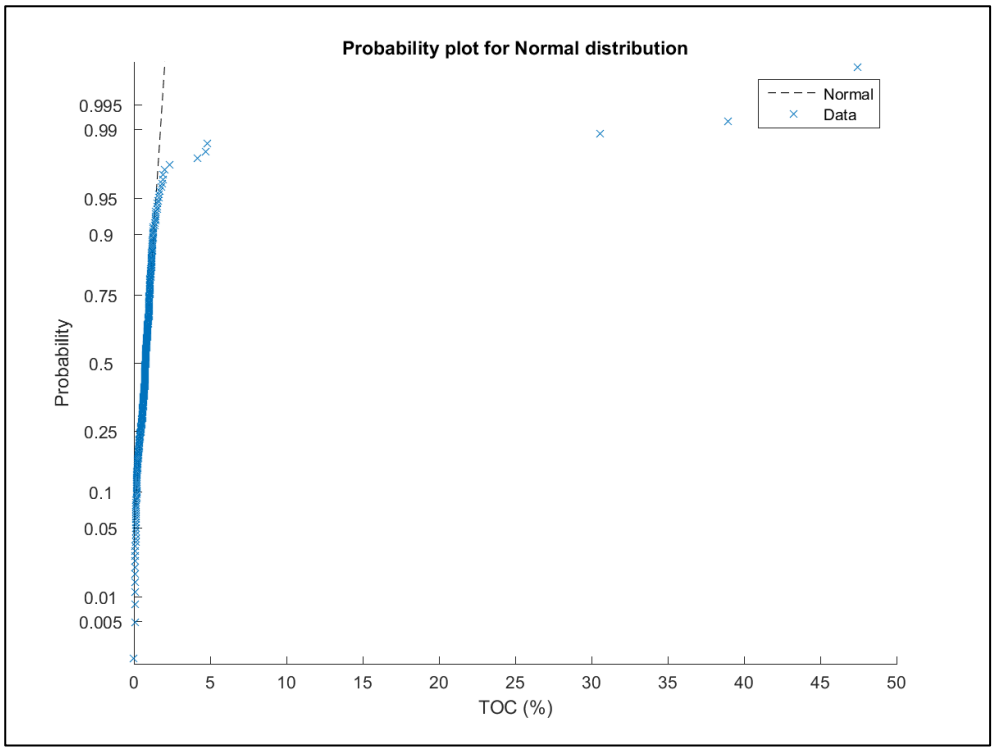

Fig 1.38. Probability plot for a normal distribution for all Middle Jurassic TOC data in the North Celtic Sea Basin & St George's Channel Basin.

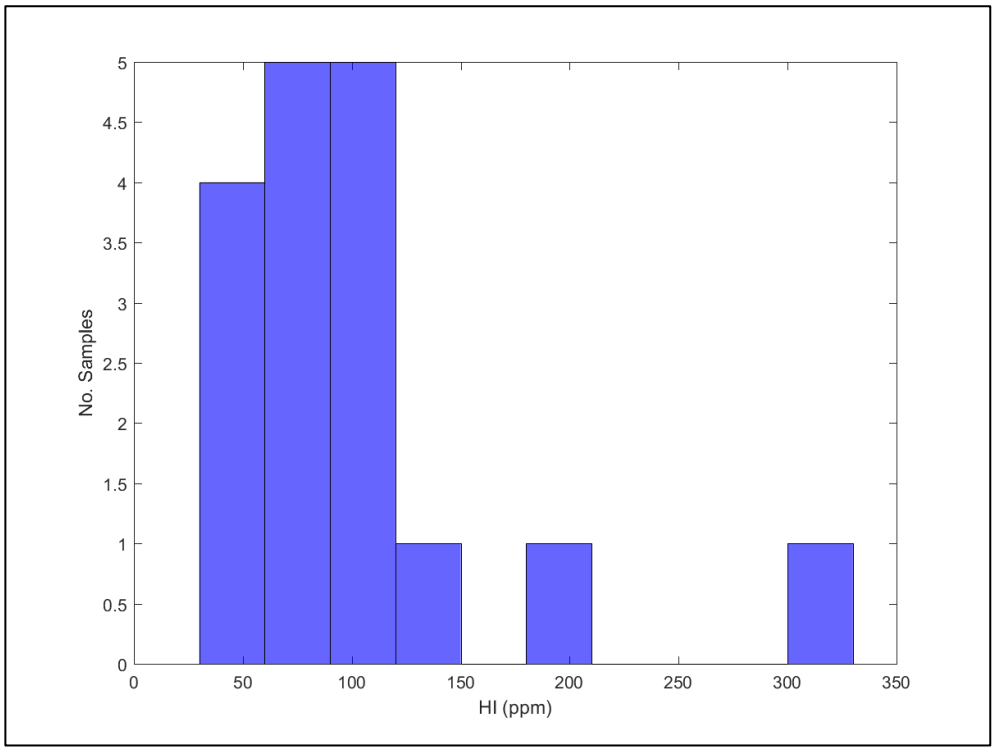

Fig 1.39. Histogram plot of all Middle Jurassic HI data for the North Celtic Sea Basin & St George's Channel Basin.

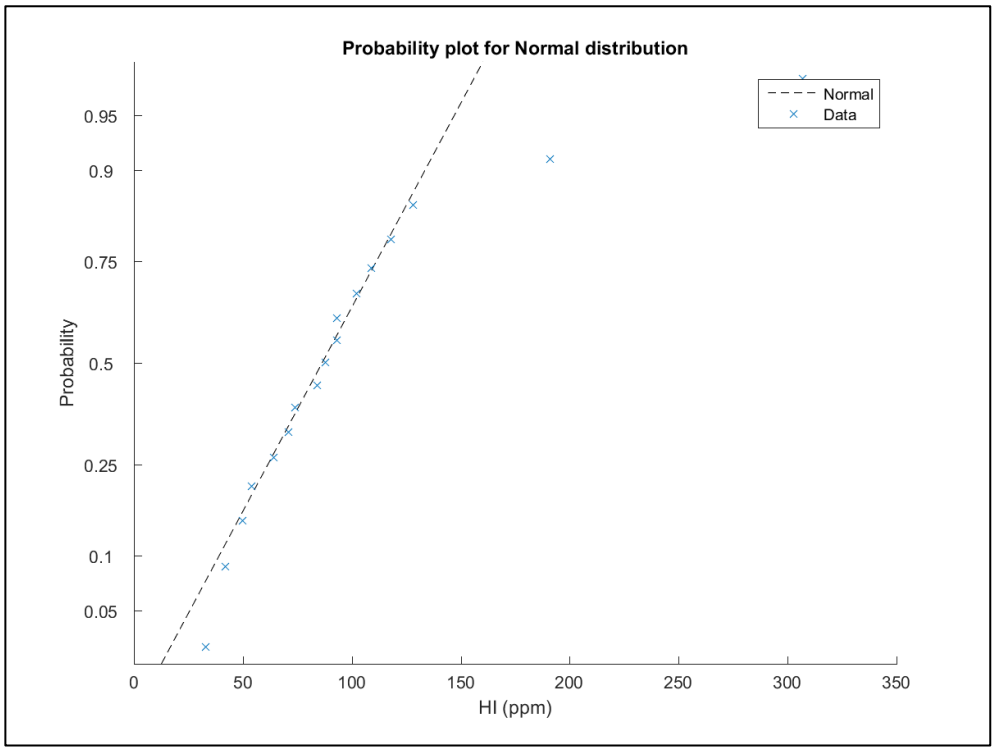

Fig 1.40. Probability plot for a normal distribution for all Middle Jurassic HI data in the North Celtic Sea Basin & St George's Channel Basin.

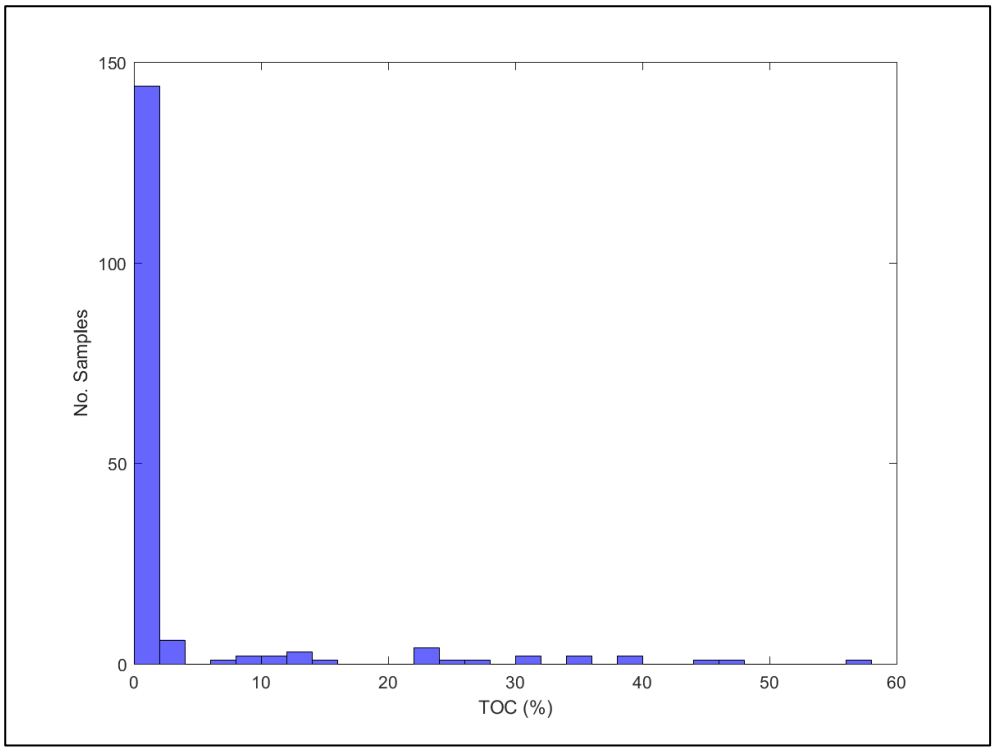

Fig 1.41. Histogram plot of all Late Jurassic TOC data for North Celtic Sea Basin & St George's Channel Basin.

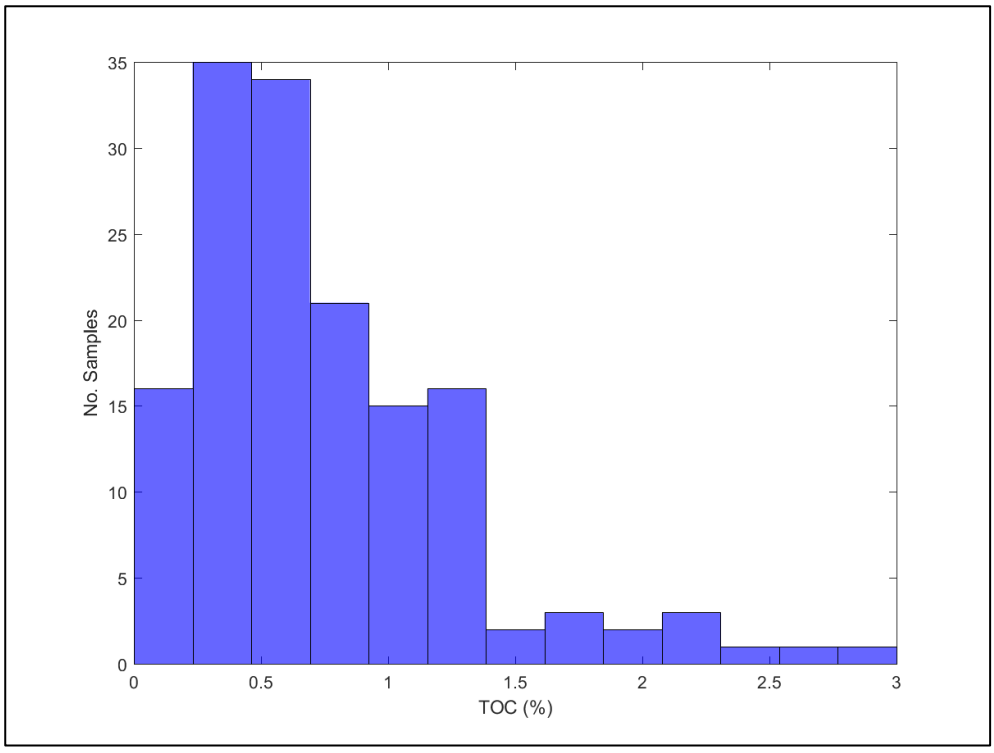

Fig 1.42. Histogram plot of all Late Jurassic TOC data for the North Celtic Sea Basin & St George's Channel Basin scaled to 0-3% TOC.

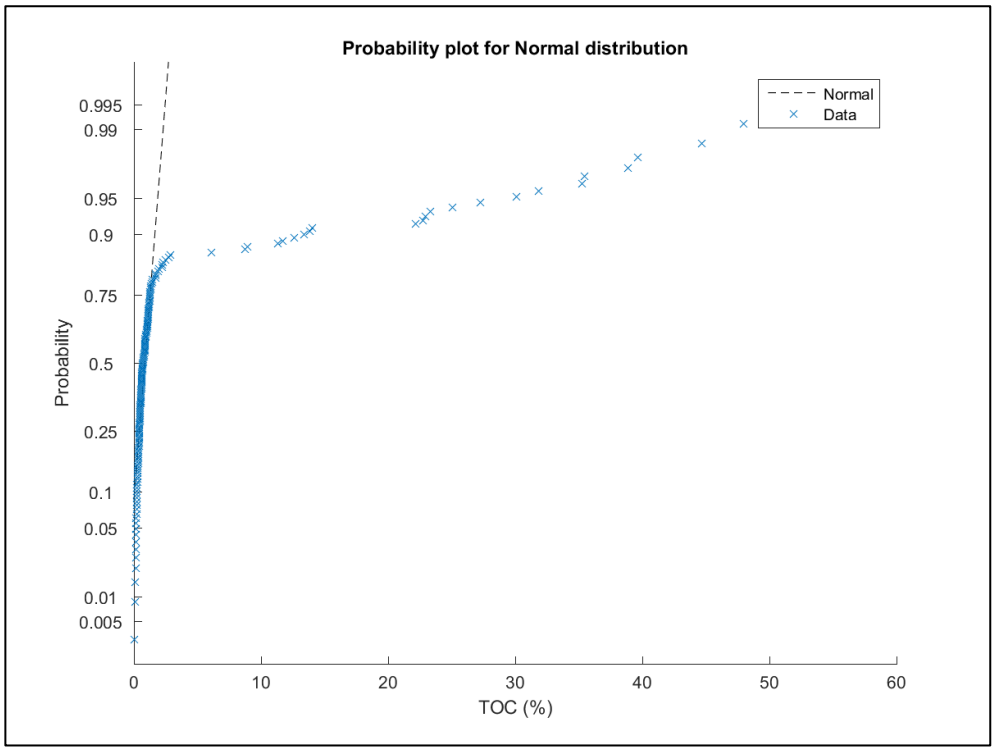

Fig 1.43. Probability plot for a normal distribution for all Late Jurassic TOC data in the North Celtic Sea Basin & St George's Channel Basin.

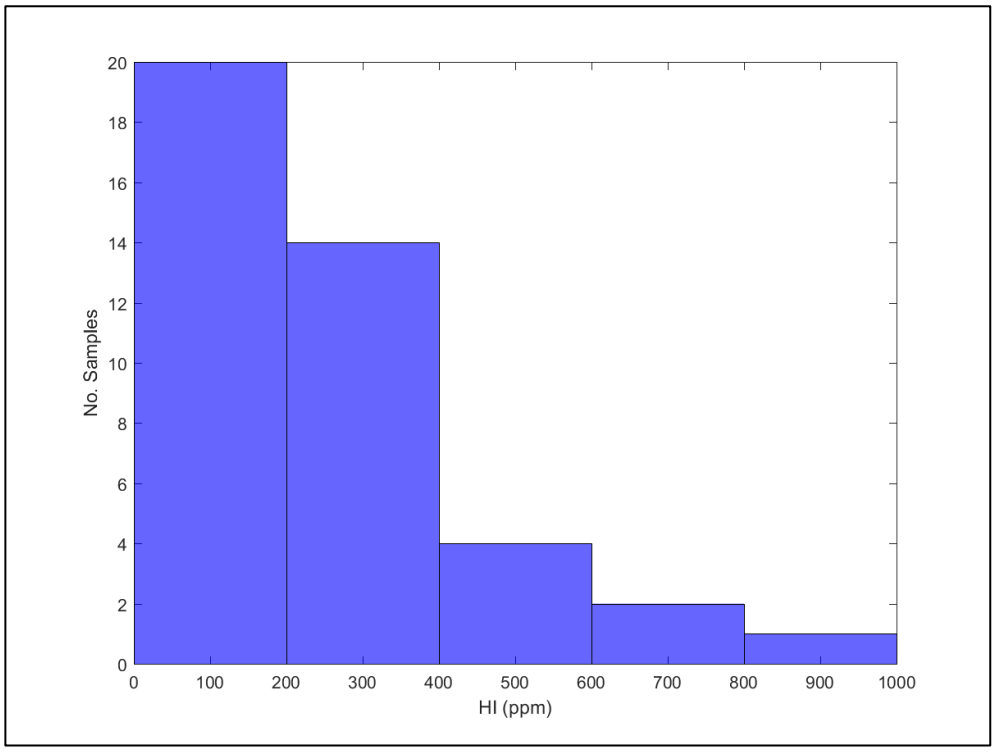

Fig 1.44. Histogram plot of all Late Jurassic HI data for the North Celtic Sea Basin & St George's Channel Basin.

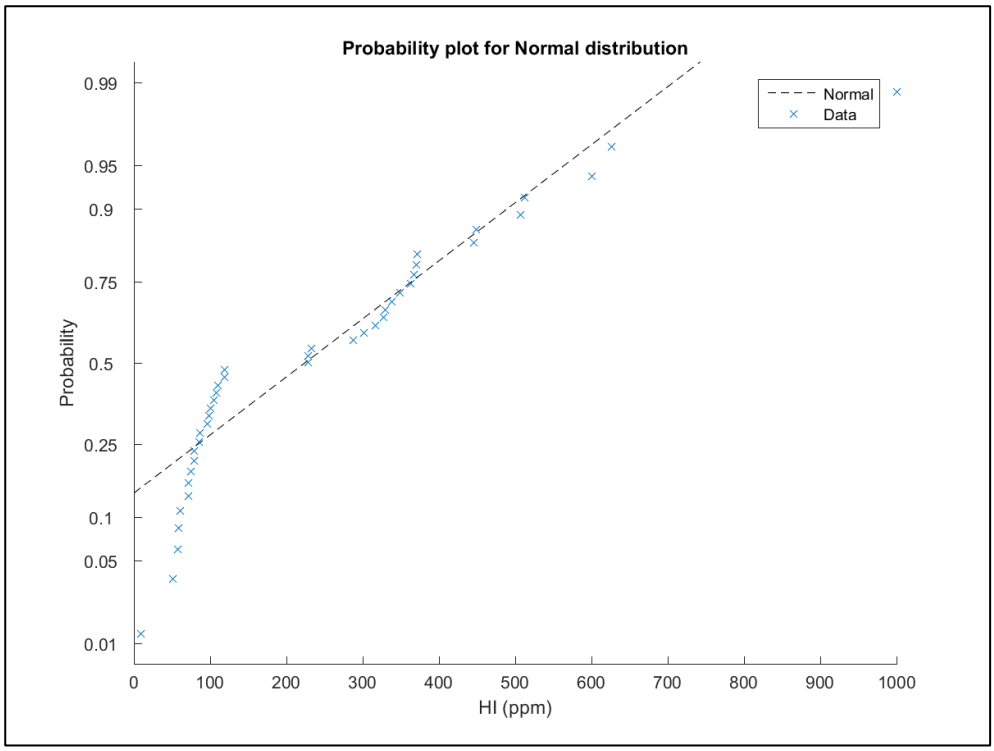

Fig 1.45. Probability plot for a normal distribution for all Late Jurassic HI data in the North Celtic Sea Basin & St George's Channel Basin.

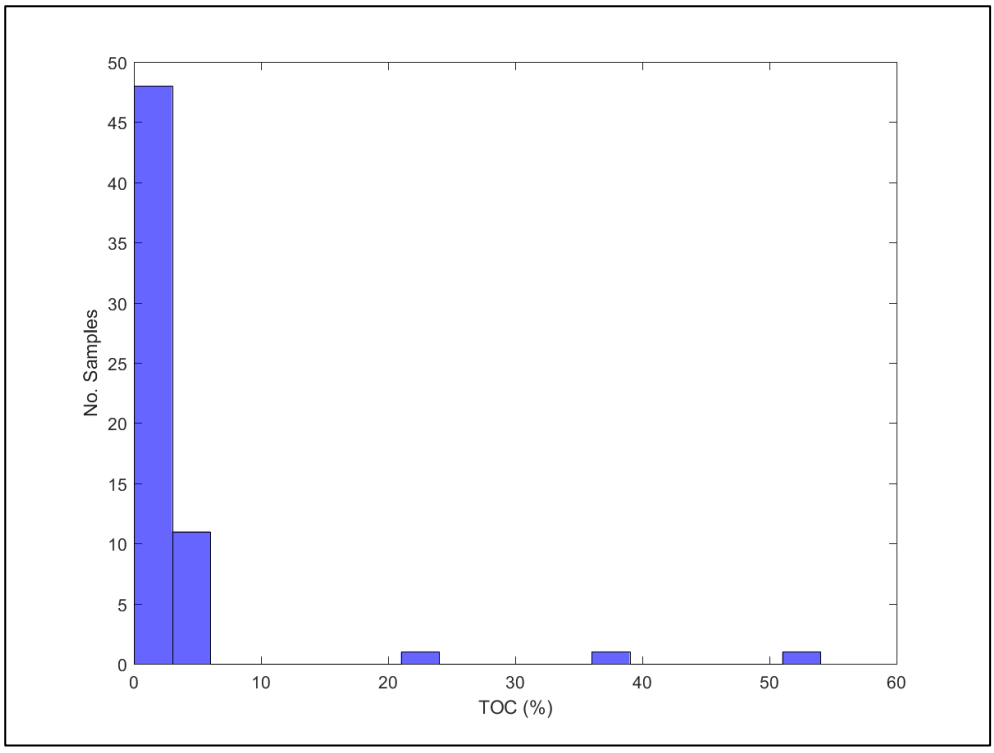

Fig 1.46. Histogram plot of all Jurassic (Early Jurassic only) TOC data for Melville Basin.

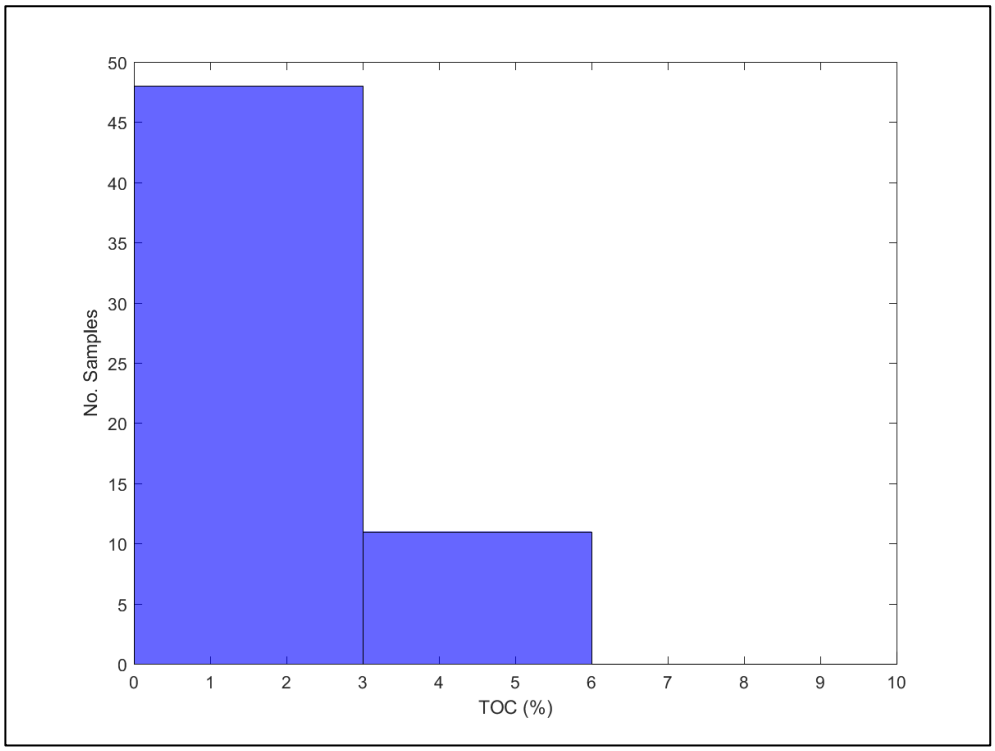

Fig 1.47. Histogram plot of all the Jurassic (Early Jurassic only) TOC data for the Melville Basin scaled to 0-10% TOC.

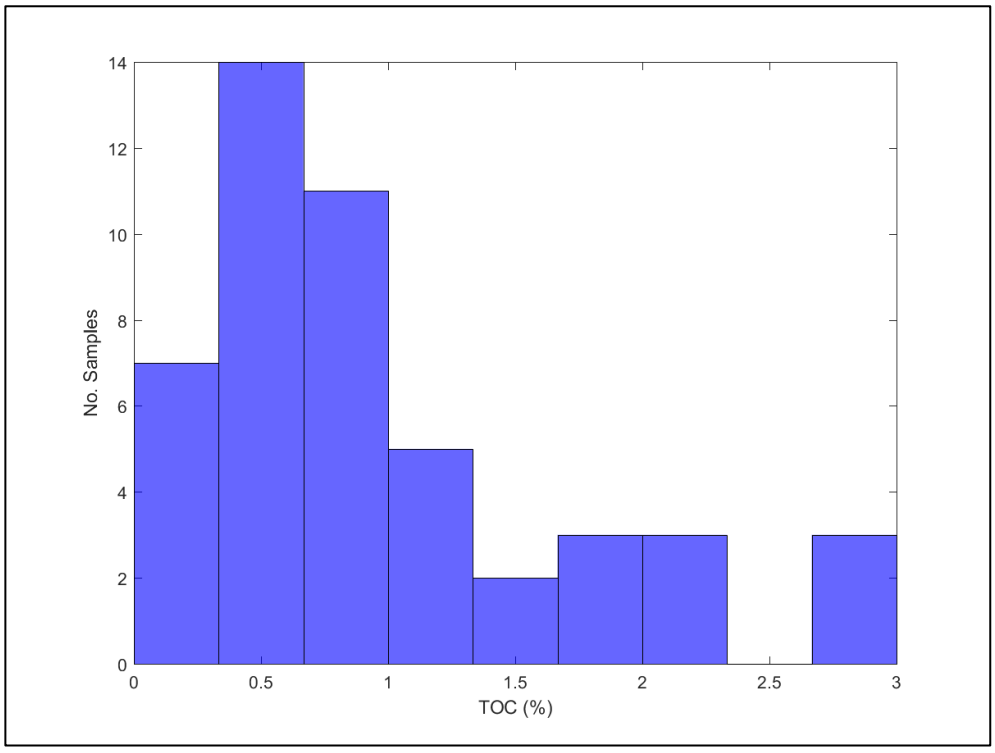

Fig 1.48. Histogram plot of all the Jurassic (Early Jurassic only) TOC data for the Melville Basin scaled to 0-3% TOC.

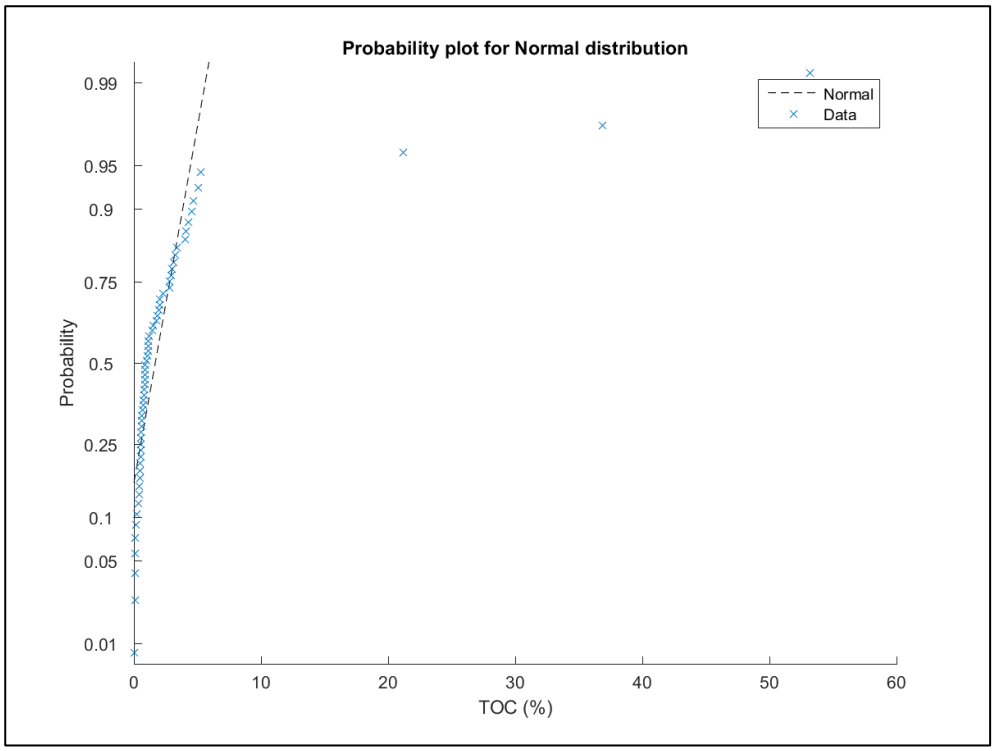

Fig 1.49. Probability plot for a normal distribution for all Jurassic (Early Jurassic only) TOC data in the Melville Channel Basin.

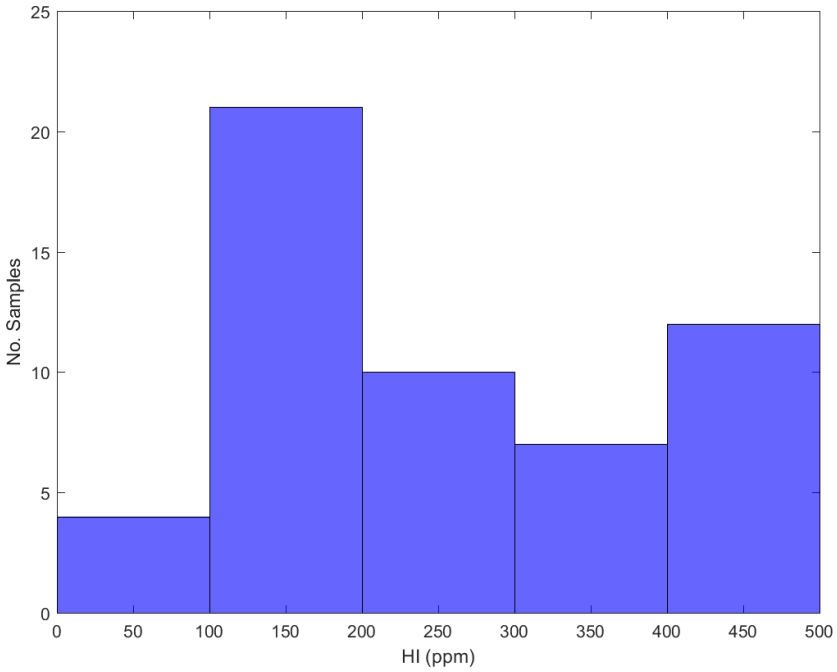

Fig 1.50. Histogram plot of all Jurassic (Early Jurassic only) HI data for the Melville Channel Basin.

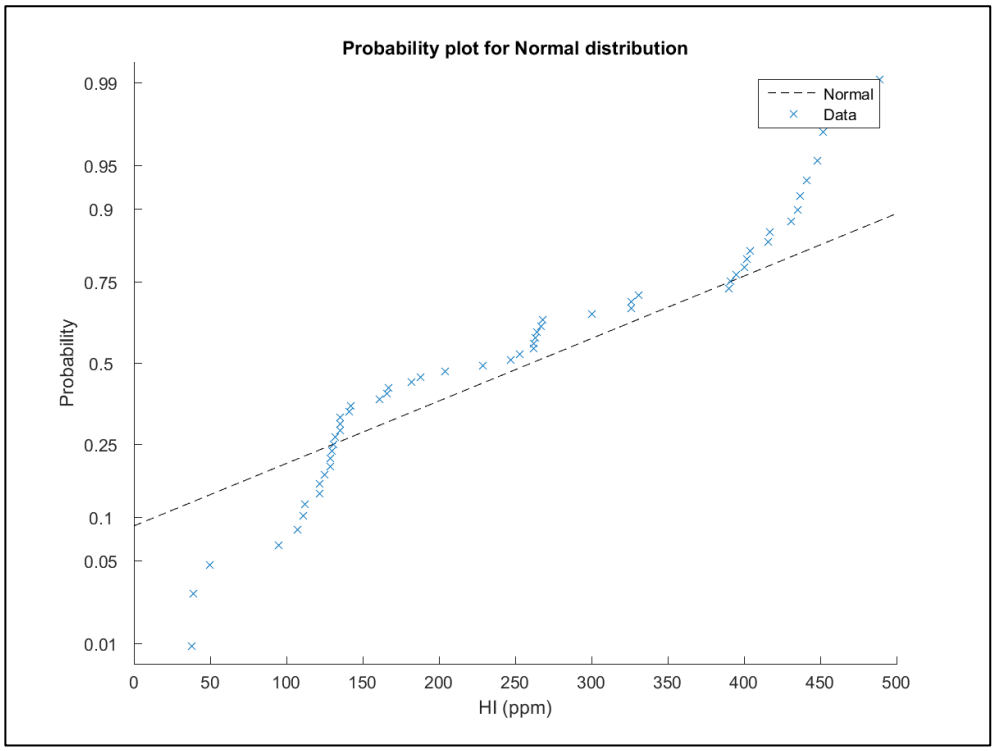

Fig 1.51. Probability plot for a normal distribution for all Jurassic (Early Jurassic only) HI data in the Melville Basin.

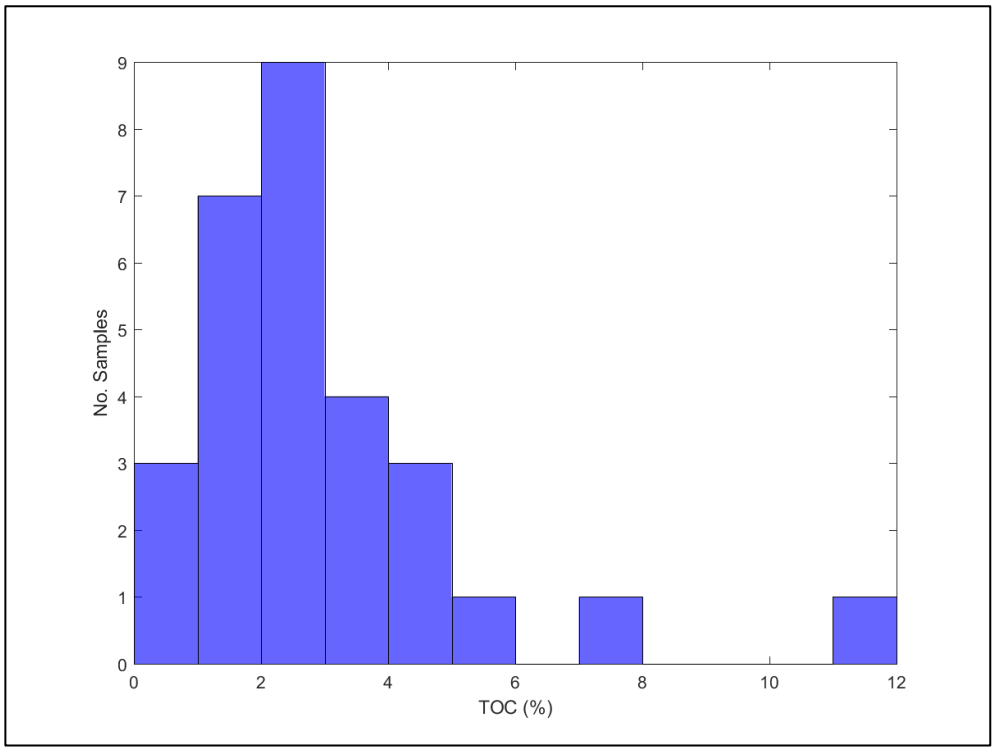

Fig 1.52. Histogram plot of all Jurassic (Early Jurassic only) TOC data for South West Channel Basin & Plymouth Bay Basin.

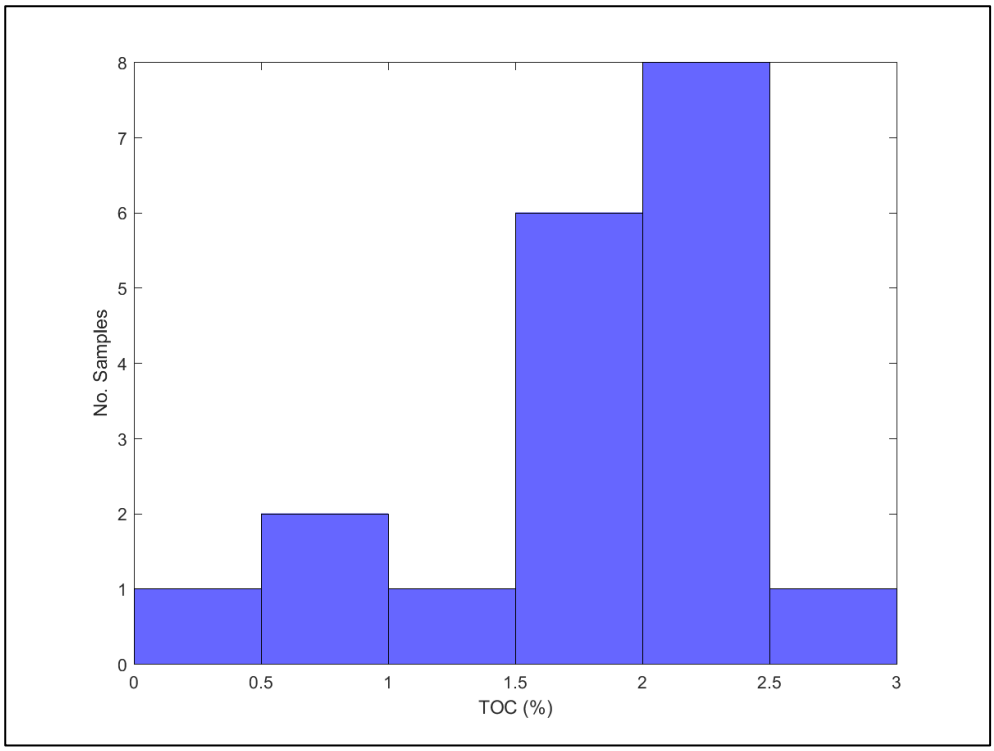

Fig 1.53. Histogram plot of all the Jurassic (Early Jurassic only) TOC data for the South West Channel Basin & Plymouth Bay Basin scaled to 0-3% TOC.

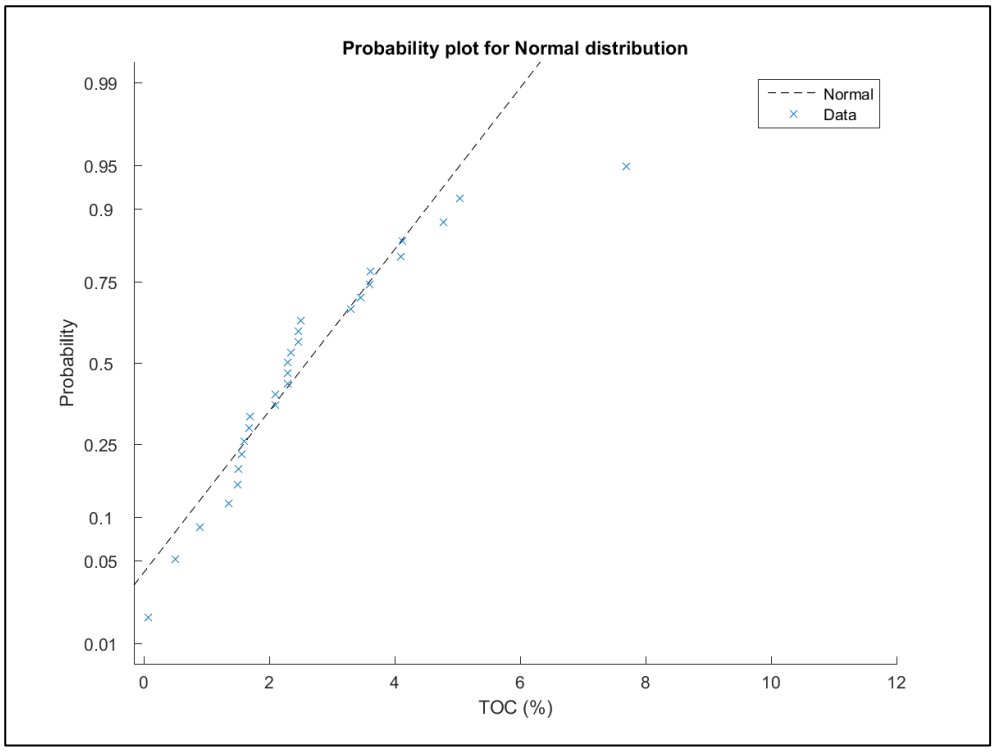

Fig 1.54. Probability plot for a normal distribution for all Jurassic (Early Jurassic only) TOC data in the South West Channel Basin & Plymouth Bay Basin.

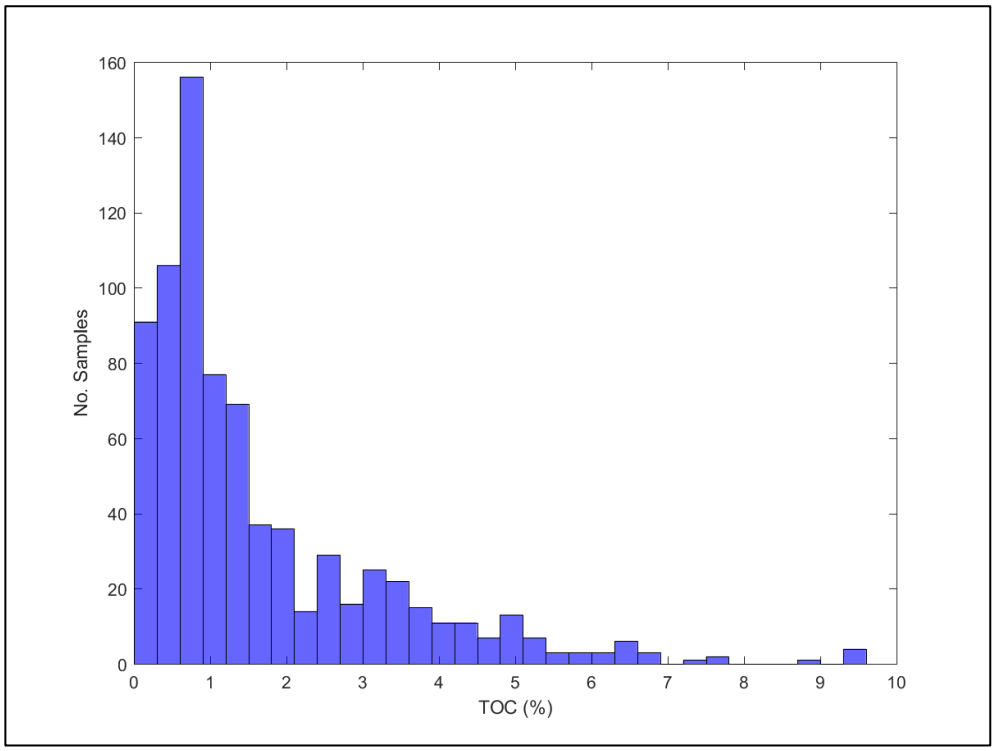

Fig 1.55. Histogram plot of all Jurassic TOC data for the Wytch Farm (Wessex Basin).

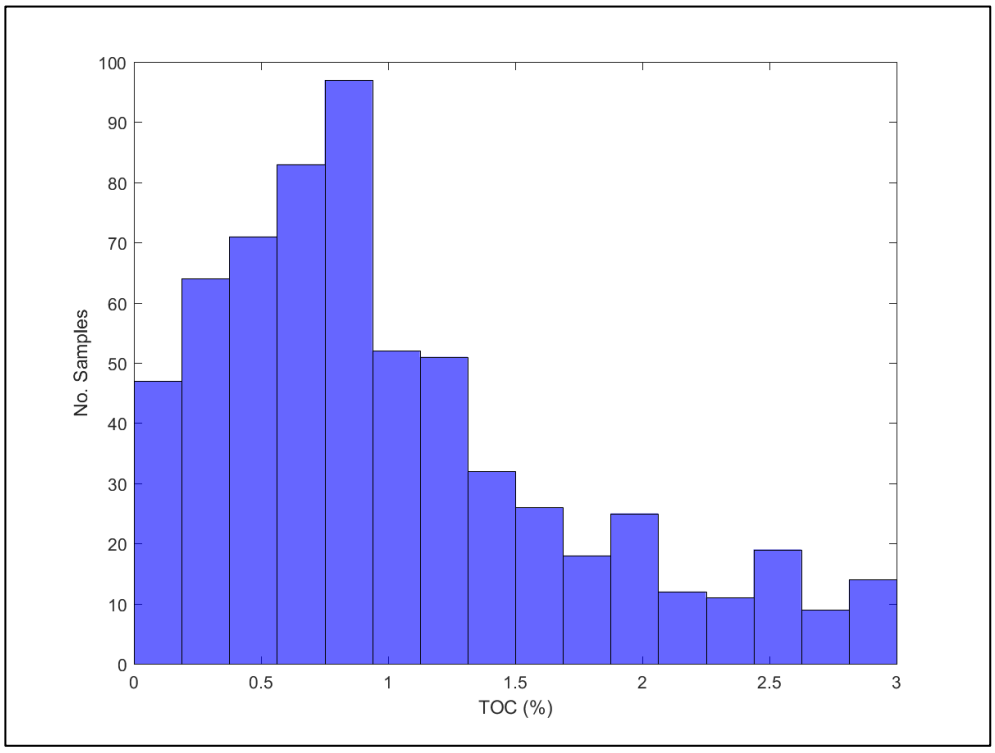

Fig 1.56. Histogram plot of all the Jurassic TOC data for the Wytch Farm (Wessex Basin) scaled to 0-3% TOC.

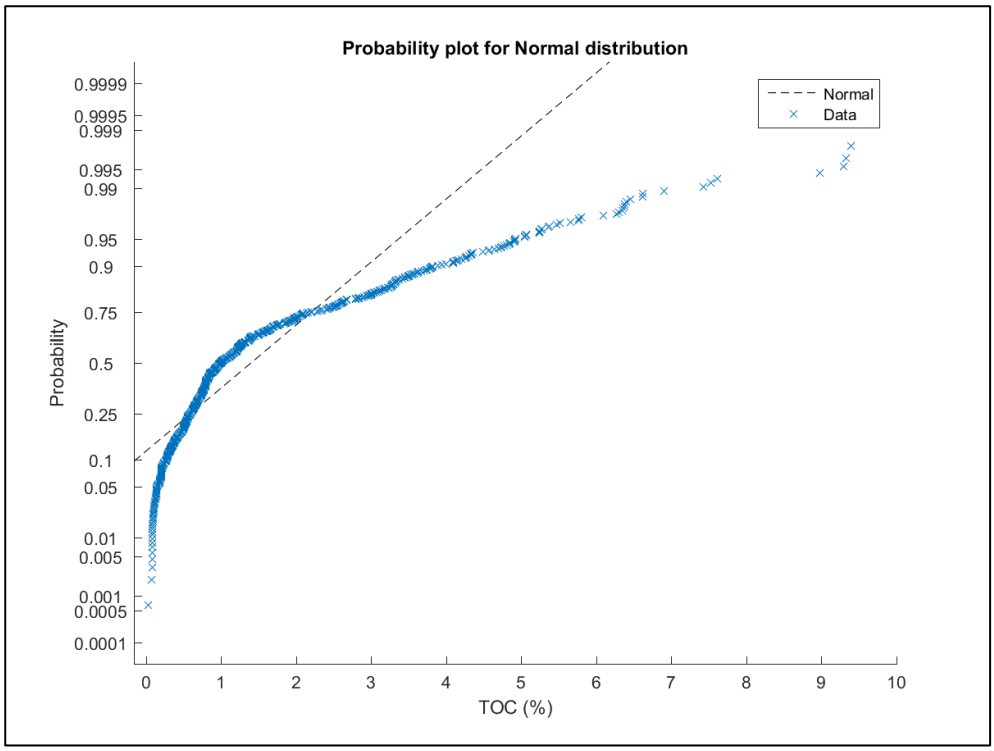

Fig 1.57. Probability plot for a normal distribution for all Jurassic TOC data in the Wytch Farm (Wessex Basin).

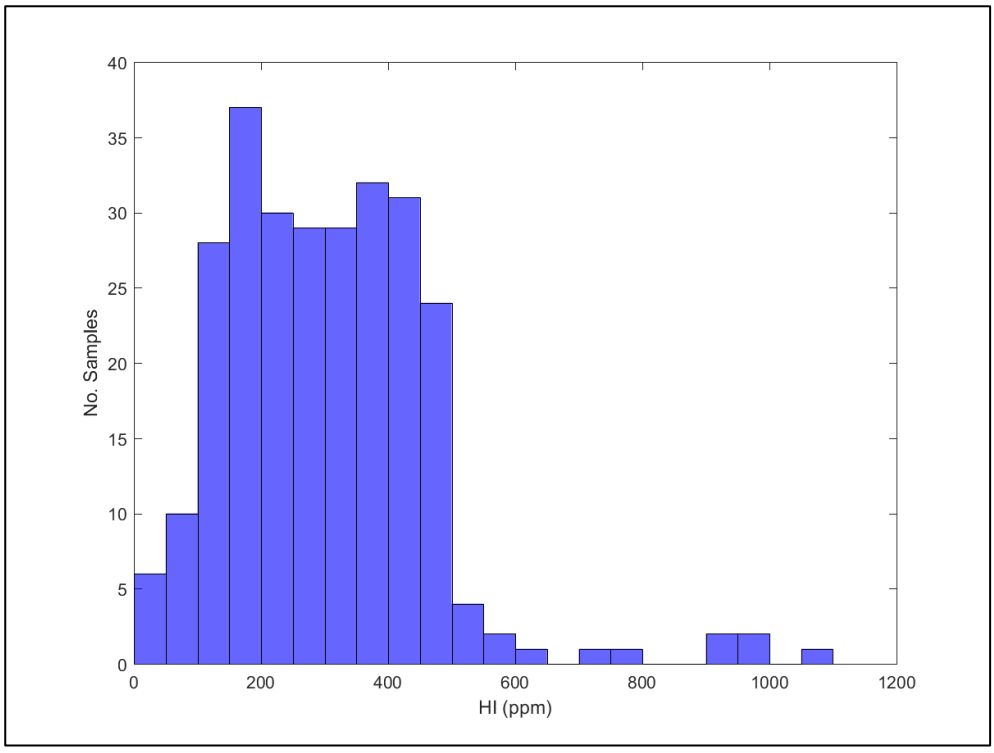

Fig 1.58. Histogram plot of all Jurassic HI data for the Wytch Farm (Wessex Basin).

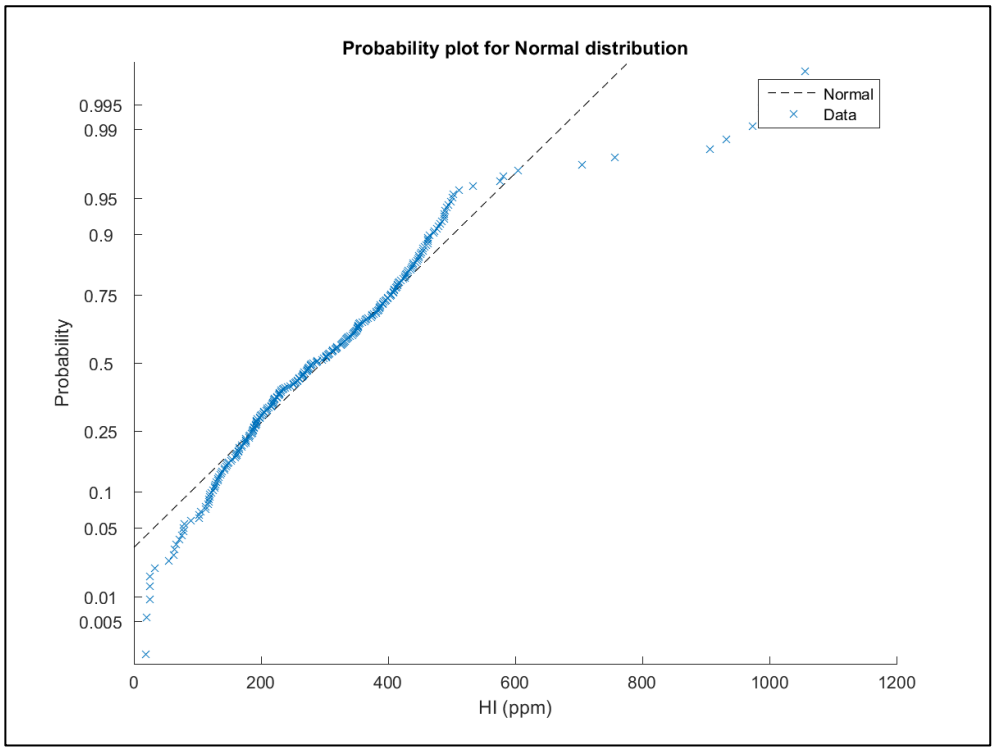

Fig 1.59. Probability plot for a normal distribution for all Jurassic HI data in the Wytch Farm (Wessex Basin).

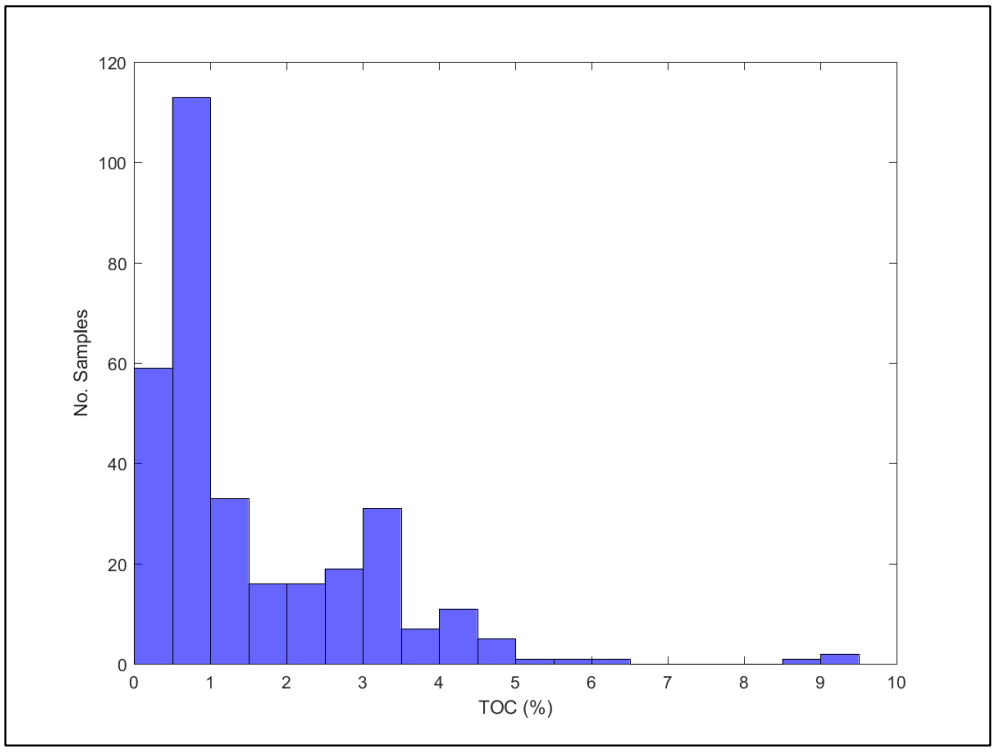

Fig 1.60. Histogram plot of all Early Jurassic TOC data for Wytch Farm (Wessex Basin).

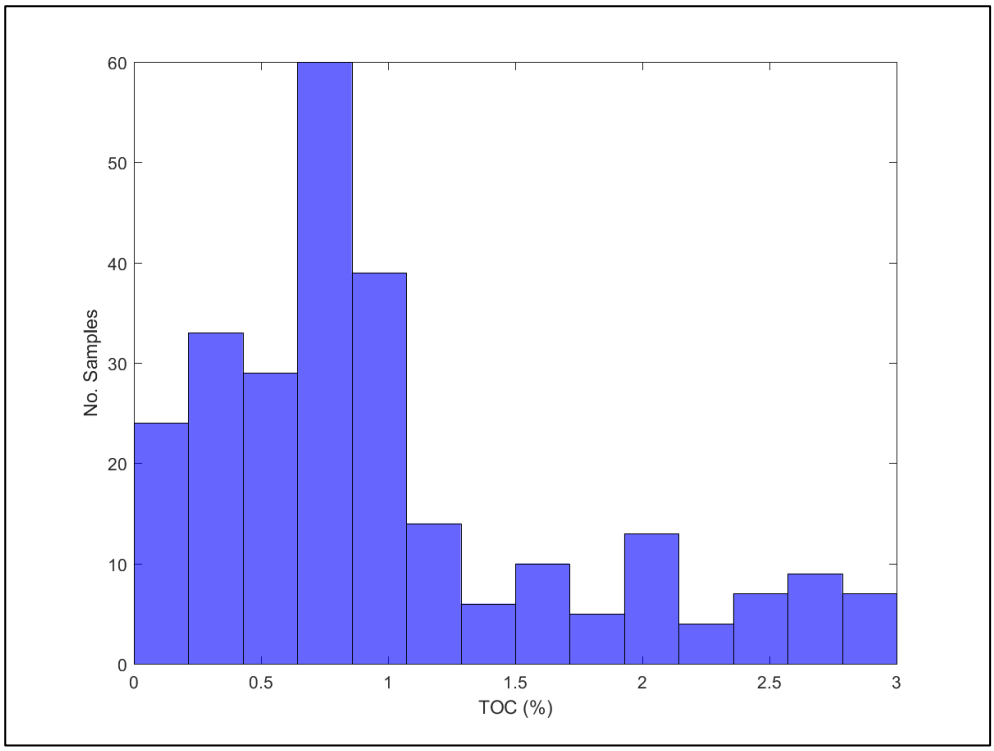

Fig 1.61. Histogram plot of all Early Jurassic TOC data for the Wytch Farm (Wessex Basin) scaled to 0-3% TOC.

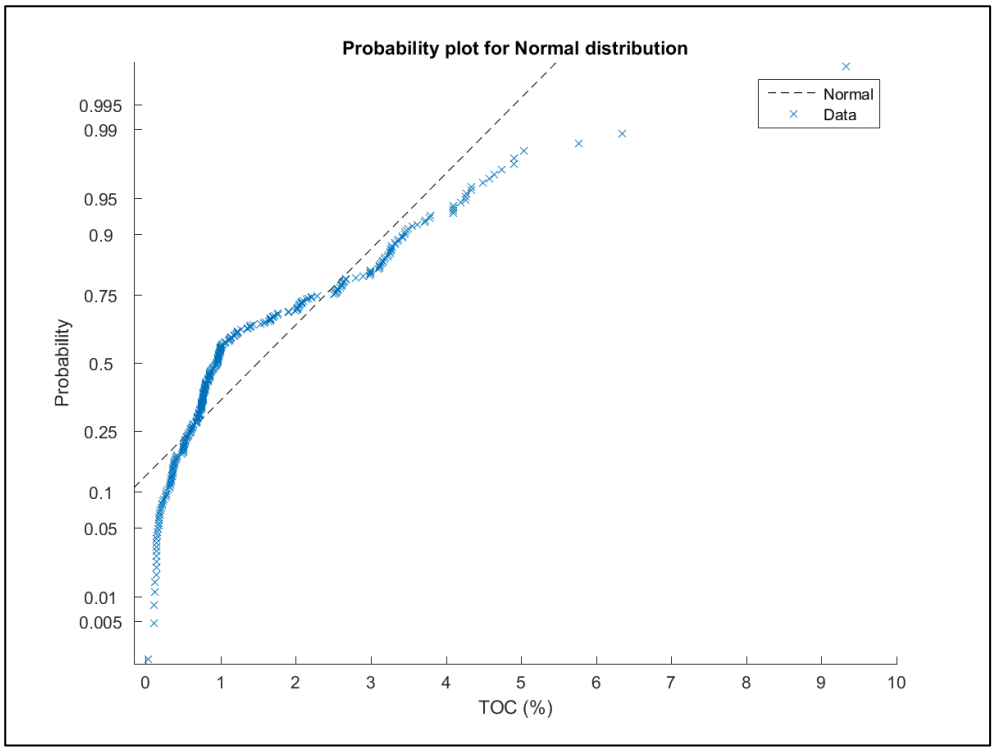

Fig 1.62. Probability plot for a normal distribution for all Early Jurassic TOC data in the Wytch Farm (Wessex Basin).

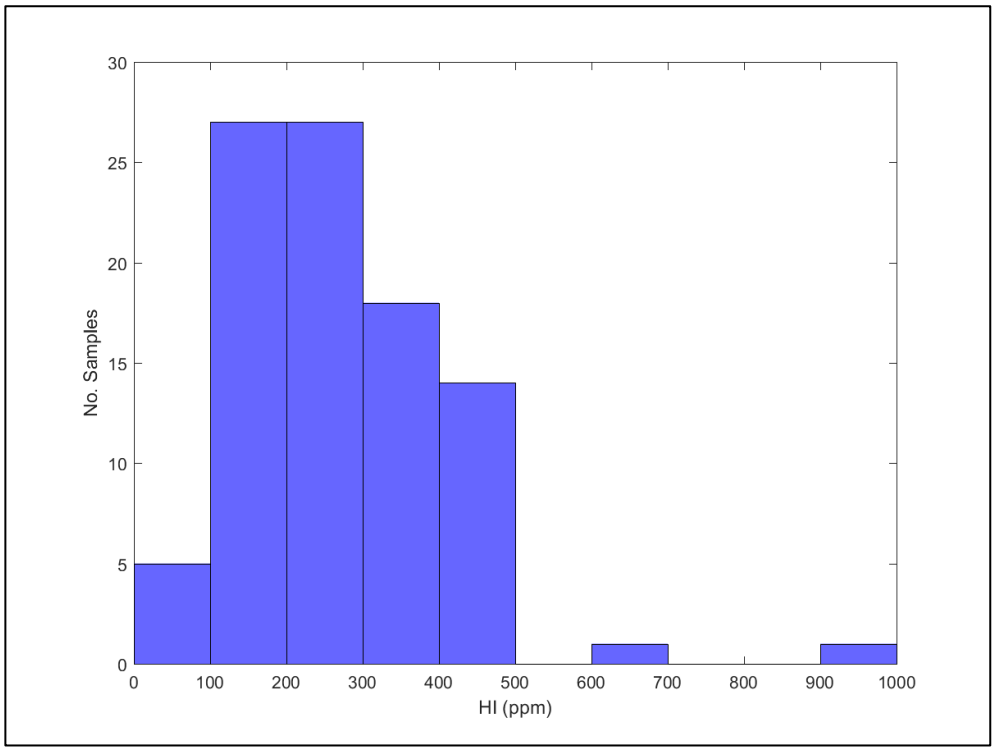

Fig 1.63. Histogram plot of all Early Jurassic HI data for the Wytch Farm (Wessex Basin).

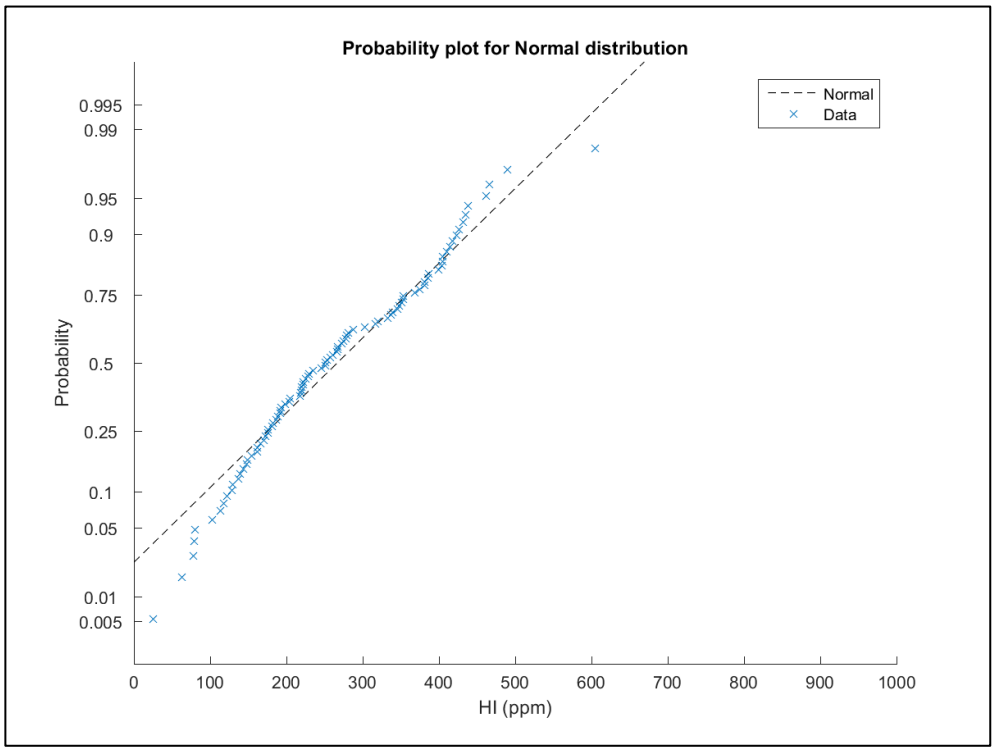

Fig 1.64. Probability plot for a normal distribution for all Early Jurassic HI data in the Wytch Farm (Wessex Basin).

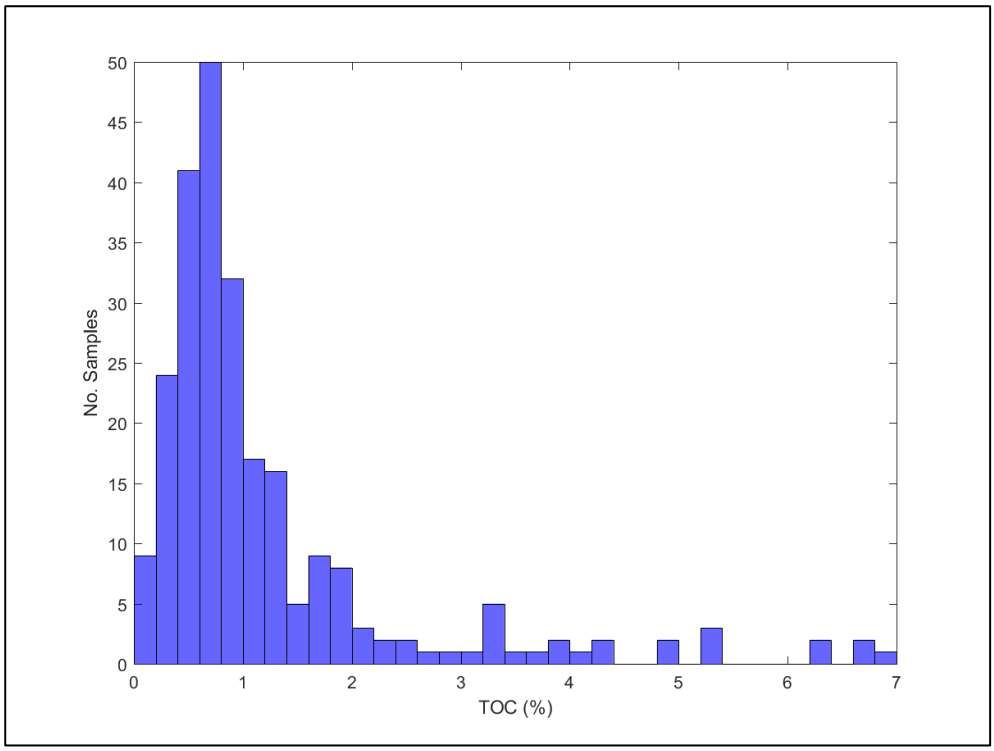

Fig 1.65. Histogram plot of all Middle Jurassic TOC data for Wytch Farm (Wessex Basin).

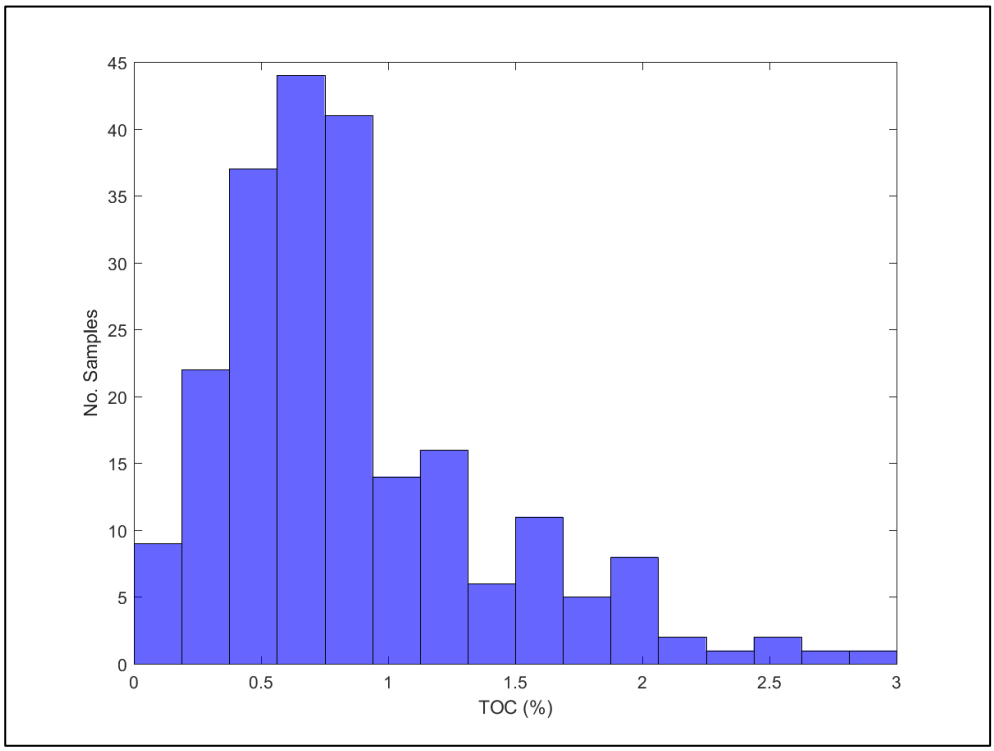

Fig 1.66. Histogram plot of all Middle Jurassic TOC data for the Wytch Farm (Wessex Basin) scaled to 0-3% TOC.

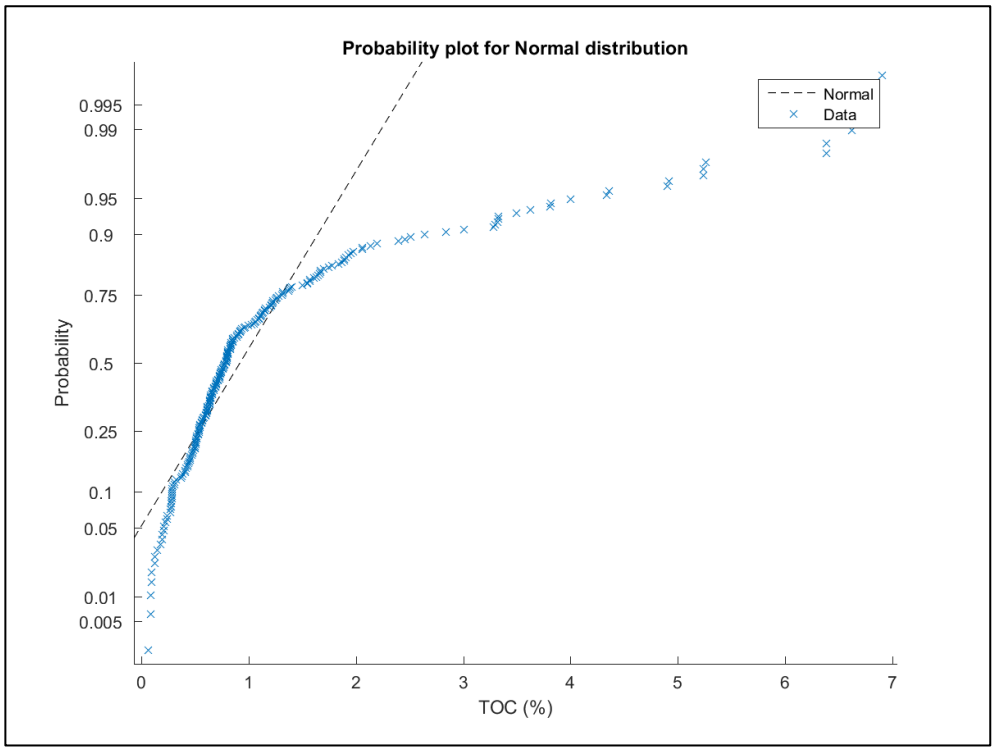

Fig 1.67. Probability plot for a normal distribution for all Middle Jurassic TOC data in the Wytch Farm (Wessex Basin).

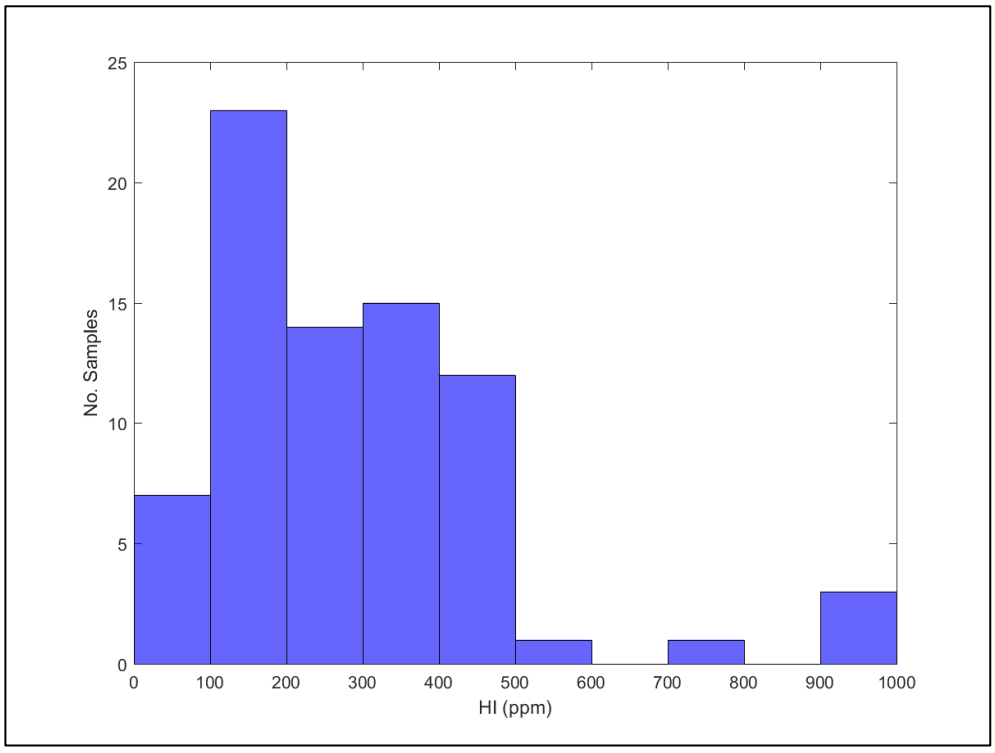

Fig 1.68. Histogram plot of all Middle Jurassic HI data for the Wytch Farm (Wessex Basin).

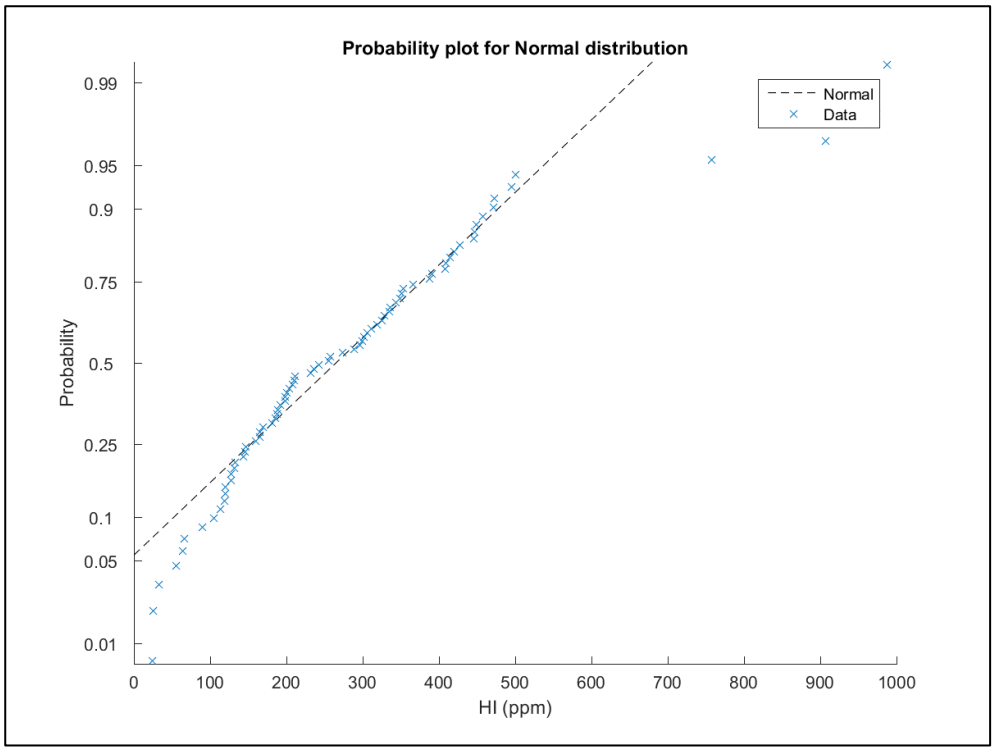

Fig 1.69. Probability plot for a normal distribution for all Middle Jurassic HI data in the Wytch Farm (Wessex Basin).

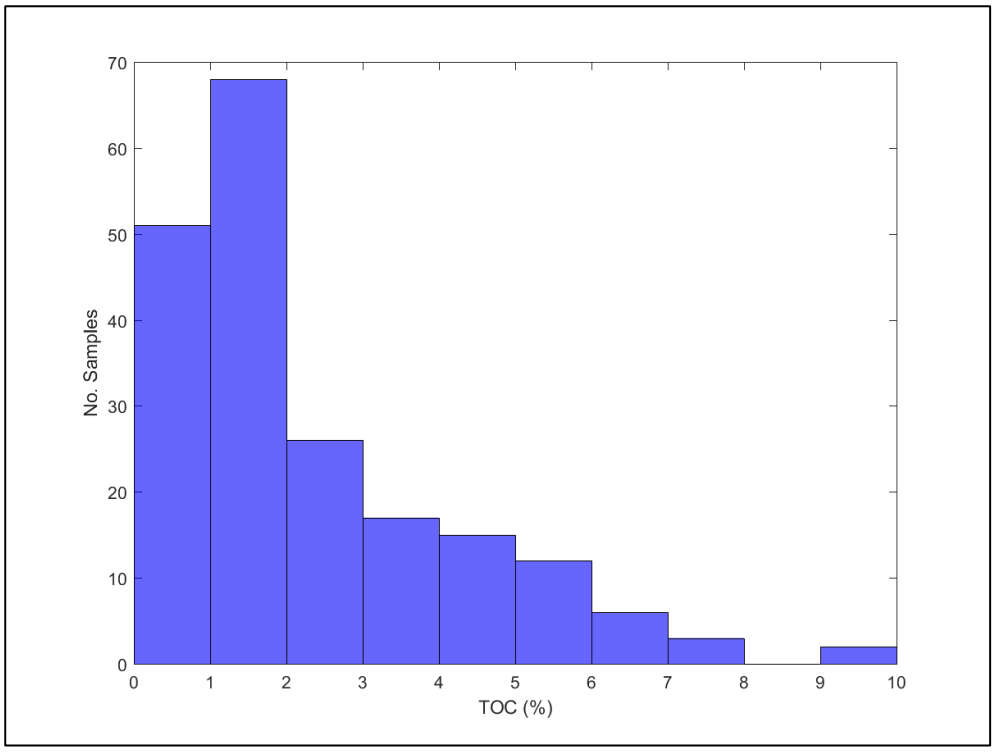

Fig 1.70. Histogram plot of all Late Jurassic TOC data for Wytch Farm (Wessex Basin).

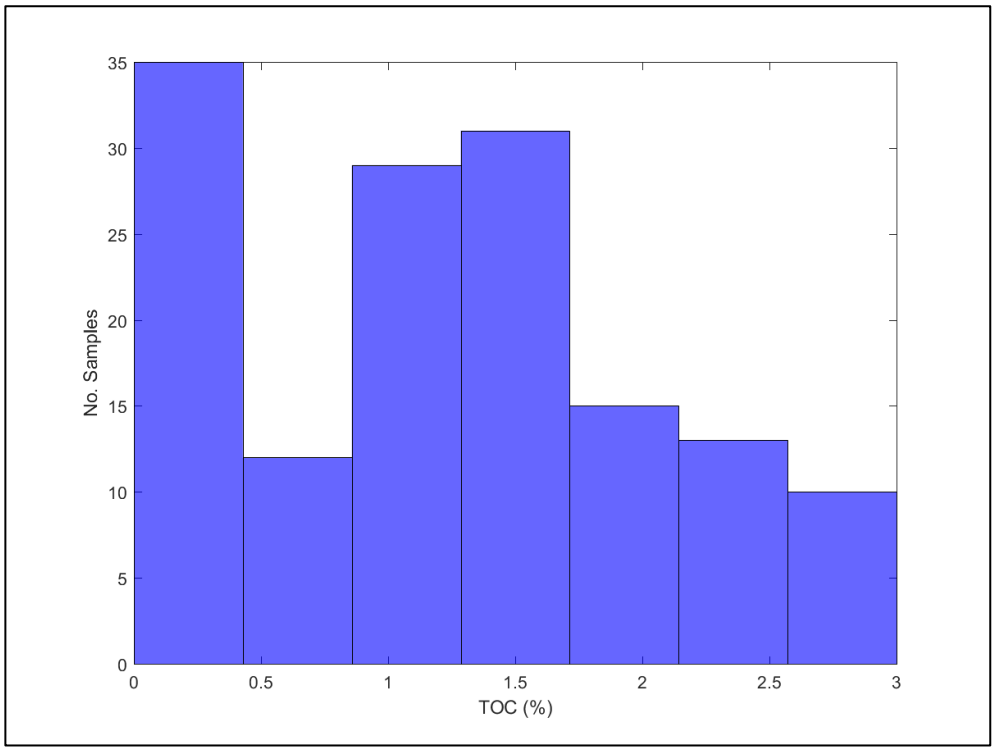

Fig 1.71. Histogram plot of all Late Jurassic TOC data for the Wytch Farm (Wessex Basin) scaled to 0-3% TOC.

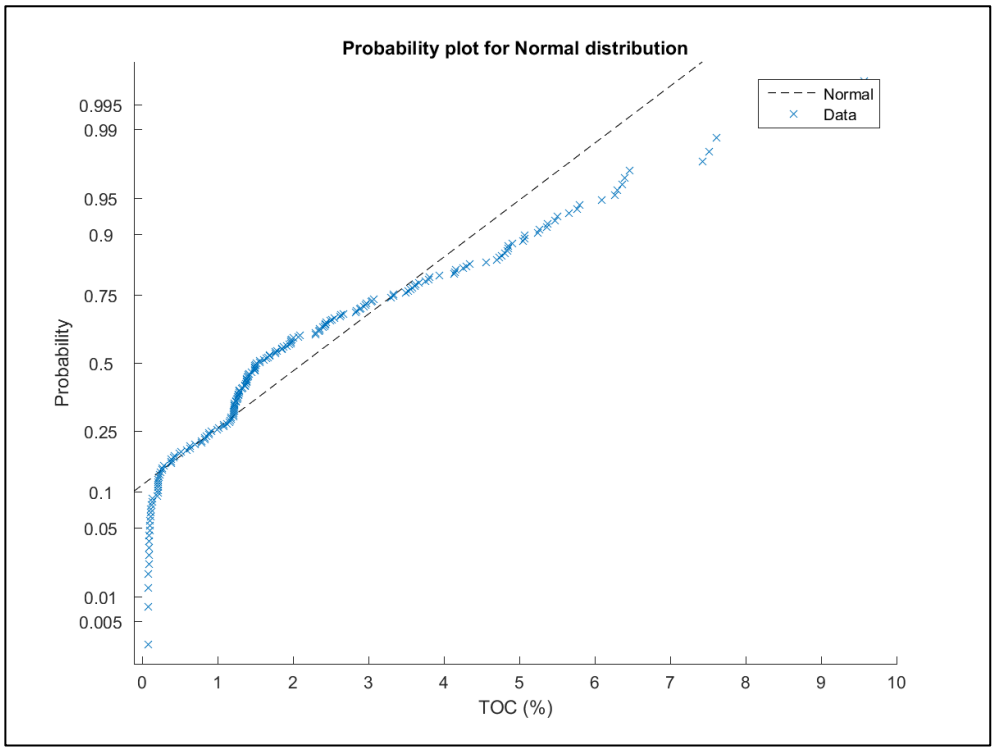

Fig 1.72. Probability plot for a normal distribution for all Late Jurassic TOC data in the Wytch Farm (Wessex Basin).

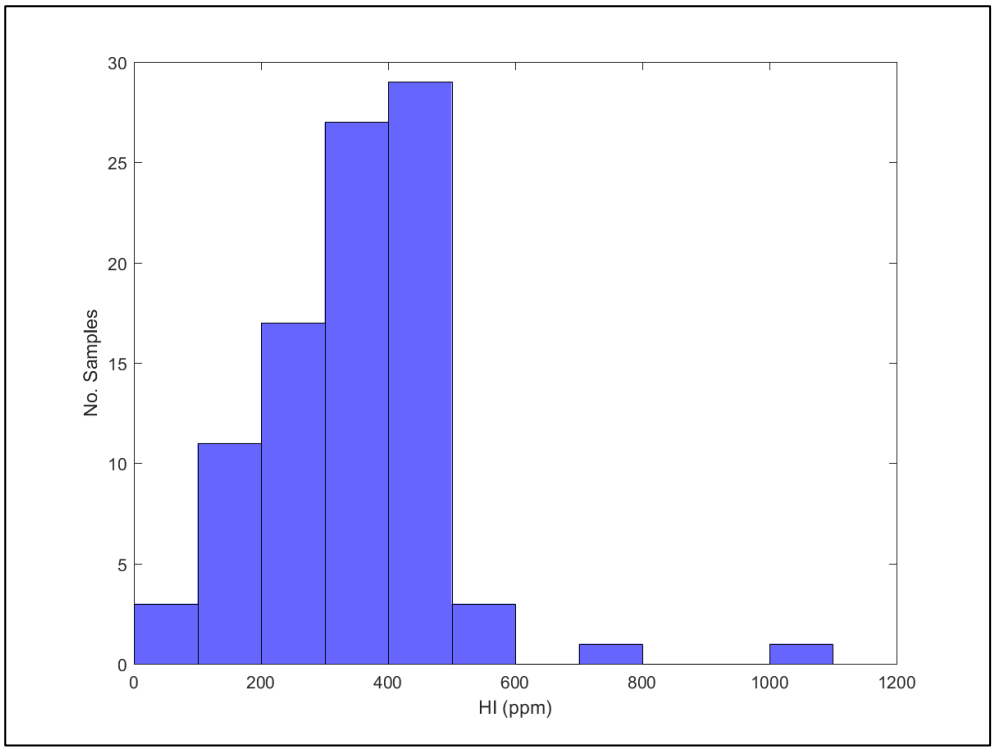

Fig 1.73. Histogram plot of all Late Jurassic HI data for the Wytch Farm (Wessex Basin).

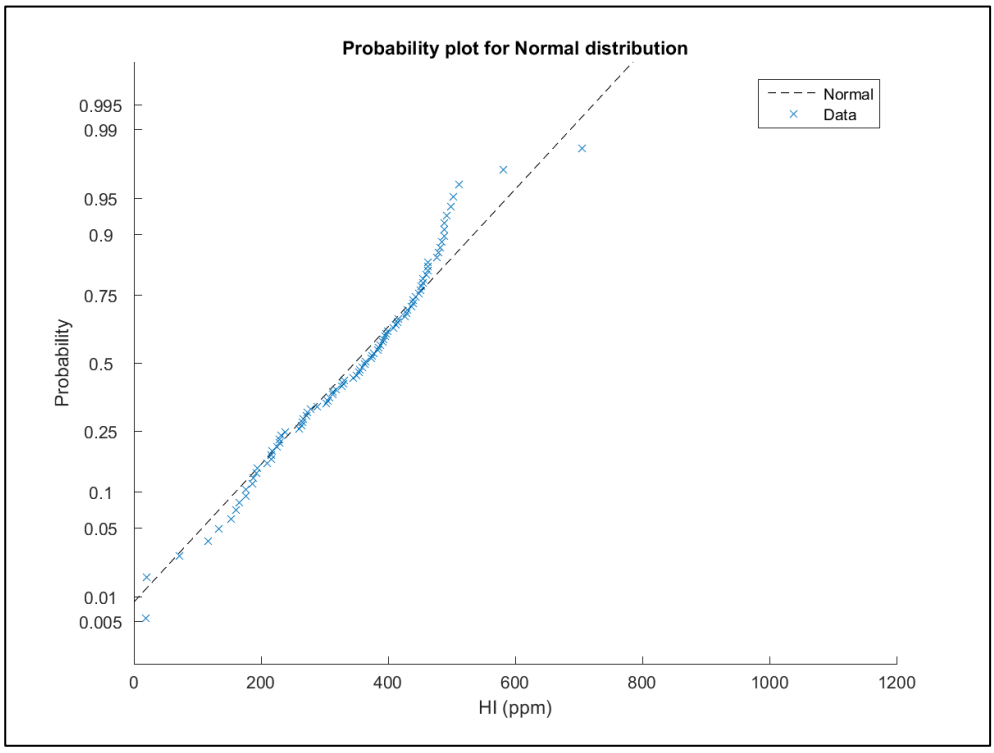

Fig 1.74. Probability plot for a normal distribution for all Late Jurassic HI data in the Wytch Farm (Wessex Basin).

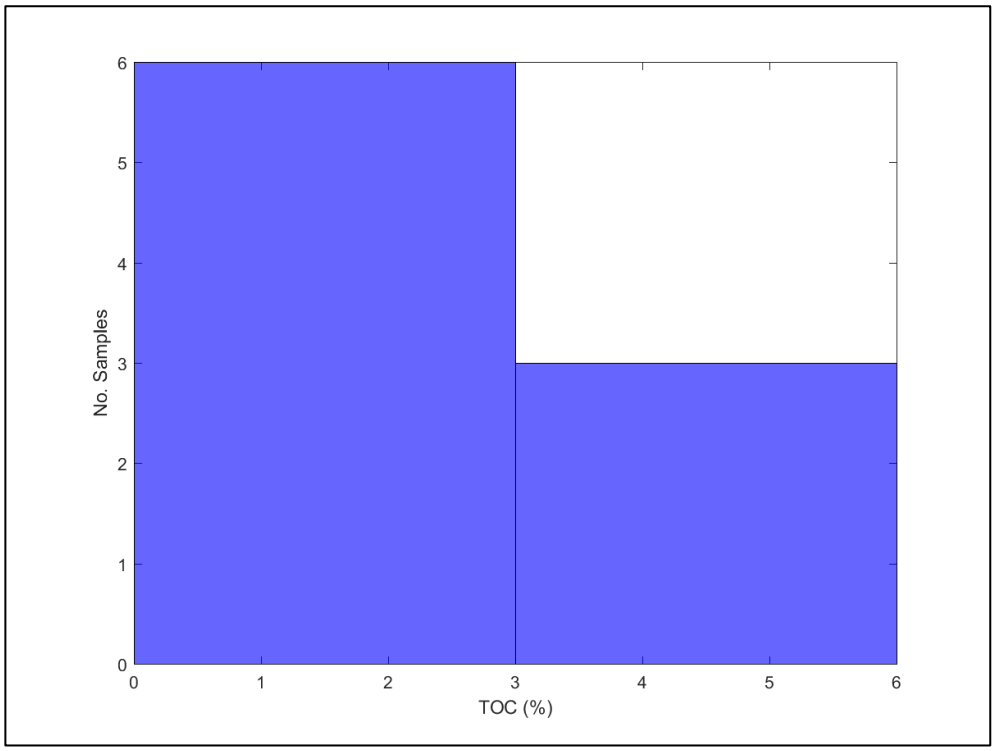

Fig 1.75. Histogram plot of all undifferentiated Jurassic TOC data for Wytch Farm (Wessex Basin).

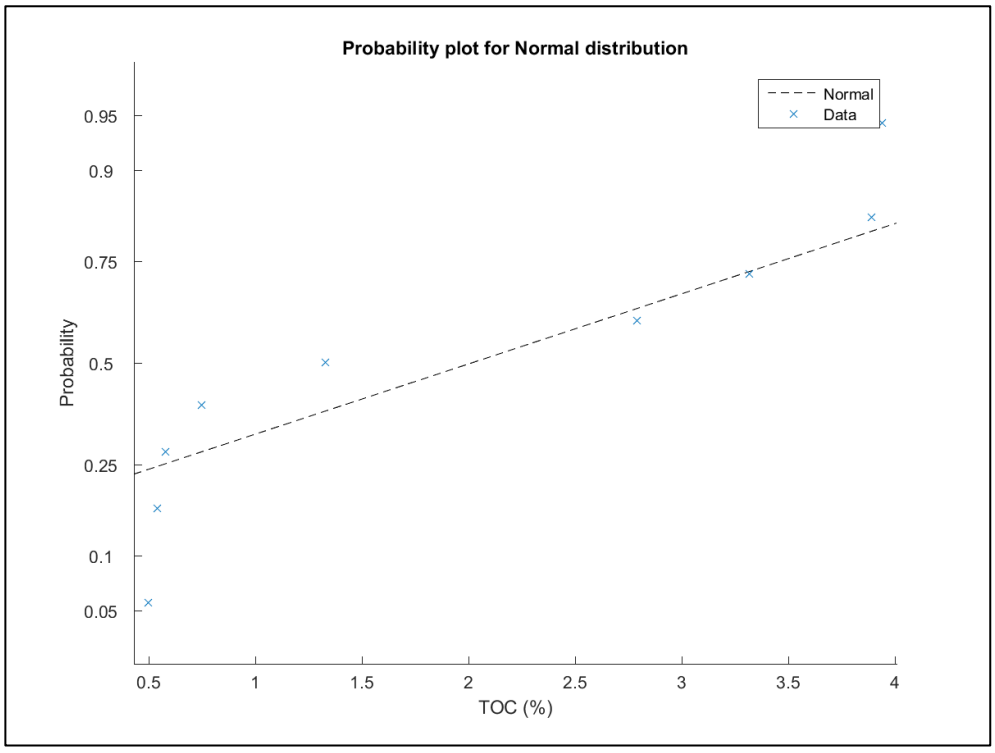

Fig 1.77. Probability plot for a normal distribution for all undifferentiated Jurassic TOC data in the Wytch Farm (Wessex Basin).

2. KinEx Modelling

Well	Basin	Series	Stage/Stages	Thickness (m)	Thickness (ft)	TOC (%)	HI (mg/g)	Kerogen Type	Comments
103/01-1	NCSB	Late Jurassic	Oxfordian to Portlandian	850	2788.7	1.8	400	Type 2 mixed - D/E	Lagoonal to lacustrine sediments
103/02-1	NCSB	Early Jurassic	Hettangian to Pliensbachian	50	164.0	2	310	Type 2 mixed - D/E	Coaly Material indicated
103/02-1	NCSB	Early Jurassic	Sinemurian	200	656.2	1.75	285	Type 2 mixed - D/E	Coaly Material indicated
102/29-1	SCSB	Early Jurassic	Sinemurian to Pliensbachian	300	984.3	3.5	400	Type 2 mixed - D/E	
102/29-1	SCSB	Early Jurassic	Hettangian to Sinemurian	220	721.8	1.75	285	Type 2 mixed - D/E	
103/21-1	SCSB	Middle to Early Jurassic	Bathonian to Upper Early Jurassic	250	820.2	4.5	440	Type 2 mixed - D/E	
103/21-1	SCSB	Early Jurassic		150	492.1	2	310	Type 2 mixed - D/E	
106/18-1	SGCB	Early Jurassic	Hettangian to Pliensbachian	125	410.1	2	300	Type 2 mixed - D/E	
106/28-1	SGCB	Early Jurassic	Pliensbachian to Toarcian	120	393.7	2	310	Type 2 mixed - D/E	
73/13-1	MB	Early Jurassic	Sinemurian	100	328.1	4	400	Type 2 mixed - B & D/E	Algal with abundant terrestrial kerogen
73/13-1	MB	Early Jurassic	Sinemurian	50	164.0	2	250	Type 2 mixed - B & D/E	Algal with abundant terrestrial kerogen
88/02-1	PBB	Early Jurassic	Hettangian to Pliensbachian	120	393.7	2	310	Type 2 mixed - D/E	Amorphous algal and herbal material
88/02-1	PBB	Early Jurassic	Hettangian to Pliensbachian	30	98.4	5	455	Type 2 mixed - D/E	Amorphous algal and herbal material
88/02-1	PBB	Early Jurassic	Hettangian to Pliensbachian	50	164.0	3	375	Type 2 mixed - D/E	Amorphous algal and herbal material
98/11-4	WF	Late Jurassic	Kimm Clay	340	1115.5	4	400	Type 2 - B	
98/11-4	WF	Late Jurassic	Kimm - Corallian - Oxford Clay	200	656.2	1.8	200	Type 2 - B	
98/11-4	WF	Early Jurassic	Lower Lias	90	295.3	3	400	Type 2 mixed - D/E	
98/11-4	WF	Early Jurassic	Lower Lias	20	65.6	2	400	Type 2 mixed - D/E	
98/13-1	WF	Late Jurassic	Kimm Clay	100	328.1	2	400	Type 2 - B	
98/13-1	WF	Late Jurassic	Kimm Clay	300	984.3	5	400	Type 2 - B	
98/13-1	WF	Late Jurassic	Kimm Clay	50	164.0	2.5	400	Type 2 - B	
98/16-1	WF	Late Jurassic	Purbeckian to Oxfordian	150	492.1	2	600	Type 2 - B	
98/16-1	WF	Late to Middle Jurassic	Oxfordian to Callovian	150	492.1	1.75	300	Type 2 - B	
98/16-1	WF	Middle Jurassic	Late to Middle Callovian	25	82.0	5	900	Type 2 - B	
98/16-1	WF	Early Jurassic	Sinemurian	200	656.2	3	300	Type 2 mixed - D/E	
98/23-1	WF	Middle Jurassic	Callovian	175	574.1	3	450	Type 2 - B	
98/23-1	WF	Early Jurassic	Sinemurian - Late Pliensbachian	75	246.1	2	180	Type 2 mixed - D/E	
98/23-1	WF	Early Jurassic	Hettangian - Early Sinemurian	50	164.0	3	150	Type 2 mixed - D/E	

Table 2.1. Table of data for the KinEx modelling with the thickness of the interval, TOC (%), HI (mg/g) and along with organofacies information required for the KinEx modelling. Where no HI information was available values were estimated based on the trends discussed in Section 5.5. The plots produced from the KinEx Modelling are shown below. The principles behind the use of the KinEx software are discussed in Chapter 4.

103/01-1

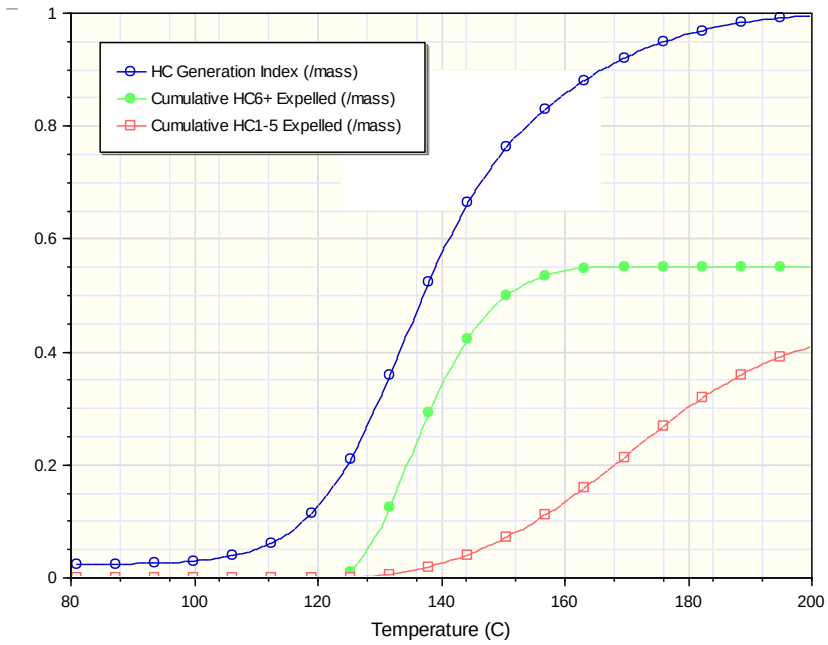

Fig 2.78. Plot of hydrocarbon yield against temperature based on the Late Jurassic source rock section of 103/01-1 using the KinEx software package with calculations based on Pepper & Corvi (1995). Kerogen type was input as algal matter (50% Type C) with high levels of terrestrial input (50% Type D/E).

HC6+ expelled and HC1-5 expelled per square kilometre

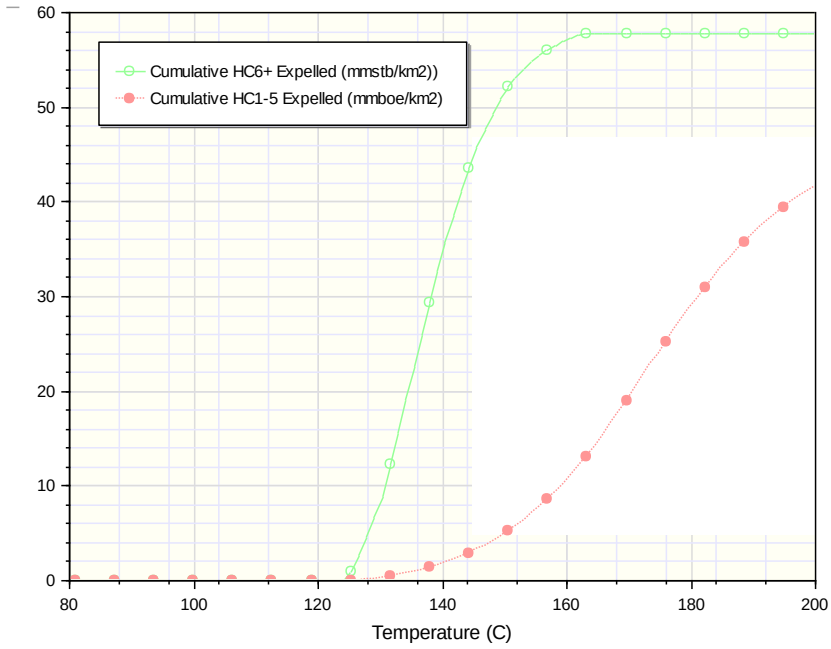

Fig 2.79. Plot of cumulative HC6+ (oil) and HC1-5 (gas) expulsion. Kerogen type was input as algal matter (50% Type C) with high levels of terrestrial input (50% Type D/E).

Type C End member

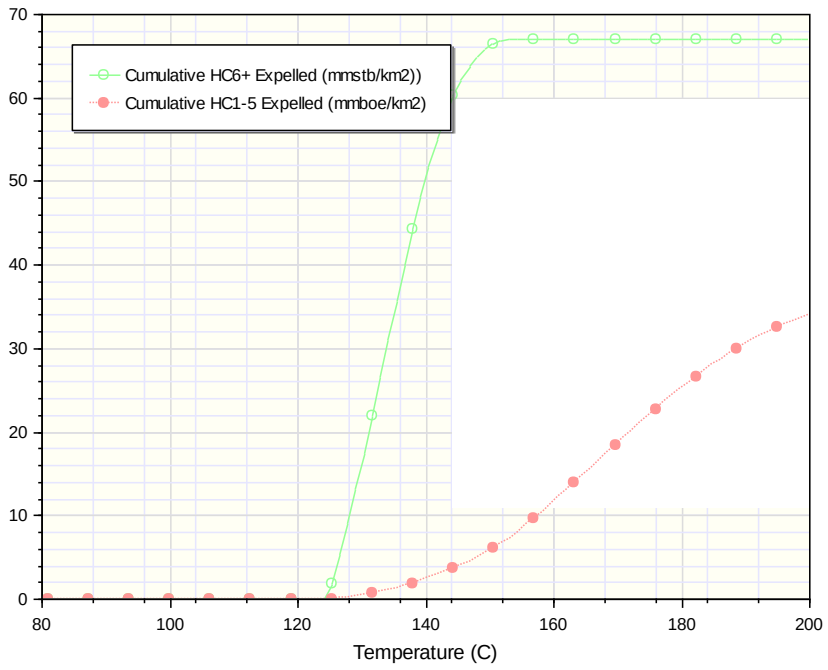

Fig 2.80. Plot of cumulative HC6+ (oil) and HC1-5 (gas) expulsion as a Type C end member. Kerogen type was input as algal matter (100% Type C).

Type D/E End Member

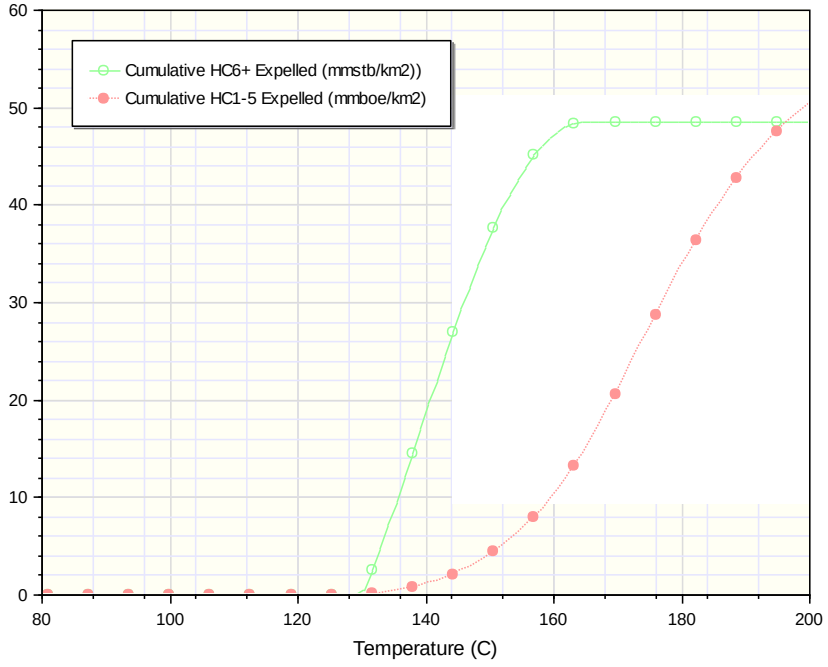

Fig 2.81. Plot of cumulative HC6+ (oil) and HC1-5 (gas) expulsion as a Type D/E end member. Kerogen type was input as 100% Type D/E.

103/02-1

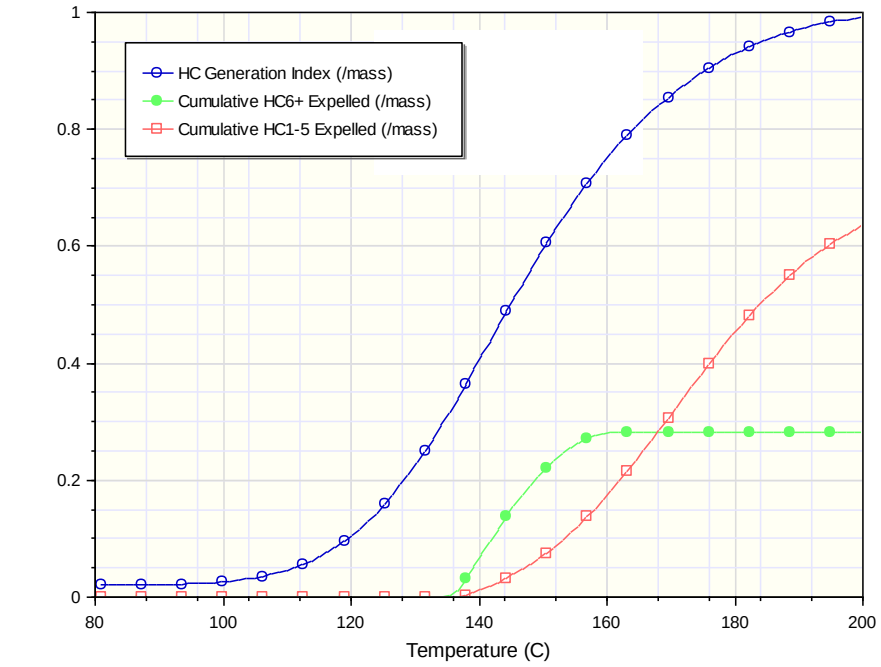

Fig 2.82. Plot of hydrocarbon yield against temperature based on the Late Jurassic source rock section of 103/02-1 using the KinEx software package with calculations based on Pepper & Corvi (1995). Kerogen type was input as 100% Type D/E.

HC6+ expelled and HC1-5 expelled per square kilometre

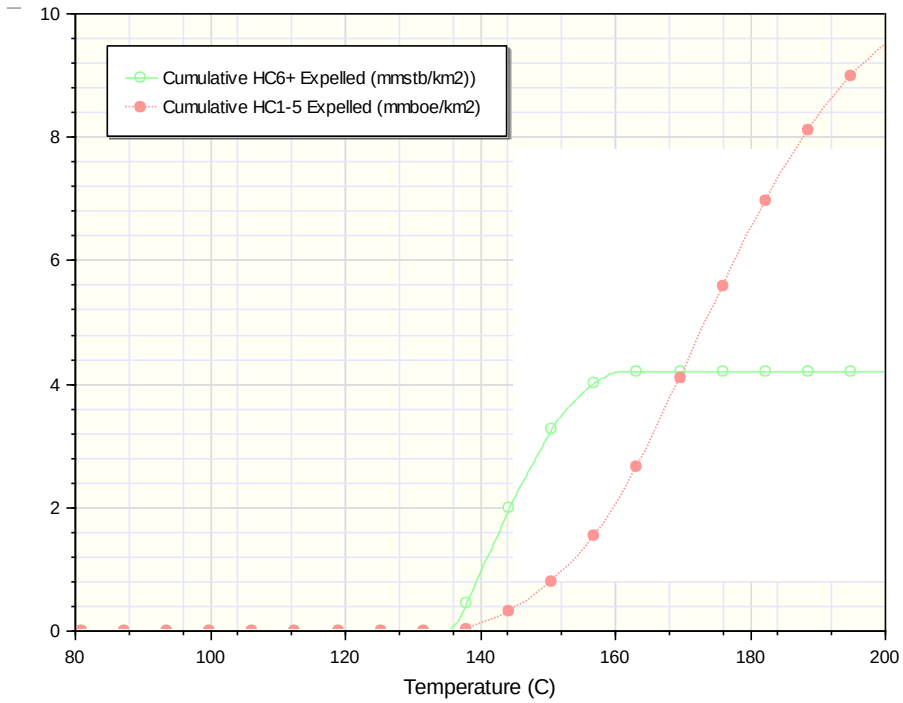

Fig 2.83. Plot of cumulative HC6+ (oil) and HC1-5 (gas) expulsion. Kerogen type was input as 100% Type D/E.

102/29-1

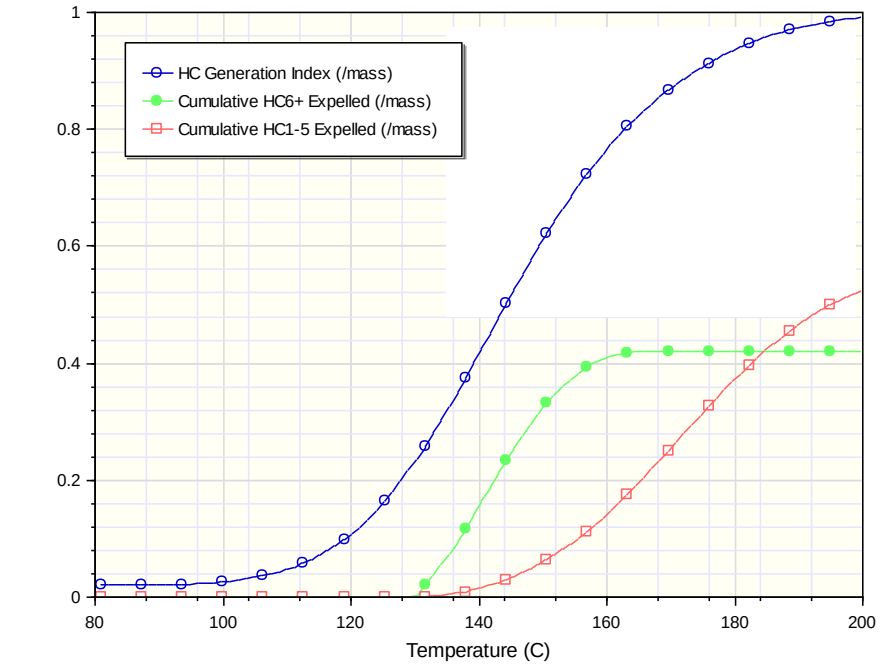

Fig 2.84. Plot of hydrocarbon yield against temperature based on the Late Jurassic source rock section of 102/29-1 using the KinEx software package with calculations based on Pepper & Corvi (1995). Kerogen type was input as 100% Type D/E.

HC6+ expelled and HC1-5 expelled per square kilometre

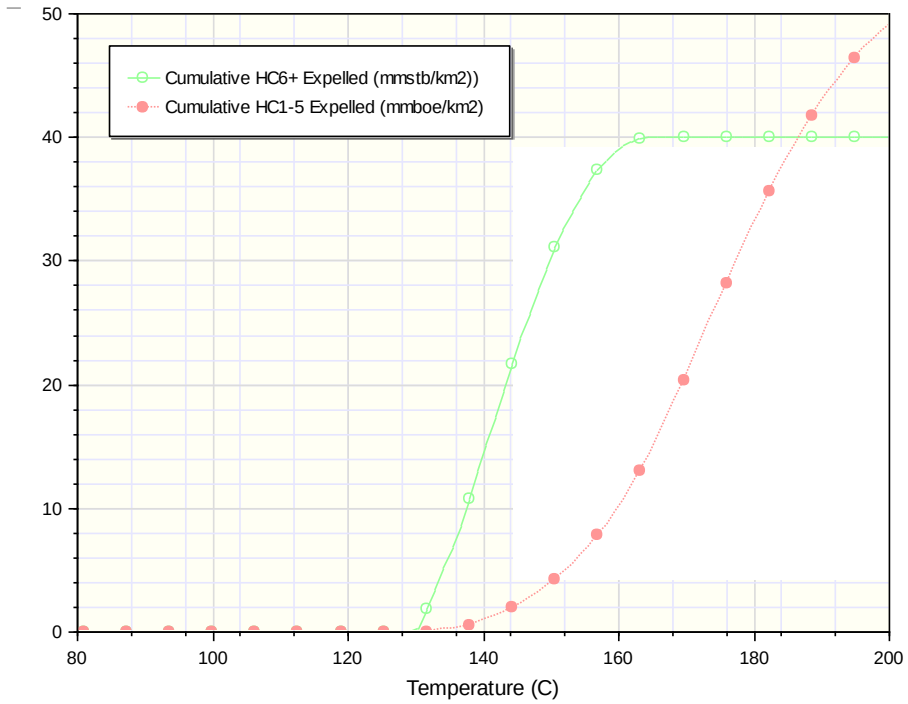

Fig 2.85. Plot of cumulative HC6+ (oil) and HC1-5 (gas) expulsion. Kerogen type was input as 100% Type D/E.

103/21-1

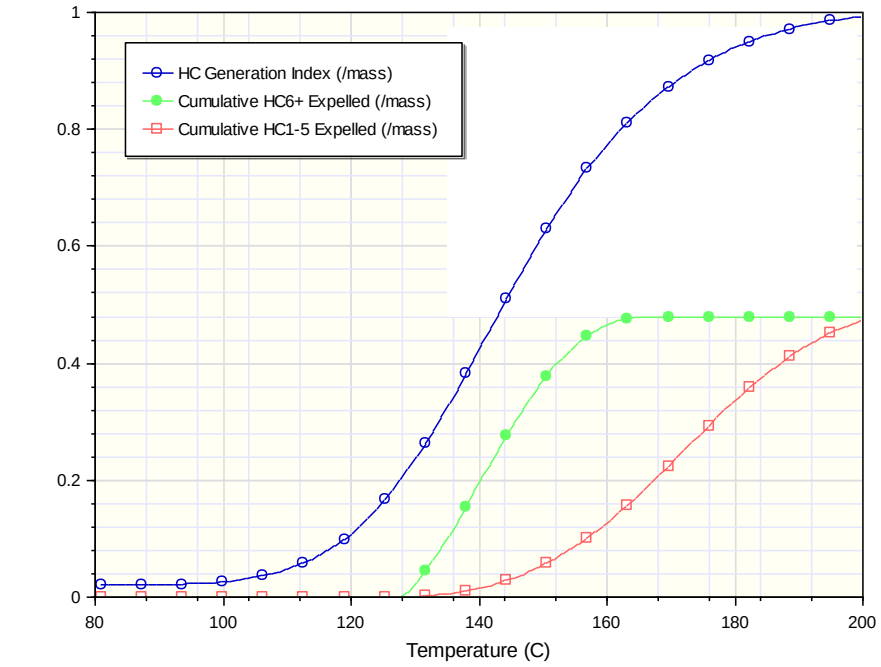

Fig 2.86. Plot of hydrocarbon yield against temperature based on the Late Jurassic source rock section of 103/21-1 using the KinEx software package with calculations based on Pepper & Corvi (1995). Kerogen type was input as 100% Type D/E.

HC6+ expelled and HC1-5 expelled per square kilometre

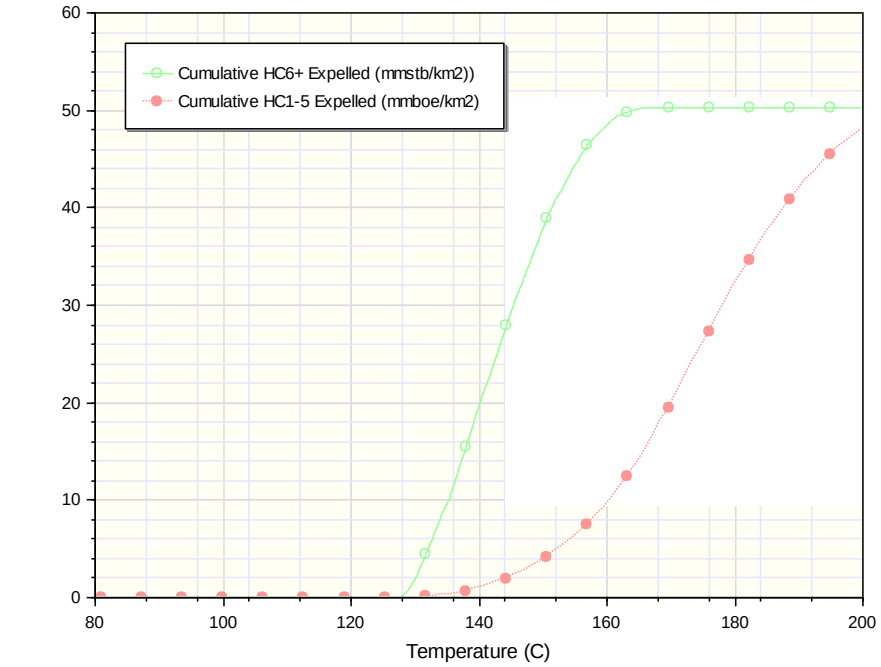

Fig 2.87. Plot of cumulative HC6+ (oil) and HC1-5 (gas) expulsion. Kerogen type was input as 100% Type D/E.

106/18-1

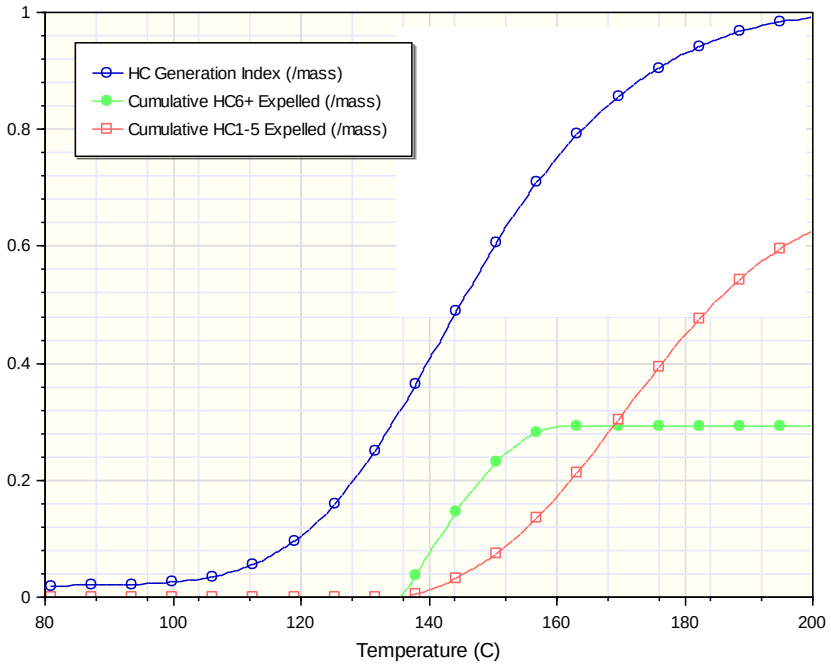

Fig 2.88. Plot of hydrocarbon yield against temperature based on the Late Jurassic source rock section of 106/18-1 using the KinEx software package with calculations based on Pepper & Corvi (1995). Kerogen type was input as 100% Type D/E.

HC6+ expelled and HC1-5 expelled per square kilometre

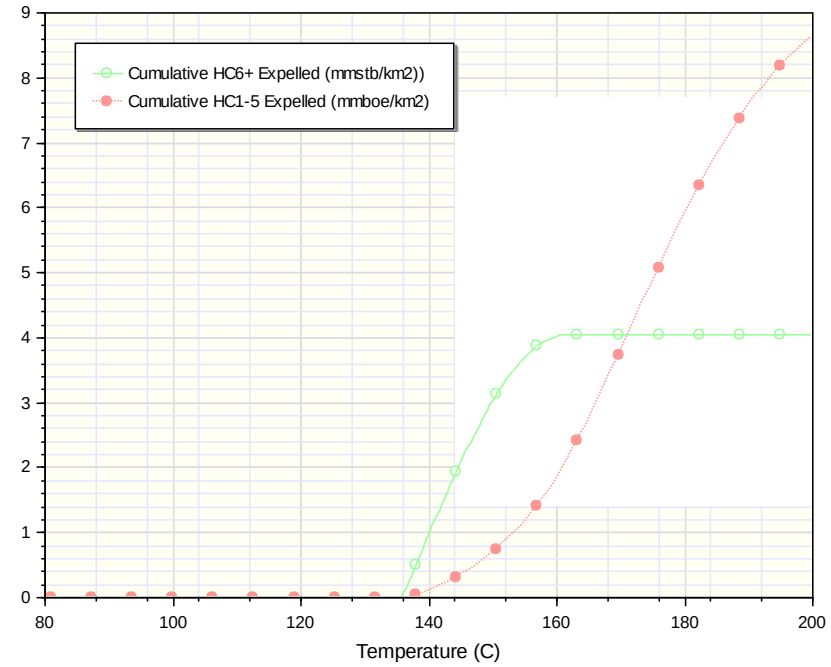

Fig 2.89. Plot of cumulative HC6+ (oil) and HC1-5 (gas) expulsion. Kerogen type was input as 100% Type D/E.

106/28-1

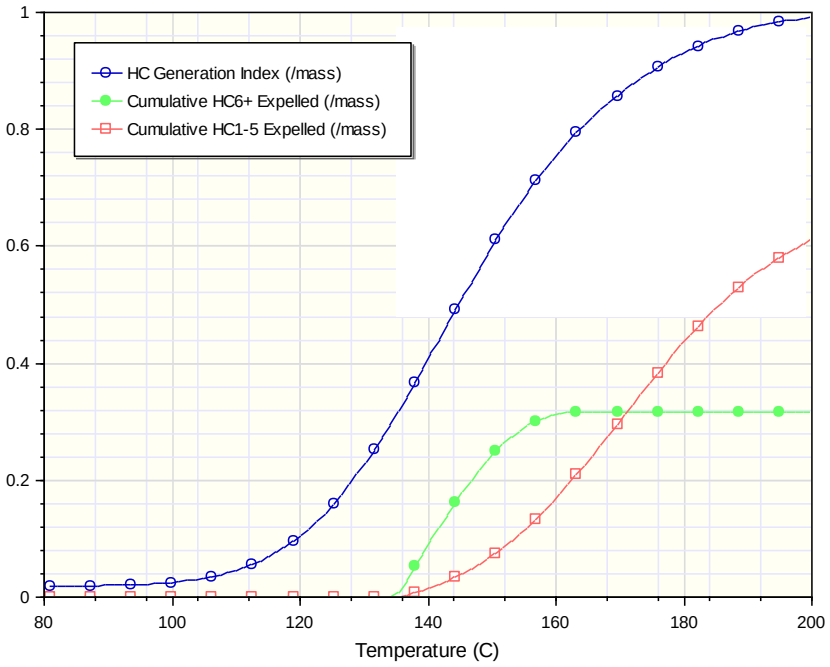

Fig 2.90. Plot of hydrocarbon yield against temperature based on the Late Jurassic source rock section of 106/28-1 using the KinEx software package with calculations based on Pepper & Corvi (1995). Kerogen type was input as 100% Type D/E.

HC6+ expelled and HC1-5 expelled per square kilometre

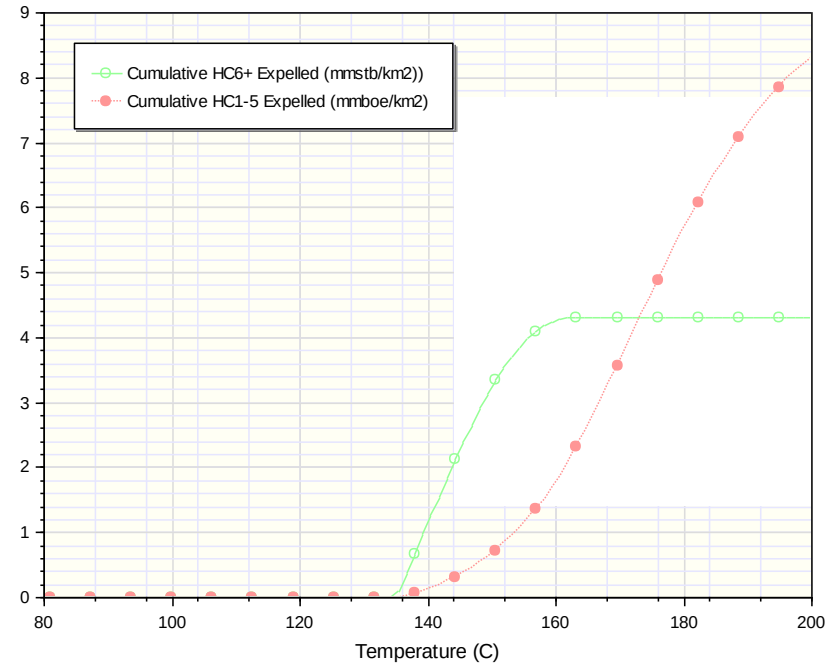

Fig 2.91. Plot of cumulative HC6+ (oil) and HC1-5 (gas) expulsion. Kerogen type was input as 100% Type D/E.

73/13-1

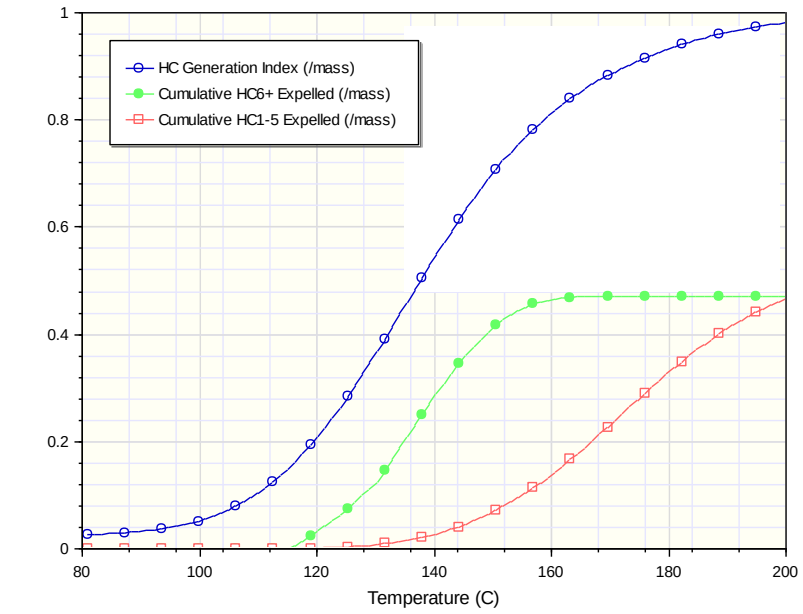

Fig 2.92. Plot of hydrocarbon yield against temperature based on the Late Jurassic source rock section of 73/13-1 using the KinEx software package with calculations based on Pepper & Corvi (1995). Kerogen type was input as 50% Type B and 50% Type D/E.

HC6+ expelled and HC1-5 expelled per square kilometre

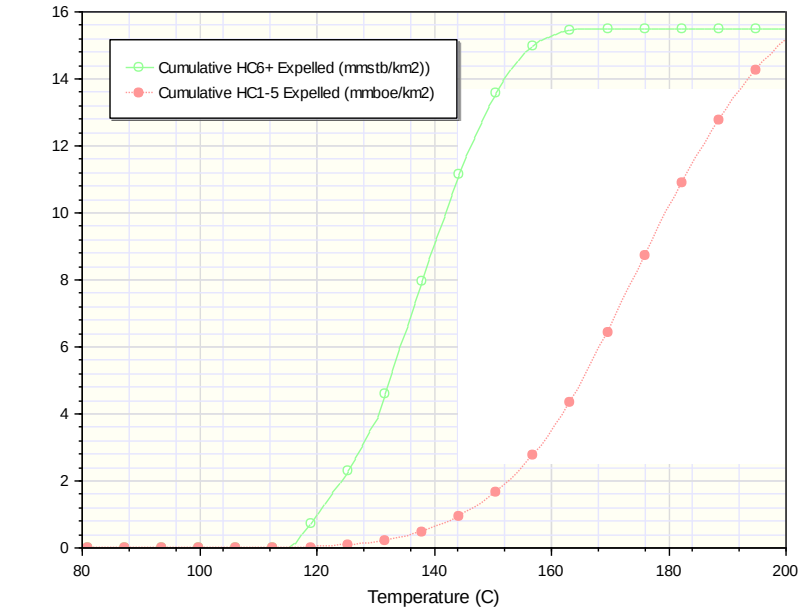

Fig 2.93. Plot of cumulative HC6+ (oil) and HC1-5 (gas) expulsion. Kerogen type was input as 50% Type B and 50% Type D/E.

Type B End Member

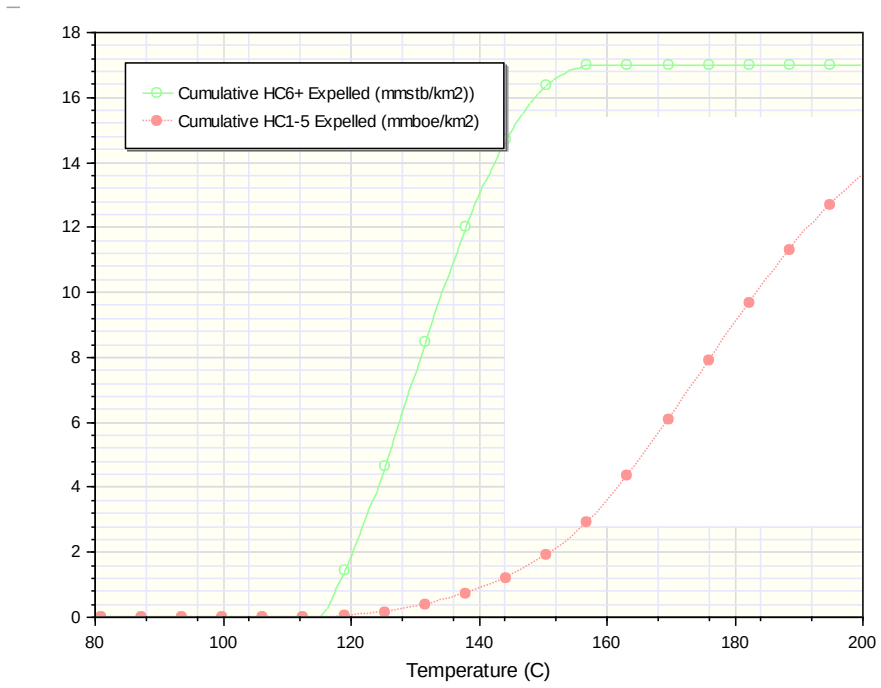

Fig 2.94. Plot of cumulative HC6+ (oil) and HC1-5 (gas) expulsion as a Type B end member. Kerogen type was input as 100% Type B.

Type D/E End Member

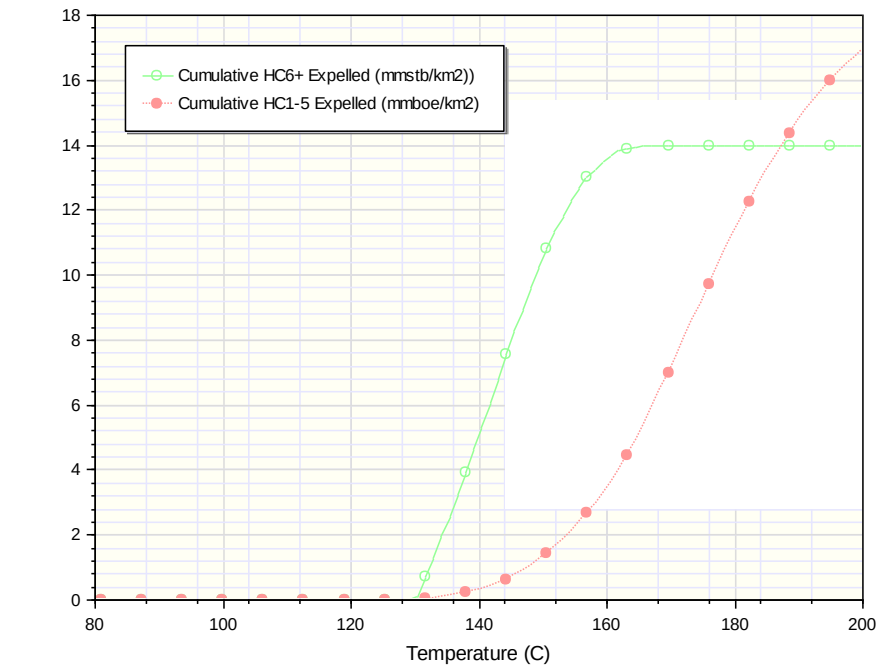

Fig 2.95. Plot of cumulative HC6+ (oil) and HC1-5 (gas) expulsion as a Type D/E end member. Kerogen type was input as 100% Type D/E.

88/02-1

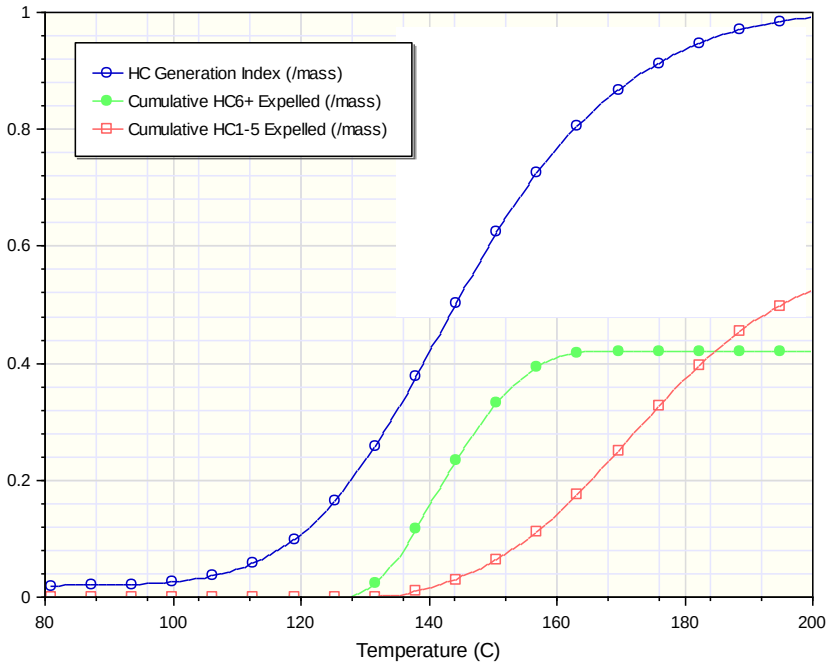

Fig 2.96. Plot of hydrocarbon yield against temperature based on the Late Jurassic source rock section of 88/02-1 using the KinEx software package with calculations based on Pepper & Corvi (1995). Kerogen type was input as 100% Type D/E.

HC6+ expelled and HC1-5 expelled per square kilometre

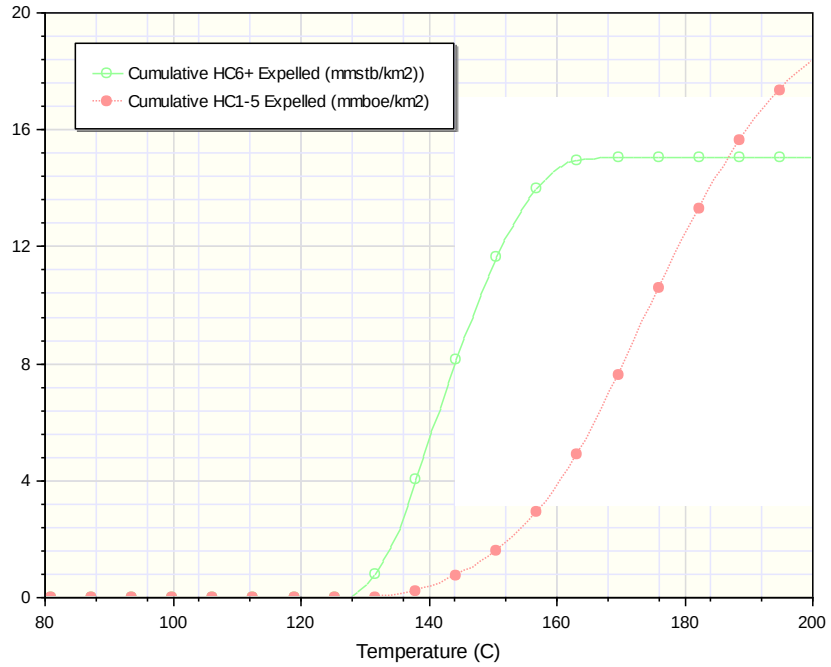

Fig 2.97. Plot of cumulative HC6+ (oil) and HC1-5 (gas) expulsion. Kerogen type was input as 100% Type D/E.

98/11-4 – Middle Jurassic 50% Type B & Early Jurassic 50% Type D/E

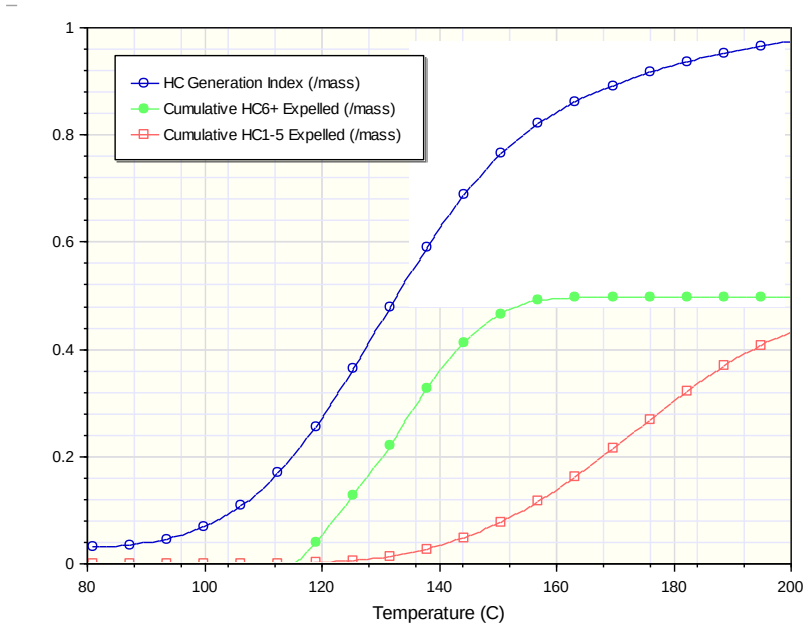

Fig 2.98. Plot of hydrocarbon yield against temperature based on the Late Jurassic source rock section of 98/11-4 using the KinEx software package with calculations based on Pepper & Corvi (1995). Kerogen type was input as 50% Type B and 50% Type D/E.

HC6+ expelled and HC1-5 expelled per square kilometre

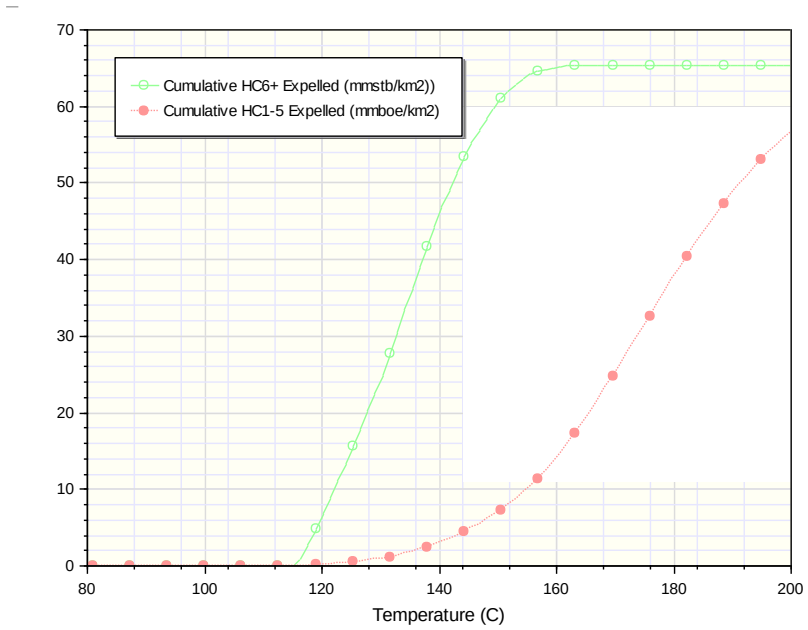

Fig 2.99. Plot of cumulative HC6+ (oil) and HC1-5 (gas) expulsion. Kerogen type was input as 50% Type B and 50% Type D/E.

Late and Middle Jurassic

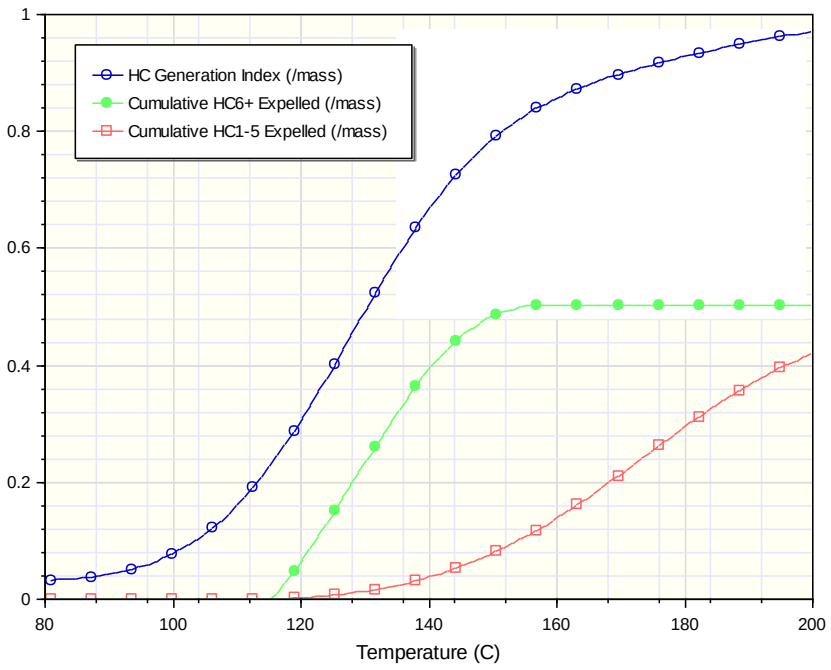

Fig 2.100. Plot of hydrocarbon yield against temperature based on the Late Jurassic source rock section of 98/11-4 using the KinEx software package with calculations based on Pepper & Corvi (1995). Kerogen type was input as 50% Type B and 50% Type D/E.

HC6+ expelled and HC1-5 expelled per square kilometre

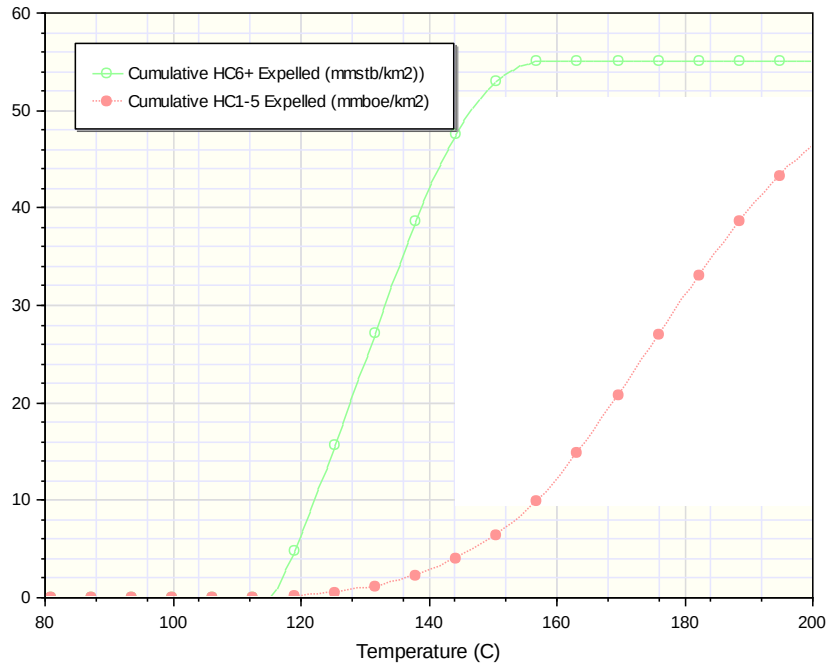

Fig 2.101. Plot of cumulative HC6+ (oil) and HC1-5 (gas) expulsion. Kerogen type was input as 50% Type B and 50% Type D/E.

Early Jurassic

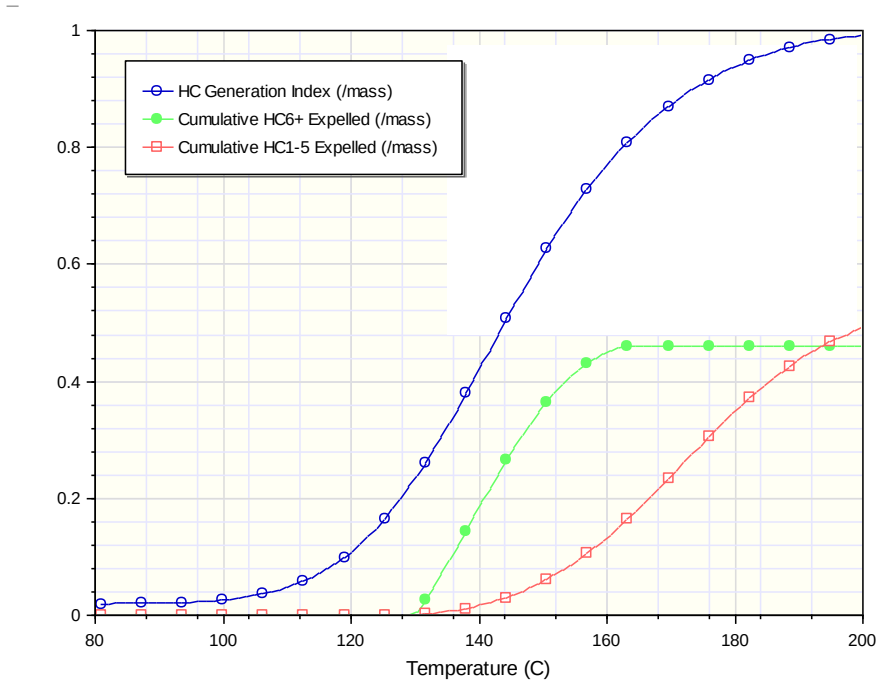

Fig 2.102. Plot of hydrocarbon yield against temperature based on the Late Jurassic source rock section of 98/11-4 using the KinEx software package with calculations based on Pepper & Corvi (1995). Kerogen type was input as 100% Type D/E.

HC6+ expelled and HC1-5 expelled per square kilometre

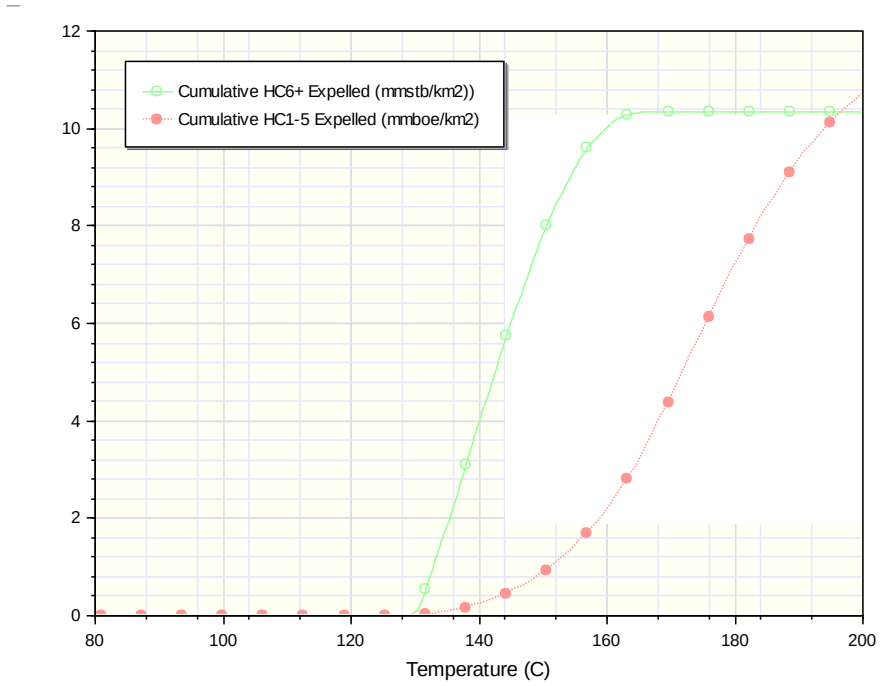

Fig 2.103. Plot of cumulative HC6+ (oil) and HC1-5 (gas) expulsion. Kerogen type was input as 100% Type D/E.

98/13-1

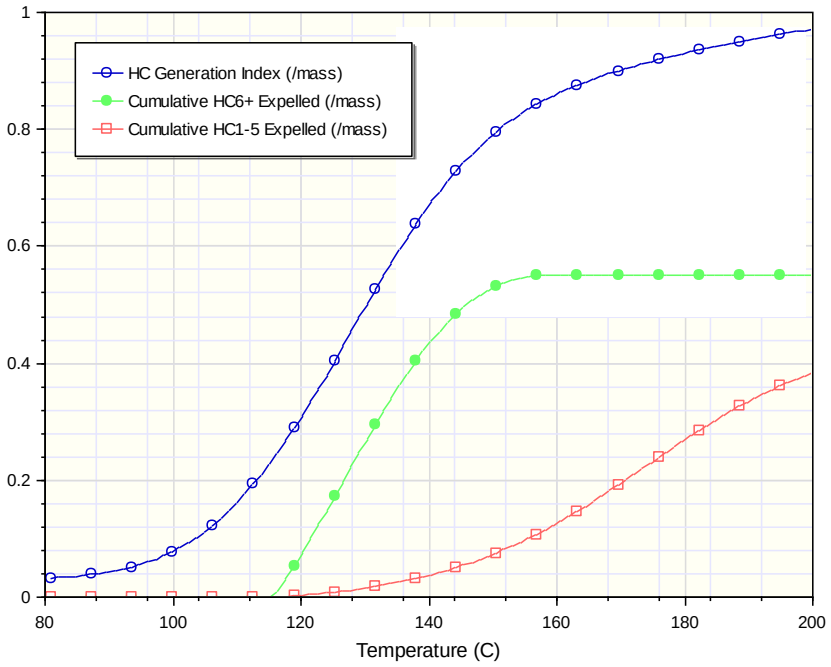

Fig 2.104. Plot of hydrocarbon yield against temperature based on the Late Jurassic source rock section of 98/13-1 using the KinEx software package with calculations based on Pepper & Corvi (1995). Kerogen type was input as 100% Type B.

HC6+ expelled and HC1-5 expelled per square kilometre

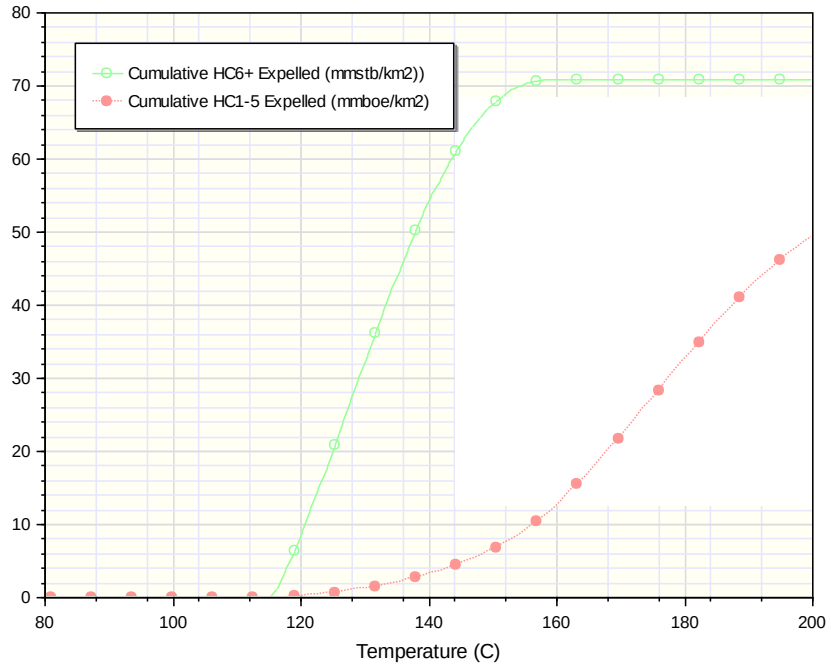

Fig 2.105. Plot of cumulative HC6+ (oil) and HC1-5 (gas) expulsion. Kerogen type was input as 100% Type B.

98/16-1 – Late and Middle Jurassic 50% Type B & Early Jurassic 50% Type D/E

Late Jurassic

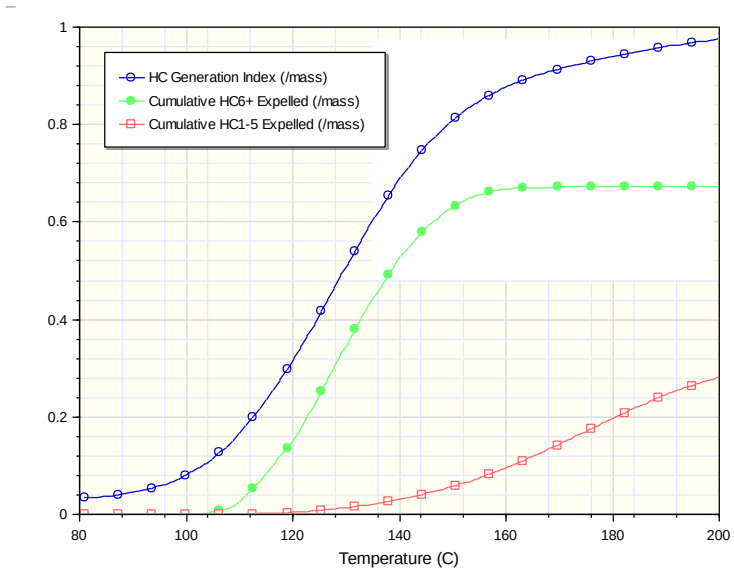

Fig 2.106. Plot of hydrocarbon yield against temperature based on the Late Jurassic source rock section of 98/16-1 using the KinEx software package with calculations based on Pepper & Corvi (1995). Kerogen type was input as 100% Type B.

HC6+ expelled and HC1-5 expelled per square kilometre

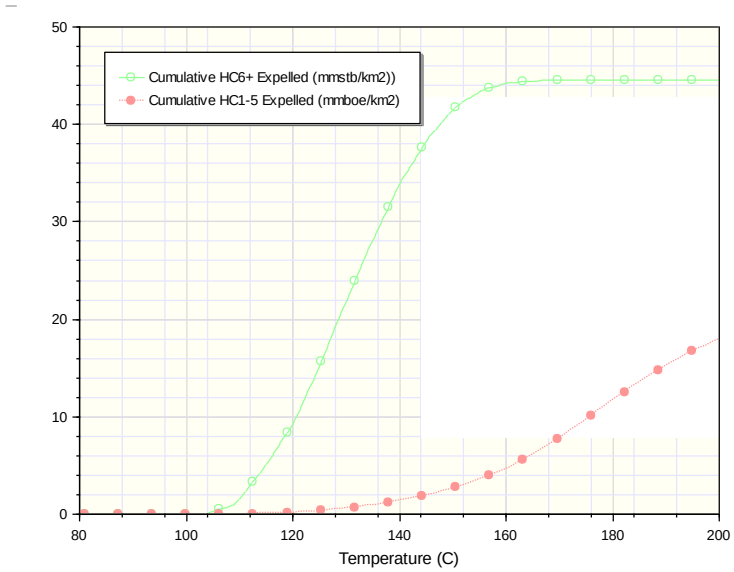

Fig 2.107. Plot of cumulative HC6+ (oil) and HC1-5 (gas) expulsion. Kerogen type was input as 100% Type B.

Early Jurassic

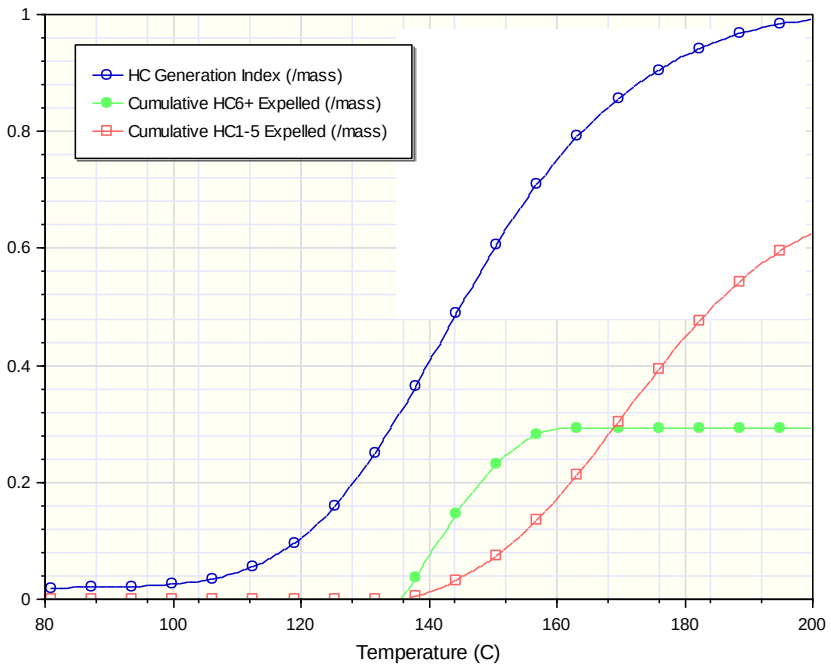

Fig 2.108. Plot of hydrocarbon yield against temperature based on the Late Jurassic source rock section of 98/16-1 using the KinEx software package with calculations based on Pepper & Corvi (1995). Kerogen type was input as 100% Type D/E.

HC6+ expelled and HC1-5 expelled per square kilometre

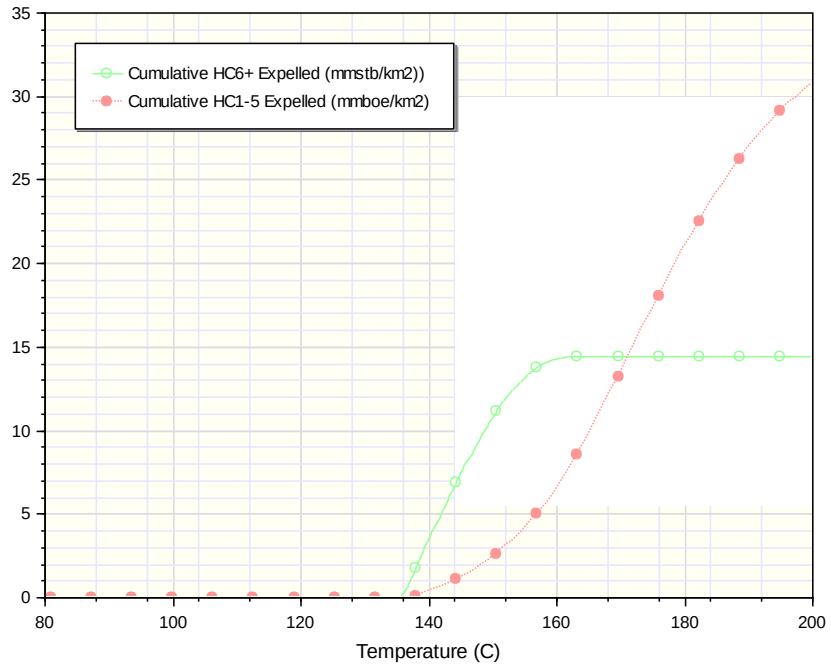

Fig 2.109. Plot of cumulative HC6+ (oil) and HC1-5 (gas) expulsion. Kerogen type was input as 100% Type D/E.

98/16-1 Late and Middle Jurassic 50% Type B & Early Jurassic 50% Type D/E

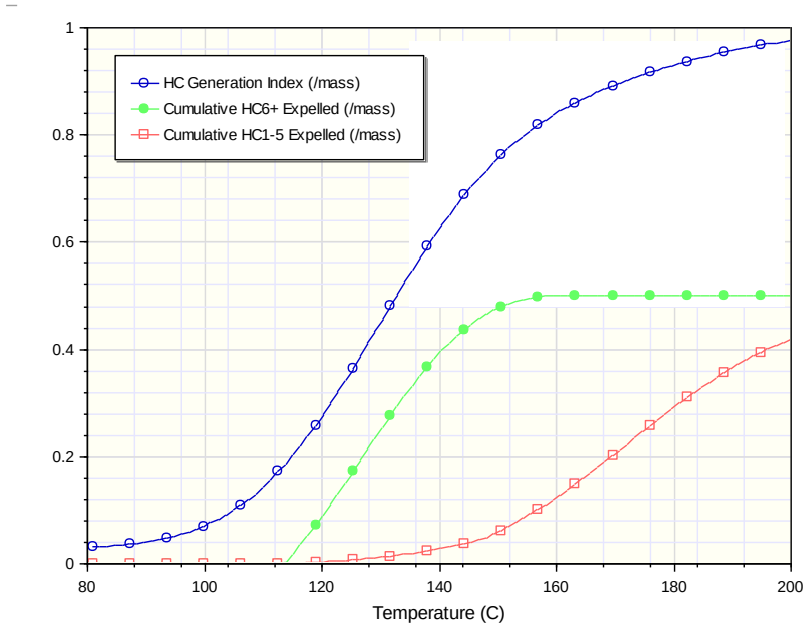

Fig 2.110. Plot of hydrocarbon yield against temperature based on the Late Jurassic source rock section of 98/16-1 using the KinEx software package with calculations based on Pepper & Corvi (1995). Kerogen type was input as 50% Type B and 50% Type D/E.

HC6+ expelled and HC1-5 expelled per square kilometre

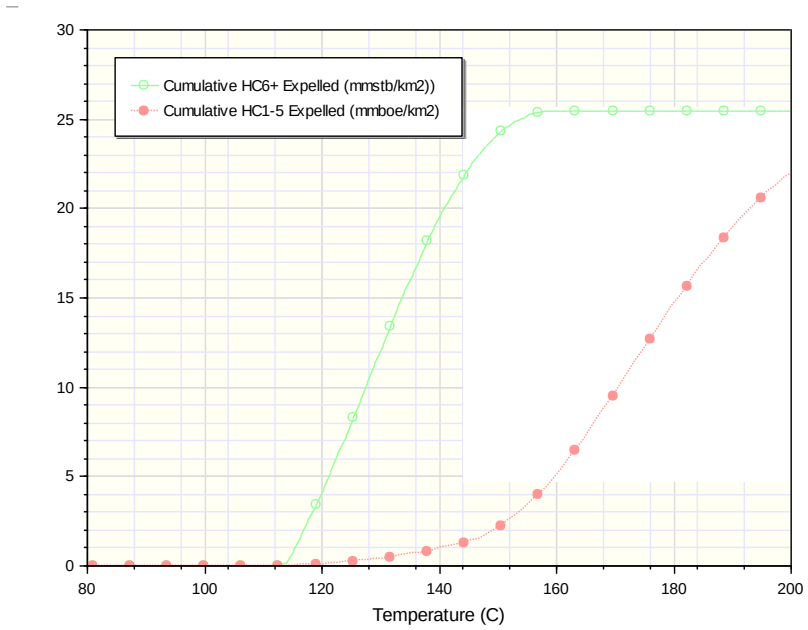

Fig 2.111. Plot of cumulative HC6+ (oil) and HC1-5 (gas) expulsion. Kerogen type was input as 50% Type B and 50% Type D/E.

Middle Jurassic

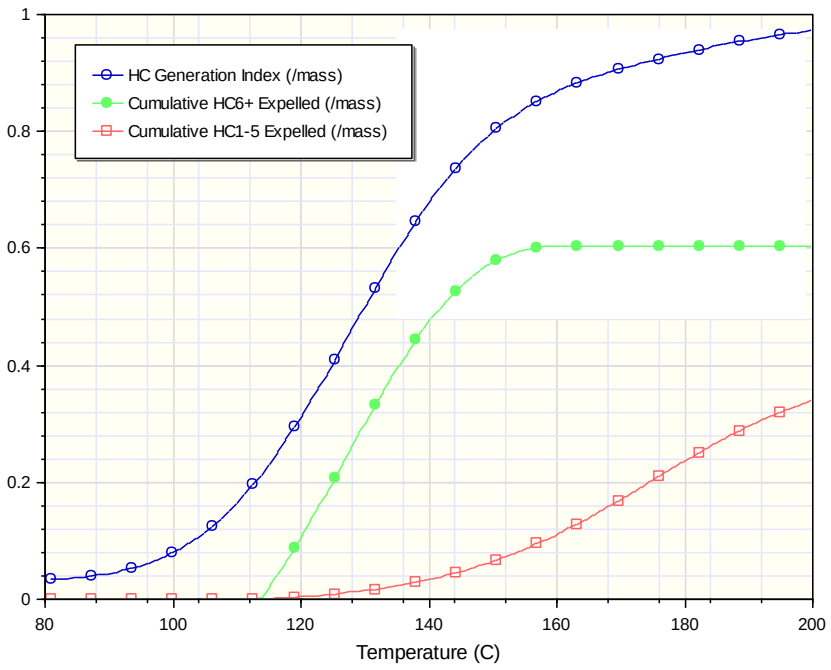

Fig 2.112. Plot of cumulative HC6+ (oil) and HC1-5 (gas) expulsion. Kerogen type was input as 100% Type B.

HC6+ expelled and HC1-5 expelled per square kilometre

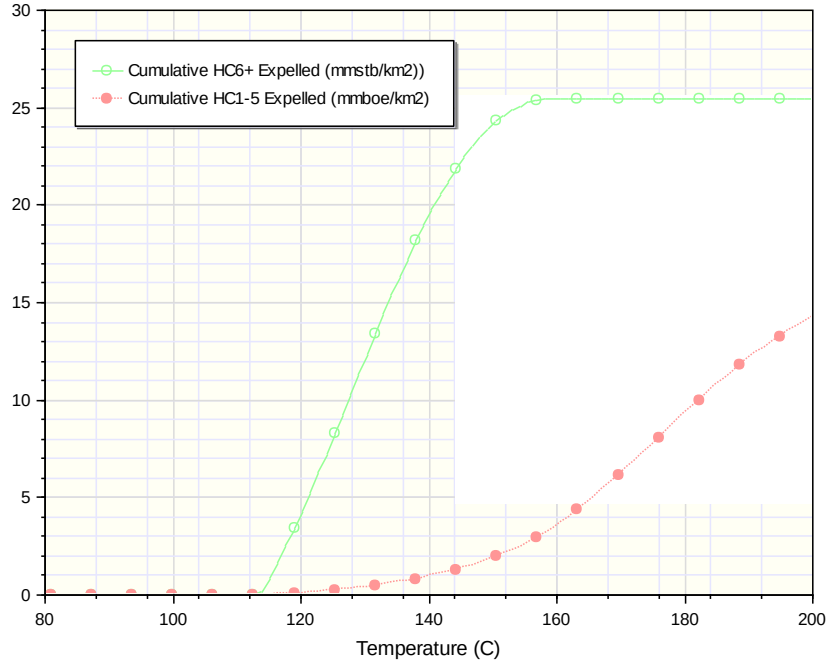

Fig 2.113. Plot of cumulative HC6+ (oil) and HC1-5 (gas) expulsion. Kerogen type was input as 100% Type B.

Early Jurassic

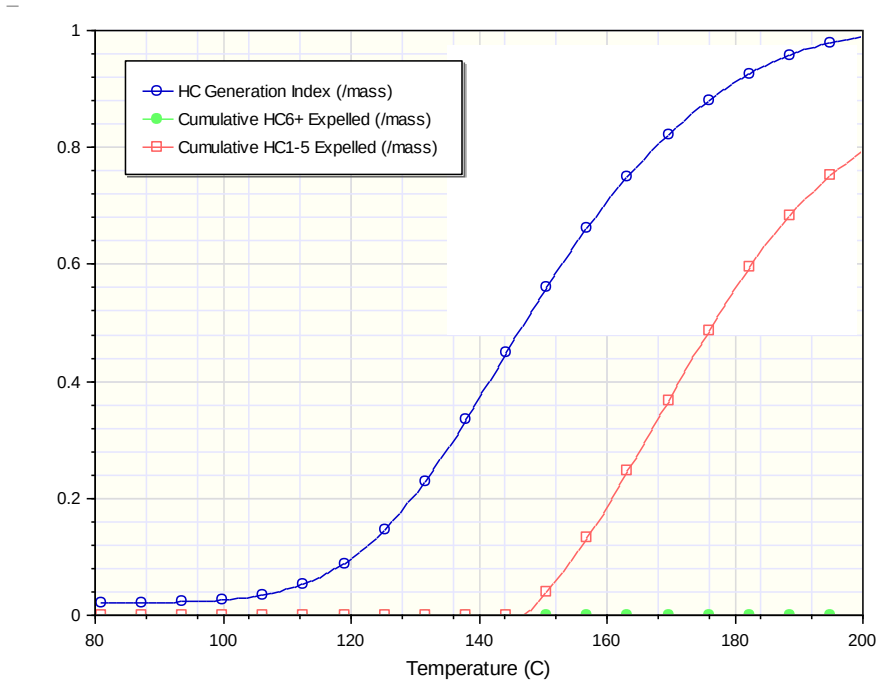

Fig 2.114. Plot of hydrocarbon yield against temperature based on the Late Jurassic source rock section of 98/16-1 using the KinEx software package with calculations based on Pepper & Corvi (1995). Kerogen type was input as 100% Type D/E.

HC6+ expelled and HC1-5 expelled per square kilometre

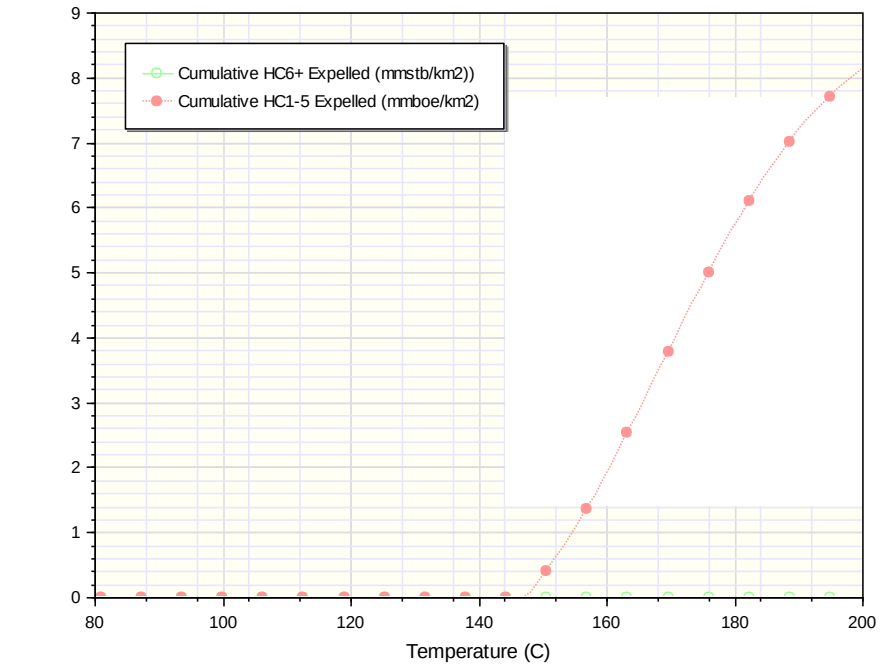

Fig 2.115. Plot of cumulative HC6+ (oil) and HC1-5 (gas) expulsion. Kerogen type was input as 100% Type D/E.

3. Wytch Farm – Key Well Images

This section includes key well images from the Wytch Farm similar to those shown in Section 5.7 for the Celtic Sea and Western Approaches

3.1. 98/13-1

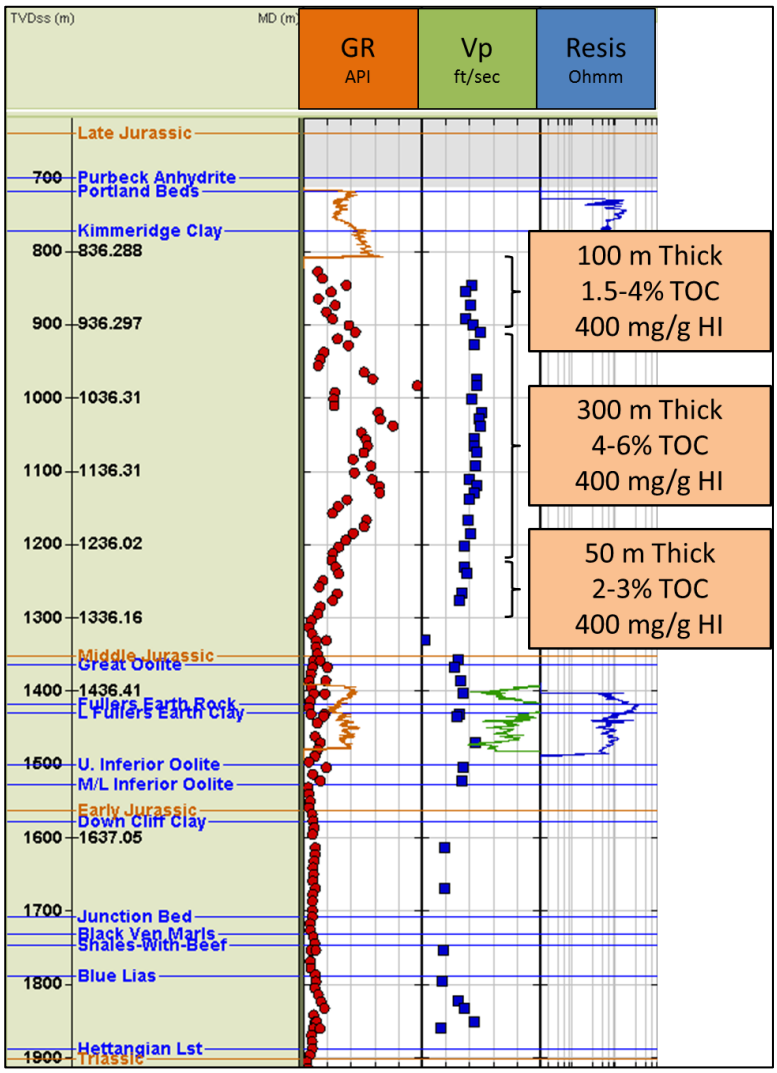

Fig 3.3. Wireline data from the Late Jurassic to Early Jurassic section of 98/13-1. TOC values are shown as red circles, HI as blue squares. GR is the gamma ray tool in API, Vp (ft/sec) is the compressional velocity and Resis is the resistivity in ohmm of the formation.

3.2. 98/16-1

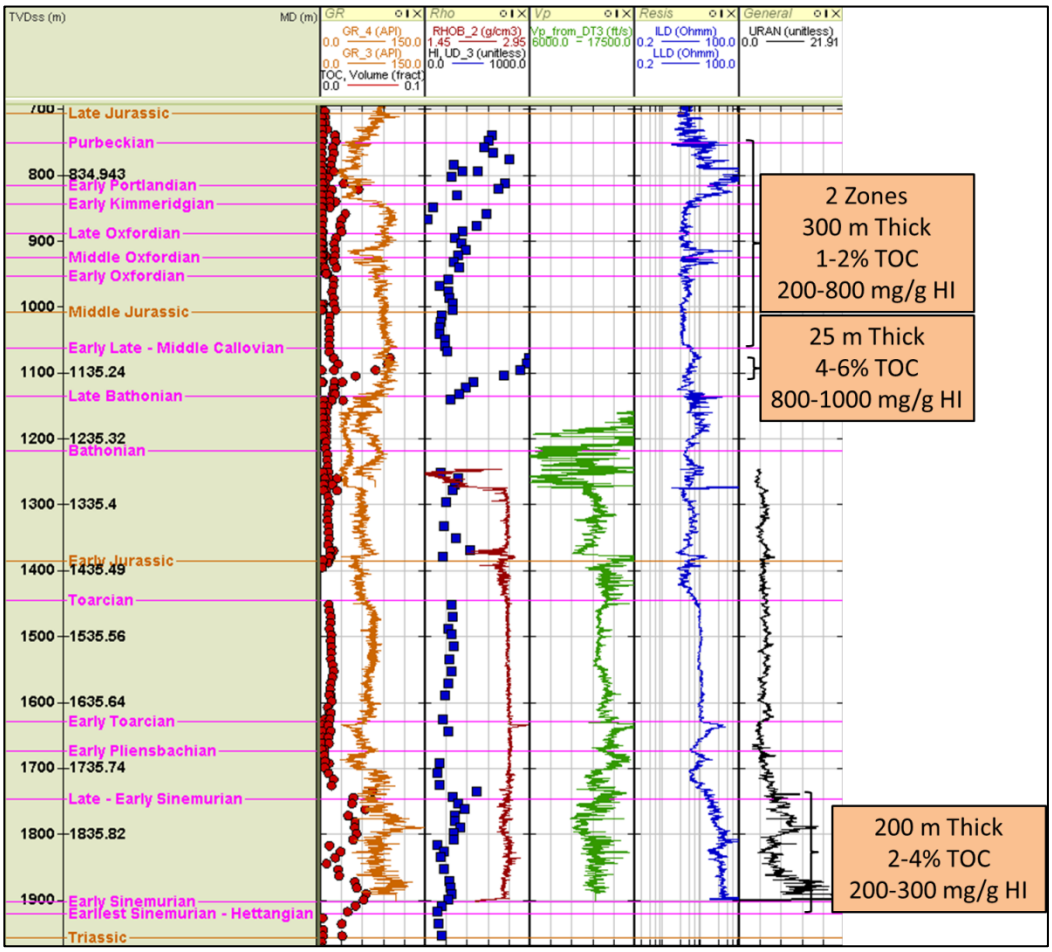

Fig 5.46. Wireline data from the Late Jurassic to Early Jurassic section of 98/16-1. TOC values are shown as red circles, HI as blue squares. GR is the gamma ray tool in API, the Density track contains the bulk density (g/cc) in red, Vp (ft/sec) is the compressional velocity and Resis is the resistivity in ohmm of the formation. The Uran track is also included which is the uranium count from SGR in ppm as described in Section 4.3.

3.3. 98/23-1

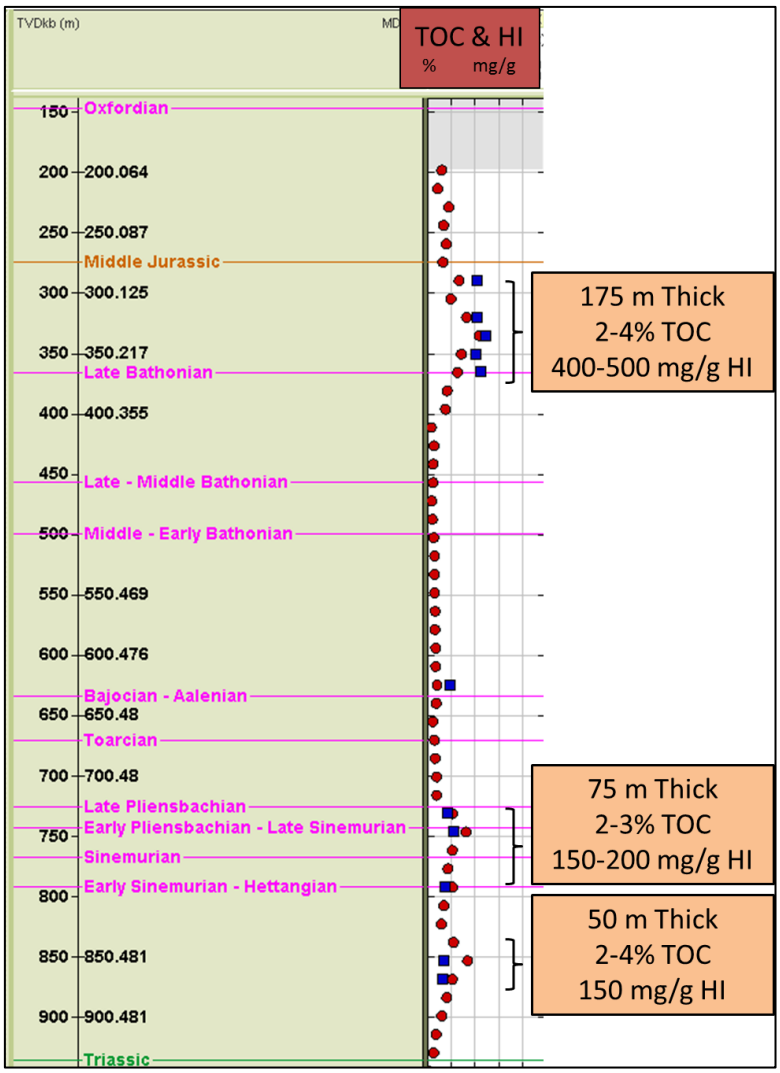

Fig 5.47. TOC and HI data for Wytch Farm well 98/23-1 for the Late Jurassic to Early Jurassic. TOC values are shown as red circles, HI as blue squares.