Department for the Economy
www.economy-ni.gov.uk

Petroleum Licence Application PLA1/16

Consultation Overview

May 2019

Purpose of Consultation

In accordance with the provisions of the Petroleum (Production) Act (Northern Ireland) 1964, the Department for the Economy (DfE) has received an application from EHA Exploration Limited (the applicant) for a Petroleum Licence. DfE has accepted the application as a valid application.

The purpose of this document is to provide consultees with an overview of the application and consultation process for this Petroleum Licence Application (PLA1/16). The following documents are attached.

Annex A	*Redacted Application Form for Petroleum Licence Application*
Annex B	*Technical Overview of the Petroleum Licence Application*
Annex C	*Company Brief for Petroleum Licence Application*
Annex D	*Map of area under consideration for Petroleum Licence Application*
Annex E	*Public Notice for Petroleum Licence Application*

General information on Petroleum Licence applications, and how DfE assesses applications, can be found on the DfE website https://www.economy-ni.gov.uk/articles/petroleum-licensing

Consultation Process

While the Petroleum (Production) Act (Northern Ireland) 1964 places no statutory obligation on DfE to consult regarding its intention to consider a Petroleum Licence application, in the interests of openness and transparency DfE has notified relevant organisations (listed below) that it has accepted Petroleum Licence Application PLA1/16 as a valid application and invited them to make representations.

NI Executive Departments	NIE Networks
Antrim and Newtownabbey Borough Council	Northern Ireland Environment Link
Armagh Banbridge & Craigavon Borough Council	Northern Ireland Water Ltd
Belfast City Council	Phoenix Natural Gas Ltd
BT Group Plc	Royal Society for the Protection of Birds
Firmus Energy	SSE Airtricity Gas (NI) Ltd
Invest NI	The National Trust
Lisburn and Castlereagh City Council	Tourism NI
Mid Ulster District Council	

In assessing previous Petroleum Licence applications, DfE would have consulted on the basis of an *'intention to award'*, having already obtained Ministerial approval. In November 2018 the Secretary of State published new guidance to government Departments entitled '*Guidance on decision-making for Northern Ireland Departments during the period for Northern Ireland Executive formation."* In line with this guidance, DfE undertook a Public Interest Test and concluded that it should continue all necessary preparatory work to ensure that a decision on this Petroleum Licence application can be taken as soon as possible after a Minister is appointed. The objective of this consultation therefore is to ensure that DfE has taken account of the range of opinions in preparation for making a recommendation to a future Minister as to whether or not a Petroleum Licence should be granted to the applicant.

In addition to placing this document on the DfE website, a Public Notice (Annex E) will be placed in the following local newspapers to ensure that DfE has an informed view of any issues that may have the capacity to impact on the granting of the Licence or its terms and conditions:

Andersonstown News	News Letter
Antrim and Ballymena Times	North Belfast News
Antrim Guardian	Portadown Times
Banbridge Chronicle	South Belfast News
Banbridge Leader	The Belfast Gazette
Belfast Telegraph	The Irish News
Dromore/Banbridge Leader	Tyrone Courier
Dungannon Herald	Tyrone Times
Lurgan Mail	Ulster Gazette
Mid Ulster Mail	

The Public Notice will appear for a period of 2 weeks from week commencing 06 May 2019. The consultation period will begin on 07 May 2019 for a minimum of eight weeks ending on 05 July 2019.

This Overview and all other documentation relevant to Petroleum Licence Application (PLA1/16) is available to view at DfE and the relevant local council offices; details are outlined in the Public Notice (Annex E).

Any person wishing to make representations in respect of Petroleum Licence Application (PLA1/16) must do so to DfE on or before 05 July 2019. Please quote reference PLA1/16 in any correspondence relating to this application.

After the consultation period has closed DfE will consider comments received. Once responses have been analysed, the application and recommendations on the award of a Licence and any required conditions on that Licence will be passed to a future Minister for consideration.

A summary of all the comments received during the consultation process and DfE's response will be published on the DfE website.

How to respond to this consultation

Representations on the consultation can be returned to DfE by:

Email: minerals@economy-ni.gov.uk

or

Post: Department for the Economy
Minerals and Petroleum Branch
Room 9
Dundonald House
Upper Newtownards Road
Belfast
BT4 3SB

DfE will take into account any representations which are made to it on or before 05 July 2019. Please note that, within the parameters outlined in the Confidentiality and Data Protection section below, your representation may be shared with the applicant.

Confidentiality and Data Protection

Your response may be made public by DfE and placed on the DfE website as part of the consultation process.

In addition information provided in response to this consultation, including personal information, may be subject to publication or disclosure in accordance with the access to information regimes (these are primarily the Freedom of Information Act 2000 (FOIA), Environmental Information Regulations 2004; Data Protection Act 2018 (DPA) and General Data Protection Regulations 2018 (GDPR)). If you want information that you provide to be treated as confidential, please be aware that, under the FOIA and EIR , there is a statutory Code of Practice with which public authorities must comply and which deals, amongst other things, with obligations of confidence.

If you do not want your name or all or part of your response to be made public, please state this clearly in the response and mark your response as 'CONFIDENTIAL.' Any confidentiality disclaimer that may be generated by your organisation's IT system or included as a general statement will be taken to apply only to information in your response

for which confidentiality has been specifically requested. An automatic confidentiality disclaimer will not, of itself, be regarded as binding on DfE.

In view of this, it would be helpful if you could explain to us why you regard the information you have provided as confidential. If we receive a request for disclosure of the information we will take full account of your explanation, but we cannot give an assurance that confidentiality can be maintained in all circumstances.

For information regarding the Minerals and Petroleum Branch Privacy (MAPB) Notice following the introduction of GDPR please go to the following link https://www.economy-ni.gov.uk/publications/privacy-notice-minerals-and-petroleum-branch

Applicants for a Petroleum Licence may need to include commercially sensitive information in their applications, such as financial forecasts and proprietary data. DfE will handle such information in accordance with the Freedom of Information Act 2000, the Data Protection Act 2018 and the Environmental Information Regulations 2004 and other relevant law, which take full cognisance of issues of transparency and confidentiality. This has resulted in the redaction of information from the published application form.

Copies of the Consultation

This Consultation Document may be accessed on the Minerals and Petroleum page of the DfE Website https://www.economy-ni.gov.uk/topics/minerals-and-petroleum or by email request at minerals@economy-ni.gov.uk or in writing from MAPB at the address above or by telephoning the branch on 02890 520993.

If you require access to the consultation documents in a different format – eg Braille, disk, audio cassette, larger font – or in a minority ethnic language, please contact DfE on 028 9038 8462 and appropriate arrangements will be made as soon as possible.

Annex A

Department for the Economy

Redacted Application Form for

Petroleum Licence Application PLA1/16

Submitted to the Department

By

EHA Exploration Limited

Part 1	Applicant information			
Name of each applicant in full [1]	Registered office address	Company number	Proposed equity interest	SME? [2]
1. EHA EXPLORATION LIMITED	Baronscourt, Newtownstewart, Omagh, County Tyrone, BT78 4EZ	NI627374	100%	Yes
2.				
3.				
4.				
5.				

Part 2	Operator information

Name of proposed operator[3] and contact details

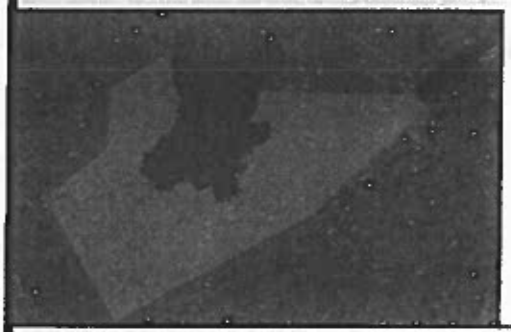
Name of operator	EHA EXPLORATION LIMITED
Contact address	EHA Exploration , Scottish Provident Building, 7 Donegal Square West, Belfast BT1 6JH
Telephone number	028 90918850
Mobile number	
Fax number	
E-mail address	info@ehaexploration.com

Part 3 Area applied for

Applicants are reminded that they are obliged to submit as part of their application an Ordnance Survey map on a scale of 1:50,000, or such other map as the Department may allow upon which the boundaries of the area in relation to which a licence is sought are clearly delineated.

Description	So
Area (km²)	1134 km2
Irish Grid Co-ordinates of area perimeter	See below and map included with application

Comments/notes[3]



Grid Reference	X	Y	Latitude	Longitude	Description
H 95000 86000	295000	386000	54.713211	-6.5265459	295000, 386000
H 85000 80000	285000	380000	54.661107	-6.6834237	285000, 380000
H 85000 70000	285000	370000	54.571288	-6.6863205	285000, 370000
H 75000 58000	275000	358000	54.465078	-6.8439714	275000, 358000
H 87000 41000	287000	341000	54.310471	-6.6639082	287000, 341000
J 20000 60000	320000	360000	54.474409	-6.1494161	320000, 360000
J 35000 80000	335000	380000	54.650212	-5.9089874	335000, 380000
J 38000 78400	338000	378400	54.635036	-5.8632929	338000, 378400
J 10360 80000	310360	380000	54.6562	-6.2905647	310360, 380000

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Part 4 Contact details

Give details of the person DETI should treat as its first point of contact about this application[4]

Name of company	EHA Exploration Limited
Name of contact	Mr Melvyn Ennis (Geologist/Technical Director)
Contact address	EHA Exploration., Scottish Provident Building, 7 Donegal Square West, Belfast BT1 6JH
Telephone number	028 90918850
Mobile number	[redacted]
Fax number	
E-mail address	info@ehaexploration.com

Part 5	Declaration

A duly authorised officer from each of the applicants listed in Part 2 must approve the information given in this form.

I hereby declare that the information given in this application is correct:

Authorisations

Company	Name	Signature	Capacity[5]	Date
EHA Exploration Limited	Mr Hashem Arouzi	[redacted]	CEO	15/6/16

[1] Full registered name of each company included in the application, precisely as in its Certificate of Incorporation. If there are two or more companies, list them according to the size of their proposed equity interests, starting with the company with the biggest percentage and working downwards to that with the smallest.

[2] Check or tick the box if company is an SME (Small or Medium Enterprise – i.e. has gross assets less than £15m and no more than 250 employees).

[3] Add useful information, such as: block linkages, joint preferences, preferences for part of an area.

[4] See Guidance Note: Transparency.

[5] Capacity within the company by which the signatory is authorised to sign.

APPLICATION FORM FOR PETROLEUM LICENCE

(Petroleum Production Act (Northern Ireland) 1964)

Appendix A: Financial capacity

Note: in the case of a multi-party Applicant, an Appendix A form must be completed by each Licence Partner

Part A1 Company Details

1. Company information

Registered name	EHA EXPLORATION LIMITED
Place of Incorporation	NORTHERN IRELAND
Registration Number	NI627374
Principal Place of Business	Scottish Provident Building, 7 Donegall Square West, Belfast, Co Antrim BT1 6JH
Registered Office Address	Baronscourt, Newtownstewart, Omagh, County Tyrone, BT78 4EZ
Place in the UK from which operations under the licence will be directed and controlled	Scottish Provident Building, 7 Donegall Square West, Belfast, Co. Antrim BT1 6JH
Place in the UK from which commercial activities in connection with the licence will be directed and controlled	Scottish Provident Building, 7 Donegall Square West, Belfast, Co. Antrim BT1 6JH
Details of holding / subsidiary companies – corporate structure diagram must be attached to this form	-There are no subsidiary companies of EHA Exploration Limited

Members of the board of directors or other governing body

Name in Full	Usual Residential Address	Nationality
Mr. Hashem Arouzi	[redacted]	UK Citizen
Mr. Jamie Hamilton	Baronscourt Newtontownstewart Omagh BT78 4ez	British
Mr. Melvyn Ennis	[redacted]	British

Contact details

Contact details of the person DETI should treat as its first point of contact about the information in this Form

Name of contact	Melvyn Ennis
Postal address	14 Lenamore Ave., Jordanstown Newtownabbey, Co. Antrim BT37 OPF
Telephone number	[redacted]
Fax number	
E-mail address	melvyn@ehaexploration.com

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Part A2 Financial Capacity Questionnaire

1. CAPITAL AUTHORISED AND ISSUED

Class of capital	Amount authorised	Amount issued	Voting rights of each class
Ordinary	100,000	100,000	equal

2. ALL HOLDINGS OF NOT LESS THAN 5% IN NUMBER OR VALUE OF ANY CLASS OF CAPITAL THAT HAS BEEN ISSUED BY THE APPLICANT

Name of holder or names of joint holders, in full	Nationality of holder(s)	Class of holding	Amount
N/A	N/A	N/A	N/A

3. ALL CAPITAL ISSUED TO BEARER

Class of capital	Total amount issued	Amount issued to bearer
Ordinary	100,000	100,000

4. OBLIGATIONS / LIABILITIES

Item	Amount £ million
Shareholders' funds (net assets)	1,292975
At what date?	10/12/2014
Deduct:	
UK Capital Commitments as itemised in Part 2 Below	0
Non-UK Capital Commitments as itemised in Part 3 Below	0
Contingent liabilities not included in the balance sheet or Capital Commitments above	0
Total A:	1.292975

Q1: *If Total A is negative*, what assurances are available on the future solvency of the applicant?

Although Total A is not Negative a parent company Guarantee has been included.

To calculate Total B, deduct the applicant's share of all exploration expenditure (capital or revenue) arising from the sum of all current UK licence applications from Total A, giving details of expenditure of each application on a separate Expenditure Profile (Part 4 below)

Total B: 0

Q2: *If Total B is negative* how does the applicant propose to fund its share of the expenditure arising from the sum of all applications submitted in this current period?

To calculate Total C, deduct the balance of exploration expenditure arising from the sum of the joint and several liabilities incurred from all current applications from Total B (giving details of expenditure of each application on a separate sheet).

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	Total C: 0
Q3. *If Total C is negative*, how does the applicant propose to meet the sum of the joint and several liabilities that could arise from all current applications?	

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Part A3	Existing UK Capital Commitments					
Licence	Gross Costs £ million	Net Costs (Costs Applicable to Applicant only) £ million				
		Field Development Programme	Firm		Drill-or-Drop	Total
			Wells	Seismic		
					Total	-

Part A4	Existing non-UK Capital Commitments
Enter sum of exploration and development commitments for all non-UK Oil and Gas assets for which there are agreed or planned work programmes	Total £million
	-

Part A5	Planned Expenditure Profile
Applicant	EHA EXPLORATION LIMITED
Licence Area	SOUTH LOUGH NEAGH BASIN
Licence Partner(s)	-

Year of licence	Gross Costs £ million	Net Costs (Costs Applicable to Applicant Only) £ million			
		Firm		Drill-or-Drop	Total
		Wells	Seismic		
1	0.5	-	-	-	0.5
2	1.2	-	-	-	1.2
3	0.5	-	-	-	0.5
4	-	-	-	2.3	2.3
5	-	-	-	-	-
Total	2.2				

Submit estimates of your share of the costs of the proposed work programme associated with the area you are applying for.

Part A6	Declaration

A duly authorised officer must approve the information given in this form.
I hereby declare that the information given in Appendix A is correct:

Name	Signature	Capacity	Date
MR HASHEM AROUZI	[redacted]	CHIEF EXECUTIVE OFFICER	15/6/16

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APPLICATION FORM FOR PETROLEUM LICENCE

Petroleum (Production) Act (Northern Ireland) 1964

Appendix B: Technical Information Form

Appendix B, the Technical Information Form, should accompany the Application Form. It comes in five parts, as follows:

B1: Lead/Prospect Summary Sheet. A separate copy of this sheet must be completed for each lead, prospect, new play or discovery identified by the applicant within the acreage applied for. An assessment of the Risks and Reserves for each Lead/Prospect, and whether it is ready to be drilled, or what further evaluation is need before a decision on drilling can be taken, should be included.

B2: Work Programme Summary Sheet. This form must set out the Applicant's proposed Work Programme within the acreage applied for.

B3: Supporting Technical Information. The Applicant must show how it has applied technical expertise to the available data to arrive at its assessment of the prospectivity of the area applied for, and present its technical case that its Work Programme represents the best way to explore for the petroleum resources (or to develop known resources) in the acreage.

This information may be provided in a format of the Applicant's choosing but, as a guide, DETI suggests that a fit-for-purpose application should normally be less than 30 pages long, including displays (relevant maps and seismic sections indicating well ties, where appropriate).

Please refer to the guidance for further information including the marking scheme that will be applied when assessing the technical part of the application.

B4: Operator competence and technical capacity. The Applicant must provide evidence that the nominated operator has the proven capability to supervise, manage and undertake the proposed Work Programme. In the case of a firm well commitment this competence must extend to the drilling operations. If the well commitment is 'Drill or drop' the operator is required only to demonstrate competence relating to Part I of the Work Programme in the application (however, DETI requires a competent Operator to be nominated and approved before the Licensee proceeds to Part II of the Work programme – the well).

B5: Declaration. To be completed by an authorised officer of the nominated operator.

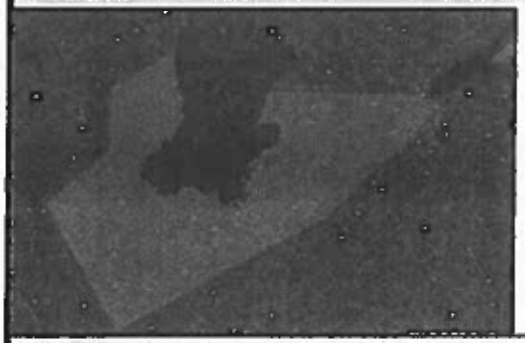
Parts B1, B2 and B5 should be completed using the specified forms, or copies thereof.

Part B1	Lead/Prospect summary sheet[i]
Area	Name of lead, prospect, new play or discovery
South Lough Neagh Basin	South Lough Neagh Basin

Brief description of lead, prospect, new play or discovery

Type[ii]:	Description[iii]	Key technical work needed[iv]
Lead	Conventional hydrocarbon targets See attached technical report	• Geochemical prospecting of an area of approximately 1134km² • Geophysical surveys – 2D seismic survey of 300 km. • Exploratory drilling -

Map (Annotate the scale and corner coordinate points, using Irish National Grid co-ordinates)



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J 10360 80000	310360	380000	54.6562	-6.2905647	310360 , 380000

Geologic cross-section

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Not applicable- Lead not fully evaluated

Representative seismic section

Not applicable- Lead not fully evaluated

Metrics (Lead / prospect / new play / discovery volumes)			
Input parameters	**MIN**	**ML**	**MAX**
Area (acres/km²)	n/a	n/a	n/a
Height of closure (ft/m)	n/a	n/a	n/a
Net reservoir (ft/m)	n/a	n/a	n/a
Net: gross (%)	n/a	n/a	n/a
Gross rock volume (acre-ft, MM m³)	n/a	n/a	n/a
Porosity (%)	n/a	n/a	n/a
Hydrocarbon saturation (%)	n/a	n/a	n/a
Formation volume factor/Gas expansion factor	n/a	n/a	n/a
Recovery factor (%)	n/a	n/a	n/a
Gas in place (bcf/bcm)	n/a	n/a	n/a
Oil/condensate in place (mmbo/mmboe)	n/a	n/a	n/a
Oil/gas reserves (mmbbl/bcf/bcm)	n/a	n/a	n/a

Estimated technical chance of success[v]:
Not applicable

Part B2	Work Programme summary sheet[vi]	
Operator: EHA EXPLORATION LIMITED	Area(s): SOUTH LARNE-LOUGH NEAGH	
Number of Wells	Firm	Drill-or-Drop[vii]
For each well, specify the minimum depth in metres and the horizon to which you will drill	Not Applicable	An exploration well to test the Tiassic, Permian and Carboniferous succession, at a location to be agreed with the department.
New shoot 2D seismic (firm)[viii] Specify in line kilometres. Please indicate proposed survey area and/or distribution in Irish National Grid 100 km squares		A programme of Geophysical surveys – To Shoot 2D seismic survey of minimum 300km lines (firm) and further 2D in areas where leads may have been identified.
New shoot 3D seismic (firm)[viii] Specify in square kilometres. Please indicate proposed survey area and/or distribution in Irish National Grid 100 km squares		N/A
Obtain existing 2D seismic (firm)[viii] Specify in line kilometres and survey ID. Key: O – Obtain; R – Reprocess; OR – Obtain and reprocess		Liaise to obtain confidential seismic data if possible from relevant bodies. Re-process seismic data
Other work[viii] Examples: geotechnical studies, gravity/magnetic data acquisition, magneto-telluric surveys, geochemical surveys		Geochemical survey
Number and technical competence of staff to undertake the work programme (please include any relevant technical qualifications held by those staff and details of training undertaken by those staff in the 3 years prior to the date of application) – use separate sheet, if necessary		No Key staff: 9 excluding 3 staff positions to be filled. See separate sheet for other details - B2.1
Comments[ix]		Not applicable

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Part B5	Declaration		
A duly authorised officer must approve the information given in this form. I hereby declare that the information given in Appendix B is correct:			
Name	Signature	Capacity[x]	Date
Mr Hashem Arouzi	[redacted]	Chief Executive Officer	15/6/16

[i] Present a separate sheet for each lead, prospect, new play or discovery.

[ii] Choose from new play idea, lead, prospect or discovery not fully evaluated or prospect fully evaluated.

[iii] For example, Sherwood Sandstone 4-way dip closure, Carboniferous 3-way dip/fault trap with stratigraphic upside

[iv] Key work to address prospectivity; e.g. reprocess 100km² 2D, PSDM, inversion, facies analysis. If no further work is needed enter "None".

[v] If possible include estimates for trap presence, seal effectiveness, reservoir presence, reservoir quality, etc.

[vi] Refer to the Guidance Note (5.4.3.3) for more details on completing this sheet.

[vii] Drill-or-Drop is the *minimum* Work Programme that will be accepted for *any* Application.

[viii] All work commitments other than drilling are Firm.

[ix] Example: indicate priorities within acreage applied for, by reference to Irish Grid 100km (10km x 10km) square; minimum area required; priority of prospects identified.

[x] Capacity within the company by which the signatory is authorised to sign.

EHA EXPLORATION	CPD for EHA key Technical Staff	
Type	QP 3	Page 1 of 11
Document No.	EHA-2-167	Rev 0

This document describes the Continual Professional Development of EHA' Key Technical Staff completed within the last 3 years;

- Mr Melvyn Ennis – Technical Director (Geologist)
- Dr. Dietar Schumacher – Exploration Manager (Geologist)
- Mr David Carruthers – Production Manager – (Petroleum Engineer)
- Dr. Vahid Joekar-Niasar – Reservoir Engineer
- Dr. Masoud Babaei – Petroleum Engineer
- Dr. Andrew Odjo – Engineering Manager – (Process Engineer)
- Mr. Matthew Oj - Geoscientist
- Mr Paul Bowen – HSE & Installations

Mr. Melvyn Ennis	**Geologist with 40 years' experience worldwide**
Academic Management & Leadership	Management and operation of Geophysical Surveys eg. Proton Magnetometer, VLF EM-16, Resistivity for oil and mineral exploration customers both UK and overseas, including data interpretation and reporting. Management and operation of a wide range of Geochemical Surveys for mineral exploration, including data interpretation and reporting.
List of published/referred journals	----------
Safety courses and programs	----------
Technical Courses and programs	Technical and marketing consultancy to mineral water bottling companies Technical consultancy on trouble shooting of both drilling operations and ground water aquifers overseas, most recently for a client in Southern California. From 2013 to 2016
Invited Talks	----------
Memberships and Societies	----------
Other **Achievements**	Design and manufacture drilling rigs (2 x deep hole top head rotary truck mounted rigs completed) Design and manufacture unique portable rig for use with Pionjar Sampling rig, complete with hydraulic power pack Design and manufacture unique deep hole fishing tool for use with steel or plastic casing, liners and screen (patent application). Successfully tested in the field

	recently. Large market place in all application fields of drilling. Research and development of unique mode of conducting Geophysical Surveys which will have patent applications As inventor of the world's first DTH Reverse Circulation drilling and sampling system and now accepted as a standard exploration tool worldwide, continued research and technical advisor.

Dr. Dietar Schumacher	
Academic Management & Leadership	Dr. Schumacher is Vice President for Geosciences and Technology for E&P Field Services, A Paris-based company providing surface geochemical exploration surveys and other geological E&P services worldwide. Before joining E&P Services, Deet was Director of Geochemistry (1997-2012) for Geo-Microbial Technologies, an international provider of surface geochemical and microbiological surveys. He received his B.S. and M.S. degrees in Geology from the Univ. of Wisconsin (Madison) and his Ph.D. from the Univ. of Missouri (Columbia). Dr. Schumacher taught geology at the University of Arizona for 7 years before joining Phillips Petroleum in 1977. He held a variety of positions at Phillips, including Research Supervisor for petroleum geology and Senior Geological Specialist. Deet joined Pennzoil in 1982 and served as manager of geology/geochemistry before transferring to assignments with Pennzoil International, Pennzoil Offshore, and Pennzoil Technology Group. From 1994 thru 1996, Deet was a Research Professor with the Energy and Geosciences Institute at the University of Utah. He also served as Sr. Director of Geophysics for Terralliance, a small California-based exploration and technology company (2006-2009). Dr. Schumacher has a long-standing interest in the exploration and development applications of petroleum geochemistry, particularly geochemical and geomicrobiological exploration methods. In the past 30 years, he has been responsible for acquiring and interpreting surface geochemical data for hundreds of surveys conducted in North and South America, Europe, Africa, the Middle East, Asia, and Australia. He has organized and taught an industry short course, *Geochemical Exploration for Oil and Gas*, for AAPG and other geological organizations and individual companies worldwide for more than 20 years. Schumacher has edited several significant volumes on petroleum exploration, including AAPG Memoir 66 (1996), "*Hydrocarbon Migration and Its Near-Surface Expression*", and "*Surface Exploration Case Histories*", published jointly by AAPG and SEG in 2002. Dr. Schumacher is a Certified Petroleum Geologist (CPG-4301), a member of the American Association of Petroleum Geologists and the Canadian Society of Petroleum Geologists, and a past-president of the Houston Geological Society and of the American Association of Petroleum Geochemical Explorationists..

List of published/referred journals	**Recent Publications – Dietmar (Deet) Schumacher** List of publication from 1969 to 2010 available on request **Recent Presentations Available to View or Download on AAPG's Search and Discovery Site:** 2015 Schumacher, D., and L. Clavareau, Petroleum Exploration in Geologically Complex Areas: Opportunities for Geochemical and Non-Seismic Hydrocarbon Detection Surveys: AAPG Search and Discovery Article 80505, http://www.searchanddiscovery.net 2015 Schumacher, D., Improving Exploration Success of Surface Geochemical Surveys: Seven Pitfalls to Avoid: AAPG Search and Discovery Article 80504, http://www.searchanddiscovery.net 2014 Schumacher, D., Non-Seismic Detection of Hydrocarbons: An Overview: AAPG Search and Discovery Article 41697, http://www.searchanddiscovery.net 2013 Schumacher, D., Geochemical Exploration in Northern South America: Recent successes from Venezuela, Colombia, and Peru: AAPG Search and Discovery Article 30287, http://www.searchanddiscovery.net
Safety courses and programs	----------
Technical Courses and programs **Invited Talks** **Memberships and Societies**	He has organized and taught an industry short course, *Geochemical Exploration for Oil and Gas*, for AAPG and other geological organizations and individual companies worldwide for more than 20 years. Schumacher has edited several significant volumes on petroleum exploration, including AAPG Memoir 66 (1996), "*Hydrocarbon Migration and Its Near-Surface Expression*", and "*Surface Exploration Case Histories*", published jointly by AAPG and SEG in 2002. Dr. Schumacher is a Certified Petroleum Geologist (CPG-4301), a member of the American Association of Petroleum Geologists and the Canadian Society of Petroleum Geologists, and a past-president of the Houston Geological Society and of the American Association of Petroleum Geochemical Explorationists..

Mr. David Carruthers	
Academic Management & Leadership	----------
List of published/referred journals	----------
Safety courses and programs	VCA Operational Supervisors
Technical Courses and programs	Distillation Troubleshooting – Icheme – Henry Z Kister, Marriott hotel London 2013
Invited Talks	**2016 Refinery Basics and cracking technologies,** Andurand Capital, London 2 May,2015 ---------- **2015 Workshop on the impact of Shale Oil on USGC Refineries,** Knightsbridge, London 15 January,2015 ---------- **2014 Social and economic benefits of small scale oil & gas facilities,** SAEDC, Ingleside Texas, London 20 May,2015 ----------
Memberships and Societies	1. Society of Petroleum Engineers 2. MEI – Member of the Energy Institute – Chartered Petroleum Engineer 3. ICAEW – Member if the Institute of Chartered Accountants

Dr. Vahid Joekar-Niasar	
Academic Management & Leadership	**International workshop** on "Pore-Scale Modeling Techniques for Multiphase Flow and Reactive Transport", Shell Global Solutions Int., Rijswijk, January 2013 (*Several distinguished speakers are invited from Princeton Uni., MIT, Utrecht Uni., Texas Uni. at Austin, Eindhoven Uni, Heriot-Watt Uni., Illinois Univ., Pacific North National Lab, and Schlumberger Russia*). ----------

List of published/referred journals	**2014** Pore-scale and continuum simulations of solute transport micromodel benchmark experiments, M Oostrom, Y Mehmani, P Romero-Gomez, Y Tang, H Liu, H Yoon, Q Kang, V **Joekar-Niasar** et al, Computational Geosciences, 1-23 --- Non-equilibrium in multiphase multicomponent flow in porous media: An evaporation example, P Nuske, **V Joekar-Niasar**, R Helmig, International Journal of Heat and Mass Transfer 74, 128-142 --- Kinetics of Low-Salinity-Flooding Effect, H Mahani, S Berg, D Ilic, WB Bartels, V **Joekar-Niasar**, SPE Journal, SPE-165255-PA --- Micromodel study of two-phase flow under transient conditions: Quantifying effects of specific interfacial area, NK Karadimitriou, SM Hassanizadeh, **V Joekar-Niasar**, PJ Kleingeld, Water Resources Research --- Karadimitriou, N., Musterd, M., Kleingeld, P., Kreutzer, M., Hassanizadeh, M., **Joekar-Niasar, V.**, On the fabrication of PDMS micro-models by rapid prototyping, and their use in two-phase flow studies, Water Resources Research, doi:10.1002/wrcr.20196. --- **Joekar-Niasar, V.**, Doster, F., Armstrong, R.T., Wildenschild, D., Celia, M.A., (2013), Trapping and Hysteresis in Two-Phase Flow in Porous Media: A Pore-Network Study, Water Resources Research, *accepted.* --- **Joekar-Niasar, V.**, Schotting, R., Leijnse, A., (2013) Analytical Solution of Electro-Hydrodynamic Flow and Transport in Rectangular Channels: Inclusion of Double Layer Effects, Computational Geosciences, 10.1007/s10596-012-9337-8.
Safety courses and programs	---
Technical Courses and programs	H Khosravian, V Joekar-Niasar, N Shokri, Effects of flow history on residual saturation during two-phase flow in porous media, EGU General Assembly Conference Abstracts 16, 12273 --- **Joekar-Niasar, V.**, Dynamics of double layer forces controlled by diffusion of ions in a thin water film, Interpore 2013, Prague. (oral)

Invited Talks	**2015 Workshop on Interfaces and their role in displacement and transport in unsaturated porous media**, Potsdam, Germany 10–12 March,2015 --------- **2013 SIAM Conference on Mathematical & Computational Issues in the Geosciences**, Pore-network modeling of electrokinetic flow and transport in micro-capillaries, Padova, Italy, 17-20 June, 2013
Memberships and Societies	1. American Geophysical Union 2. Society of Petroleum Engineers 3. International Society of Porous Media (InterPore) 4. Alumni of Utrecht University 5. Alumni of Sharif University of Technology

Dr. Masoud Babaei	
Academic Management & Leadership	**PhD in Petroleum Engineering,** Imperial College London, London, UK 2009-2012 Thesis: Multiscale Wavelet and Upscaling-Downscaling for Reservoir Simulation ----------
List of published/referred journals	**M. Babaei**, R. Govindan, I. Pan, A. Korre and S. Durucan, \Genetic algorithm-based optimisation of well rate allocation for CO2 storage using upscaled models", to appear in Journal of Greenhouse GasControl. **M. Babaei**, R. Govindan, A. Korre, J.-Q. Shi, M. McCormac and S. Durucan, \CO2 storage potential at Forties oil field and the surrounding Palaeocene sandstone aquifer accounting for leakage risk through abandoned wells", to appear in Journal of Greenhouse Gas Control. A. Alkhatib, **M. Babaei** and P.R. King (2013), \Decision making under uncertainty in EOR: applying the Least Squares Monte Carlo method (LSM) in chemical EOR implementation", SPE Journal, 18(4), 721{735, DOI 10.2118/154467-MS **M. Babaei** and P.R. King (2013), \An upscaling-static-downscaling scheme for simulation of enhancedoil recovery processes", Journal of Transport in Porous Media, 98(2), 465{484, DOI: 10.1007/s11242-013-0149-7.

	M. Babaei, A.H. Elsheikh and P.R. King (2013), \A comparison study between an adaptive quad-tree grid and uniform grid upscaling of reservoir simulation", Journal of Transport in Porous Media, 98(2),377{400, DOI: 10.1007/s11242-013-0149-7.
Safety courses and programs	----------
Technical Courses and programs	----------
Invited Talks	M. Babaei and P.R. King (2013), \SPE-164833 An Upscaling-Static-Downscaling Scheme for Simulation of Enhanced Oil Recovery Processes", 75th EAGE Conference and Exhibition incorporating SPE-EUROPEC2013, 10{13 June, London, UK. ----------
Memberships and Societies	Society of Petroleum Engineers (SPE) 2004-present Petroleum Engineering and Rock Mechanics (PERM) Research Group 2009-present European Association of Geoscientists and Engineers (EAGE) 20013-present Postdoctoral Research Associate Representative of EAGE student chapter

Dr. Andrew Odjo	
Academic Management & Leadership	**PhD in chemical Engineering Engineering,** Institute of Chemical Processes Engineering, University of Alicante P. O. Box 99, Alicante, Spain ----------
List of published/referred journals	Flow properties of vacuum gas oil–low densitypolyethylene blends Antonio Marcilla, **Andrew O. Odjo**, J.C. García-Quesada, Amparo Gómez,Rosa N. Martínez, Deseada Berenguer ---------- Article: Refinery Nonconventional Feedstocks: Influence of the Coprocessing of Vacuum Gas Oil and Low Density Polyethylene in Fluid Catalytic Cracking Unit on Full Range Gasoline Composition **Andrew O. Odjo** · Angela N. García · Antonio Marcilla ---------- Article: Conversion of low density polyethylene into fuel through co-processing with vacuum gas oil in a fluid catalytic cracking riser reactor

	Andrew O. Odjo · Angela N. García · Antonio Marcilla ----------
Safety courses and programs	----------
Technical Courses and programs	----------
Invited Talks	----------
Memberships and Societies	Member of the Icheme

Mr. Matthew Oj			
Academic Management & Leadership	**MSc Petroleum Geoscience** Oxford Brookes University, UK - 2013 ----------		
List of published/referred journals	----------		
Safety courses and programs	Project Management Institue IOSH Membership Number	Member ID: 2852028 Member ID: 169755	2014 2014
Technical Courses and programs	----------		
Invited Talks	----------		
Memberships and Societies	Society of Petroleum Engineers (SPE)		

Mr. Paul Bowen			
Academic Management & Leadership	----------		
List of published/referred journals	----------		
Safety courses and programs	B.A. Safety Training B.E.H Training Centre & Total Safety Ltd.	Passed 1 off Certificate's TS/774/05/07/2011	

PASMA Portable Scaffold Training UK Construction Training Ltd.	Passed 1 off Certificate 207438
Slinger & Banksman. Safety Training RNC. Training Services.	Passed 1 off Certificate 1224.01
Telescopic Mobile Elevated Work Platform S.I.D. Training Ltd.	Passed 1 off Certificate 153-171255-SID-1670
JIB-PMES. Safety Training CSCS Training Centre.	Passed 1 off Certificate 2402000
Manual Handling Training Course STOWAN Safety Training	Passed 1off Certificate
Confined Spaces Appreciation Course STOWAN & KENTRA Safety Training	Passed 1off Certificate AT2522
Supervisor V.C.A. Dutch Safety Training Falck Nutec Training & Vanneau Groep Partners	Passed 1off Certificate 9644558/EN/707656.
Industrial Gas Training Course Blue Flame Associates Ltd	Passed 5off Certificate's COCH 1, CIGA 1, CORT 1, CDGA 1, & TPCP 1.
Risk Assessment Training Course STOWAN Safety Training	Passed 1off Certificate HSE Licence No: 32/08
C.D.M. Regulations Awareness Training Course VITAL Training Services & STOWAN Safety Training	Passed 1off Certificate L 1809/8
Emergency First Aid at Work Course IDEAL Training Solution	Passed 1off Certificate
Supervisor CONCOM Safety Training IMPRESS Training	Passed 1off Certificate

S.C.A.T.S. Safety Training New Horizons Training Centre.	Passed 1 off Certificate 728782
Asbestos Awareness Course To Instructors Standard Steve Dean Training Centre.	Passed 1 off Certificate 0789
JIB-PMES. Safety Training CSCS Training Centre.	Passed 1 off Certificate 2402000
O.S.A.F.C. Safety Training Emirates Technical & Safety Development Centre Abu Dhabi, UAE.	Passed 1 off Certificate 0058570025071320802
Basic H2S Safety Training Emirates Technical & Safety Development Centre Abu Dhabi, UAE.	Passed 1 off Certificate 00589014125071320919
Confined Space Inc Escape BA Training TOTAL Access Training Centre.	Passed 1 off Certificate TATR/CST1/70738
Koch-Glitsch UK Ltd Fall Protection Equipment Training TOTAL Access Training Centre.	Passed 1 off Certificate TATR/FPAP/707756
ECITB. Safety Passport Training TTE Training Centre.	Passed 1 off Certificate 1605835
ECITB. Leading A Team Safely, Training TTE Training Centre.	Passed 1 off Certificate 1522955

OPITO Approved Compressed Air Emergency Breathing System (CA-EBS) Initial Deployment Training (Offshore) SURVIVEX Training Centre.	Passed 1 off Certificate 9847590211145643

	OPITO Approved Minimum Industry Safety Training (Offshore) SURVIVEX Training Centre.	Passed 1 off Certificate 984753011111141148	
Technical Courses and programs	As above		
Invited Talks	-		
Memberships and Societies	-		

END OF DOCUMENT

ENVIRONMENTAL AWARENESS STATEMENT

APPLICATION TO DETI FOR PETROLEUM EXPLORATION LICENSE FOR SOUTH LOUGH NEAGH BASIN NORTHERN IRELAND

0	Issued	21.10.2014	ME	DC	HA	JH
Rev.	Description	Date	Prep	Check	Appro	QA

DATE	DETAILS OF REVISIONS	REV No.

CONTENTS

APPENDICES

1.0 Introduction

1.1 EHA Exploration Limited is a Private Limited Company registered in Northern Ireland (NI627374).

1.2 EHA Exploration Limited has an interest in undertaking oil and gas exploration in the South Lough Neagh Basin in central Northern Ireland. To this end the Company has established a partnership approach with the following Northern Ireland and GB based companies:

- Proxion Energy Group (energy industry technical and professional services)
- Baxter PR (public relations & communications)
- MARENCO (environmental consultancy)

1.3 The process will involve the following operations over an approximate three year period:

- Desk-top review of existing data including aerial surveys
- Geochemical sampling
- Geophysical surveying
- Seismic surveying
- 'Drill or Drop' phase

1.4 In order to gain permission to undertake this exploration project, EHA Exploration Limited has been in consultation with the Department of Enterprise Trade and Industry (DETI) Minerals & Petroleum Branch (MAPB) and an application for a Petroleum Licence has been prepared in accordance with the requirements of the Petroleum (Production) Act (NI) 1964. The process requires that an Environmental Awareness Statement accompanies the Petroleum Licence Application. The Statement must demonstrate the applicant's awareness of environmental issues and regulatory requirements. This report addresses the above requirements and includes the following:

- Environmental Policy Statement
- Key Stakeholders
- Environmental Legislative Constraints
- Environmental Impact
- Project Environmental Management Programme
- Environmental Management Implementation Programme

2.0 EnvironmentalPolicyStatement

EHA Exploration Limited
Environmental Policy Statement

EHA Exploration Limited is a private limited company registered in Northern Ireland. The Company has an interest in undertaking oil and gas exploration in the South Lough Neagh Basin, central Northern Ireland. The process will involve the following operations over an approximate three year period:

- Desk-top review of existing data including aerial surveys
- Geochemical sampling
- Geophysical surveying
- Seismic surveying
- 'Drill or Drop' phase

EHA Exploration Limited has identified the maintenance of an Environmental Management System as a key strategic objective, recognising environmental management to be of equal importance to other prime business considerations. EHA Exploration Limited will initially conduct an Environmental Impact Assessment and continue to monitor environmental aspects during all phases of the exploration programme. The Company operates to a principle of co-ordinated environmental management based on environmental sustainability.

EHA Exploration Limited is committed to:

- Maintaining an Environmental Management System appropriate to its operations in the oil and gas exploration sector.
- Compliance with relevant environmental legislation, regulations and industry codes of practice, including all relevant environmental licences, consents and permits.
- 'pollution prevention' through operational best practice, waste minimisation, emissions/discharge management, efficient resource use, and natural environment conservation awareness.
- Continual environmental performance improvement, by achieving realistic objectives and targets within a systematic management programme context.
- Implementing this environmental policy statement across the Company's operations in Northern Ireland by communicating with and training of employees and sub-contractors.
- Making this environmental policy statement available to stakeholders and the public

This Environmental Policy is supported by senior management.

27th November 2014

Hashem Arouszi (CEO)EHA Exploration Limited

3.0 Key Stakeholders

3.1 EHA Exploration Limited recognises that interaction with key environmental stakeholders is essential to ensure that good environmental management is delivered during the exploration project. In the project scoping phase a full list of stakeholders will be established and a consultation process initiated. During the project, regular contact will be maintained to ensure developments in regulatory requirements and industry best practice are incorporated in all phases of the exploration project.

3.2 Table 3.1 identifies key environmental stakeholders in Northern Ireland. These fall into two categories: statutory and non-governmental organisations (NGOs). This is an indicative list and additional stakeholders will be identified during the project in respect of specific local issues and project elements. Appendix 1 details the key purpose and contact details for each stakeholder. EHA Exploration Limited will also establish contacts with utility companies (NIE, BT, Firmus Energy etc.) during the early stages of the project.

3.3 EHA Exploration Limited has identified NIEA as the critical statutory stakeholder for this project. NIEA takes the lead in advising on, and in implementing, the Government's environmental policy and strategy in Northern Ireland. It carries out a range of activities which promote the Government's key themes of sustainable development, biodiversity and climate change.

3.4 NIEA is recognised as the leading body responsible for protecting, conserving and promoting the environment and heritage in Northern Ireland through working towards four key operating principles:

- *'We will make it easy for people to do good business and difficult for people to do bad business'*
- *'We will help create a resource efficient Northern Ireland'*
- *'We will help people see our environment and heritage as an opportunity, not a barrier'*
- *'We will be a customer-focussed and people-centred organisation'*

3.5 NIEA is identified as a key partner in this project in respect of designated sites, protected habitat and species and licence/permit requirements.

3.6 EHA Exploration Limited has identified RSPB as the critical NGO stakeholder for this project. RSPB plays a leading role in making sure that Northern Ireland's natural heritage gets appropriate protection. RSPB has extensive experience of advising on large scale projects to ensure such developments do not harm important wildlife sites.

3.7 EHA Exploration Limited will outline its project plans to RSPB ahead of commencing works and will continue to work with the organisation to ensure appropriate measures are taken to avoid and/or mitigate against potential impacts.

3.8 EHA Exploration Limited proposes the establishment of an Environmental Working Group for the project. Members will include EHA Exploration Limited personnel, key stakeholder representatives and project consultants. This group would meet every six months during the project to ensure environmental considerations are appropriately addressed.

Table 3.1 - Key Stakeholders

Type	Name	
Statutory	Department of Environment for Northern Ireland (DOENI)	
	Northern Ireland Environment Agency (NIEA) - agency of DOENI	
	Department of Agriculture and Rural Development (DARD)	
	Minerals & Petroleum Branch (MAPB) Department of Enterprise, Trade and Investment (DETI)	
	Department of Culture Arts and Leisure (DCAL)	
	Northern Ireland Water	
	Council for Nature Conservation & the Countryside (CNCC)	
	Planning Service – agency of DOENI	
	Transport NI - Business Unit within Department for Regional Development	
	Antrim Borough Council	Antrim & Newtownabbey (from 1st April 2015)
	Newtownabbey Borough Council	
	Armagh City & District Council	Armagh, Banbridge & Craigavon (from 1st April 2015)
	Banbridge District Council	
	Craigavon Borough Council	
	Belfast City Council	
	Lisburn City Council	Lisburn & Castlereagh (from 1st April 2015)
	Castlereagh Borough Council	
	Cookstown District Council	Mid Ulster(from 1st April 2015)
	Dungannon & South Tyrone Borough Council	
	Magherafelt District Council	
	North Down Borough Council	North Down & Ards(from 1st April 2015)
NGOs	Royal Society for the Protection of Birds (RSPB)	
	National Trust	
	Ulster Wildlife Trust	
	Ulster Architectural Heritage Society	

4.0 EnvironmentalLegislativeConstraints

4.1 As an element of environmental management, EHA Exploration Limited will establish a procedure in respect of legislative compliance. This will take the form of an Environmental Legislation and Other Requirements Register. This register will be specific to NI legislative requirements.

4.2 Table 4.1 identifies the key pieces of environmental legislation relevant to the proposed EHA Exploration Limited exploration project. Appendix 2 details key requirements of this legislation.

Table 4.1 - Environmental Legislation

Subject	Ref.	Legislation	Purpose
Water	W01	Water (NI) Order 1999	Conservation of waterways
	W02	Fisheries Act (NI) 1966	Details fisheries pollution offences
	W03	Groundwater Regulations (NI) 1998 (& 2009 and 2011 amendments)	Limits discharge direct to groundwater
	W04	Anti-Pollution Works Regs (NI) 2003	Deals with anti-pollution works notices
	W05	Control of Pollution (Applications & Registers) Regulations (NI) 2001	Procedures for applications for / variation of consents
Waste Management	WM01	Waste and Contaminated Land (NI) Order 1997	Framework Order from which subordinate legislation arises to regulate waste management in NI
	WM02	Controlled Waste (Duty of Care) Regs (NI) 2013 (& 2014 amendment)	Establishes the 'Duty of Care' principle
	WM03	Controlled Waste Regulations (NI) 2002	Defines what is and is not to be treated as household, industrial & commercial waste
	WM04	Hazardous Waste Regulations (NI) 2005	Sets out a revised regime to control and track the movement of hazardous waste
Pollution Control	PC01	Control of Pollution (Oil Storage) Regulations (NI) 2010	Deals with proper storage of oils.
Noise Nuisance	NN01	Pollution Control and Local Government (NI) Order SI 1978	Part 3 deals with provisions relating to noise nuisances
	NN02	Control of Noise (Codes of Practice for Construction & Open Sites) Order (NI) 2002	Identifies approved codes of practice
Conservation	CO01	Environment (Northern Ireland) Order SI 2002	Part 4 sets out new provisions for ASSIs, with particular regard to their declaration and how they are managed
	CO02	Conservation (Natural Habitats, etc.) Regulations (NI) 1995 (as amended)	Deals with habitat protection
	CO03	Wildlife (NI) Order SI 1985 (as amended)	Offence to interfere with endangered species of wild animals and plants
	CO04	Nature Conservation and Amenity Lands (Northern Ireland) Order 1985	Makes provisions for the protection and management of important sites
	CO05	Wildlife & Natural Environment Act (NI) 2011	Makes provision about biodiversity; amends the Wildlife (NI) Order 1985 and Part 4 of the Env. (NI) Order 2002
Information	IN01	Environmental Information Regulations 2004	Public availability of environmental information
	IN02	Environmental Liability (Prevention & Remediation) Regulations (NI) 2009	Aims to prevent environmental damage
Planning	PL01	Planning (NI) Order 1991	Development planning(Part IV)
	PL02	Planning (Environmental Impact Assessment)	Provision for environmental impact

		Regulations (NI) 2012	assessment before Planning Consent

4.3 EHA Exploration Limited recognises the need to periodically examine and reassess the legal and other requirements relating to its activities during the length of the exploration project. Therefore a periodic conformity review of environmental policy, legal compliance and other requirements will be undertaken. The Conformity Review will take the form of a short written report and will record how EHA Exploration Limited complies with key environmental legislation and relevant codes of practice etc.

4.4 EHA Exploration Limited is aware that under the 'Conservation (Natural Habitats, etc.) Regulations (NI) 1995', DETI is required to 'screen' licence plans to determine if they are likely to have a significant environmental effect on European designated sites. These include Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). In addition, DETI must assess the likely effects on Areas of Special Scientific Interest (ASSIs) and RAMSAR sites.

4.5 The onus is on EHA Exploration Limited to provide DETI with all relevant information in respect of project work details and potential impacts on designated sites. Consequently EHA Exploration Limited will undertake a full Environmental Impact Assessment for submission to DETI (Section 5.0).

4.6 EHA Exploration Limited is aware that species protected under the Wildlife (NI) Order 1985 (as amended) may be present in areas where aspects of the exploration project are planned. In addition, habitats, species, earth science and landscape interests which are given protection under planning provisions may also be present. EHA Exploration Limited will undertake appropriate surveys following extensive consultation with key stakeholders (including MAPB, NIEA, Planning Service and RSPB).

4.7 EHA Exploration Limited is aware of the terms of the Planning (NI) Order 1991 and subsequent planning regulations. The Company will consult with Planning Service prior to exploratory works (especially in respect of exploratory boreholes) to ascertain planning approval requirements.

4.8 EHA Exploration Limited is also aware of regulatory constraints in respect of fisheries, waterways, agri-environment schemes and waste management and will consult fully with the relevant statutory bodies and NGOs to ensure compliance during the project.

5.0 EnvironmentalImpact

5.1 EHA Exploration Limited will conduct an Environmental Impact Assessment during the early stages of the project.

5.2 Initially a detailed Scoping Document will be prepared following consultations with the key stakeholders identified in Section 3.0. This process will fully identify areas of environmental concern.

5.3 EHA Exploration Limited is acutely aware of the high conservation value of sites within the application area. The Company recognises that DETI has obligations to ensure that the integrity of Natura 2000 sites is not compromised. DETI is required to undertake a Stage 1 screening to identify Natura 2000 sites that could be affected by exploration and if necessary Stage 2 Appropriate Assessment will be carried out in respect of seismic or drilling submissions. Table 5.1 and Figure 5.1 detail the Natura 2000 and Ramsar designations within the application area.

5.4 Of the six Natura 2000 and Ramsar sites identified, four are adjacent to the application site boundary. Two sites, Peatlands Park SAC (207.3 Ha) and Montiaghs Moss SAC (151.3 Ha), are within the site boundary. Currently it remains EHA Exploration Limited's intention not to undertake field work activities within these SAC sites.

5.5 EHA Exploration Limited is also aware that DETI is required to consult with NIEA if field-based activity is to be undertaken within an Area of Special Scientific Interest (ASSI). EHA Exploration limited understands its obligations in respect of seeking prior approval should they wish to work in or close to an ASSI. Table 5.2 details the ASSI designations in the applications area and Figure 5.2 indicate the ASSIs, NNRs and AONBs.

5.6 Of the 21 ASSIs identified, three are adjacent to the application site boundary. 18 are within the site boundary (including Peatlands Park and Montiaghs Moss). Three sites are water bodies (Portmor Lough, Lough Gullion and Brookend Old Dam) and one is a restricted site (Maghaberry – within Prison site). The remaining 12 land-based sites have a combined area of 915.4 Ha. Based on this limited area,currently it is EHA Exploration Limited's intention not to undertake field work activities within ASSI sites.

5.7 Following the preparation of the Scoping Document and subsequent further consultations, the Environmental Impact Assessment will be conducted. Where appropriate existing government and NGO datasets will be used to assess potential impacts. Where the need is identified and agreed with DETI additional surveys will be undertaken. These may include:

- habitat assessments
- flora surveys
- fauna surveys
- ground investigations
- water quality surveys
- fisheries surveys
- landscape assessments
- historic building/monument surveys
- noise surveys
- traffic assessments

5.8 Where specific surveys are deemed necessary these will be undertaken to best practice standards by suitably qualified surveyors and at the appropriate time of year.

5.9 A key objective of the Environmental Impact Assessment will be to provide DETI with the appropriate information to 'screen' the project under the terms of the Conservation (Natural Habitats, etc.) Regulations (NI) 1995 (as amended). This will then allow DETI to determine the need for HRA in respect of the whole project or individual elements of it.

5.10 A critical output of the Environmental Impact Assessment will be the identification of 'environmental constraints'. A scoring system will be applied to identify areas of low, low-medium, medium, medium-high and high risk within the application boundary. Key stakeholders will be consulted to decide the constraints applied to each risk level.

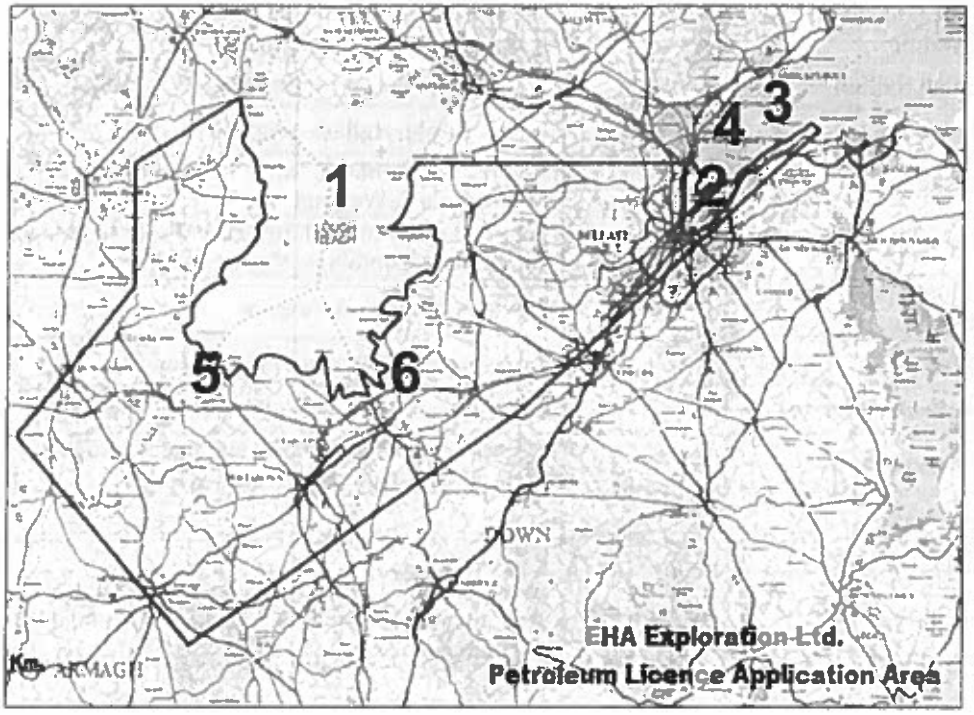
5.11 EHA Exploration Limited recognises that this project is dynamic and the success of each phase will dictate the specification of subsequent phases. Consequently EHA Exploration Limited will ensure that monitoring and surveying requirements will be constantly reviewed with the Environmental Working Group to ensure environmental concerns are addressed.

Table 5.1 – Natura 2000 & Ramsar Sites

Site Name	Area (Ha)	Key Features
Lough Neagh & Lough Beg SPA	41,188	The site qualifies by regularly supporting internationally important numbers of wintering Bewick's and whooper swans and also by regularly supporting nationally important numbers of breeding common tern. It qualifies as a wetland of international importance by regularly supporting over 20,000 of a variety of species of waterfowl in winter.
Lough Neagh & Lough Beg Ramsar	50,166	The site qualifies by being the largest freshwater lake in the UK. It is a relatively shallow body of water supporting beds of submerged aquatic vegetation fringed by associated species-rich damp grassland, reedbeds, islands, fens, marginal swampy woodland and pasture. It also, qualifies as it supports over forty rare or local vascular plants. The Lough and its margin are also home to a large number of rare or local invertebrates. The site regularly supports substantial numbers of individuals from particular groups of waterfowl which are indicative of wetland values, productivity and diversity.In addition, this site is of special value for maintaining the genetic and ecological diversity of NI because of the quality and peculiarities of its flora and fauna. Lough Neagh also qualifiesfor supporting an important assemblage of breeding birds. The site qualifiesby regularly supporting over 20,000 waterfowl in winter. It regularly supports internationally important numbers of wintering Bewick's and whooper swans. and nationally important numbers of breeding common tern. The site also qualifiesby supporting a population of pollan one of the few locations in Ireland.
Belfast Lough SPA& Ramsar	432.1	The site qualifies by regularly supporting internationally important numbers of redshank in winter. The site also regularly supports nationally important numbers of shelduck,oystercatcher, purple sandpiper, dunlin, black-tailed godwit, bar-tailed godwit, curlew and turnstone.
Belfast Lough Open Water SPA	5593	The site qualifies as it supports an internationally important wintering population of great crested grebe.
Peatlands Park SAC	207.3	Peatlands Park is a large lowland raised bog that has been extensively cut for turf in the past. It represents one of the largest areas of degraded raised bogin NI. Regeneration is taking place over a large part of the site. The peatland flora includes bog-rosemary*Andromeda polifolia*at one of its few Northern Ireland sites. The peatland interest also incorporates an area of intact lowland raised bog at Mullenakill. Associated woodland interest includesold sessile oak woods and Bog woodland.TheBog woodlandappears to have developed through seral succession over a shallow, peat-bottomed lake.
Montiaghs Moss SAC	151.3	Montiaghs Moss is an extensive area of cut-over bog, which contains one of the largest and longest-established populations of marsh fritillary*Euphydryas aurinia*in Northern Ireland. The population is very dispersed throughout the entire site, reflecting the extent of habitat that is suitable for the specie

Table 5.2 – ASSIs

Map No. (Figure 5.2)	Site Name	Area (Ha)	Key Features
1	Outer Belfast Lough	228.6	Maritime Cliff & Slope; Seabird Assemblage; Wader Assemblage; Waterfowl Assemblage
2	Inner Belfast Lough	240	Wader Assemblage; Wildfowl Assemblage; Coastal
3	Leathemstown	44.7	Lowland Meadow & Pasture; Purple Moor-grass & Rush Pasture
4	Slievenacloy	375.4	Fungi; Lowland Meadow & Pasture; Purple Moor-grass & Rush Pasture
5	Aghnadarragh	3.5	Earth Science (artificial outcrop)
6	Portmor Lough	286	Invertebrate Assemblage; Waterfowl Assemblage
7	Montiaghs Moss	151.3	Butterflies; Dragonflies; Higher Plant Assemblage; Invertebrate Assemblage
8	Maghaberry	9.9	Breeding Birds; Species-rich Grassland
9	Ballynanaghten	1.2	Dry Grassland – semi-natural & species-rich
10	Clarehill	1.3	Earth Science (exposed limestones)
11	Lough Gullion	126.3	Wet Grasslands; Fens; Reedbeds & Swamps
12	Derryvore	15.6	Inter-drumlin Hollow; Wetland
13	Selshion	39.6	Botanical; Heathland; Inter-drumlin Hollow; Invertebrates; Wetland
14	Brackagh Bog	113.2	Fens & Wet Woodland; Invertebrate Assemblage; Dragonfly Assemblage; Moth Assemblage
15	Annacramph Meadows	2.5	Lowland Meadow & Pasture
16	Benburb	3	Earth Science (inter-glacial peat deposit)
17	Benburb Milltown	11	Earth Science (exposed sedimentary rocks)
18	Peatlands Park	207.3	Eutropic Lake; Lowland Raised Bog; Peatland; Semi-natural Woodland; Swamp & Fen
19	Drumcrow	7.6	Fen
20	Brookend	1.5	Grey Heron
21	Lough Neagh	39,777	Earth Science; Plant Assemblage; Invertebrate Assemblage; Reedbeds & Swamps; Waterfowl Assemblage



1 Lough Neagh & Lough Beg SPA & Ramsar Site

2 Belfast Lough SPA

3 Belfast Lough Open Water SPA

4 Belfast Lough Ramsar

5 Peatlands Park SAC

6 Montiaghs Moss SAC

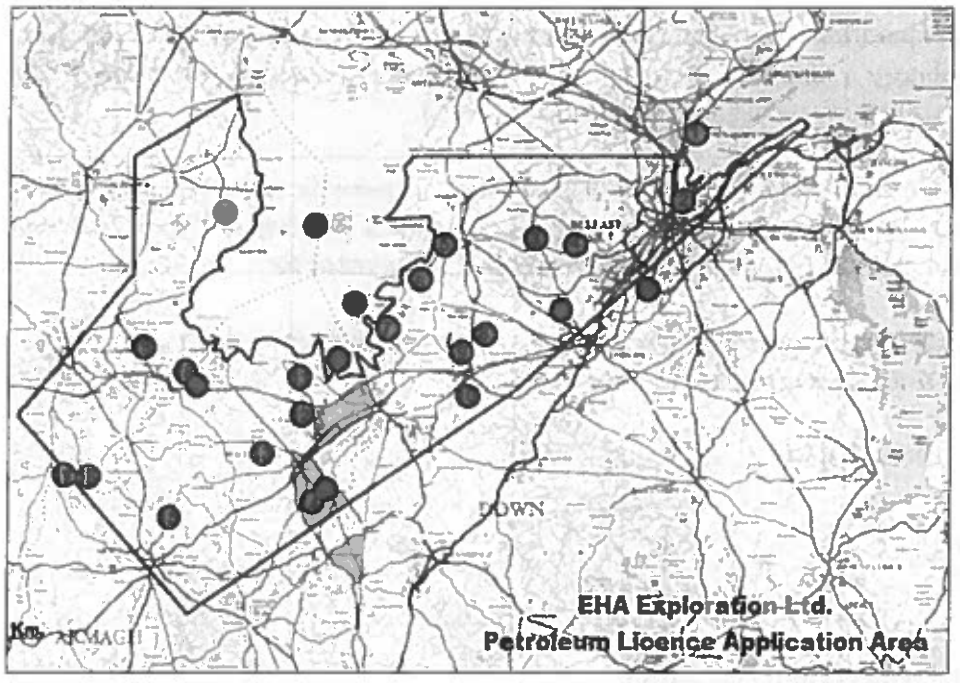
SCALE ~1 5000 (at A4)

CLIENT EHA Exploration Limited

PROJECT Petroleum Licence Application

TITLE Figure 5.1
Designated Sites Nature 2000 & Ramsar

marenco



Area of Special Scientific Interest (ASSI) (refer to Table 5.2 for site names)

National Nature Reserve (NNR)

Area of Outstanding Natural Beauty (AONB)

SCALE ~1:5000 (at A4)

CLIENT EHA Exploration Limited

PROJECT Petroleum Licence Application

TITLE Figure 5.2
Designated Sites: ASSI, NNR & AONB

marenco

6.0 ProjectEnvironmentalManagementProgramme

6.1 In its Environmental Policy Statement (Section 2.0) EHA Exploration Limited identifies the maintenance of an Environmental Management System (EMS) as a key strategic objective. The Policy also gives clear commitments to legislative compliance and pollution prevention.

6.2 For this oil and gas exploration project EHA Exploration Limited will establish an EMS compliant with the requirements of international standard ISO 14001.

6.3 A key element of the EMS will be the establishment of a project-specific Environmental Management Programme (EMP).

6.4 The EMP will contain operational procedures to include all environmental aspects of the project from assessing regulatory requirements to specific work instructions (e.g. procedures for hedgerow removal, borehole waste disposal, noise nuisance etc.).

6.5 As an element of the overall EMS, the EMP will be subject to periodic audits to ensure the environmental aspects of the project are appropriately addressed and any alterations to the project specification or changes in regulatory requirements are accounted for.

6.6 The EMP will effectively become a working manual for all those involved in the project whose responsibilities could result in environmental impacts.

6.7 An example EMP is outlined below:

1.0 Introduction
- 1.1 General
- 1.2 Scope

2.0 Environmental Aspects and Legislation
- 2.1 Environmental Aspects
- 2.2 Legislation

3.0 Environmental Objectives & Targets

4.0 Environmental Roles & Responsibilities
- 4.1 Environmental Working Group
- 4.2 Project Manager
- 4.3 Sites Manager
- 4.4 Environmental Liaison Officer
- 4.5 Environmental Advisor
- 4.6 Procurement Officer
- 4.7 Management Review

7.0 EnvironmentalManagementImplementationProgramme

7.1 Table 7.1 presents an indicative implementation programme for the delivery of key environmental management deliverables. This implementation programme will be subject to continual review and amendment to suit the needs of the project and stakeholders.

Table 7.1 – Implementation Programme

Environmental Aspect	Pre-Licence	Post-Licence											
		Year 1				Year 2				Year 3			
		June-Aug	Sept-Nov	Dec-Feb	March-May	June-Aug	Sept-Nov	Dec-Feb	March-May	June-Aug	Sept-Nov	Dec-Feb	March-May
Consultation													
Identify Key Stakeholders													
Establish Environmental Working Group (EWG)													
EWG Meetings													
EMS Development													
EMS Certification													
EIA Scoping													
EIA													
Environmental Surveys													
Establish Environmental Management Programme (EMP)													
Implement EMP													

APPENDICES

APPENDIX 1

KEY STAKEHOLDERS

Type	Name	Purpose	Contact
Statutory	Department of Environment for Northern Ireland (DOENI)	protect, conserve and enhance the natural environment and built heritage	Clarence Court 18 Adelaide Street Belfast BT2 8GB tel: 028 9054 0540 email: press.office@doeni.gov.uk website: www.doeni.gov.uk
	Northern Ireland Environment Agency (NIEA) - agency of DOENI	implement an integrated approach to the sustainable use of water bodies substantially eliminate polluting discharges reduce significantly the loss of biodiversity conserve Northern Ireland's finest landscapes and monuments provide more statutory protection of buildings of special architectural or historic interest (listed buildings) improve the overall condition of listed buildings improve the condition of monuments and listed buildings at risk deliver better regulation reduce illegal waste disposal provide quality and timely responses to planning consultations inform the public about the state of the environment improve public awareness of our environment and heritage	Klondyke Building Cromac Avenue Gasworks Business Park Lower Ormeau Road, Belfast BT7 2JA tel: 0845 3020008 Pollution Hotline: 0800 80 70 60 email: niecinfo@doeni.gov.uk website: www.ni-environment.gov.uk
	Department of Agriculture and Rural Development (DARD)	development of the agricultural, forestry and fishing industries rural development providing an advisory service for farmers agricultural research and education providing a veterinary service & administration of animal health & welfare administration of schemes in NI which affect the whole of the UK application of EU agricultural policy to Northern Ireland	The Library Room 615 Dundonald House Upper Newtownards Road Belfast BT4 3SB tel: 028 9052 4999 email: dardhelpline@dardni.gov.uk website: http://www.dardni.gov.uk

Type	Name	Purpose	Contact
Statutory	Minerals & Petroleum Branch (MAPB) Department of Enterprise, Trade and Investment (DETI)	DETINI is responsible for economic policy development, energy, tourism, mineral development, health and safety at work, companies registry, insolvency services, consumer affairs and labour market and economic statistics services Minerals & Petroleum Branch administer the provision of Petroleum Licences granted by DETI under the Petroleum (Production) Act (Northern Ireland) 1964; the application and licensing process is underpinned by regulations which, among other things, set out the arrangements for making and determining applications, permissible terms and conditions for granting a Petroleum Licence and the model clauses which may be incorporated in a Petroleum Licence	Coby House Stranmillis Court Belfast BT9 5BF tel: 028 9038 8462 email: minerals@detini.gov.uk website: www.detini.gov.uk
	Department of Culture Arts and Leisure (DCAL)	responsible for arts and creativity, museums, libraries, sport, inland waterways and inland fisheries, linguistic diversity, archives, and for advising on National Lottery distribution	Causeway Exchange 1-7 Bedford Street Belfast BT2 7EG tel: 028 9025 8825 email: DCALAngling@dcalni.gov.uk website: dcalni.gov.uk
	Northern Ireland Water	responsibility for delivering water and sewerage services	PO Box 1026 Belfast BT1 9DJ tel: 0845 744 0088 email: waterline@niwater.com website: www.niwater.com
	Council for Nature Conservation & the Countryside (CNCC)	statutory advisor to DOENI on matters affecting nature conservation and the countryside also offers advice relevant to its remit to other government departments such as DARD, DRD and DCAL and is represented on other groups and working parties	Room G-07 Waterman House 5-33 Hill Street Belfast BT1 2LA tel: 028 905 43050

Type	Name	Purpose	Contact
Statutory	Planning Service	Statutory body with responsibility for dealing with planning applications.	Millennium House 17 - 25 Great Victoria Street Belfast BT2 7BN tel: 0300 200 7830 email: planning@doeni.gov.uk website : www.planningni.gov.uk
	Transport NI	Responsible for the maintenance of over 25,000km of public roads together with about 9,700km of footways, 5,800 bridges, 271,000 street lights and 367 public car parks.	Clarence Court 10-18 Adelaide Street Belfast BT2 8GB tel:028 905 40191 E-mail: roads@drdni.gov.uk website :drdni.gov.uk
	Antrim Borough Council	Environmental health departments within Councils are responsible for the enforcement of statutory duties with regard to: • air pollution, noise complaints and public health nuisances • health and safety • water pollution • consumer protection • pest control • food safety	Council Offices The Steeple Antrim BT41 1BJ tel: 028 9446 3113 email: contact@antrim.gov.uk website: www.antrim.gov.uk
	Newtownabbey Borough Council		Mossley Mill Carnmoney Road North Newtownabbey BT36 5QA tel: 028 9034 0000 web: www.newtownabbey.gov.uk

Type	Name	Purpose	Contact
Statutory	Armagh City & District Council	Environmental health departments within Councils are responsible for the enforcement of statutory duties with regard to: • air pollution, noise complaints and public health nuisances • health and safety • water pollution • consumer protection • pest control • food safety	The Council Offices The Palace Demesne Armagh BT60 4EL tel: 028 3752 9600 email: info@armagh.gov.uk website: www.armagh.gov.uk
	Banbridge District Council		Civic Building Downshire Road Banbridge BT32 3JY tel: 028 4066 0600 email: info@banbridgedc.gov.uk website: www.banbridgedc.gov.uk
	Craigavon Borough Council		Civic Centre PO Box 66 Lakeview Road Craigavon BT64 1AL tel: 028 3831 2400 email: info@craigavon.gov.uk website: www.craigavon.gov.uk
	Belfast City Council		City Hall Belfast BT1 5GS tel: 028 9032 0202 website: www.belfastcity.gov.uk

Type	Name	Purpose	Contact
Statutory	Lisburn City Council	Environmental health departments within Councils are responsible for the enforcement of statutory duties with regard to: • air pollution, noise complaints and public health nuisances • health and safety • water pollution • consumer protection • pest control • food safety	Island Civic Centre The Island Lisburn BT27 4RL tel: 028 9250 9250 email: enquiries@lisburn.gov.uk website: www.lisburn.gov.uk
	Castlereagh Borough Council		Civic & Administrative Offices Bradford Court Upper Galwally Belfast BT8 6RB tel: 028 9049 4500 website: www.castlereagh.gov.uk
	Cookstown District Council		70 Burn Road Cookstown BT80 8DT tel: 028 8676 2205 website: www.cookstown.gov.uk
	Dungannon & South Tyrone Borough Council		Circular Road Dungannon BT71 6DT tel: 028 8772 0300 website: www.dungannon.gov.uk
	Magherafelt District Council		Council Offices 50 Ballyroanan Road Magherafelt BT45 6EN tel. 028 7939 7979 email. info@magherafelt.gov.uk website: www.magherafelt.gov.uk

Type	Name	Purpose	Contact
Statutory	North Down Borough Council	Environmental health departments within Councils are responsible for the enforcement of statutory duties with regard to: • air pollution, noise complaints and public health nuisances • health and safety • water pollution • consumer protection • pest control • food safety	Town Hall The Castle Bangor BT20 4BT tel. 028 9127 0371 website: www.northdown.gov.uk

Type	Name	Purpose	Contact
NGO	Royal Society for the Protection of Birds (RSPB)	works for the conservation of wild birds, other wildlife and the places in which they live in a wide variety of ways key NGO in respect of providing advice on major development projects	Senior Conservation Officer RSPB Belvoir Park Forest Belfast BT8 7QT tel: 028 9049 1547 email: michelle.hill@rspb.org.uk w.www.rspb.org.uk/northernireland
	National Trust	protects historic houses, gardens, mills, coastline, forests, woods, fens, beaches, farmland, moorland, islands, archaeological remains, nature reserves, villages and pubs	Rowallane Stable Yard Saintfield Ballynahinch Co Down BT24 7LH tel: 028 9751 0721 email: ni.customerenquiries @nationaltrust.org.uk website: www.nationaltrust.org.uk
	Ulster Wildlife Trust	Northern Ireland's largest conservation charity	3 New Line Crossgar Co Down BT30 9EP tel: 028 4483 0282 email: info@ulsterwildlifetrust.org website: ulsterwildlifetrust.org
	Ulster Architectural Heritage Society	promotes the appreciation and enjoyment of architecture from the prehistoric to the present and encourages its preservation and conservation	66 Donegall Pass Belfast BT7 1BU tel: 028 9055 0213 email: info@uahs.org.uk website: www.uahs.org.uk

APPENDIX 2

RELEVANT LEGISLATION

Ref: W01 Water (NI) Order 1999	Jurisdiction			
	NI ♦	UK	EU	Int.

This Order was made in March 1999 and repeals the Water Act (NI) 1972. The key provisions are:

- Consents required to discharge trade effluent to waterway or underground stratum
- Payments for consents to discharge
- Enforcement notices for non-compliance with consents
- Prohibition notices in relation to certain discharges
- DoE(NI) able to undertake appropriate remedial work
- DoE(NI) to maintain water register
- DoE(NI) to have wide powers of entry and inspection
- DARD to maintain and improve waterways
- DARD to regulate and set levies for us of waterways, and have powers of entry and inspection

Ref: W02 Fisheries Act (NI) 1966	Jurisdiction			
	NI ♦	UK	EU	Int.

This Act came into force in 1966 and Part 4 deals with the protection of fisheries. Amongst other things, this Part makes it an offence to:

- use or possess deleterious matter for the capture, destruction or injury of fish;
- pollute a watercourse;
- remove any material from the bed of a river without the consent of the Fisheries Conservancy Board;
- obstruct the passage of fish or fail to protect fish where water is abstracted.

Ref: W03 Groundwater Regulations (NI)1998(&2009and2011amendments)	Jurisdiction			
	NI ♦	UK	EU ♦	Int.

DOE must take necessary steps to prevent the direct or indirect discharge into groundwater of list 1 substances & control pollution resulting from the discharge of list 2 substances. Authorisation for the disposal or tipping for the purposes of disposal, of list 1 & 2 substances is required.

Additionally activities in or on land which pose an indirect threat to groundwater by these substances can be prohibited or regulated.

Ref: W04 Anti-Pollution Works Regulations (NI) 2003	Jurisdiction			
	NI ♦	UK	EU	Int.

These Regulations set out the contents of anti-pollution works notices served under the Water (Northern Ireland) Order 1999 and deal with the procedure for appeals against them. A works notice must:

- Describe the nature of the risk to relevant waters, identify those which may be affected and the place from which the matter enters those waters
- Describe the nature and extent of the pollution and identify the waters affected, with regard to an actual pollution incident
- Specify the works or operations which must be carried out by the person served the notice
- Specify any periods referred to in the Water (Northern Ireland) Order 1999, with regard to the notice
- State DoE(NI) reasons for serving the notice
- Inform the person who is served the notice of their right to appeal
- State DoE(NI) can recover costs and expenses from investigations carried out under the Water (Northern Ireland) Order 1999, from the person who is served the notice
- Set out the consequences of not complying with a works notice

Ref: W05 Control of Pollution (Applications & Registers) Regulations (NI) 2001	Jurisdiction			
	NI ♦	UK	EU	Int.

These Regulations set out the procedure which must be followed in relation to applications for, or the variation of, consents under Part 2 of the Water (Northern Ireland) Order and provide details of the advertising of applications and the details which must be entered into a water pollution control register.

Ref: WM01 Waste and Contaminated Land (NI) Order 1997	Jurisdiction			
	NI ♦	UK	EU	Int.

This Order sets out provisions relating to waste on land and the collection and disposal of waste. Part 2 of the Order deals with waste management licences and makes it an offence to deposit, treat, keep or dispose of controlled waste without one.It also sets out details for a duty of care for those involved with controlled waste, whereby attempts must be made to:

- prevent the deposit of controlled waste without a licence;
- prevent contravention of the Pollution Prevention and Control Regulations (NI) SR 2003/46;
- prevent the escape of waste;
- make sure any transfers of waste are only to authorised people.

Ref: WM02 Controlled Waste (Duty of Care) Regs (NI) 2013 (& 2014 amendment)	Jurisdiction			
	NI ♦	UK	EU	Int.

These regulations implement certain provisions within the Waste and Contaminated Land (NI) Order 1997. They place a 'duty of care' on producers, carriers and disposers of waste to ensure appropriate handling, carriage and disposal. Companies must ensure that their obligations under Duty of Care are met fully, including maintaining records of all waste operators linked to site operations and ensure all licenses are complete and up to date.

Ref: WM03 Controlled Waste Regulations (NI) 2002	Jurisdiction			
	NI ♦	UK	EU	Int.

These Regulations defines what is and is not to be treated as household, industrial and commercial waste.

Ref: WM04 Hazardous Waste Regulations (NI) 2005	Jurisdiction			
	NI ♦	UK	EU ♦	Int.

These Regulations set out a revised regime to control and track the movement of hazardous waste. They work in conjunction with the List of Wastes Regulations (Northern Ireland) 2005, which reproduce the list of wastes from Decision 2000/532/EC, which contains the current version of the European Waste Catalogue. There is still a requirement to pre-notify NIEA at least three working days, and not more than one month, before a consignment of hazardous waste is removed from any premises. A consignment note must be completed before hazardous waste is removed from any premises. There is also a schedule of carriers for when more than one carrier transports the consignment as well as provisions for carrier's rounds, which includes successions of rounds by the same carrier.

Ref: PC01 Control of Pollution (Oil Storage) Regulations (NI) 2010	Jurisdiction			
	NI ♦	UK	EU	Int.

The aim of the Regulations is to establish a regime for the control of oil storage on commercial sites. Oil storage containers with a capacity above 200 l must be bunded in an appropriate manner to prevent spillage.

Ref: NN01 Pollution Control and Local Government (NI) Order 1978	Jurisdiction			
	NI	UK	EU	Int.
	♦			

The Order controls noise nuisances generally, and specifically in relation to noise on construction sites, in streets and from plant and machinery.

Ref: NN02 Control of Noise (Codes of Practice for Construction and Open Sites) Order (Northern Ireland) 2002	Jurisdiction			
	NI	UK	EU	Int.
	♦		♦	

The following four Codes of Practice, which cover all construction and other open sites, have been approved:

- BS 5228: Part 1: 1997 (with Amendment 1), on basic information and procedures for noise and vibration control;
- BS 5228: Part 3: 1997, on surface coal abstraction by opencast methods;
- BS 5228: Part 4: 1992 (with Amendment 1), on noise and vibration control applicable to piling operations;
- BS 5228: Part 5: 1997, on surface mineral abstraction.

Ref: CO01 Environment (Northern Ireland) Order SI 2002	Jurisdiction			
	NI	UK	EU	Int.
	♦		♦	

Part 4 sets out new provisions for ASSIs, with particular regard to their declaration and how they are managed. Additional land next to an ASSI can now be combined with the ASSI, if it is of special interest.
The owners and occupiers of land in an ASSI must enter into an agreement with the DoE NI to manage the land accordingly and a notice will be served on them if they fail to follow its provisions.

Ref: CO02 Conservation (Natural Habitats, etc.) Regulations (NI) 1995 (as amended)	Jurisdiction			
	NI	UK	EU	Int.
	♦		♦	

These Regulations came into set out measures relating to the conservation of natural habitats and of wild flora and fauna and in doing so; implement EC Directive 92/43/EEC (the Habitat Directive) on the same topic. These Regulations designate sites as Special Areas of Conservation and introduce management agreements, which maintain these sites and remove the threat of their degradation and destruction, by restricting potentially damaging operations. They also provide the DoE(NI) with powers to make byelaws, which prevent the entry or movement into a site and the killing or taking of wildlife, or plants, protected by European law, as well as prohibiting the disturbance of their habitats, breeding grounds and surrounding vegetation. There are exemptions to certain regulations, which are fully outlined.

Ref: CO03 Wildlife (NI) Oder 1985	Jurisdiction			
	NI	UK	EU	Int.
	♦			

The aim of the Order is to make it an offence to interfere with endangered species of wild animals and plants. It sets out exemptions for certain activities which require a licence. It also provides for the designation of areas of special protection. The Order also identifies plants that if 'planted or caused to grow in the wild' constitutes an offence. These include Japanese Knotweed.

Ref: CO04 Nature Conservation and Amenity Lands (Northern Ireland) Order 1985	Jurisdiction			
	NI	UK	EU	Int.
	♦			

The aim of the Order is to make provisions for the protection and management of important sites in Northern Ireland. This involves two systems of protection. Local sites of interest are protected under national legislation and sites of European interest under both national and the more stringent European systems. It also makes provision for the designation of National Parks, AONBs, and nature reserves. *Wildlife & Natural Environment Act (NI) 2011*

Ref: CO05 Wildlife & Natural Environment Act (NI) 2011	Jurisdiction			
	NI	UK	EU	Int.
	♦			

An Act to make provision about biodiversity; to amend the Wildlife (Northern Ireland) Order 1985 and Part 4 of the Environment (Northern Ireland) Order 2002; to abolish game licences and game dealers' licences; to prohibit hare coursing events; to amend the Game Preservation Act (Northern Ireland) 1928; and for connected purposes. This Act amends Schedules to the Wildlife Order

Ref: IN01 Environmental Information Regulations 2004	Jurisdiction			
	NI	UK	EU	Int.
	♦	♦	♦	

These Regulations establish an access regime which allows people to request environmental information from public authorities and those bodies carrying out a public function. As a result, they implement EC Directive 2003/4/EC, on public access to environmental information. All environmental information held by a public authority must be progressively made available to the public by easily accessible electronic means. They must make this information available on request within 20 or 40 days, depending on its complexity and volume.

Ref: IN02 Environmental Liability (Prevention & Remediation) Regulations (NI) 2009	Jurisdiction			
	NI	UK	EU	Int.
	♦		♦	

The Regulations aim to prevent environmental damage by imposing obligations on operators of economic activities requiring them to prevent, limit or remediate environmental damage. They apply to damage to protected species, natural habitats, areas of special scientific interest (ASSIs), water and land. An operator will be held "strictly liable" if they carry out certain activities which cause environmental damage, or where there is an imminent threat of such damage, regardless of whether they intended to cause the damage or were negligent. Such activities include the operation of permitted IPPC installations, waste management operations, discharges to water sources, water abstraction and impoundment and the transport, manufacture, use, storage, processing, filling and release of certain dangerous substances and preparations. Operators carrying out other, less harmful activities will only be held liable when found to be at fault for damage to protected habitats and species

Ref: PL01 Planning (NI) Order 1991	Jurisdiction			
	NI	UK	EU	Int.
	♦			

This Order consolidates the legislative provisions governing Planning Control in Northern Ireland. Development control is a key function of the planning process and under the Planning (NI) Order 1991; the Planning Service has a duty to control development. However, not all development requires planning permission.

Ref: PL02 Planning (Environmental Impact Assessment) Regulations (NI) 2012	Jurisdiction			
	NI	UK	EU	Int.
	♦		♦	

These Regulations consolidate and replace the Planning (Environmental Impact Assessment) Regulations (Northern Ireland) SR 1999/73 and implement Directive 2011/92/EU, on the assessment of the effects of certain public and private projects on the environment, which introduces a preventative approach to environmental impact caused by development.

Department for the Economy
www.economy-ni.gov.uk

Petroleum Licence Application PLA1/16

Technical Overview

Summary

The Department for the Economy (DfE) has received an application for a Petroleum Licence covering a substantial area to the west, south and east of Lough Neagh. This area overlies part of a geological basin, with deeply buried sedimentary rocks that are likely to include potential porous reservoir rocks, reservoir sealing rocks and hydrocarbon source rocks. The underlying geology means that there may potential for oil to be present.

This document provides you with detailed information about the geology, the history of exploration in this area and the applicant's proposed Work Programme.

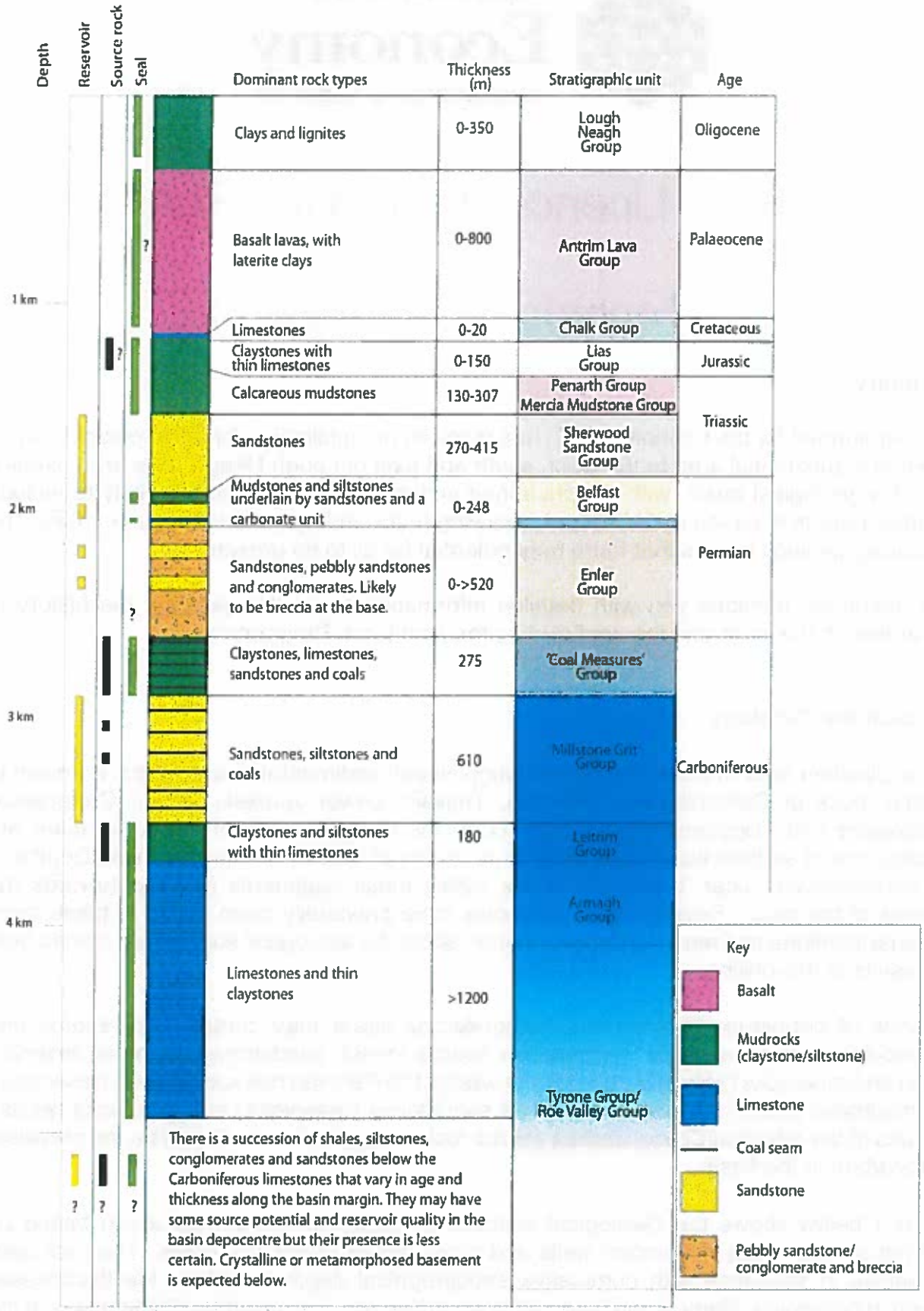
Location and Geology

The application area overlies part of the Lough Neagh sedimentary basin which is known to contain rocks of Carboniferous, Permian, Triassic, Lower Jurassic, Upper Cretaceous, Palaeocene and Oligocene age (Figure 1). In the deepest parts of the basin there are successions of sedimentary rocks likely to be in excess of 4.5 kilometres thick. Depths to the non-reservoir, older 'basement' rocks below these sediments reduces towards the margins of the basin. Several deep boreholes have previously been drilled in these more marginal locations and much of the information about the geological succession comes from the results of this drilling.

In terms of petroleum geology the Carboniferous strata may contain coal seams and organic-rich shales (potential hydrocarbon source rocks), sandstones (potential reservoir rocks) and mudrocks (potential caprocks or seals); the Permian has sandstones (reservoirs) and mudrocks (seals) and the Triassic has sandstones (reservoirs) and mudrocks (seals). Analysis of the potential Carboniferous source rocks suggest that oil should be the prevalent hydrocarbon in the basin.

Figure 1 below shows the Geological succession expected in the subsurface based on information from deep exploration wells and rock units exposed at surface. The rock units are shown in sequence with cumulative stratigraphical depth based on the thicknesses proven in boreholes. Many areas have not been drilled and the maximum thicknesses of the rock units are predicted to be greater in the deepest parts of the Lough Neagh sedimentary basin. Colour in the stratigraphic column corresponds to units recognisable on seismic sections in Figure 2.

Figure 1 Expected Geological Succession in the Subsurface



Available seismic lines indicate trap structures either in the form of tilted fault blocks or anticlinal structures at depths of 1-2.5 kilometres (see Figure 2). Sandstone reservoir quality studies indicate that porous and permeable reservoirs exist at depth and would lend

themselves to conventional oil or gas extraction processes if they are filled with hydrocarbons.

Figure 2 Interpreted Seismic Sections

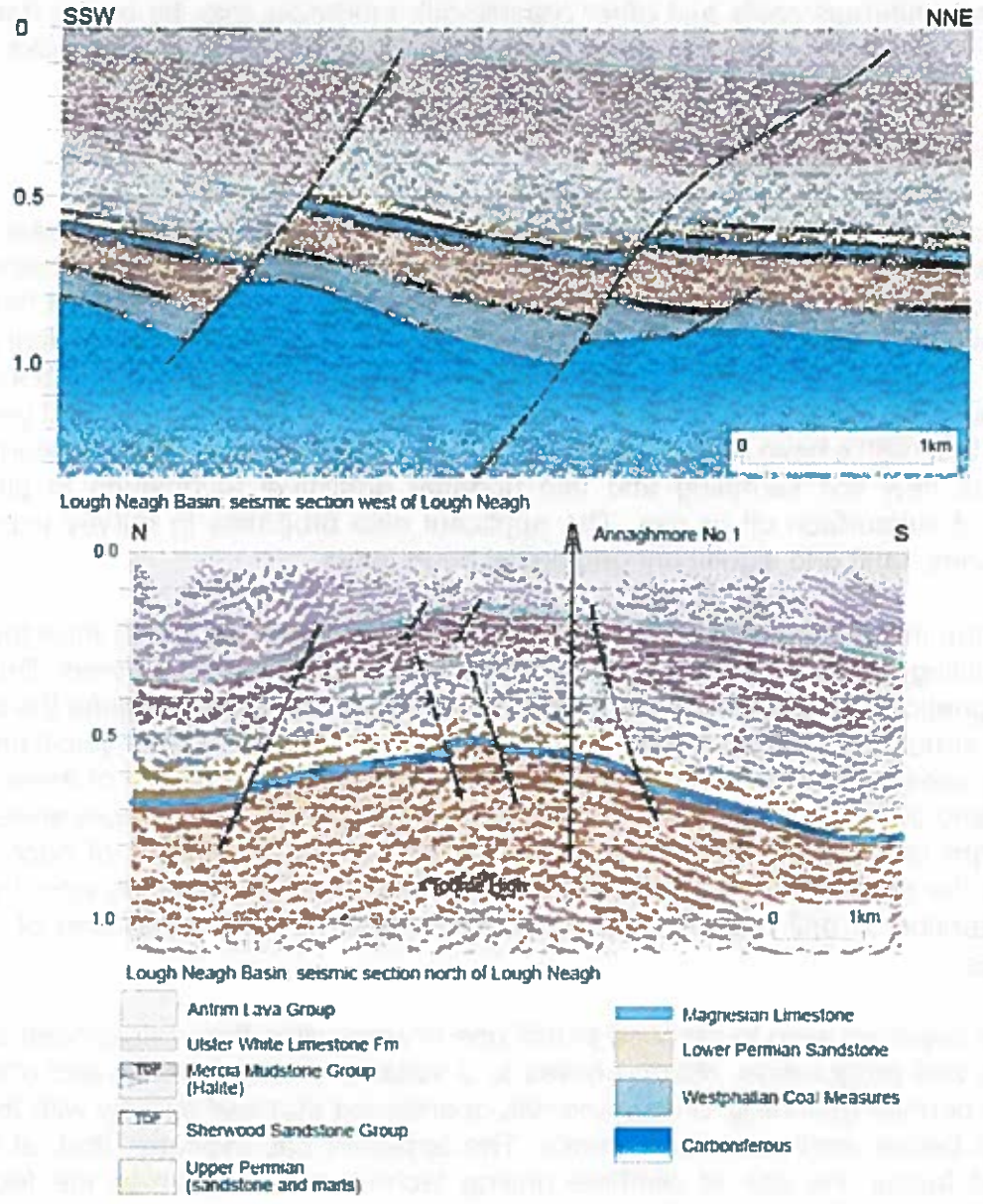


Figure 2 shows interpreted seismic sections across structures typical of the Lough Neagh Basin. The numbers on left hand side of sections relate to seismic two-way travel times (TWT), where 1.0 second TWT approximates to 3 kilometres depth.

Previous exploration in the area

The area previously formed part of a Petroleum Licence, PL7/87, which covered most of the Lough Neagh sedimentary basin. The Licensee was given 12 months to carry out a preliminary evaluation of the area before deciding which part of the basin they wished to explore in greater detail. In the end the company involved applied for an area over the northern part of the Lough Neagh basin which formed PL9/88 and led to the acquisition of 2D seismic reflection survey data and the drilling of two exploration wells (Annaghmore No. 1 and Ballynamullan No. 1) south of Toomebridge.

In the area currently applied for there is a limited amount of 2D seismic reflection data collected from surveys commissioned by DfE in 1981 and 1983, as well as borehole, geophysical and geochemical data in the Geological urvey Northern Ireland (GSNI) archives. The area west of Lough Neagh contains the East Tyrone coalfield and it is possible that the Carboniferous coals and other organic-rich mudrocks may be buried deep enough elsewhere in the basin to have become thermally mature gas or oil source rocks.

Proposed Work Programme

The applicant proposes using geochemical surveys as an initial reconnaissance tool to identify areas suitable for further detailed, and more expensive, exploration methods. It has long been recognised that oil and gas reservoirs may seep into overlying rock horizons and show up as microscopic traces of hydrocarbons or as characteristic geochemical signatures in the soil. In the Lough Neagh Basin there are no obvious signs of hydrocarbons seepage at the surface but oil staining and gas traces in previous exploration wells and geochemical surveys in the 1980's have revealed evidence of oil and natural gas. The applicant proposes to carry out new soil sampling and use updated analytical techniques to pinpoint any indicators of subsurface oil or gas. The applicant also proposes to survey across known fracture zones, fault and significant geological boundaries.

Following the initial assessment, the proposed Work Programme would then focus on the most promising areas for follow-up geochemistry and geophysical surveys. Both passive electromagnetic (EM) and seismic reflection methods are proposed to image the subsurface geological structures in these areas. These relatively non-invasive geophysical methods are commonly used exploration tools in the pre-drilling phase. The objective of these surveys is to understand the structure of the rocks at depth and to identify one or more areas where oil or gas might be trapped in the sandstone reservoir rocks. If analysis of such structures resulted in the applicant identifying one or more drilling targets then they would inform DfE of their intention to drill one or more exploration wells in the second part of their Work Programme.

Should the applicant wish to proceed to drill one or more sites they would need to plan and design the well programme, obtain access to a suitable drilling location and obtain all the necessary permits (planning, environmental, operational etc) and comply with the relevant regulations before work could commence. The applicant has indicated that, at this stage, they would favour the use of slimhole drilling techniques to minimise the footprint and operational impact of an exploration well.

Summary of proposed Work Programme

Years 1 – 3 (Part I)

- Analysis and modelling of existing exploration data and the results of Tellus airborne geophysics and ground geochemical surveys.
- Reconnaissance geochemical surveys over whole Licence area.
- Geophysical surveys;
    - EM surveys,
    - 2D seismic acquisition 300 – 450 line kms.
- Further modelling and analysis of new data.

Before the end of year three the company must decide whether to proceed with the drilling programme or to relinquish the Licence. This is known as "Drill or Drop." The applicant will then inform DfE of its intention to proceed to Part II of the Work Programme or relinquish the Licence.

Years 4 – 5 (Part II)

- Plan and design the exploration well(s).
- Application to drill (planning, technical, environmental).
- Subject to obtaining all necessary permits, drill exploration well.
- Analyse results.
- Plug and abandon well, restore wellsite or, if successful, complete well for possible future production

Depending on the results from the exploration well, the applicant would inform DfE of their intention to proceed to the Second Term of the Licence, to appraise the drilling results, or relinquish the Licence.

In any event the applicant would be required by DfE to relinquish at least 50% of the Licence area. This is outlined in the following legislation-

http://www.legislation.gov.uk/nisr/1987/196/contents/made
http://www.legislation.gov.uk/nisr/2010/169/regulation/2/made

Petroleum Licence Application PLA1/16

Company Brief

EHA EXPLORATION

Making energy work for Northern Ireland

About EHA Exploration Ltd

EHA Exploration Ltd is a hydrocarbon exploration company and we plan to investigate the potential hydrocarbon reserves which may be held deep underground across parts of Northern Ireland. We are a locally based business made up of individuals with extensive knowledge and experience of the energy sector.

We have engaged professionals across the planning and exploration sector. As this project evolves we are committed to ensuring that economic benefits and employment opportunities which follow, will benefit Northern Ireland.

We are also committed to ensuring that if there are extractable hydrocarbon reserves in NI the benefits can be delivered to the local area and to local businesses.

We are a Northern Irish company, we know this region and we are committed to the economic regeneration of Northern Ireland as well as the long term stability of energy supply.

We will undertake our initial exploratory testing in a safe and an efficient manner with as little impact to the local people and environment as possible.

What we plan to do

The first stage of our project is the application to the Department for the Economy for a Petroleum Licence. If we are awarded the licence we will carry out work in two stages. Firstly, using small shovels, we will examine soil in the relevant areas which will be will be tested to identify microseepage of hydrocarbons from reservoirs deep below the earth's surface. This work will be carried out with the full understanding and agreement of the landowner.

Using the results of the stage 1 process we will decide whether to move to stage 2 in what will be a significantly reduced area. In areas where the geochemical testing of the soil has indicated the potential for hydrocarbons, we will begin seismic imaging, which will help establish the geological make up further below the surface. Full details of our process can be found at www.ehaenergy.com

Meet our team

The team behind this exciting project are:

Jamie Hamilton
Jamie is Chairman of The Abercorn Estates Partnership which is a leading rural land management business covering forestry, farming, property, food, leisure and tourism in both Northern Ireland and Scotland. In the last 5 years he has developed a number of renewable energy projects covering, biomass, wind, solar and anaerobic digestion. For 8 years he was a non-executive director of Balcas Limited, the largest Irish sawmill, and leading Irish/UK producer of wood pellets which is significant energy producer from biomass. He attended Middlebury College, VT, USA and received a BA in liberal arts (psychology).

Contact: jamie@ehaexploration.com

Hashem Arouzi
Hashem was born in 1971 and is a British citizen. Mr. Arouzi began his career in 1994 at Kleinwort Benson Investment Management in London. 1999 he co-founded Gottex Fund Management, which grew to become one of the leading alternatives business. In November 2007 Gottex Fund Management was listed as a public company on the Swiss stock exchange. Since 2010 Hashem has invested across a broad range of businesses, including commodities and natural resources.

Hashem has successfully invested in a number of early stage mineral exploration companies including most recently Alderan Resources, which floated in 2017 on the Australian exchange.

Contact: hashem@ehaexploration.com

Melvyn Ennis,Technical Director / Lead Geologist.
Managing Director of North Ridge Exploration Ltd., an exploration company, Melvyn is the inventor of the world's first reverse circulation drilling and sampling hammer and he has extensive knowledge of the drilling industry. Born in Northern Ireland, Melvyn's expertise has been called upon in energy projects in the USA, across Europe, Asia and South Africa.

Contact: melvyn@ehaexploration.com

David Carruthers
David is the Chief Operating Officer of Proxion Energy Group, and advisor to EHA Exploration. David has worked across the energy sector for over 20 years and is a respected figure in the business.

Contact: david@ehaexploration.com

Brendan Mulgrew, Managing Partner, MW Advocate
Brendan is a communications specialist and an advisor to EHA Exploration. He is from Belfast and has worked in the energy sector for 15 years. Brendan has overseen community consultation initiatives for a range of infrastructure projects across Ireland, north and south.

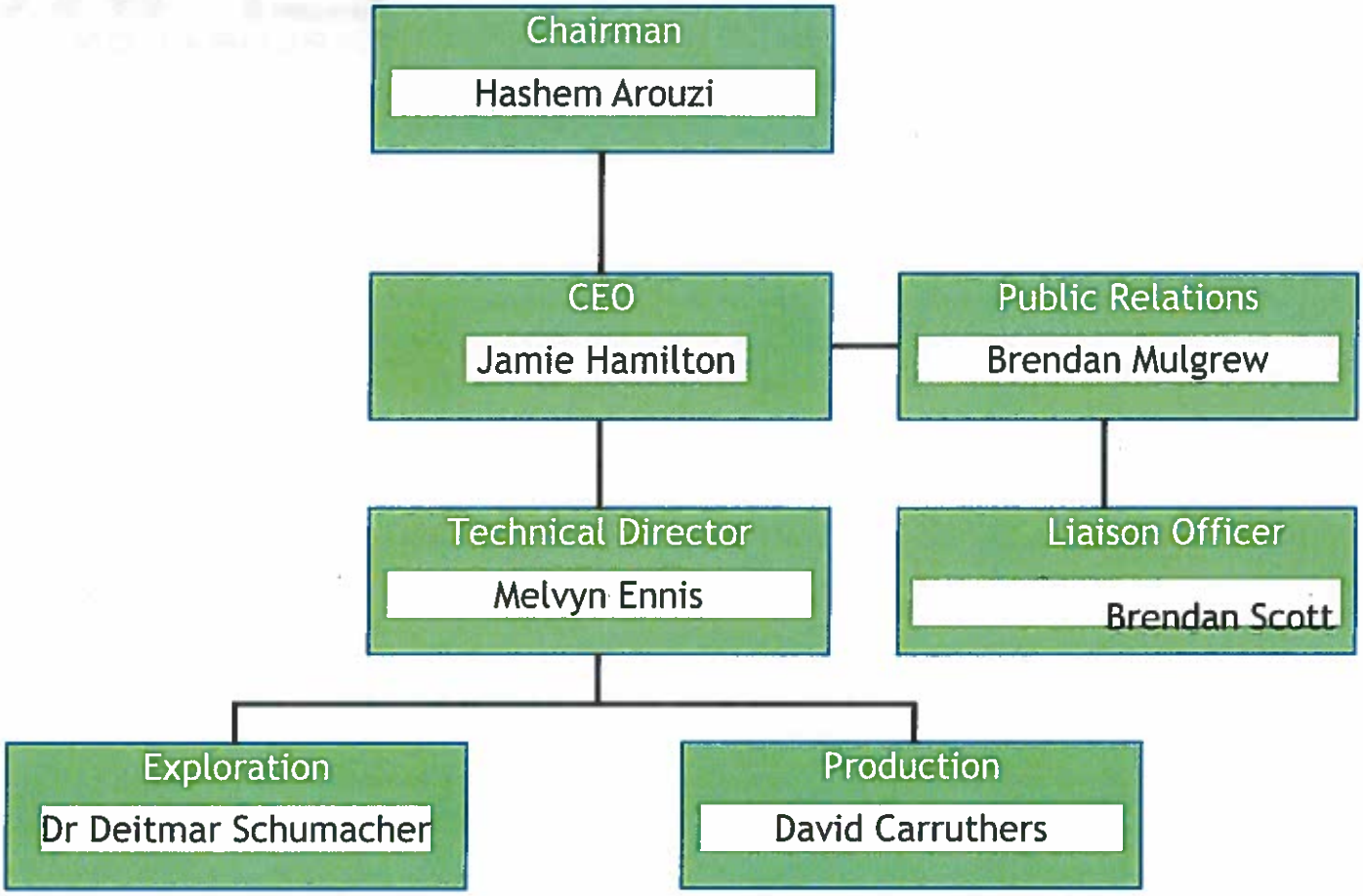
Contact: brendan@ehaexploration.com

Dr Deitmar Schumacher
Dr. Schumacher is Vice President for Geosciences and Technology for E&P Field Services. Before joining E&P Services, Dietmar was Director of Geochemistry for Geo-Microbial Technologies. He received his BS and MS degrees in Geology from the Univ. of Wisconsin and his Ph.D. from the Univ. of Missouri. He has more than 35 years of academic and industry experience, and is a

Certified Petroleum Geologist (CPG-4301), a member of AAPG, CSPG, and EAGE.

Contact: deitmar@ehaexploration.com

Organisational Structure



If you would like to register for updates about the project as it progresses you can do so by emailing info@ehaexploration.com

We will continue to keep the community updated over the coming months and you can visit our website www.ehaexploration.com to find out more.

EHA Exploration Ltd
Scottish Provident Building
7 Donegall Square West
Belfast BT1 6JH

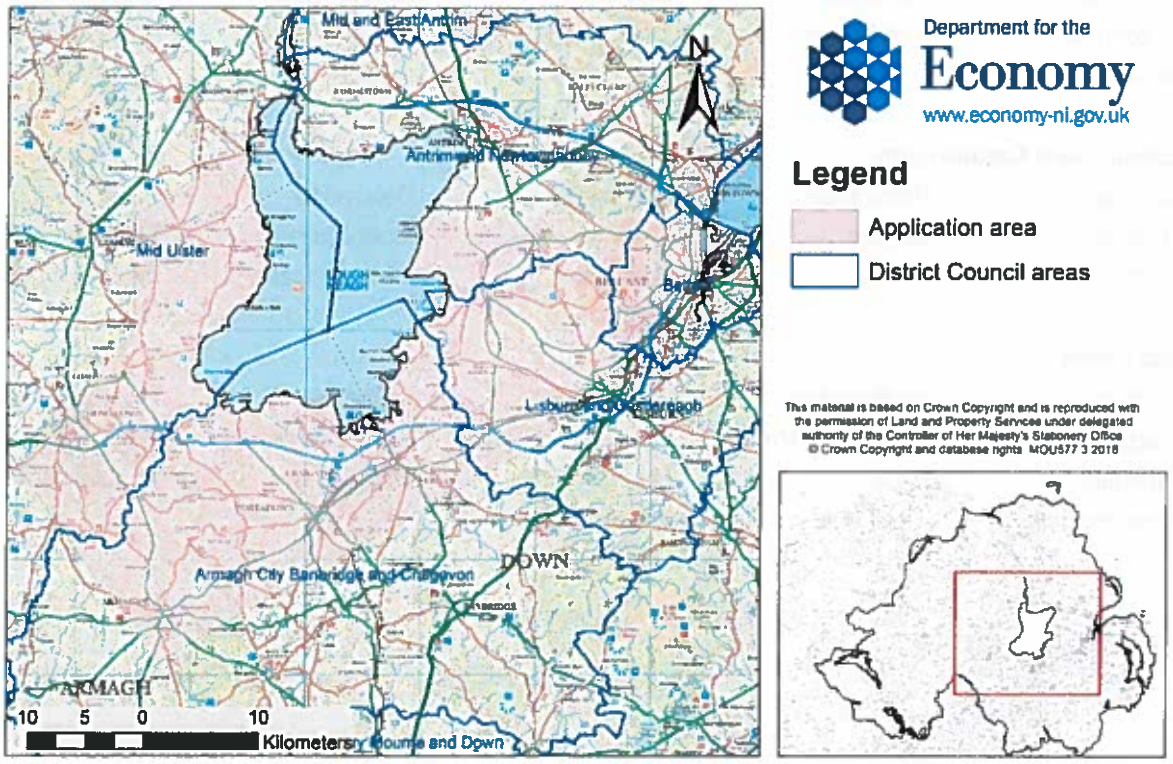
T: 028 90918850

E: info@ehaexploration.com W: www.ehaexploration.com

EHA
EXPLORATION

Petroleum Licence Application PLA1/16

Area under Consideration



* Please note that the area applied for that is depicted in this map supersedes those in the maps shown on pages 44 and 45 of the original application form.

This Licence application covers all, or part of, the following wards (listed by local government district):

Antrim And Newtownabbey

Aldergrove	Clady	Collinbridge	Crumlin	Valley

Armagh City, Banbridge and Craigavon

Aghagallon	Ballybay	Blackwatertown	Bleary	Brownlow
Cathedral	Corcrain	Craigavon Centre	Demesne	Derrytrasna
Donaghcloney	Gilford	Hamiltonsbawn	Kernan	Killycomain
Knocknashane	Lough Road	Loughgall	Magheralin	Mahon
Mourneview	Navan	Parklake	Richhill	Seagahan
Shankill	Tandragee	The Birches	The Mall	Waringstown

Belfast

Andersonstown	Ardoyne	Ballygomartin	Ballymurphy	Ballysillan
Beechmount	Bellevue	Blackstaff	Cavehill	Central
Chichester Park	Cliftonville	Clonard	Collin Glen	Duncairn
Dunmurry	Falls	Falls Park	Forth River	Fortwilliam
Innisfayle	Ladybrook	Lagmore	Legoniel	Musgrave
New Lodge	Poleglass	Shankill	Shaw's Road	Stewartstown
Sydenham	Turf Lodge	Twinbrook	Water Works	Windsor
Woodvale				

Lisburn and Castlereagh

Ballinderry	Ballymacash	Ballymacoss	Derryaghy	Glenavy
Knockmore	Lagan	Lisnagarvey	Maghaberry	Magheralave
Maze	Moira	Stonyford	Wallace Park	White Mountain

Mid Ulster

Ardboe	Aughnacloy	Ballysaggart	Caledon	Castlecaulfield
Coagh	Coalisland North	Coalisland South	Donaghmore	Killyman
Killymeal	Lissan	Moy	Moygashel	Mullaghmore
Stewartstown	The Loup	Washing Bay		

Annex E

Department for the
Economy
www.economy-ni.gov.uk

Petroleum Licence Application PLA1/16

Petroleum (Production) Act (Northern Ireland) 1964 (1964. Ch.28.)

In exercise of its powers in the above Act under section 2(1), the Department for the Economy is considering a Petroleum Licence Application (PLA1/16) within the Counties of Antrim, Armagh, Down and Tyrone.

Details of the application, including a map showing the area covered by the proposed licence,may be inspected at the addresses below between Monday and Friday, 9.30 am to 12.30 pm and 2.00 pm to 4.30 pm.

Department for the Economy,
Minerals and Petroleum Branch, Dundonald House, Upper Newtownards Road, Belfast, BT4 3SB

Antrim and Newtownabbey Borough Council,
Civic Centre, 50 Stiles Way, Antrim, BT41 2UB, Mossley Mill, Newtownabbey, BT36 5QA

Armagh City, Banbridge and Craigavon Borough Council,
The Palace Demesne, Armagh, BT60 4EL
Civic Building, Downshire Road, Banbridge, BT32 3JY
Craigavon Civic and Conference Centre, 66 Lakeview Rd, Craigavon, BT64 1AL

Belfast City Council,
Cecil Ward Building, 4-10 Linenhall Street, Belfast, BT2 8BP

Lisburn and Castlereagh City Council,
Civic Headquarters, Lagan Valley Island, Lisburn, BT27 4RL

Mid Ulster District Council,
Cookstown Office, Burn Road, Cookstown, BT80 8DT
Dungannon Office, Circular Road, Dungannon, BT71 6DT
Magherafelt Office, Ballyronan Road, Magherafelt, BT45 6EN

This information has also been made available at:
https://www.economy-ni.gov.uk/consultations/petroleum-licence-application-pla116

Any person may make representations to the Department about the Petroleum Licence Application by 05 July 2019 either by email to minerals@economy-ni.gov.uk or by post to the above address. Please quote the reference PLA1/16 in your representation.

Department for the Economy
www.economy-ni.gov.uk

Petroleum Licence Application PLA2/16

Consultation Overview

May 2019

Purpose of Consultation

In accordance with the provisions of the Petroleum (Production) Act (Northern Ireland) 1964, the Department for the Economy (DfE) has received an application from Tamboran Resources (UK) Limited for a Petroleum Licence. DfE has accepted the application as a valid application.

The purpose of this document is to provide consultees with an overview of the application and consultation process for this Petroleum Licence Application (PLA2/16). The following documents are attached.

Annex A	*Redacted Application Form for Petroleum Licence Application*
Annex B	*Technical Overview of the Petroleum Licence Application*
Annex C	*Company Brief for Petroleum Licence Application*
Annex D	*Map of area under consideration for Petroleum Licence Application*
Annex E	*Copy of Public Notice for Petroleum Licence Application*

General information on Petroleum Licence Applications, and how the Department assesses applications, can be found on the Department's Website https://www.economy-ni.gov.uk/articles/petroleum-licensing

Consultation Process

While the Petroleum (Production) Act (Northern Ireland) 1964 places no statutory obligation on DfE to consult regarding its intention to consider a Petroleum Licence Application, in the interests of openness and transparency DfE has notified relevant organisations (listed below) that it has accepted Petroleum Licence Application PLA2/16 as a valid application and invited them to make representations.

NI Executive Departments	Northern Ireland Water Ltd
Fermanagh and Omagh District Council	Phoenix Natural Gas Ltd
BT Group Plc	Royal Society for the Protection of Birds
Firmus Energy	SSE Airtricity Gas (NI) Ltd
Invest NI	The National Trust
NIE Networks	Tourism NI
Northern Ireland Environment Link	

In assessing previous Petroleum Licence Applications, the Department would have consulted on the basis of an *'intention to award'*, having already obtained Ministerial approval. In November 2018 the Secretary of State published new guidance to government Department entitled '*Guidance on decision-making for Northern Ireland Departments during the period for Northern Ireland Executive formation'*. In line with this guidance, the Department undertook a Public Interest Test and concluded that it should continue all necessary preparatory work to ensure that a decision on the Petroleum Licence Application can be taken as soon as possible after a Minister is appointed. The objective of this consultation therefore is to ensure that we have taken account of the range of opinions in preparation for making a recommendation to a future Minister as to whether or not the Petroleum Licence should be granted.

In addition to placing this document on the DfE website, a Public Notice (Annex E) will be placed in the following local newspapers to ensure that DfE has an informed view of any issues that may have the capacity to impact on the granting of the licence or its terms and conditions:

Fermanagh Herald	The Impartial Reporter
Belfast Telegraph	News Letter
The Belfast Gazette	The Irish News

The Public Notice, will appear in the above newspapers for a period of 2 weeks from 07 May 2019. The consultation period will begin on 07 May 2019 for an eight week period ending on 05 July 2019.

This Overview and all other documentation relevant to this Petroleum Licence Application (PLA2/16) is available to view at the Department and the relevant local council offices; details are outlined in the Public Notice (Annex E).

Any person wishing to make representations in respect of this licence application must do so to DfE by close of business on 05 July 2019. Please quote reference PLA2/16 on any correspondence relating to this application.

After the consultation period has closed the Department will consider comments received. Once responses have been analysed, the application and recommendations on the award of a licence and any required conditions on that licence will be passed to a future Minister for consideration.

A summary of all the comments received during the consultation process and the Department's response will be published on our website.

How to respond to this consultation

Representations on the consultation can be returned to DfE by:

Email: minerals@economy-ni.gov.uk

or

Post: Department for the Economy
Minerals and Petroleum Branch
Room 9
Dundonald House
Upper Newtownards Road
Belfast
BT4 3SB

DfE is required to take into account any representations which are made to it by close of business on 05 July 2019. Please note that you should assume that, within the parameters outlined in the Confidentiality and Data Protection section below, your representation will be shared with the company: Tamboran Resources (UK) Limited.

Confidentiality and Data Protection

Your response may be made public by DfE and placed on the DfE website as part of the consultation process.

In addition information provided in response to this consultation, including personal information, may be subject to publication or disclosure in accordance with the access to information regimes (these are primarily the Freedom of Information Act 2000 (FOIA), Environmental Information Regulations 2004; Data Protection Act 2018 (DPA) and General Data Protection Regulations 2018 (GDPR)). If you want information that you provide to be treated as confidential, please be aware that, under the FOIA and EIR , there is a statutory Code of Practice with which public authorities must comply and which deals, amongst other things, with obligations of confidence.

If you do not want all or part of your response or name made public, please state this clearly in the response and mark your response as 'CONFIDENTIAL.' Any confidentiality disclaimer that may be generated by your organisation's IT system or included as a general statement will be taken to apply only to information in your response for which confidentiality has been specifically requested. An automatic confidentiality disclaimer generated by your IT system will not, of itself, be regarded as binding on the Department.

In view of this, it would be helpful if you could explain to us why you regard the information you have provided as confidential. If we receive a request for disclosure of the information we will take full account of your explanation, but we cannot give an assurance that confidentiality can be maintained in all circumstances.

For information regarding the Minerals and Petroleum Branch Privacy Notice following the introduction of GDPR please go to the following link https://www.economy-ni.gov.uk/publications/privacy-notice-minerals-and-petroleum-branch

Applicants for a Petroleum Licence may need to include commercially sensitive information in their applications, such as financial forecasts and proprietary data. DfE will handle such information in accordance with the Freedom of Information Act 2000, the Data Protection Act 2018 and the Environmental Information Regulations 2004 and other relevant law, which take full cognisance of issues of transparency and confidentiality. This has resulted in the redaction of information from the published application form.

Copies of the Consultation

This Consultation Document may be accessed on the DfE Minerals and Petroleum Branch (MAPB) page of the DfE Website https://www.economy-ni.gov.uk/topics/minerals-and-petroleum or by email request at minerals@economy-ni.gov.uk, or in writing from MAPB at the address above or by telephoning the branch on 02890 520993.

If you require access to this Consultation document in a different format – eg Braille, disk, audio cassette, larger font – or in a minority ethnic language, please contact the Department on 028 9038 8462 and appropriate arrangements will be made as soon as possible.

Annex A

Department for the Economy

Redacted Application Form for

Petroleum Licence Application PLA2/16

Submitted to the Department

By

Tamboran Resources (UK) Limited

Tamboran Resources UK
Energy for Northern Ireland

Tamboran Resources (UK) Limited

Application for Petroleum Licence - Lough Allen Basin North

Submitted to Petroleum and Minerals Branch, Department for the Economy

19th September 2016

APPLICATION FORM FOR PETROLEUM LICENCE

Petroleum (Production) Act (Northern Ireland) 1964

Completion of this application form, including the Appendices, is required to satisfy the requirements in Regulation 3 of the Petroleum Production Regulations (Northern Ireland) 1987 (as substituted by regulation 2(4) of the Petroleum Production (Amendment) Regulations (Northern Ireland) 2010 ("the 2010 Regulations")) that a petroleum licence application should be completed on an approved form and should contain the information required by Schedule 1 to those Regulations (as substituted by regulation 2(5) of, and the Schedule to, the 2010 Regulations).

Apart from the obligation to complete in full this application form, each applicant company must also provide a completed Appendix A form. This information will be used to assess an applicant's financial viability and capability to complete the work programme submitted.

Applicants must also submit as part of their application, Appendix B – Parts B1, B2 and B5 should be completed using the specified forms, whereas the applicant has discretion as to how to submit the information required to fulfil the requirements of Parts B3 and B4.

An Appendix C form should also be included as part of the application in order to demonstrate the applicant's awareness of environmental issues and regulatory requirements. The applicant has discretion regarding the content of Appendix C.

Data Protection Act 1998 Contact details, including individuals' names and email addresses, will be held and used by DETI in communications relating to the application and to any Licence issued as a result of it. In the case of successful applications this information will be made publicly available by DETI, and this will include publishing contact details on its website. DETI will also use the information to answer queries from companies or individuals wishing to contact the applicant. Anyone who wishes to object to any of these uses should make clear their objections, and the grounds for them, in their application.

Contents

Tamboran Resources UK
Energy for Northern Ireland

Tamboran Resources (UK) Limited
27 Frances Street
Newtownards
Co. Down BT23 7DW
[redacted]
Company Number: NI605039

9th September 2016

Minerals and Petroleum Unit
Department of the Economy
Room 9
Dundonald House
Upper Newtownards Road
Belfast
BT4 3SB

Dear Sir/Madam,

Tamboran Resources (UK) Limited application for a Petroleum Licence under the Petroleum Production Act (Northern Ireland) 1964

Please find enclosed the documentation that makes up the above application and a cheque for the application fee.

[redacted]

[redacted]

Tamboran Resources (UK) Limited

Executive Summary

1. The application is in respect of exploration only. It is based on an area of approximately 608 sq. km in south west County Fermanagh. It follows Licence PL2-10 previously held by the Company. [redacted] Review proceedings. Unlike Licence PL2-10, this application does not include any part of Lower Lough Erne.
2. The first stage of the licence application is a proposal to drill a single conventional borehole at a site of approximately 1 hectare in size. The borehole will be about 1,500 metres deep with the sole purpose of establishing the rock sequence and collecting rock samples (core). The Bundoran Formation is the main target, which includes sandstone (Dowra Sandstone) near the base that is a potential conventional gas reservoir.
3. The rock samples mentioned above will be taken for laboratory analysis and will determine the direction of the second stage of the licence programme. At the end of the first stage above, a decision will be taken either to drop the licence or to proceed. The Company anticipates proceeding to the second stage and understands that further drilling will require planning permission, following a full planning application that will include an Environmental Impact Assessment. It could decide only to carry out further investigation of the conventional target of the sandstone within the Bundoran Formation or, additionally, to look at the shale (known as an unconventional target) within the formation. A programme for each of these target prospects is detailed.
4. The application describes similar natural gas operations elsewhere in the world. It makes the point that these sources of natural gas have substantially reduced carbon dioxide emissions in those countries where these operations are being carried out. This has significantly reduced energy prices and led to an industrial revival in those countries.
5. The past history of petroleum and gas exploration in the region is also described. It shows that County Fermanagh holds real prospects for significant quantities of natural gas, especially throught eh application of new extraction techniques. The present application demonstrates that the Company has the competence, resources and technical capacity to undertake the relevant exploration work. After the work under this licence has been successfully completed, a decision on whether to proceed to the extraction of natural gas would be taken. That, however, will require a production licence, be subject to the full rigours of the planning system and is several years away.
6. As at the time of this application, the Company believes that recovery of up to three times the gas reserves as assessed in 2012 (PL2-10 Licence report) is now possible. In real terms, this would mean a natural gas supply and energy security for Northern Ireland lasting until the end of this century. The reserves could be worth in excess of £20 billion, would lower present carbon emissions, yield billions of pounds in tax revenues and investment and millions of pounds in rates payments, creating around 3000 long-term jobs (directly and indirectly) in greater County Fermanagh and Northern Ireland.
7. The Company is locally based. It has experience in the licence area and has been approached with offers of suitable land for exploration. It has already invested in excess of £3 million locally and is committed to using local businesses, suppliers and workers as far as possible. It plans to create a substantial and generous Community Investment Fund. The Company team has significant experience of community and stakeholder relations and intends to implement a full communications plan, supported by a local engagement team ready to be mobilised on the ground to ensure that local people are fully informed about all aspects of the work. The Company will strongly promote the real economic, environmental and social benefits of natural gas and fully expects to be able to satisfy all reasonable people that the work will be carried out safely, to the highest professional standards and to the benefit of everyone.

8. The Company asks the Department to note that the former Minister of the Environment, Mark H. Durkan MLA, was asked the following question in response to his publication of the Strategic Planning Policy Statement (SPPS) on 28th September 2015:

   "To ask the Minister of the Environment whether the presumption against the extraction of unconventional hydrocarbons in the Strategic Planning Policy Statement, is in relation to the extraction phase only and not the exploration phase." AQW 50998/11-16

   It is noted that on 11th December 2015 the Minister stated categorically in a written response that:

   "the SPPS does not refer to the exploration of unconventional hydrocarbon extraction".

Part 1 Applicant information				
Name of each applicant in full	Registered office address	Company number	Proposed equity interest	SME?
1. Tamboran Resources (UK) Limited	27 Frances Street, Newtownards. County Down. Northern Ireland, BT23 7DW	NI605039	100%	

Part 2 Operator information

Name of proposed operator and contact details

Name of operator	Tamboran Resources (UK) Limited
Contact address	27 Frances Street, Newtownards, Co. Down, Northern Ireland, BT23 7DW.
Telephone number	[redacted]
Mobile number	[redacted]
Fax number	[redacted]
E-mail address	[redacted]

Part 3	Area applied for
Applicants are reminded that they are obliged to submit as part of their application an Ordnance Survey map on a scale of 1:50,000, or such other map as the Department may allow upon which the boundaries of the area in relation to which a licence is sought are clearly delineated.	
Description	The area lies in County Fermanagh to the southwest of Lower and Upper Lough Erne; a large part of the region is commonly termed the Fermanagh Highlands. It terminates south-westwards at the border with the Republic of Ireland. 1:50,000 scale maps appended. The area lies within the northern part of the Lough Allen Basin so is termed Lough Allen Basin North.
Area (km²)	Approximately 608 sq km (150,240 acres)
Irish Grid Co-ordinates of area perimeter	From the border between Northern Ireland and the Republic of Ireland at G92805800 take a straight line east to H10005800, then a straight line southeast to H34001940 where the line meets the national border. Follow the national border west-northwest to the starting point G92805800 where the perimeter is completed. [G92805800 to H10005800 to H34001940, border back to first reference point.]
Comments/notes	

Past research by the Company under licence PL2-10 has shown that some areas within the Fermanagh region are more prospective than others, so this licence application modifies the area requested for licensing. However, the work has not, so far, been able to continue to the stage where there is certainty about the size of the natural gas resource. The purpose of this licence application, [redacted] is to allow the size of the gas resource to be estimated with a much higher level of certainty than has been possible to date.

This will involve drilling at only one or two sites within the applicationarea, each site to be about 1 to 2 hectares in size. The first borehole, to a total depth of between 1,000 and 1,500 metres, will be for rock core collection only. The Company expects that permitted development rights will apply. Continuation of the project depends on the result of that drilling. It is expected that the data will justify going to a second phase of drilling when the levels with gas will be tested. The test holes will require full planning consent and this will only be applied for after further socio-environmental monitoring/impact assessment studies have been carried out.

The Company has developed a robust and comprehensive communications, public information and stakeholder engagement plan. It is committed to working at all times to, or exceeding, best industry and regulatory practice. It has shown in the previous licence work that it will operate closely with all interested parties.

The Company, in addition to sensitive and confidential financial data, has included in the appendices scientific data that must for commercial reasons, respectfully, also be held strictly confidential.

It is noted that the project will be managed directly by the Company's Chief Executive Officer who will be supported by a wider management team based in Belfast and Dublin. It is proposed that offices will be taken in County Fermanagh to assist with community and stakeholder engagement.

The selection of a site/s for drilling has not yet been finalised but the Company has been approached by a significant number of landowners in the licence area who are interested in working with the Company. There are several viable site options which meet the requirements of geology, access and minimal impact on the landscape, environment and people.

To date, the Company has spent over £3 million locally. It is committed to working with local people, organisations and businesses. It has supported local firms involved with security and installation, construction, transportation, hospitality and legal, communications, accountancy and insurance service providers.

The Company recognises that a small but vocal minority opposes exploration. It believes many of the concerns are due to misinformation and / or misunderstanding of the facts - with some following an agenda of being against the use of any hydrocarbons in the energy mix and some seeking to exploit concerns of others. It means that investment in a comprehensive awareness raising and information communications programme is required. The Company is fully committed to funding and implementing an extensive stakeholder engagement campaign.

A full communications overview and presentation can be made available to DfE on a confidential basis on request.

This will cover a full, integrated communications approach that will include appointment of local Community Liaison Officers; establishing working groups to represent the interested local communities and bodies; community information engagements; opinion polling and surveying; and arranging visits to places where shale natural gas sites are operating, all of which would reflect and be focused upon County Fermanagh.

The Company will communicate its plans proactively, positively and clearly to all key audiences. It will be a good and responsible long-term neighbour, employer and investor to the people of Fermanagh and Northern Ireland.

Since the discussion about the potential exploration for shale gas commenced in 2011, the shale gas industry has been exploring for and extracting natural gas from wells – safely – in the United States and elsewhere. This has provided significant social, environmental and economic benefits.

The Company is confident that rational, reasonable people looking at the facts and the opportunities will conclude that, based on the evidence of safe working operations around the world, that natural shale gas exploration in County Fermanagh should proceed, subject to the Company meeting all applicable environmental requirements and regulation.

In the long term, this project has the potential to transform Northern Ireland's economy, create thousands of local jobs, assist the ailing manufacturing sector through cutting energy costs and secure energy supplies for generations.

The Company believes it is critical that the people and Government of Northern Ireland are given the opportunity to know whether or not natural gas, capable of being extracted in commercial quantities, is in place A rational and informed decision about future operations, based on the facts, can then be made.

Part 4 Contact details

Give details of the person DETI should treat as its first point of contact about this application

Name of company	Tamboran Resources (UK) Limited
Name of contact	[redacted]
Contact address	27 Frances Street, Newtownards, Co. Down, Northern Ireland, BT23 7DW.
Telephone number	[redacted]
Mobile number	[redacted]
Fax number	[redacted]
E-mail address	[redacted]

Part 5 Declaration

A duly authorised officer from each of the applicants listed in Part 2 must approve the information given in this form.

I hereby declare that the information given in this application is correct:

Authorisations

Company	Name	Signature	Capacity	Date
Tamboran Resources (UK) Limited	[redacted]		[redacted]	19th September 2016

Tamboran Resources UK
Energy for Northern Ireland

Tamboran Resources (UK) Limited

Application for Petroleum Licence - Lough Allen Basin North

Submitted to Petroleum and Minerals Branch, Department for the Economy

Appendix A: Financial Capacity

APPLICATION FORM FOR PETROLEUM LICENCE

(Petroleum Production Act (Northern Ireland) 1964)

Appendix A: Financial capacity

Note: in the case of a multi-party Applicant, an Appendix A form must be completed by each Licence Partner

Part A1 Company Details

Company information

Registered name	Tamboran Resources (UK) Limited
Place of Incorporation	Northern Ireland
Registration Number	NI605039
Principal Place of Business	27 Frances Street, Newtownards, Co Down, Northern Ireland, BT23 7DW
Registered Office Address	27 Frances Street, Newtownards, Co Down, Northern Ireland, BT23 7DW
Place in the UK from which operations under the licence will be directed and controlled	Temporary Office at - 27 Frances Street, Newtownards, Co Down, Northern Ireland, BT23 7DW. The company intends to establish a main operations office in County Fermanagh following the award of this licence.
Place in the UK from which commercial activities in connection with the licence will be directed and controlled	Temporary Office at - 27 Frances Street, Newtownards, Co Down, Northern Ireland, BT23 7DW. The company intends to establish a main operations office in County Fermanagh following the award of this licence.
Details of holding / subsidiary companies – corporate structure diagram must be attached to this form	Corporate structure and organisational chart attached at the end of this Appendix.

Members of the board of directors or other governing body		
Name in Full	Usual Residential Address	Nationality
Karl Prenderville	[redacted]	Irish
Robert Anthony Bryn Bazley	[redacted]	British
Jeremy John Deeley	[redacted]	British

Contact details	
Contact details of the person DETI should treat as its first point of contact about the information in this Form.	
Name of contact	[redacted]
Postal address	27 Frances Street, Newtownards, Co Down, Northern Ireland, BT23 7DW
Telephone number	[redacted]
Fax number	[redacted]
E-mail address	[redacted]

TAMBORAN RESOURCES (UK) Limited
Organisational Chart

Spinner Directors:

- [redacted]

Tamboran Resources (UK) Ltd. Directors:

- [redacted]

Consultants:

- [redacted]

Consulting companies:

- [redacted]
- Weber Shandwick, Northern Ireland and Ireland (Communications and Engagement)
- Approved Drilling Contractors *(to be appointed when appropriate)*

Part A2 Financial Capacity Questionnaire

1. CAPITAL AUTHORISED AND ISSUED

Class of capital	Amount authorised	Amount issued	Voting rights of each class
Ordinary Share Capital	500,002	500,002	Full voting rights

2. ALL HOLDINGS OF NOT LESS THAN 5% IN NUMBER OR VALUE OF ANY CLASS OF CAPITAL THAT HAS BEEN ISSUED BY THE APPLICANT

Name of holder or names of joint holders, in full	Nationality of holder(s)	Class of holding	Amount
[redacted]	[redacted]	Ordinary	100% (500,002)

3. ALL CAPITAL ISSUED TO BEARER

Class of capital	Total amount issued	Amount issued to bearer
-	NONE	NONE

4. OBLIGATIONS / LIABILITIES

Item	Amount £
a Shareholders' funds (net assets)	108,000
At what date?	8 September 2016
Audited:	
UK Capital Commitments as itemised in Part 2 Below	ZERO
Non-UK Capital Commitments as itemised in Part 3 Below	ZERO
Contingent liabilities not included in the balance sheet or Capital Commitments above	ZERO
Total A	108,000

All loans provided by the Company's previous parent and [redacted] have been waived and written off as part of the terms agreed with [redacted] to acquire TRUK.

Q1: If Total A is negative, what arrangements are available on the future solvency of the applicant?

All future funding of the Company's activities will be through advances from [redacted] with funding made available from its strategic funding partner for the further phases of the proposed 5 year work programme, subject to the results of the initial phase work programme and agreement with DIE on the terms applicable to subsequent phases of the Licence work programme.

TRUK therefore continues to have committed financial backing to continue its activities and the Directors are preparing all financial statements of the Company on the going concern basis.

To calculate Total B, deduct the applicant's share of all exploration expenditure (capital or revenue) arising from the sum of all current UK licence applications from Total A, giving details of expenditure of each application on a separate Expenditure Profile (Part 4 below)

Total B: (529.9 Million)

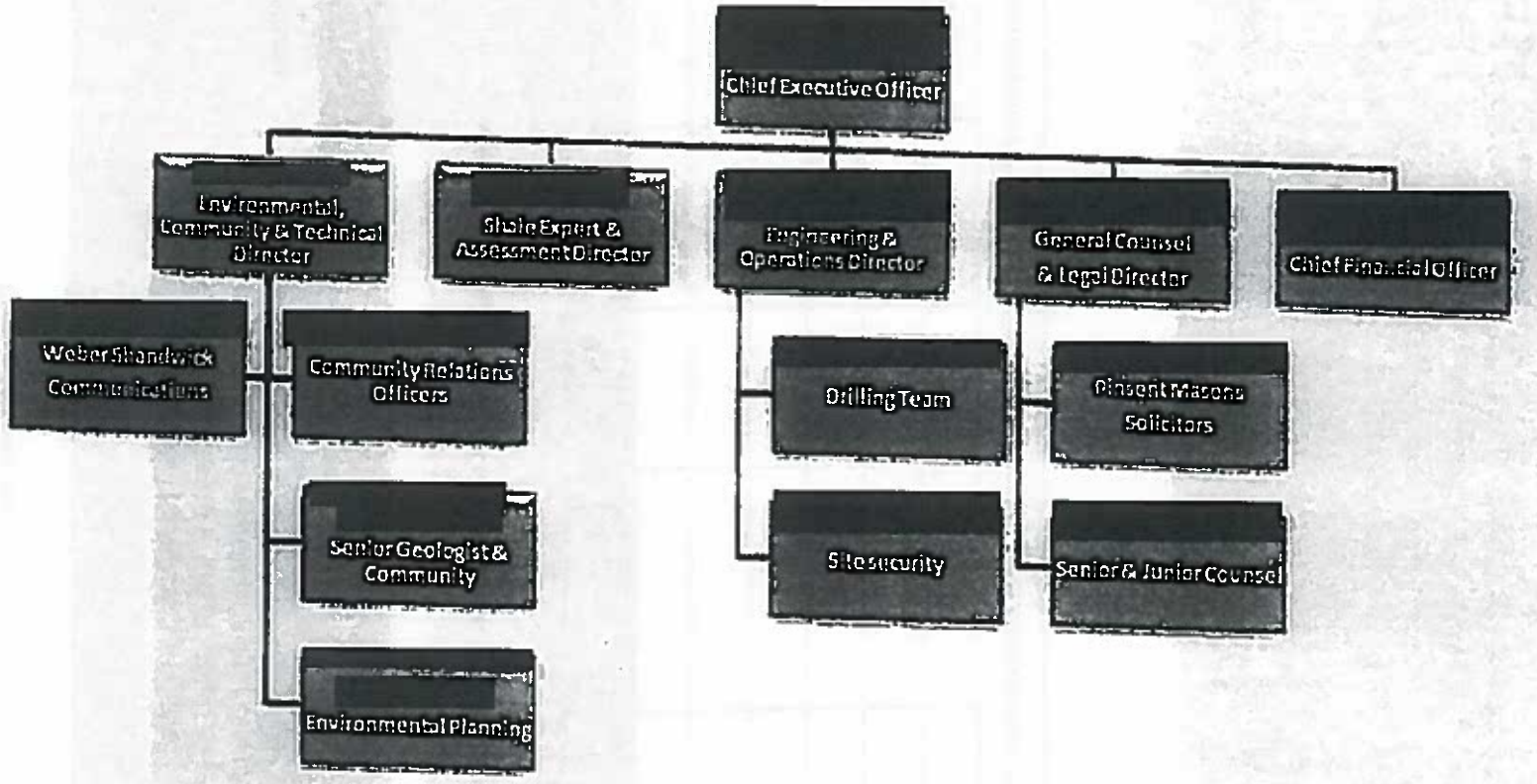
Q2: *If Total B is negative*, how does the applicant propose to fund its share of the expend.ture arising from the sum of all applications submitted in this current period?	The commitments secured by [redacted] from its strategic funding partner in favour of its subsidiary, TRUK, will ensure the full capital funding of the project. See attached letter from the strategic funding partner confirming the availability of funding for the further phases of the proposed 5 year work programme. Further details of this funding arrangement and the future funding of the company / project will be discussed as deemed necessary with the Department on a strictly confidential basis
To calculate Total C, deduct the balance of exploration expenditure arising from the sum of the joint and several liabilities incurred from all current applications from Total B (giving details of expenditure of each application on a separate sheet).	
Total C:	(£29.9 Million)
Q3. *If Total C is negative*, how does the applicant propose to meet the sum of the joint and several liabilities that could arise from all current applications?	Tamboran Resources (UK) Limited is applying for a 100% interest in the licence. See answers to Q1 and Q2 above.

Part A3 Existing UK Capital Commitments

Licence	Gross Costs £ million	Net Costs (Costs Applicable to Applicant only) £ million				
		Field Development Programme	Firm Wells	Firm Seismic	Drill-or-Drop	Total
NIL	NIL	NIL	NIL	NIL	NIL	NIL
					Total	

Part A4 Existing non-UK Capital Commitments

	Total £million
Enter sum of exploration and development commitments for all non-UK Oil and Gas assets for which there are agreed or planned work programmes.	NIL


Chief Executive Officer
Environmental, Community & Technical Director
Shale Expert & Assessment Director
Engineering & Operations Director
General Counsel & Legal Director
Chief Financial Officer
Weber Shandwick Communications
Community Relations Officers
Drilling Team
Pinsent Masons Solicitors
Senior Geologist & Community
Site Security
Senior & Junior Counsel
Environmental Planning

Part A5 Planned Expenditure Profile

Applicant	Tamboran Resources (UK) Limited
Licence Area	Approximately 608 sq km in southwest County Fermanagh as precisely detailed in Part 3 of this application
Licence Partner(s)	None

Year of Licence	Gross Costs £ million	Net Costs (Costs Applicable to Applicant Only) £ million			
		Firm Wells	Firm Seismic	Drill-or-Drop	Total
1	1.75				1.75
2	1.75	4.00			5.75
3	2.00		2.00		4.00
4	2.00	5.00			7.00
5	2.00	9.50			11.50
Total	9.50	18.50	2.00		30.00

Submit estimates of your share of the costs of the proposed work programme associated with the area you are applying for. 100%

Part A6 Declaration

A duly authorised officer must approve the informat on given in this form.

I hereby declare that the information given in Appendix A is correct:

Name	Signature	Capacity	Date
[redacted]	[redacted]		9th September 2016

Tamboran Resources UK
Energy for Northern Ireland

Tamboran Resources (UK) Limited

Application for Petroleum Licence - Lough Allen Basin North

Submitted to Petroleum and Minerals Branch,
Department for the Economy

Appendix B: Technical Information Form

APPLICATION FORM FOR PETROLEUM LICENCE

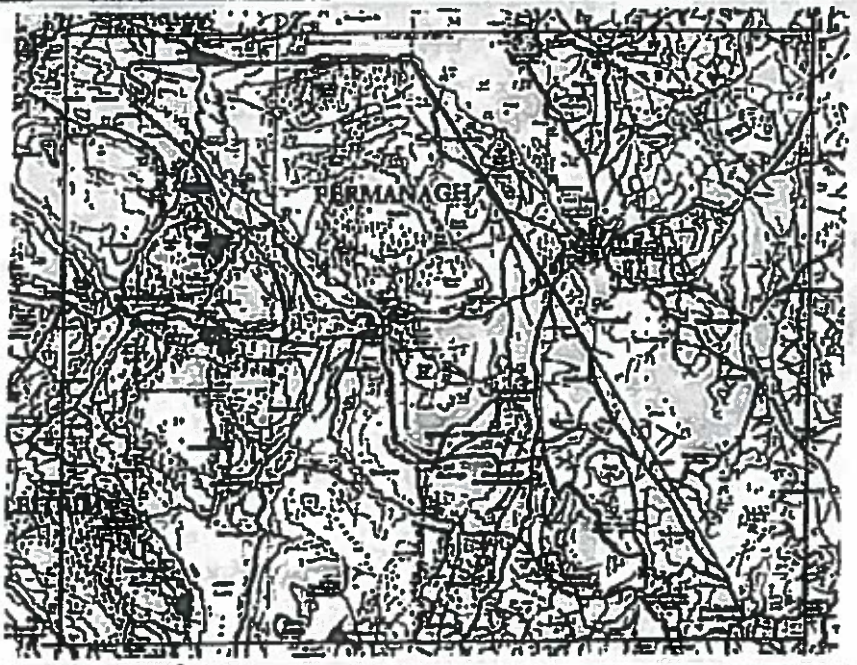
Petroleum (Production) Act (Northern Ireland) 1964

Appendix B: Technical Information Form

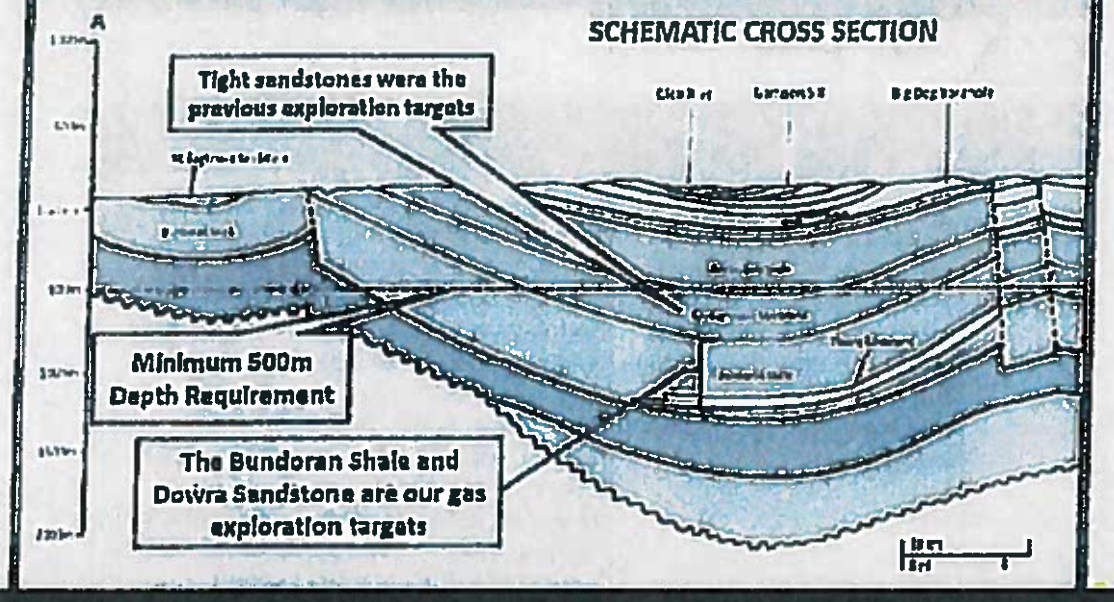
Contents

Part B1	Lead/Prospect summary sheet	
Area	Name of lead, prospect, new play or discovery	
Southwest Fermanagh	Lough Allen Basin North play	
Brief description of lead, prospect, new play or discovery;		
Type:	Description	Key technical work needed
Natural gas from shale and sandstone	Part of a substantial Carboniferous age basin with shale and sandstone formations some hundreds of metres thick. The main lead is the Bundoran Shale Formation which includes the Dowra Sandstone near its base.	The play is ready for drilling following research carried out by Tamboran Resources Ltd/ Tamboran Resources (UK) Ltd under the terms of DETI Petroleum Licence PL2-10. Initially rock samples need to be collected from the Bundoran Shale by drilling a single borehole in a deep part of the basin. They require testing for a range of properties including total organic content and fracturing potential. This is key to deciding whether to apply for permission to test for natural gas, the potential second stage of the exploration.

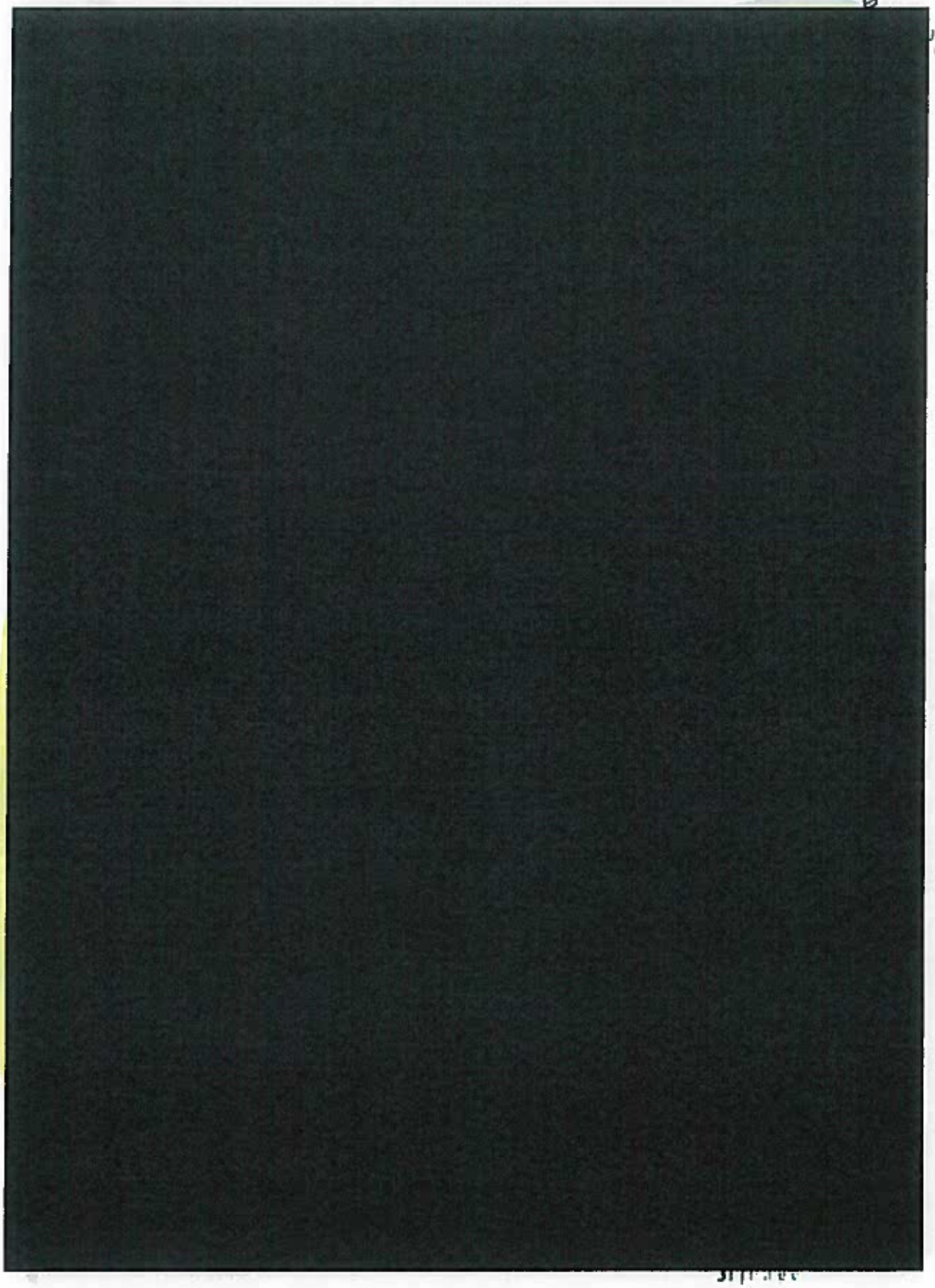
Map (Annotate the scale and corner coordinate points, using Irish National Grid co-ordinates)



Geologic cross-section – base source Geological Survey of Northern Ireland



[redacted]



Part B2	Work Programme summary sheet	
Operator:	Area(s):	
Number of Wells	Firm	Drill-or-Drop
For each well, specify the minimum depth in metres and the horizon to which you will drill	One exploration hole to minimum 1,000 m drilled to top of the limestone formation below the shale. Core samples and geophysics	Results good from first borehole then at least 2 wells, each minimum depth 1000m to fully penetrate the Bundoran Shale Formation. Test one in vertical and then others to have laterals for testing.
New shoot 2D seismic (firm) Specify in line kilometres. Please indicate proposed survey area and/or distribution in Irish National Grid 100 km squares		To be decided according to site of the drill pad. Uncertain if necessary at this stage
New shoot 3D seismic (firm) Specify in square kilometres. Please indicate proposed survey area and/or distribution in Irish National Grid 100 km squares		60 sq km around the selected drill site. To be shot after the Drill or Drop decision is taken.
Obtain existing 2D seismic (firm) Specify in line kilometres and survey ID. Key: O – Obtain; R – Reprocess; OR – Obtain and reprocess		This has been carried out by the Company under DETI licence PL2-10 and the Company has the results
Other work Examples: geotechnical studies, gravity/magnetic data acquisition, magneto-telluric surveys; geochemical surveys		Environmental studies, including geochemical work, have been carried out by the Company under DETI licence PL2-10
Number and technical competence of staff to undertake the work programme (please include any relevant technical qualifications held by those staff and details of training undertaken by those staff in the 3 years prior to the date of application) – use separate sheet, if necessary		See attached sheet

Comments	See also Appendix B4 (Operator competence and technical ability)

Number and technical competence of staff to undertake the work programme (including relevant technical qualifications held by the staff and details of training undertaken in the past 3 years)

There are five staff named in this application and their full curriculum vitae are given. All hold relevant advanced degrees and professional qualifications. This applies equally to a larger number of experts of the companies who will be contracted to carry out key aspects of the work programme.

It should be noted that the team includes two of Northern Ireland's leading geologists, one having completed a doctorate on the subject of black shales and with experience in conservation having a degree that includes zoology and been on the Council for Nature Conservation & the Countryside for some years. The designations that team members hold such as Chartered Geologist, European Geologist and Chartered Engineer show a professional standard that has to be maintained by continuing professional development through practical experience, attendance at appropriate workshops and approved conferences. Other professional designations, apart from research degrees, will be seen in staff CV's. They include APEGGA, MCIMM, MPetSoc, MIAEG. FSEG, MIMMM as well as there being a qualified lawyer and accountant.

Our overseas named staff have continued their professional development within the petroleum (particularly natural gas) industry by the practical application of their skills, professional workshops and attachment to university departments.

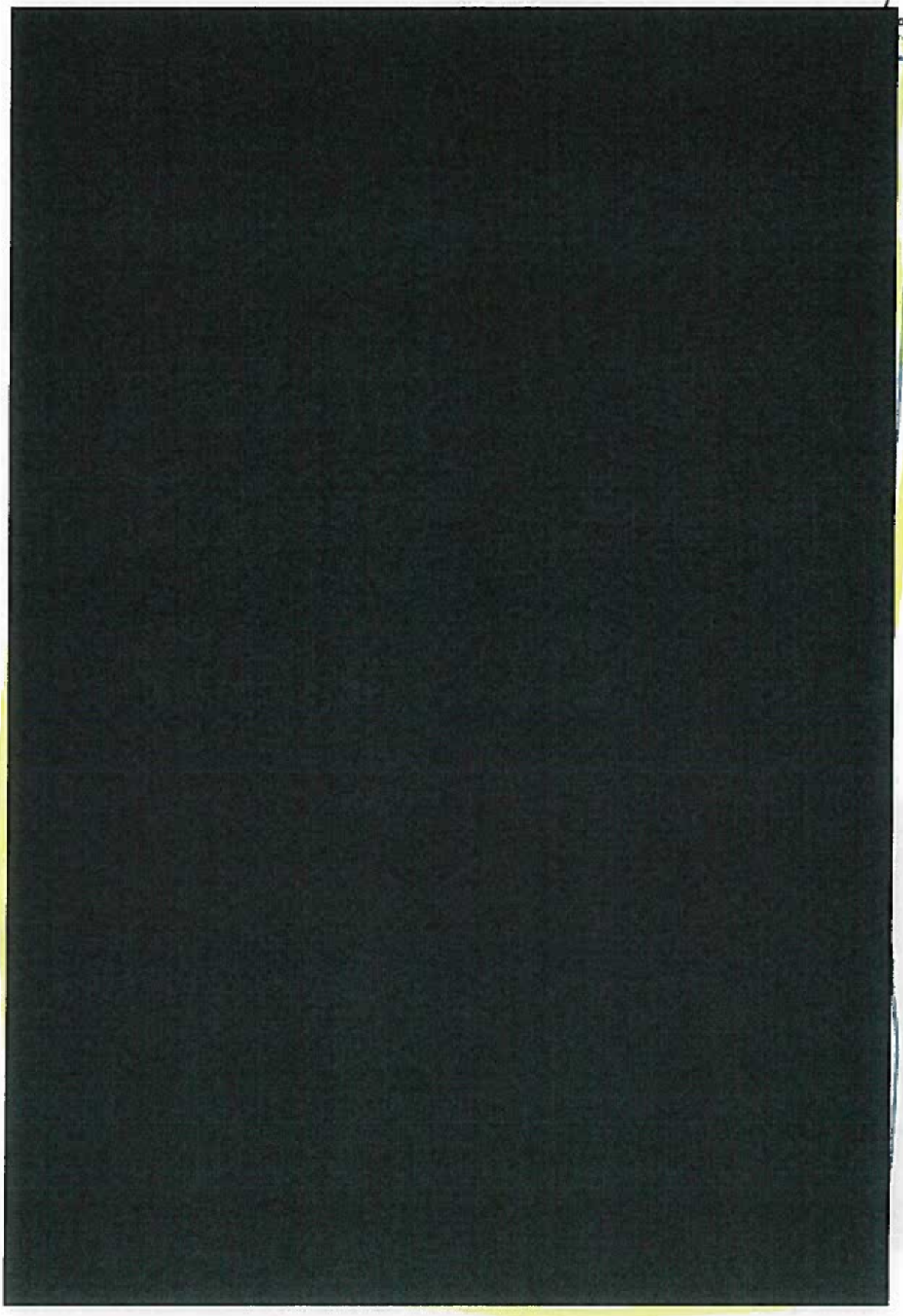
The necessary expertise/technical capacity is available to cover all aspects of the geology/geophysics of Northern Ireland, geology/geophysics/geochemistry of international shale gas basins, techniques for estimating quantity/quality of gas, drilling, the environment and health and safety. There is expertise and prior experience in managing both the research programme and the drilling.

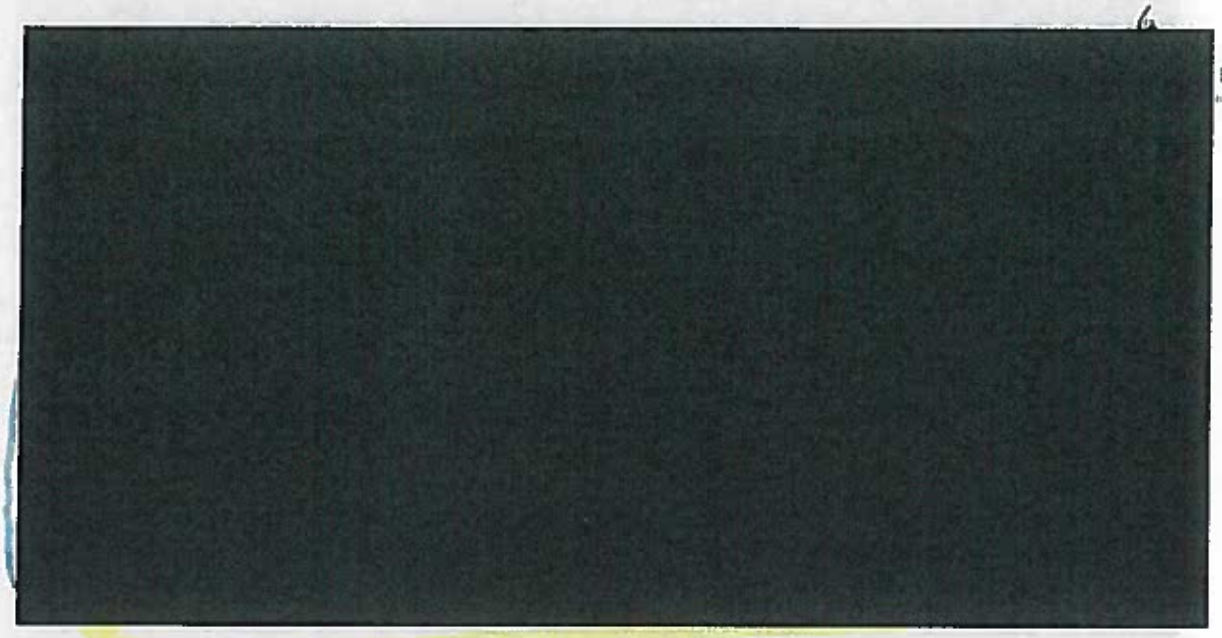
In the last 3 years staff have attended computer skills training, media training, Health & Safety management training. Staff attended many conferences, and some of the workshops attached to them, as well as the meetings themselves at Shale UK in London, UK Shale Gas Summit, Shale World UK. All are designated learning experiences apart from giving other advantages. Local meetings held in Belfast and Dublin such as Engineers Ireland and Energy Ireland, are also considered significant.

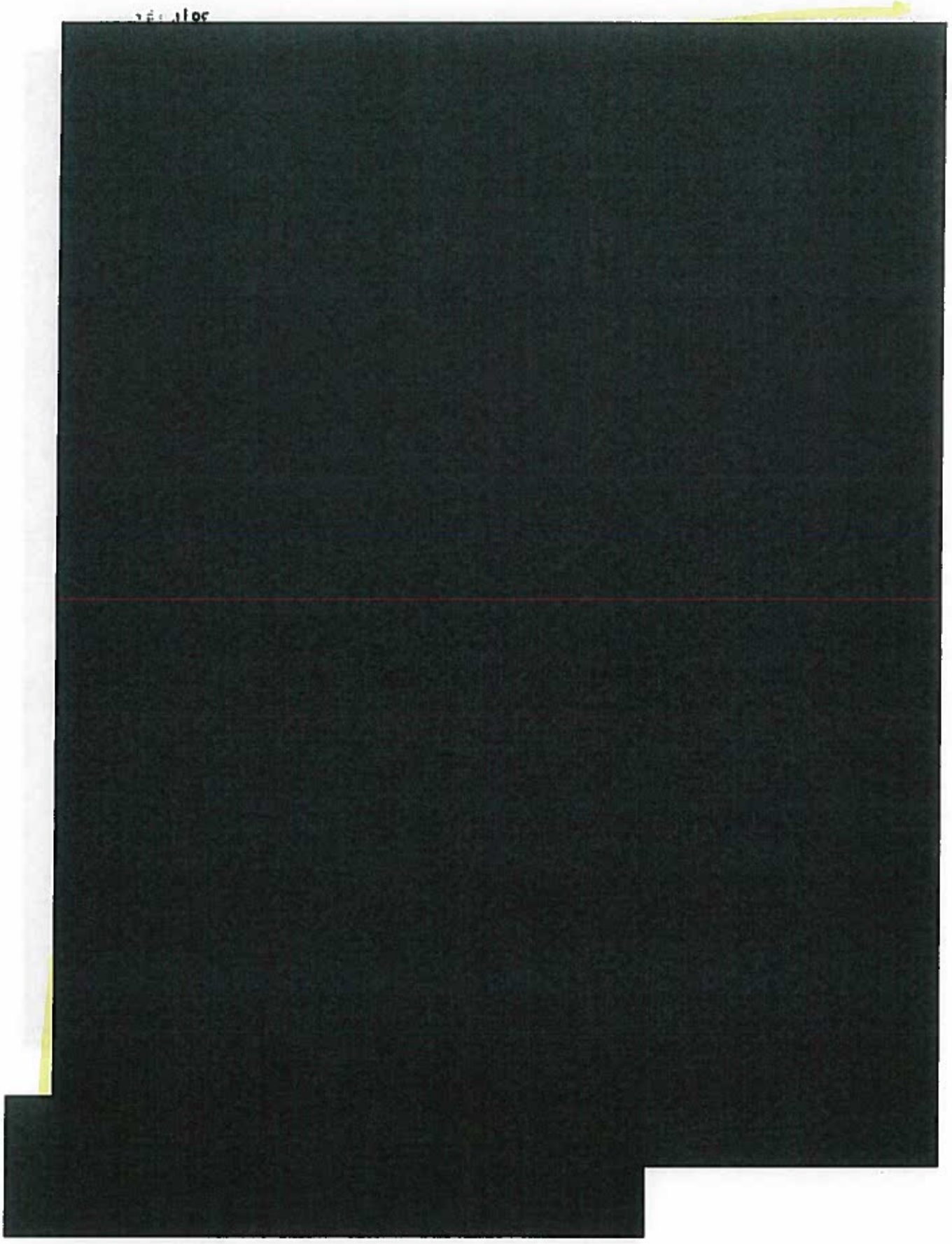
The drilling team assembled by TRUK in order to complete the first stage of Licence PL10-2 in summer 2014 was interviewed by DETI officials and in our opinion demonstrated the high quality and professionalism demanded by TRUK. The drilling company is a UK leader in the industry and was chosen over competitors from the UK and Ireland. The same high standards will be demanded for this licence work and as will the appropriate professional and technical qualifications. The same is true o[redacted]staff who have been used for the past 4 years to prepare and act on the stringent environmental requirements of licensing. The Department knows these experts and it is planned that they will also operate on this licence.

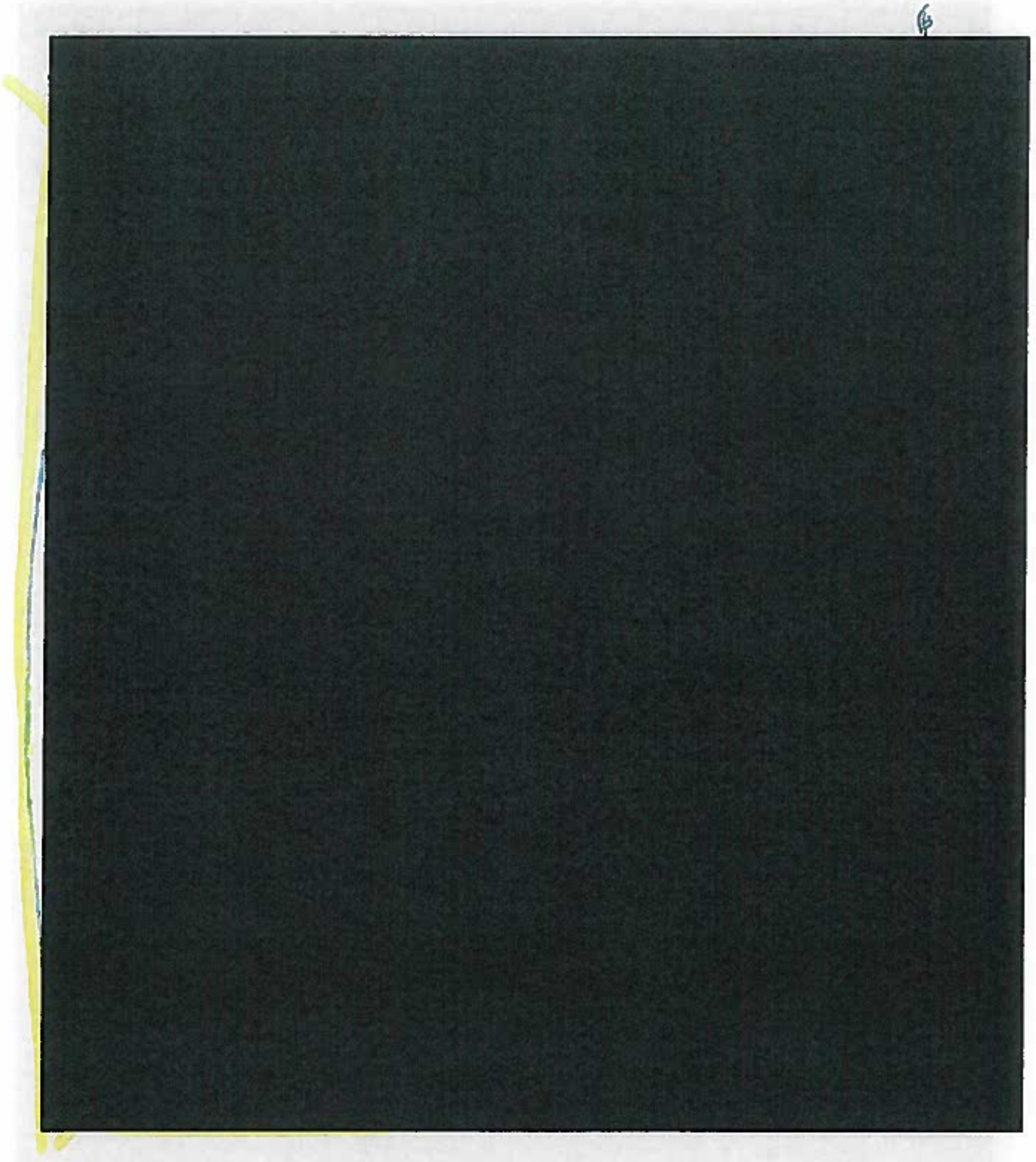
Work on the last licence involved [redacted] and [redacted] These are leaders in the shale gas industry and similar expertise will be applied to the current application although UK/Irish companies will be asked to compete for the work and all else being equal will be favoured.

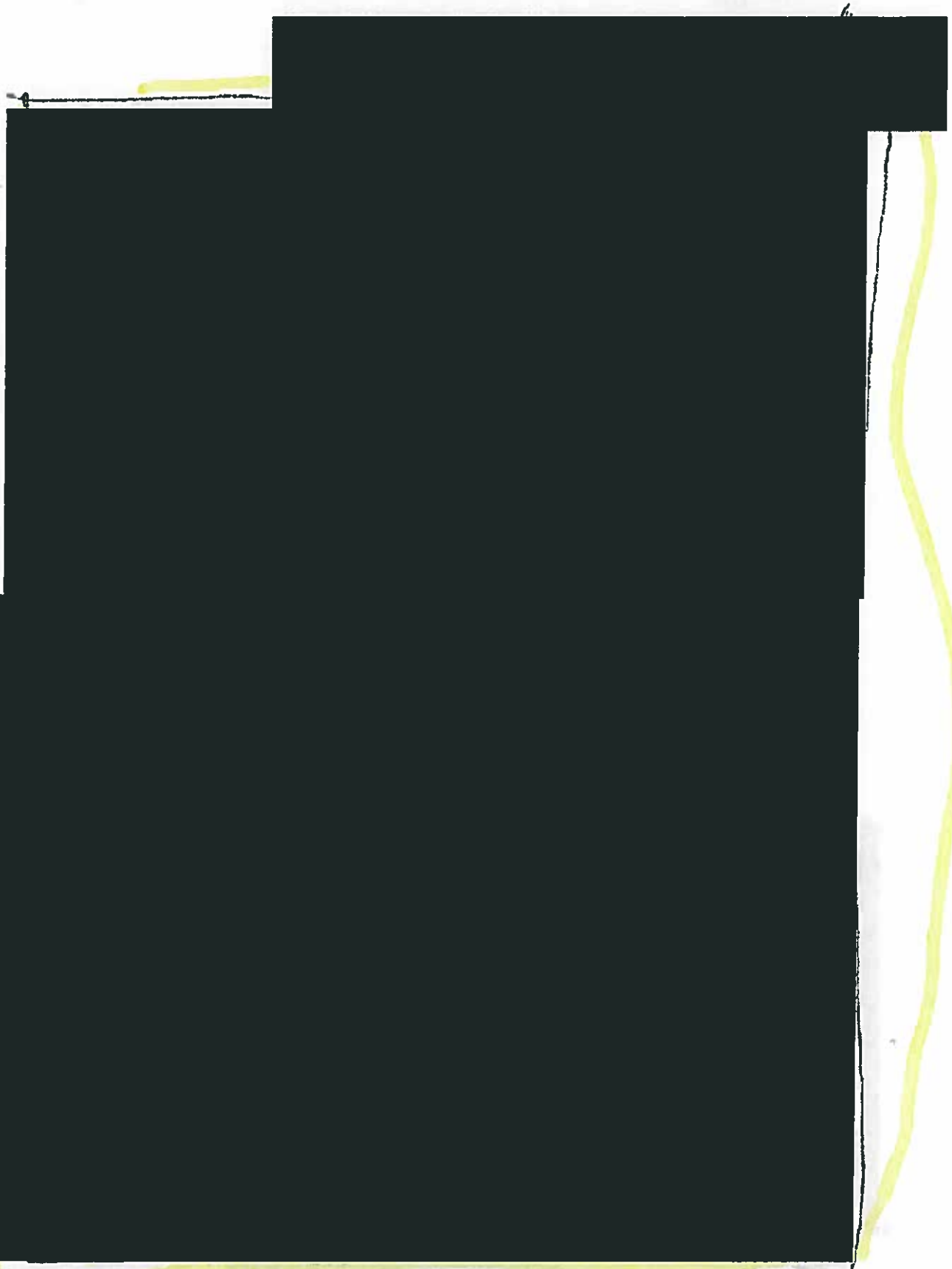
Very important is community relationships/outreach and this will be guided by the team at Weber Shandwick, Belfast; well known to the department.

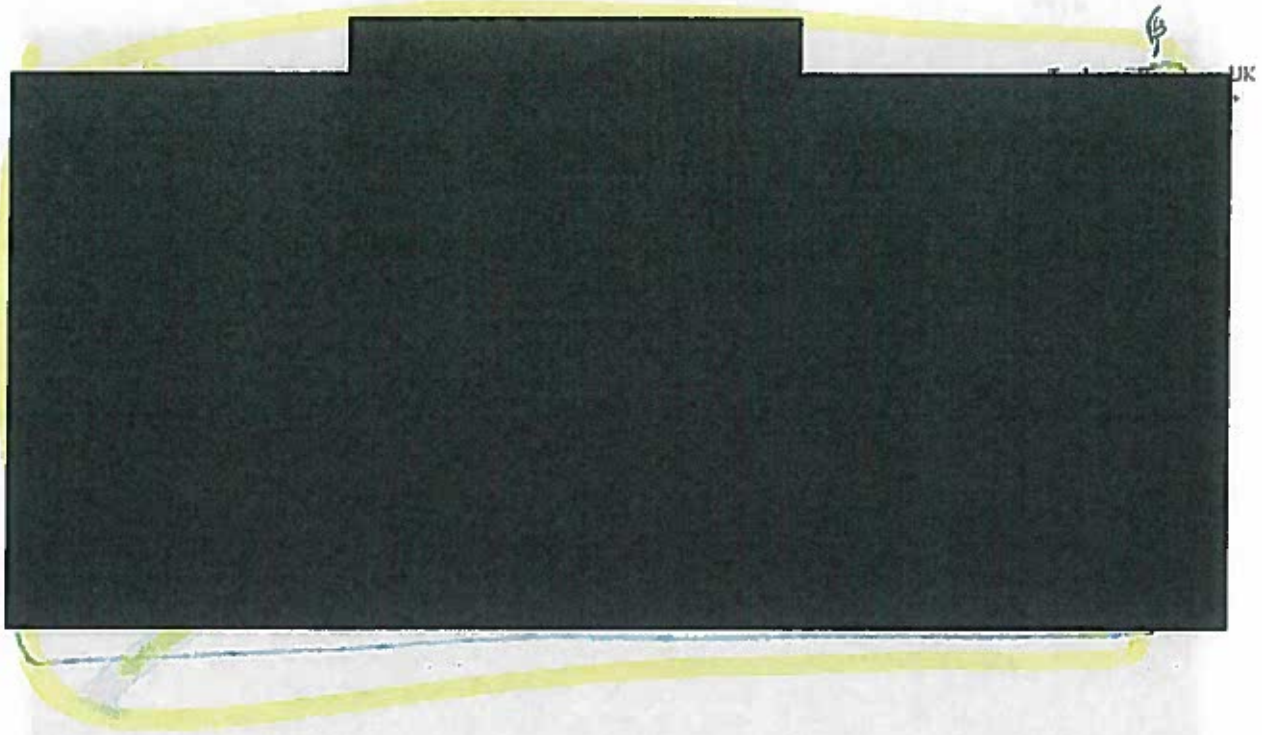


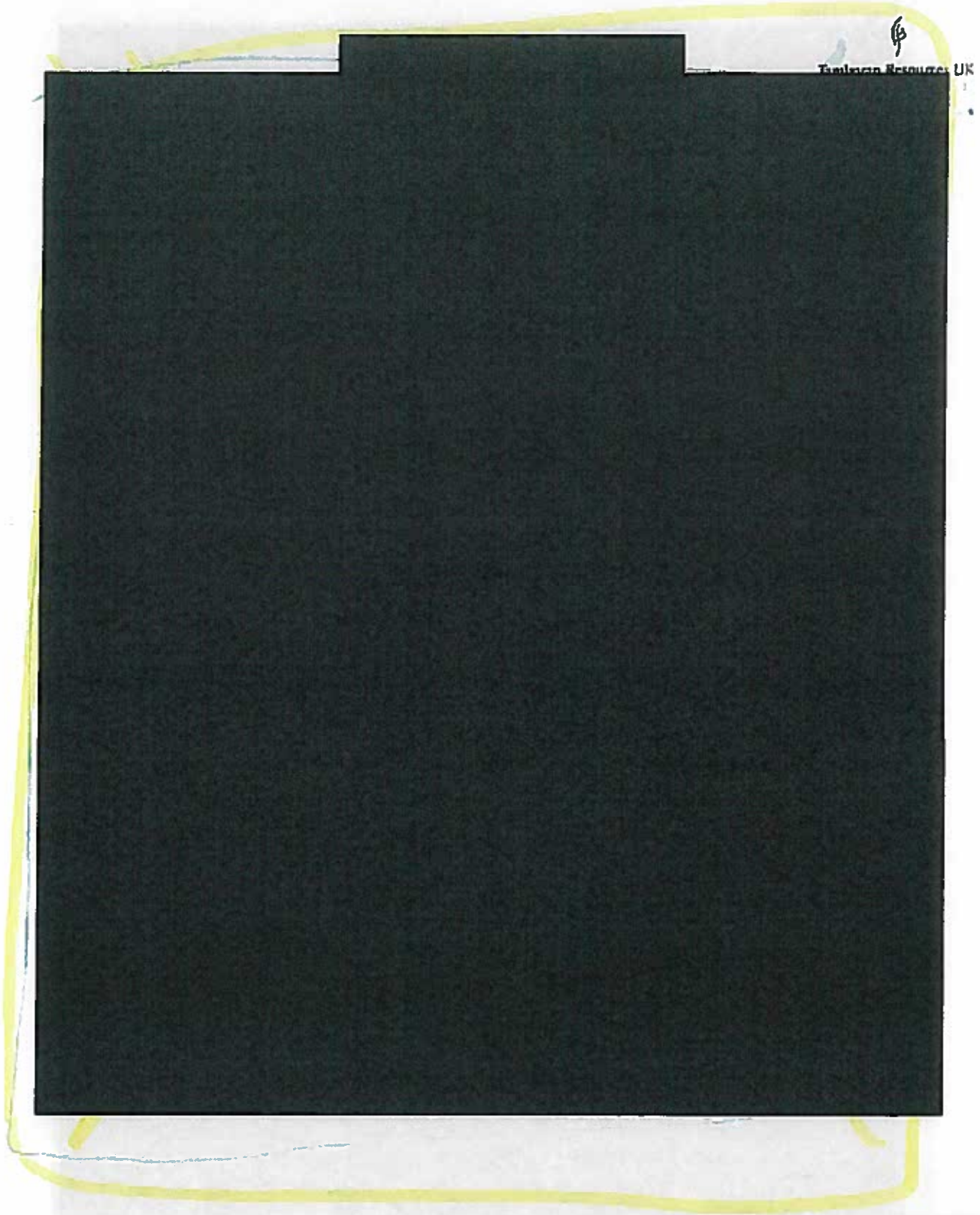


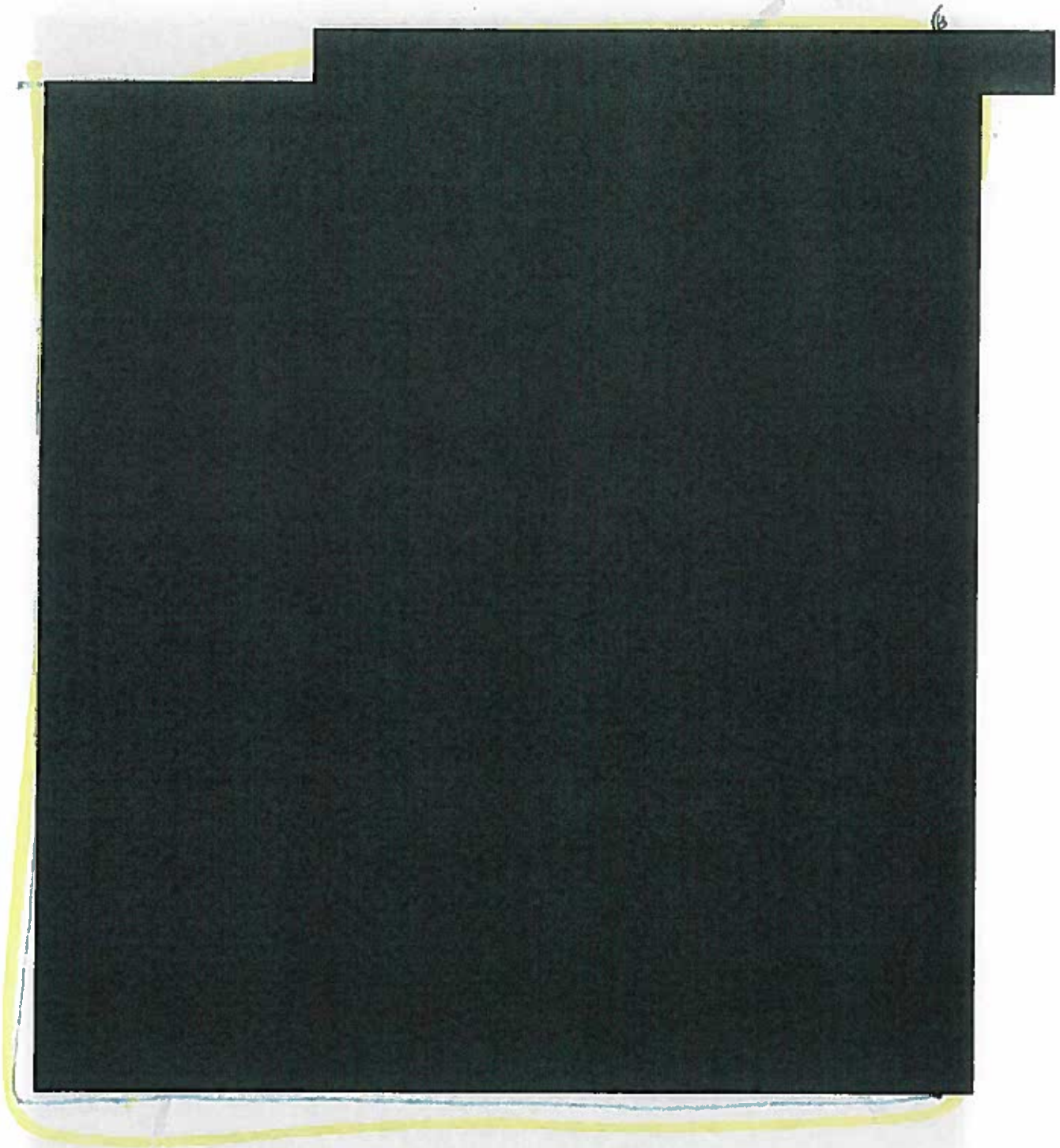


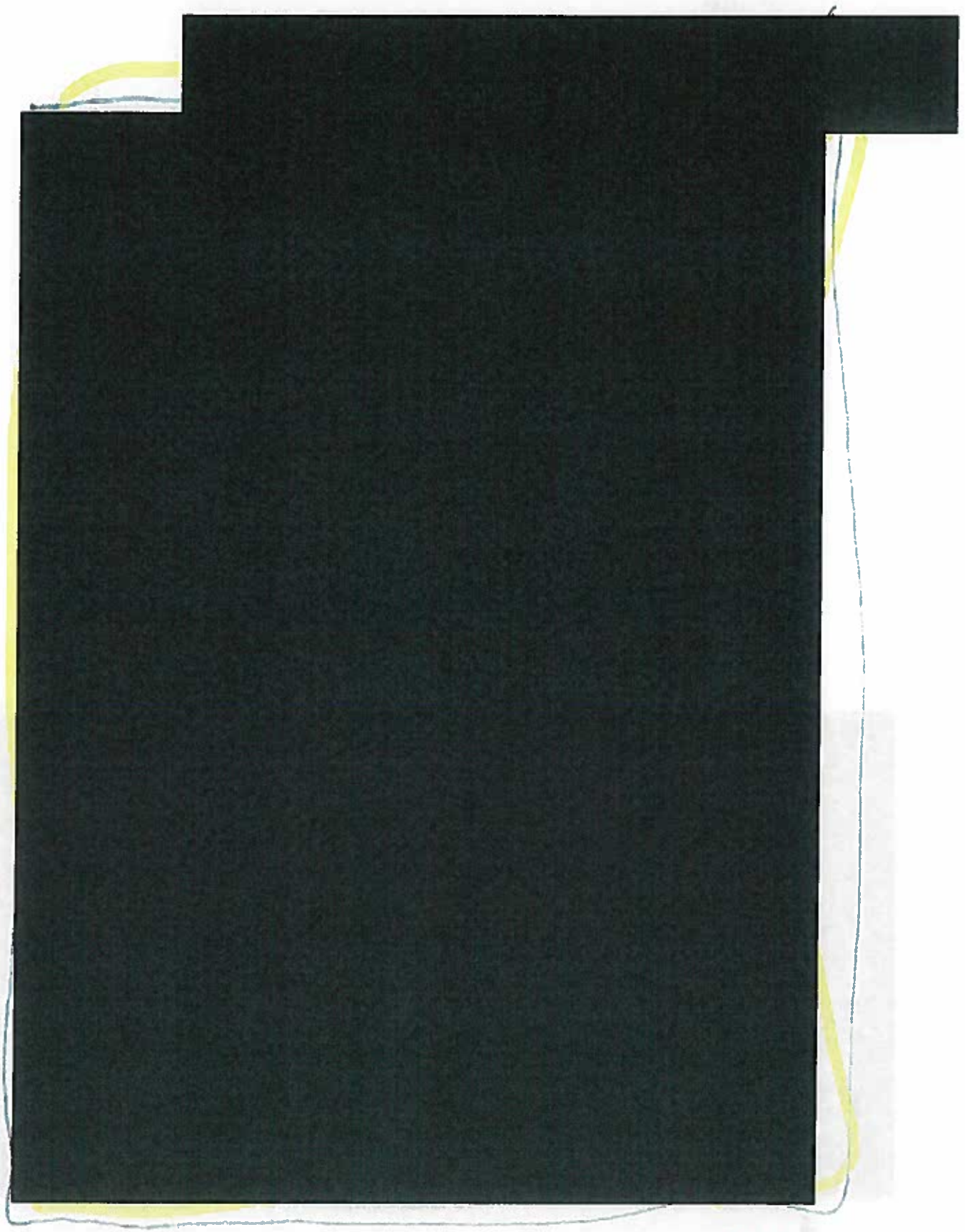


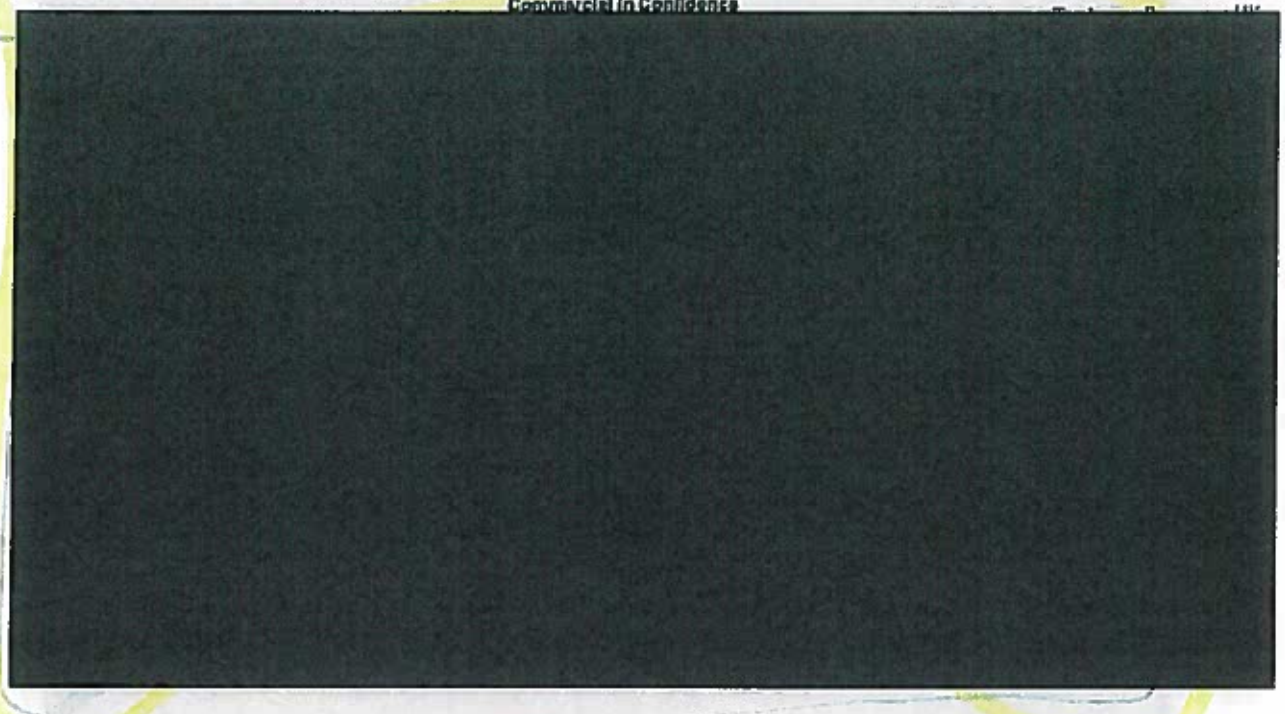


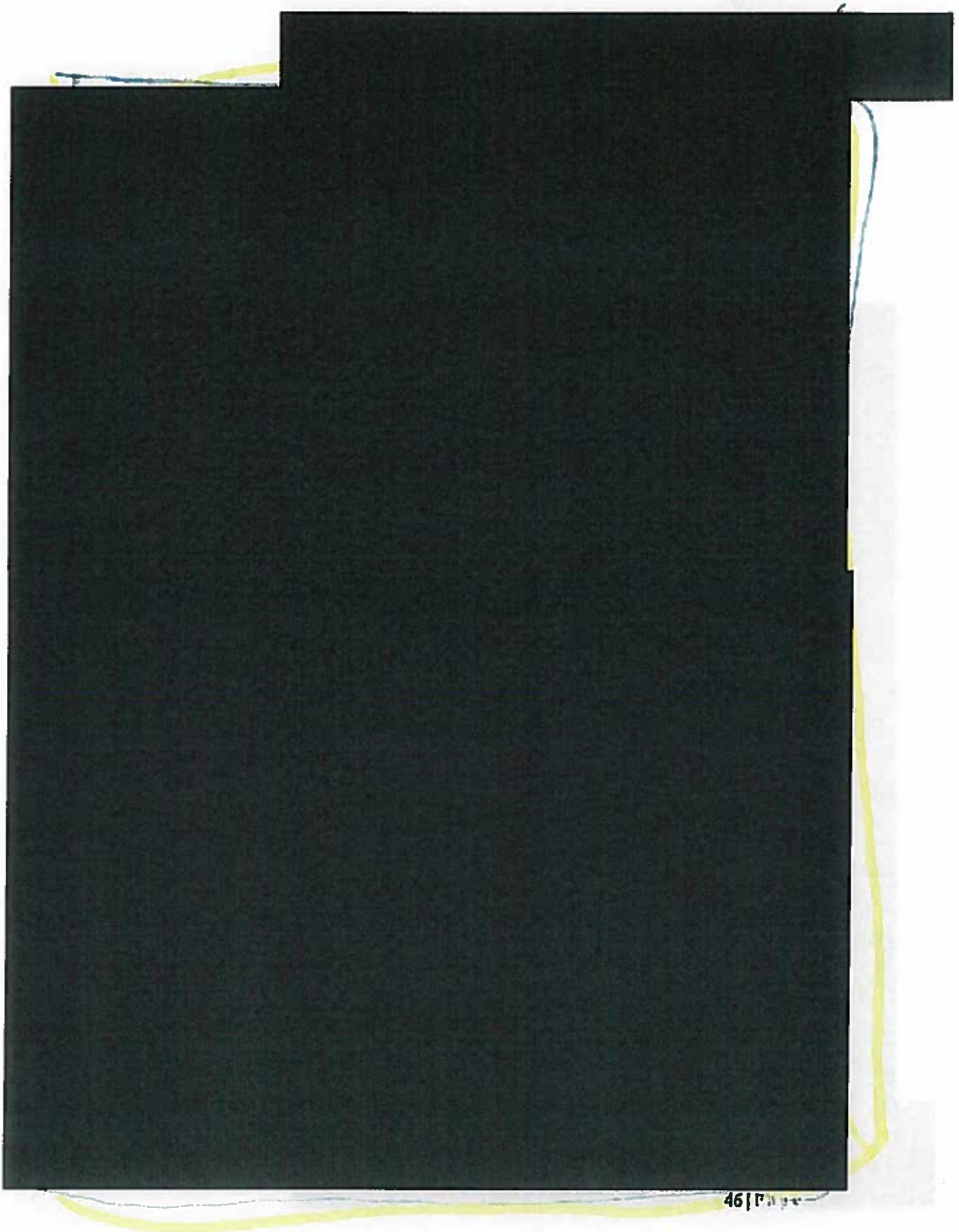


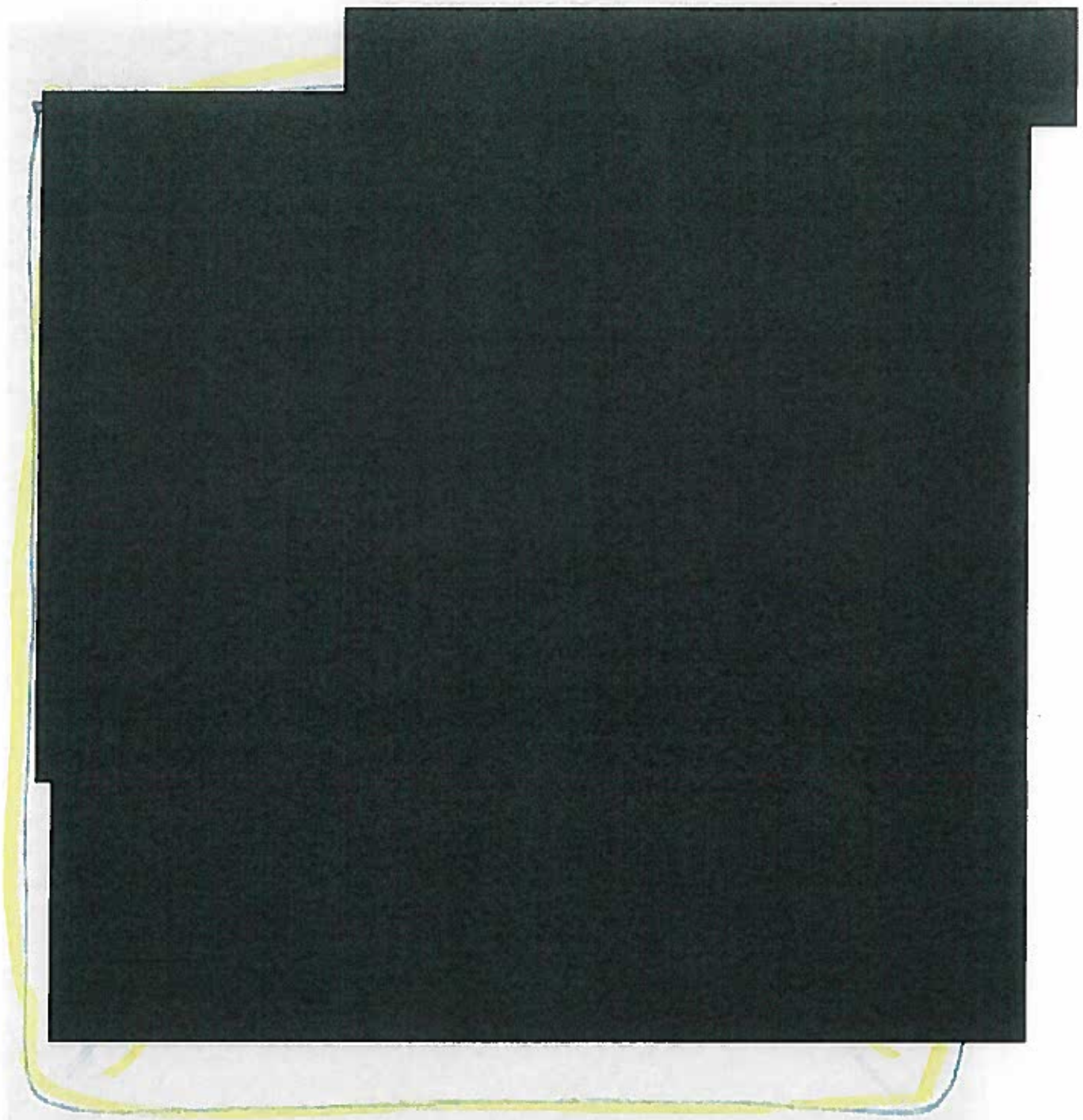












APPENDIX B3 – Supporting Technical Information

Introduction

The application follows on from DETI Licence PL2-10, which was granted on 1st April 2011 to Tamboran Resources Ltd, based in Sydney Australia. The licence was formally assigned to Tamboran Resources (UK) Ltd in July 2014. This licence application benefits from the work carried out by Tamboran Resources Ltd since April 2011. That included a reassessment of all past drilling in the area, including reanalysing selected conserved rock samples from several of the boreholes. The geology and geophysics previously carried out was also reassessed, with the latter being reworked using the most modern techniques. A 3D model of the ground beneath the licence area was developed. The work was carried out by Tamboran geologists/geophysicists with contracted input from US companies [redacted] and [redacted] The results indicated an area favourable for shale gas development.

Below is a summary and context of unconventional exploration and production in North America. This is critical to understand and appreciate the value that this relatively new source of energy and the methodology of exploration, if successful, will bring to the country and communities involved.

The Significance of Unconventional Gas and Oil Production and its Relevance to Northern Ireland and Ireland

The Shale Gas Revolution

Shale gas and shale oil production represent perhaps the most important advances in geosciences since the Plate Tectonics Theory. The fact that commercial quantities of natural gas and oil can be produced from nano-darcy rock is truly startling. It is a great achievement for geoscience and petroleum engineering like no other.

As a result, the USA is now the largest natural gas producer in the World (ahead of Russia and Canada) at 74 bcf/d (July 2014 EIA data), thanks to the shale gas revolution that was pioneered by the late George Mitchel in 1981. Shale gas production is 36 bcf/d (26 times larger than the entire UK gas production!). Shale gas represents 49% of total US gas production (EIA, 2015, Figure 1). In 2005, shale gas share of total production was a mere 3%! Production comes from several large basins across the continental USA (Figure 2), due to the presence of historic conventional production in many of these basins.

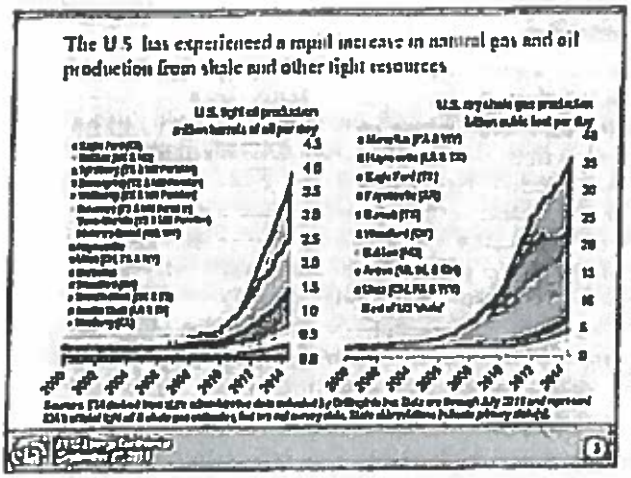


Figure 1

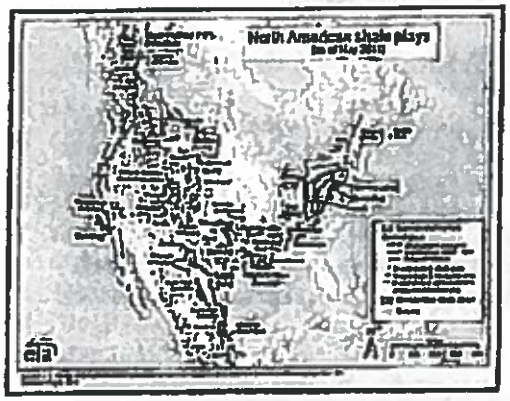


Figure 2

The US is the largest natural gas consumer at 74 bcf/d. The US is now virtually self-sufficient in terms of gas consumption from domestic production. Thus, many LNG projects are underway for export of the surplus gas to the World markets. Many of these projects were originally designed as import facility of natural gas to the USI Without this revolution the US will be importing about half of what it needs annually at a much higher cost!

The impact of the shale gas revolution on the domestic gas price is also dramatic. Currently, the USA population enjoys a stable and low gas price (about 3.5 dollars per Mcf). The gas price was much higher 10 years ago and reached 14 or 16 dollars at peak consumption period through the winter months. Worldwide, countries and companies are exploring for shale gas and tight gas like never before in order to try to emulate the North America's success story. Of the top 20 gas fields in the World, five are shale gas fields from the USI These are the Marcellus, Haynesville, Barnett, Fayetteville and Utica shales (Chesapeake Energy, 2012).

Unconventional Shale Oil and Tight Oil Production

The second phase of the shale gas revolution started around 2008. The geologists and engineers involved in the exploration and exploitation of shale gas in North America started experimenting with production of oil and condensate from these tight formations using similar methodologies to those that made the shale gas a success story; namely horizontal drilling and hydraulic fracturing. The results were amazing! From Barnett to Eagle Ford, Bakken and Permian Basin, a new wave of oil and condensate started being produced at an ever-increasing rate. As a result and in a very short time frame, the USA also became the largest crude oil producer (12.3 Million bbl/d) ahead of Saudi Arabia (11.7 Million bbl/d) and Russia (10.8 Million bbl/d). The shale oil and tight oil production is 3.6 Million bbl/d (July 2014) a 32 % of total domestic crude oil production. This is the result of the second shale revolution that was exponentially accelerated after 2009 (see Figure 1). The USA is the largest crude oil consumer at 19 Million bbl a day ahead of China (10.3 Million bbl/d) and Japan (4.4 Million bbl/d). This production is 65% of total consumption and is growing.

Figure 2 shows the major unconventional producing basins in North America. Many basins, integrated infra-structure and markets as well as innovation centres and data dissemination among other factors, contributed positively to the phenomenal increase in production of oil and gas in the USA and made it less reliant on importing oil and gas from abroad.

UK and Ireland Oil and Gas Production and Consumption

In 2013, the UK produced 801,000 bbl/d and consumed 1,508,000 bbl/d. The UK imported 53% of its daily use of oil. As for natural gas, the UK produced 1.4 Tcf in 2013 and consumed 2.7 Tcf. A net import of 1.4 Tcf or 52% of its needs (EIA website, accessed 2015). The Republic of Ireland has no indigenous crude oil production and thus imports 100% of its needs (142,000 bbl/d, in 2013). The country produced 12.2 bcf of natural gas in 2013 and consumed 168.5 bcf in the same year. An import dependency of about 92%. (EIA website, 2015 and OECD/EIA 2014). Clearly, any increase in the indigenous oil and gas production in the two countries will be of great benefit to the societies and economies of the two countries. The exploration and production of unconventional oil and gas offers such an opportunity. The presence of good natural gas infrastructure in Northern Ireland and the Republic of Ireland will help in the marketing of any produced gas in the future.

The Science and Engineering of Unconventional Resources (shale gas/oil and tight gas/oil): How does it work?

The essence of the unconventional revolution is the bedrock understanding that large amounts of oil and gas are present in relatively thick formations with very tight or very low permeability. By contrast conventional oil and gas fields have enough permeability and pressure to enable oil and gas to flow to the wellbore with little assistance. In the case of unconventional reservoirs the lack of permeability is the key challenge. Thus, to overcome that challenge years of innovation resulted in introducing artificial permeability into the rocks by means of increasing the surface area in contact with the wellbore. This is accomplished by a combination of horizontal drilling and hydraulic fracturing. Without these two essential technologies, the shale gas/oil production will not work. Shale and tight sand rocks have permeability values in the order of 10 million times less than that of a typical or a conventional reservoir. Figure 3 illustrates the range of permeability values and the comparison between conventional and unconventional reservoir values.

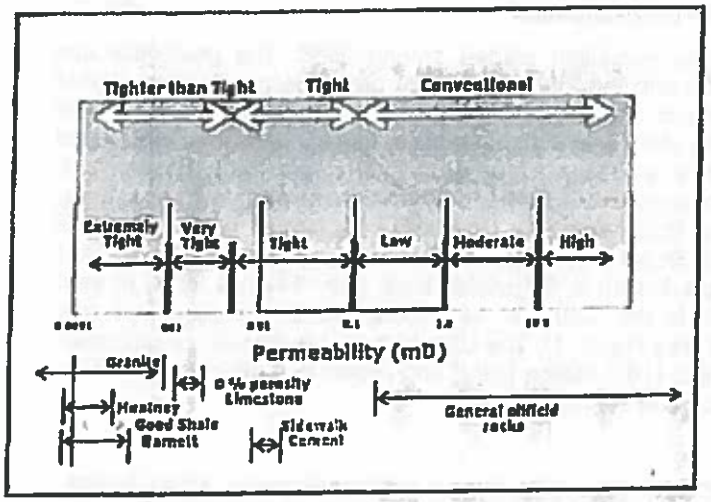


Figure 3 Permeability terminology. The unconventional rocks are extremely tight. Permeability in shale is about 10 million times smaller than the average conventional reservoir permeability! (Modified by B. Faraj after DOE, 2007).

As a result of the very low matrix permeability, the production decline curves are very steep as shown in Figure 4. Shale gas and oil wells are characterised by steep decline. Between 50% and 70% of production rate declines in the first two years of production. As a result, 50% to 90% of EUR (Estimated Ultimate Recovery) is produced in the first two to three years, providing a much-needed cash flow to continue exploring and producing. Figure 5 shows an example of Southwestern Energy well design evolution over a period of two years. It was able to increase the lateral length from about 1200 ft to 3700 ft. After stimulation, the IP of the wells increased from about 2 MMcf/d to 3.9 MMcf/d and was able to do that with minor increase of cost.

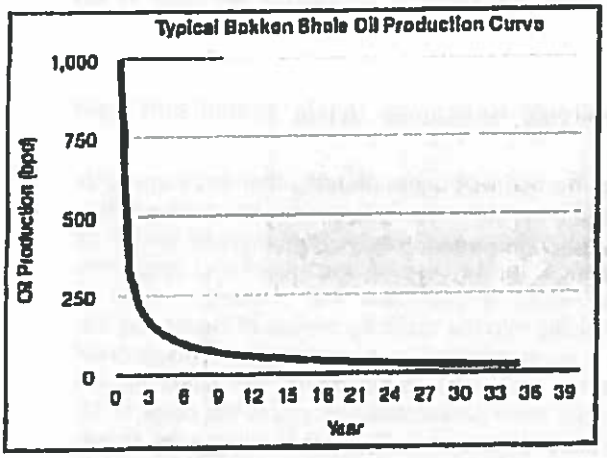


Figure 4: Typical decline rate from the light oil play of the Bakken Play. Oil production exhibits even more steep decline rate that gas wells (http://www.peakoilproof.com/search/label/Bakken).

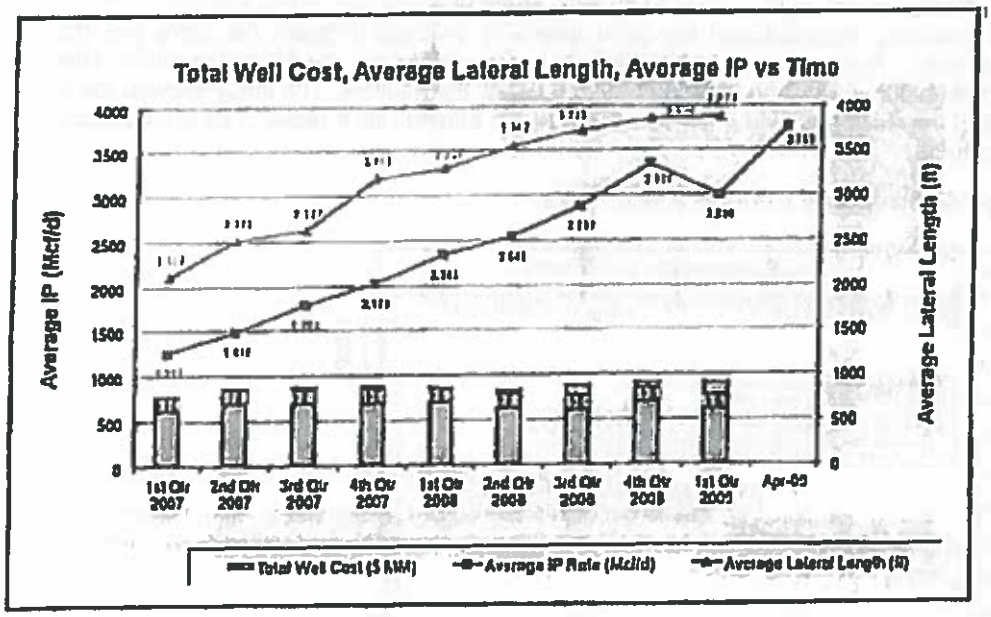


Figure 5: An example of the innovation in shale gas well design. Southwestern Energy was able to increase the lateral length from about 1200 ft to 3700 ft. After stimulation, the IP of the wells increased from about 2 MMcf/d to 3.9 MMcf/d and

Environmental Aspects of Shale Gas and Oil Wells Production

Figure 6 shows the measures taken and regulated by the oil industry for many decades now to protect groundwater from contamination. Three layers of steel casings cemented together protect the groundwater from contact with the drilling, fracing or production operations during the life of the well. Groundwater is safe. Hundreds of thousands of wells have been drilled in North America this way and it is the best way to engineer protection of our valuable groundwater resources.

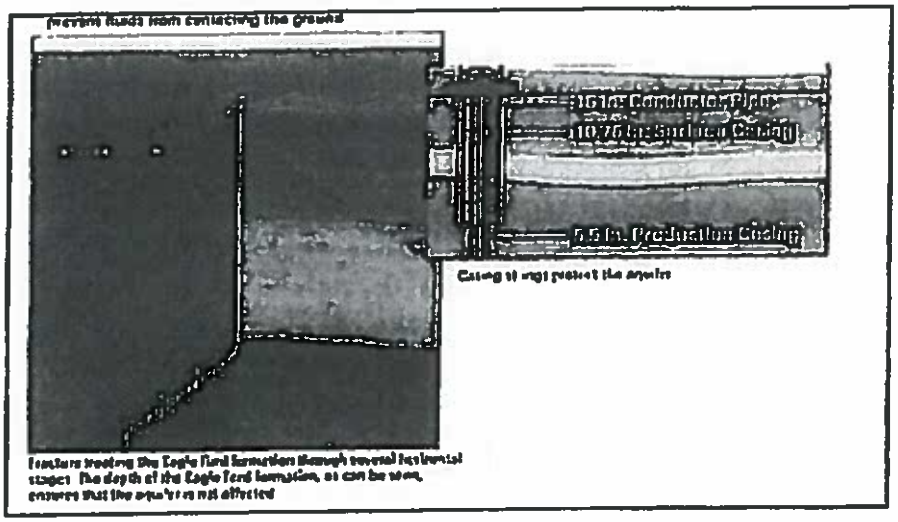
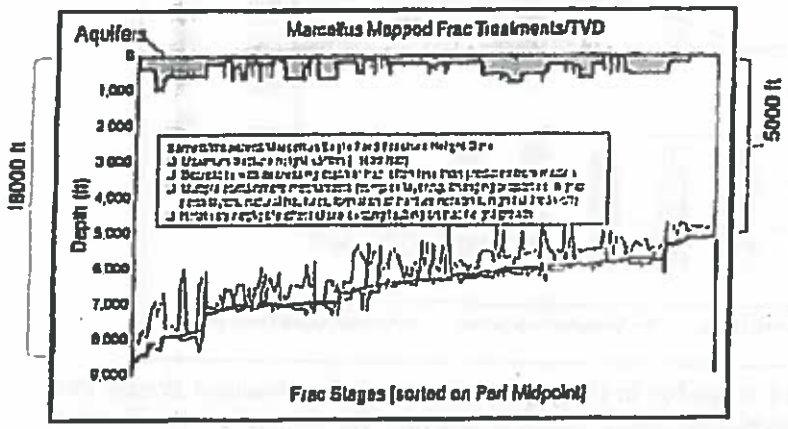


Figure 6

In addition, Fisher and Warpinksi, 2011 in an SPE study of shale frac height relative to aquifers locations, demonstrated the great distances involved between the shale and the aquifers locations. Figure 7 shows one example in the paper from the Marcellus shale. This showed a frac height of between 5000 ft to 8000 ft below the aquifers. The study showed there was no risk of the fracs reaching anywhere close to the aquifers as a result of fracturing shale below the ground.

Frac Height Growth Data from US Shale Plays



After Fisher and Warpinski, 2011, SPE paper 145949

Figure 7

Another important aspect of increased gas production, which resulted in cheaper gas in the US, is the use of natural gas in power generation instead of coal, which has more CO_2 emission than gas per unit of electricity generated. Figure 8 is a graph showing significant decreases in CO_2 emission as a result (about 0.5 Million metric ton per year) (EIA website, 2013).

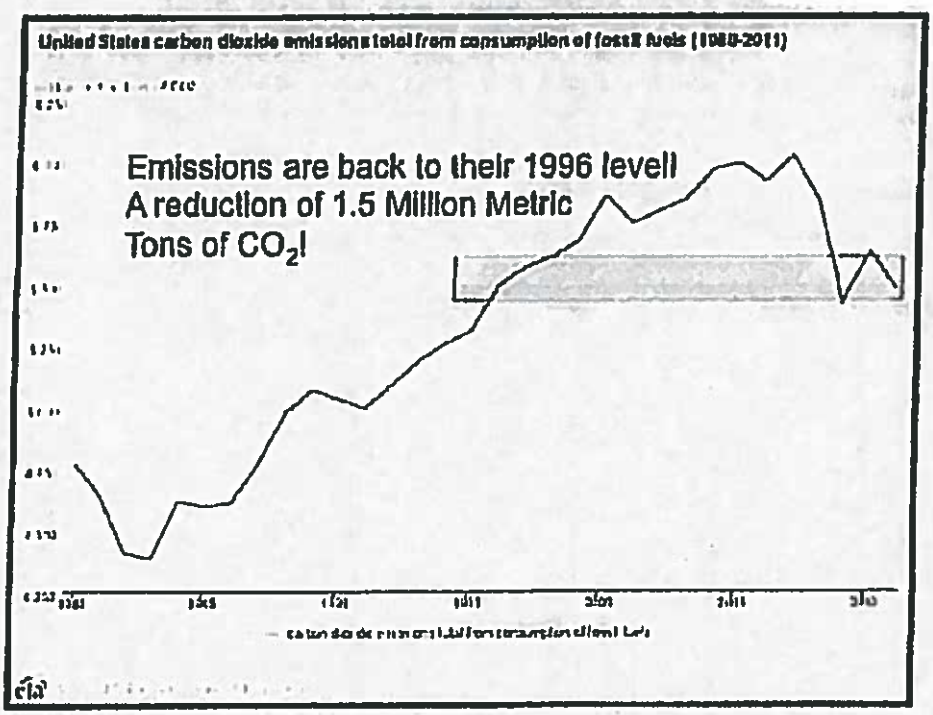


Figure 8

Conclusion

Shale gas and shale oil offer a new source of energy that until a few years ago we did not even know it was possible to produce. This new innovation of extracting oil and gas from virtually impermeable rocks introduces a paradigm shift in the science of geology and petroleum engineering.

The new source of energy has greatly benefited North American domestic markets and the expectation is that this success will be replicated in other parts of the World. Given the proven economic benefits that natural gas from shale has delivered elsewhere in the world, our objective is for Northern Ireland and the Republic of Ireland to receive the benefits from this potentially significant energy source. In addition, this will provide concomitant advantages to the local exchequer and economy.

Natural gas from shale has the potential to deliver long term energy security for the entire island of Ireland. We also note the support by the UK government for shale gas exploration and the positive findings from the USEPA report. This has the potential to be one of the largest and most economically significant projects in Northern Ireland's history.

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EIA website accessed 2015. http://www.eia.gov

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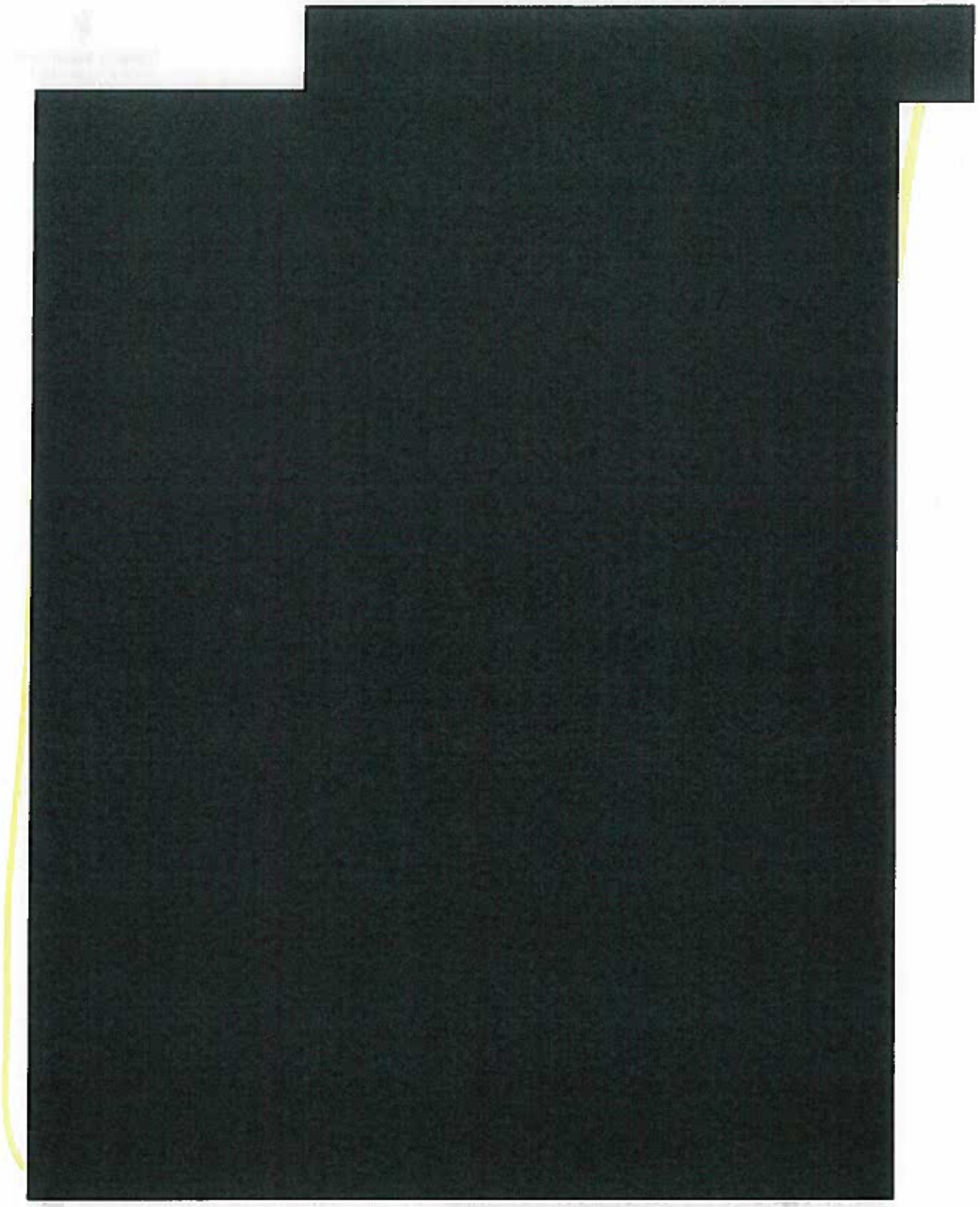

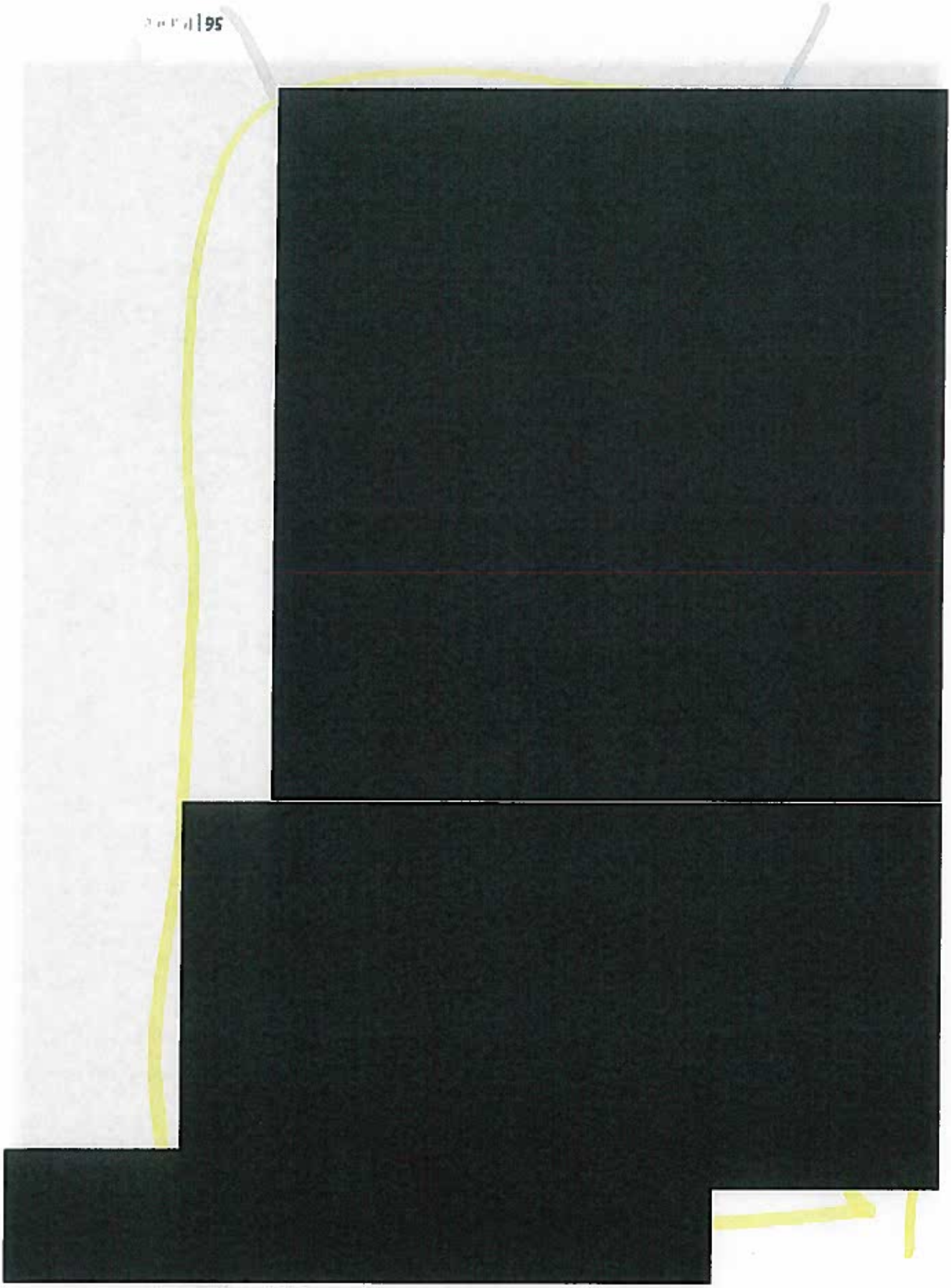

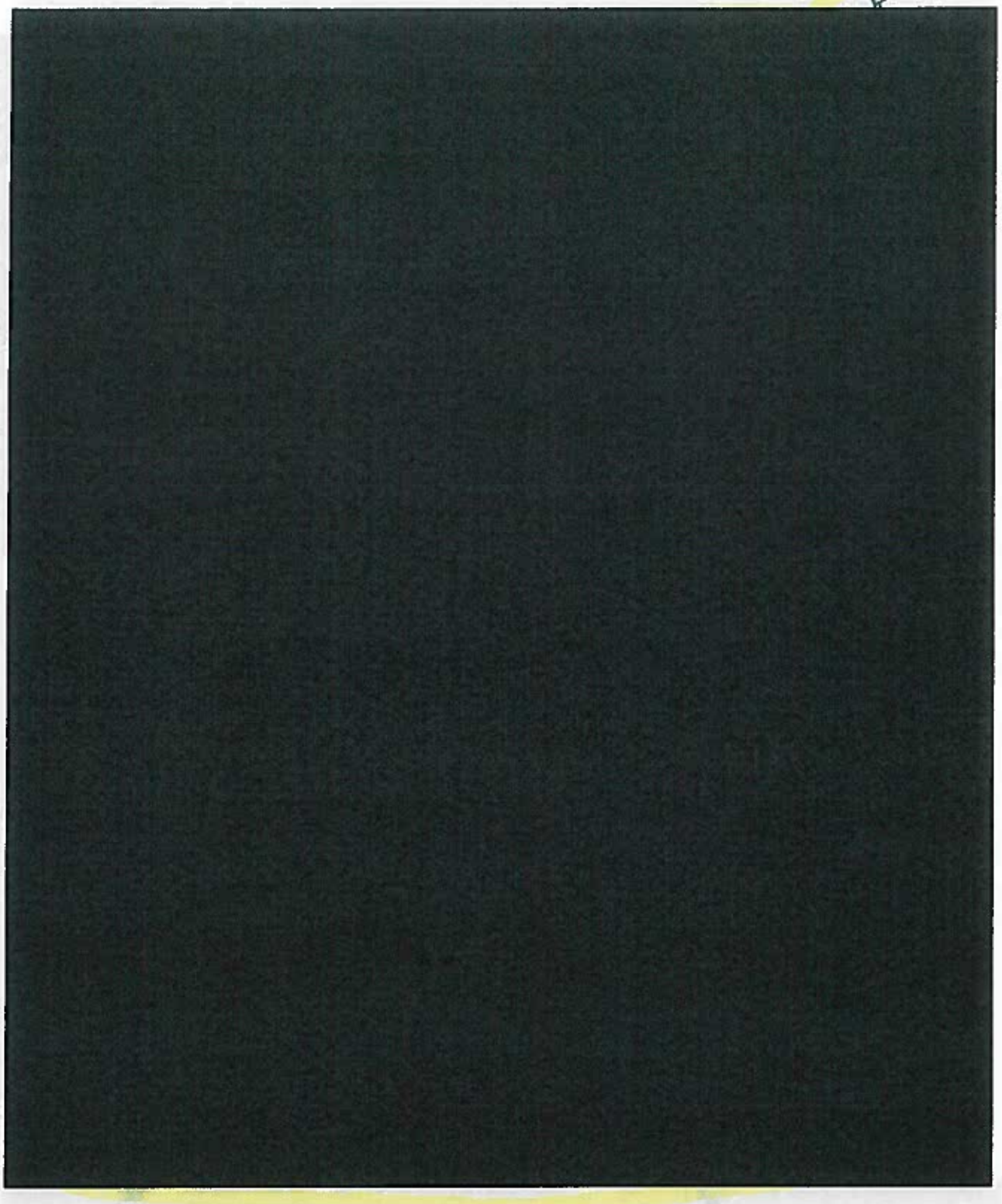

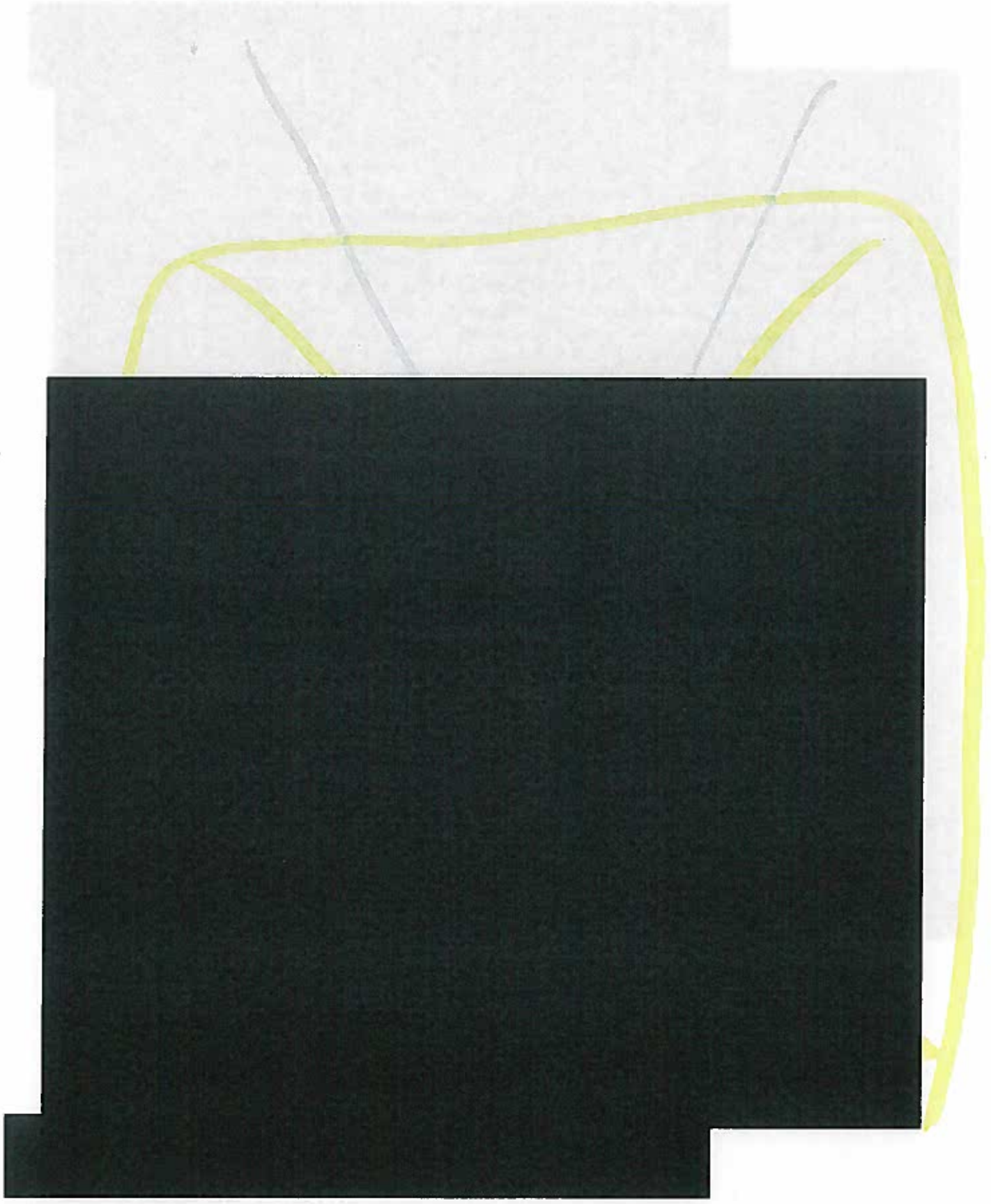

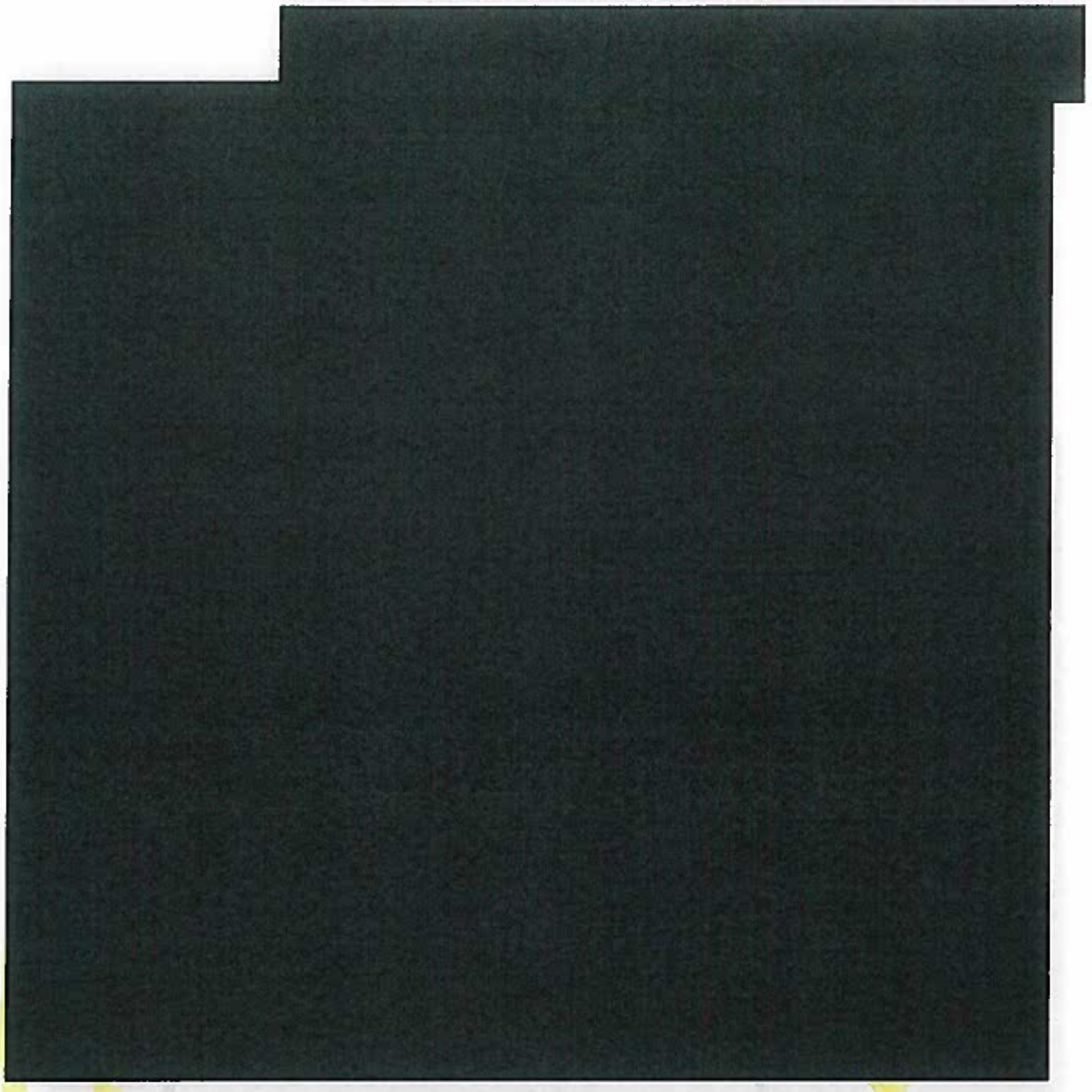

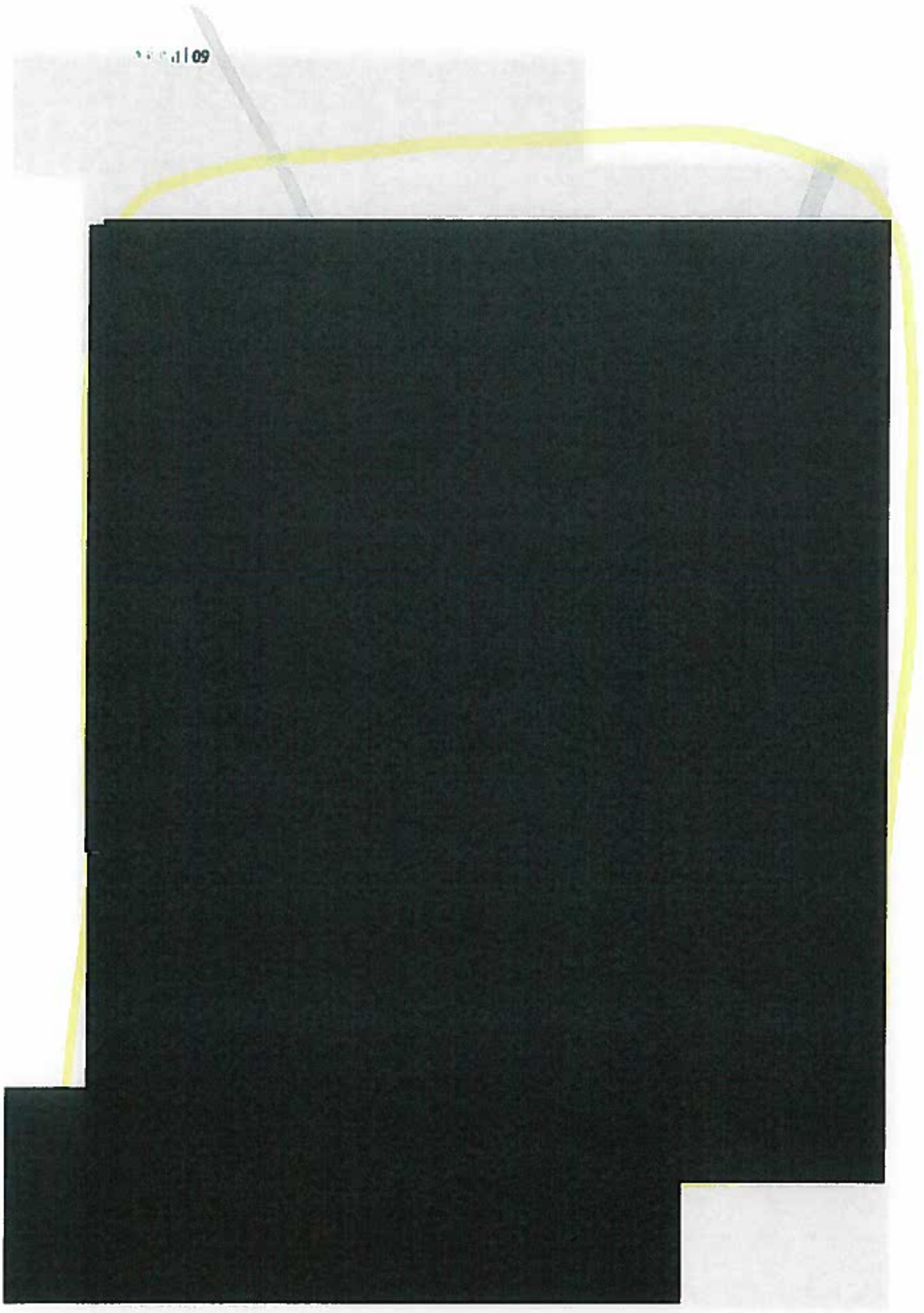

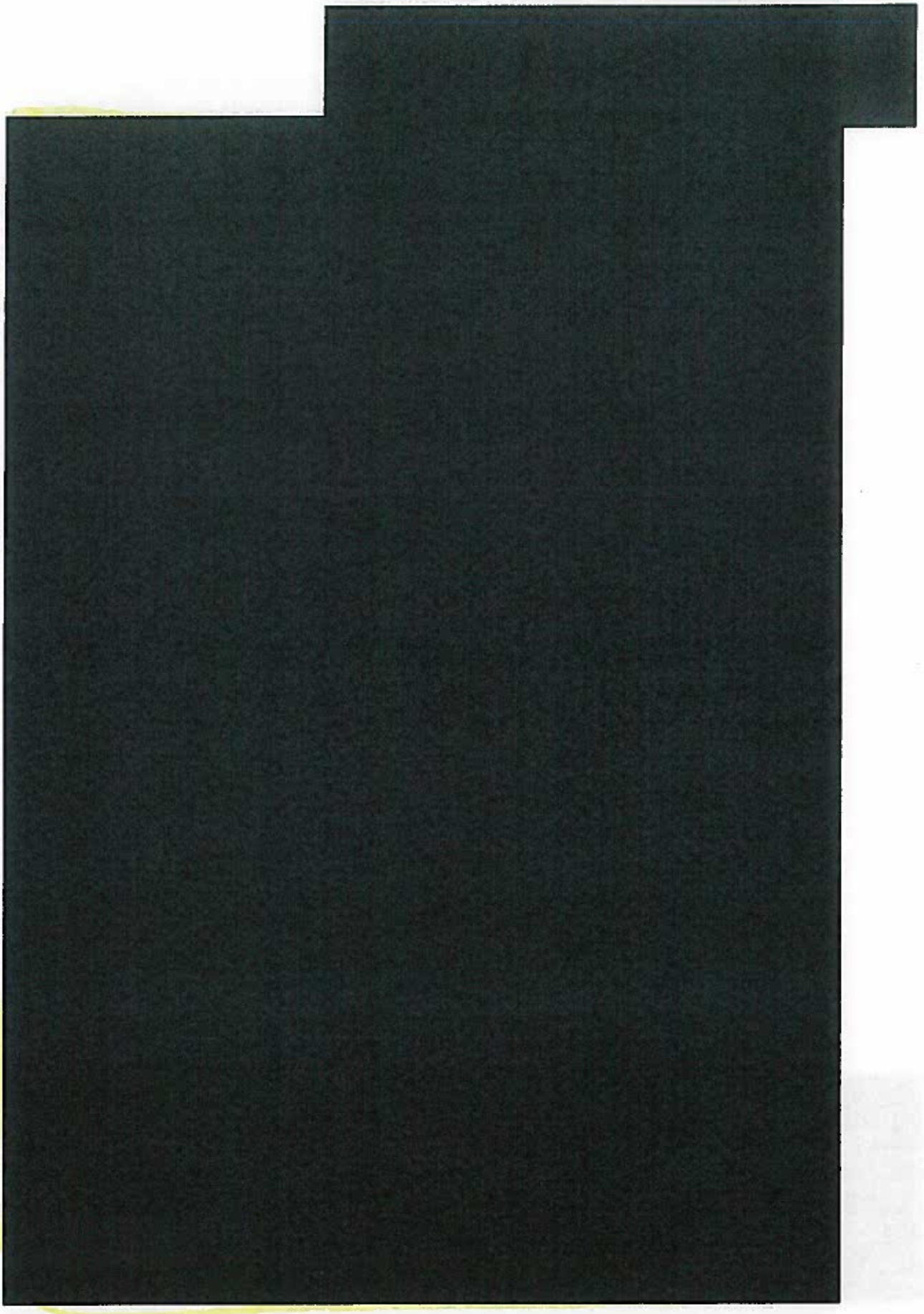

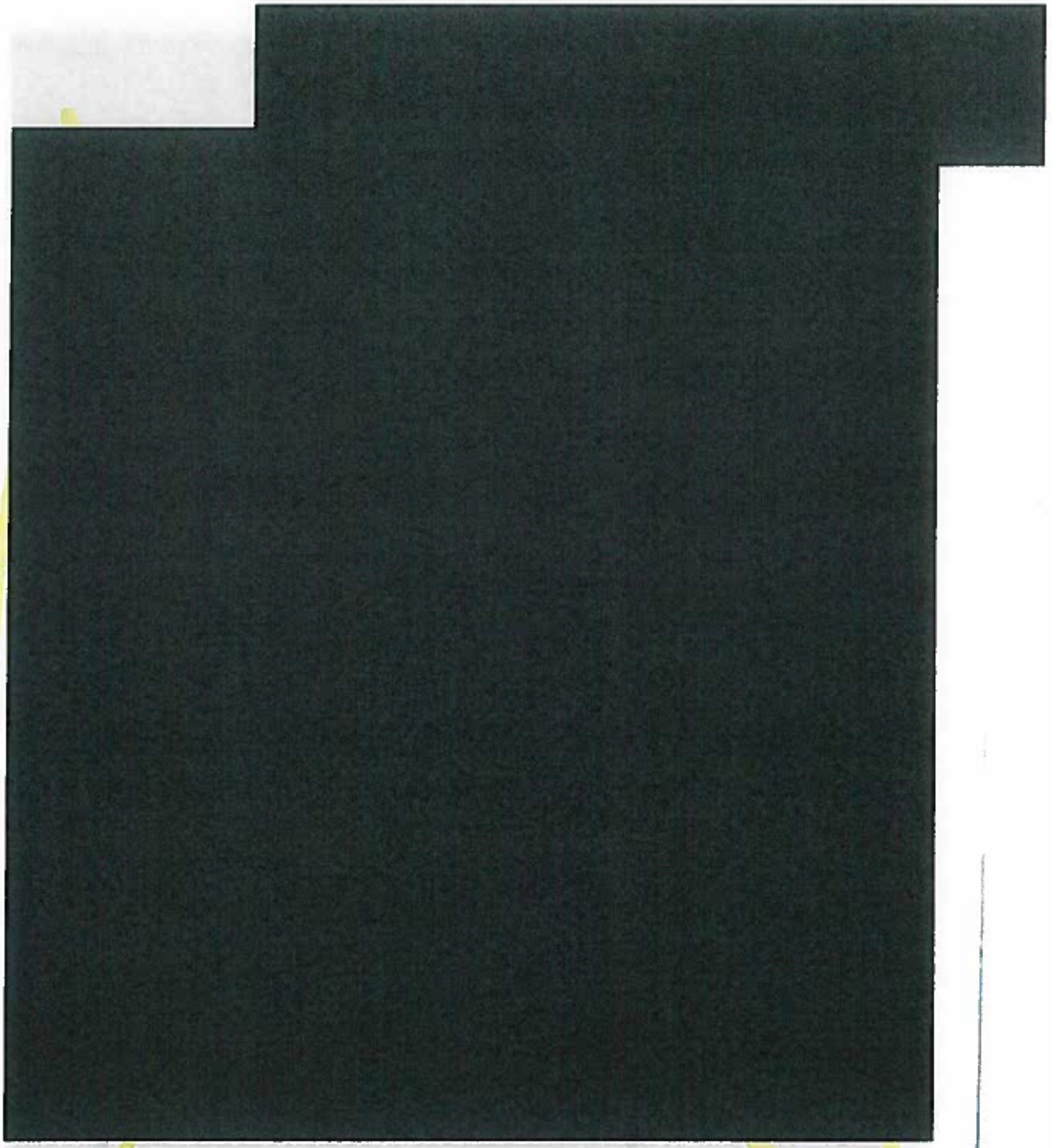

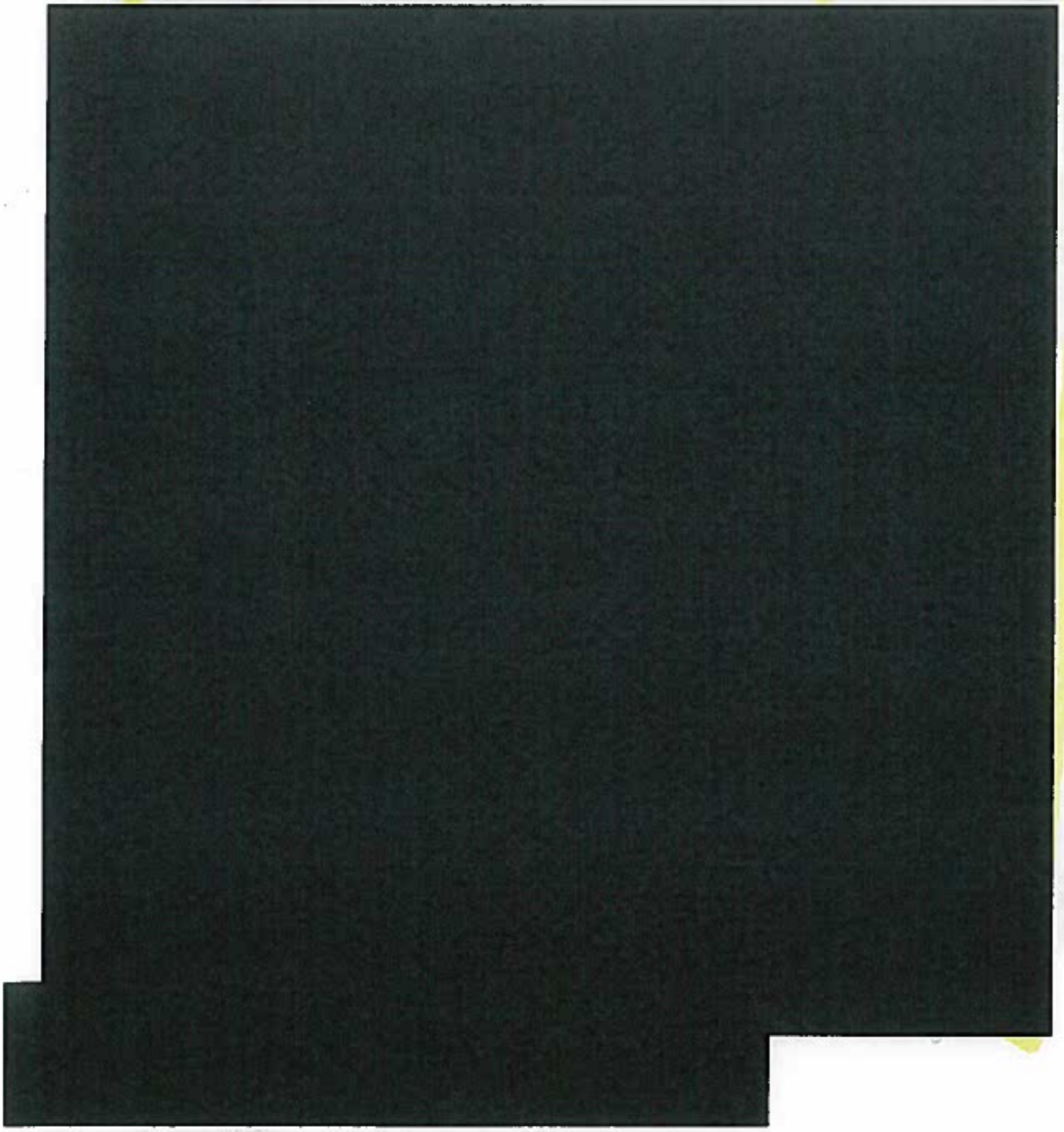

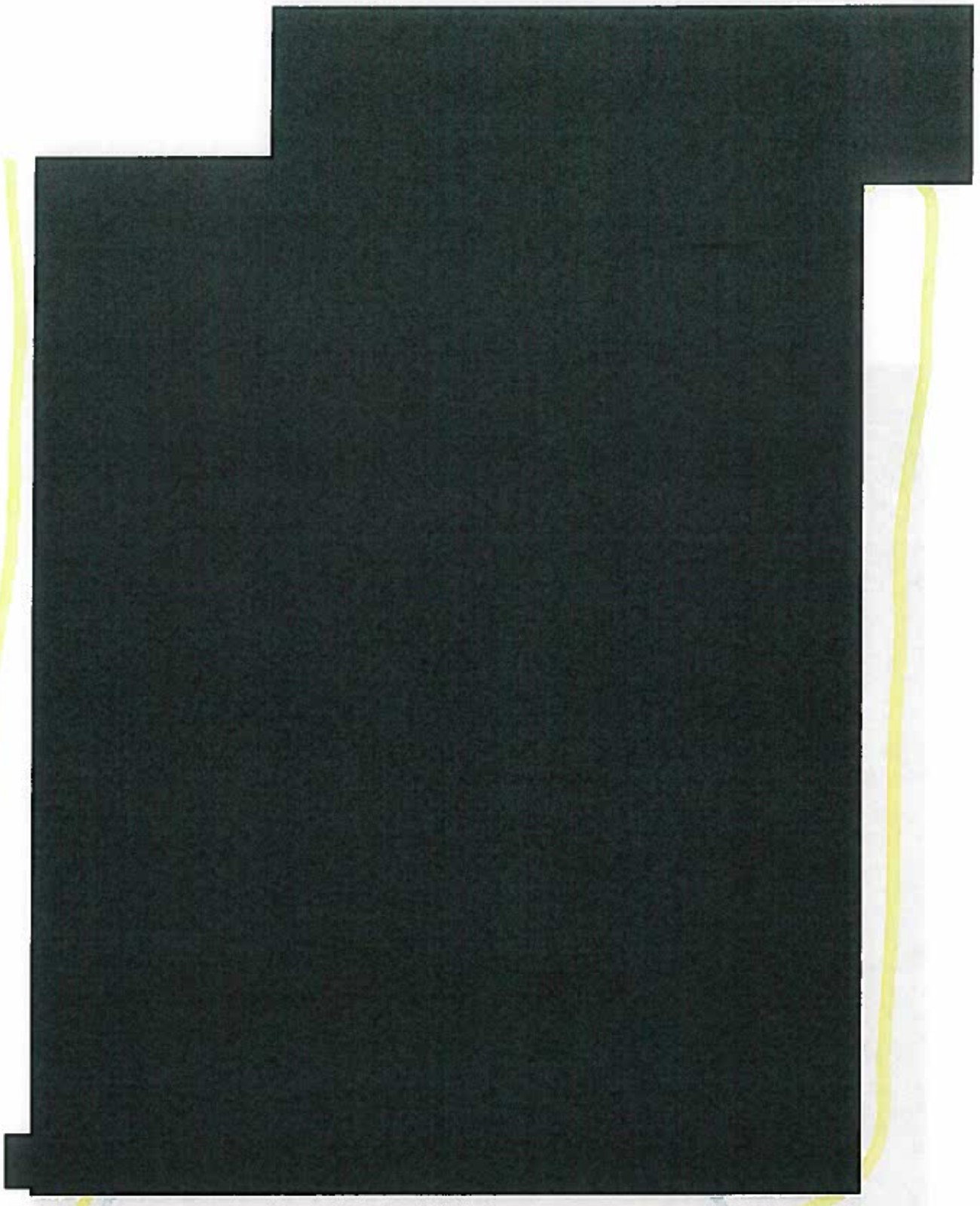

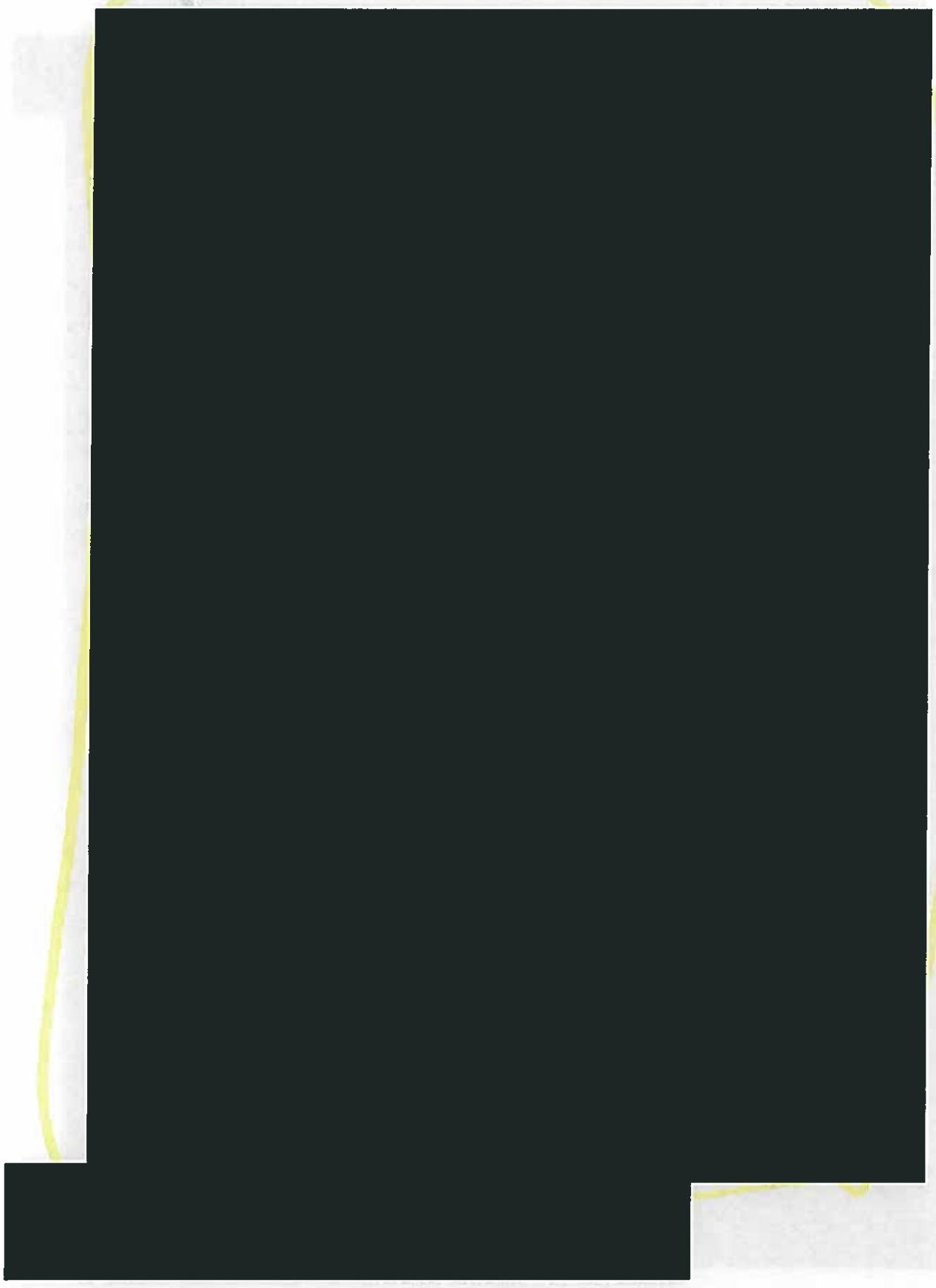

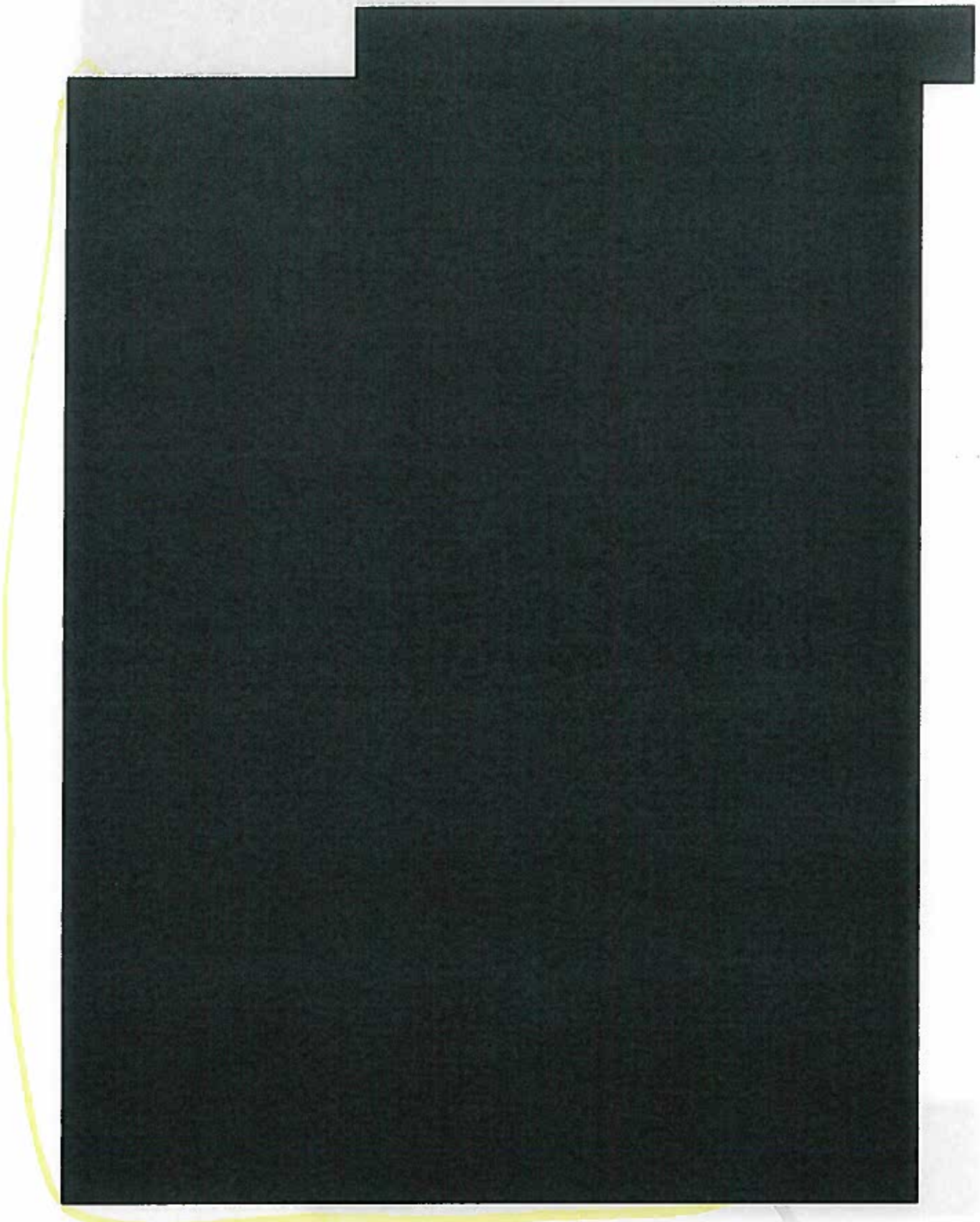

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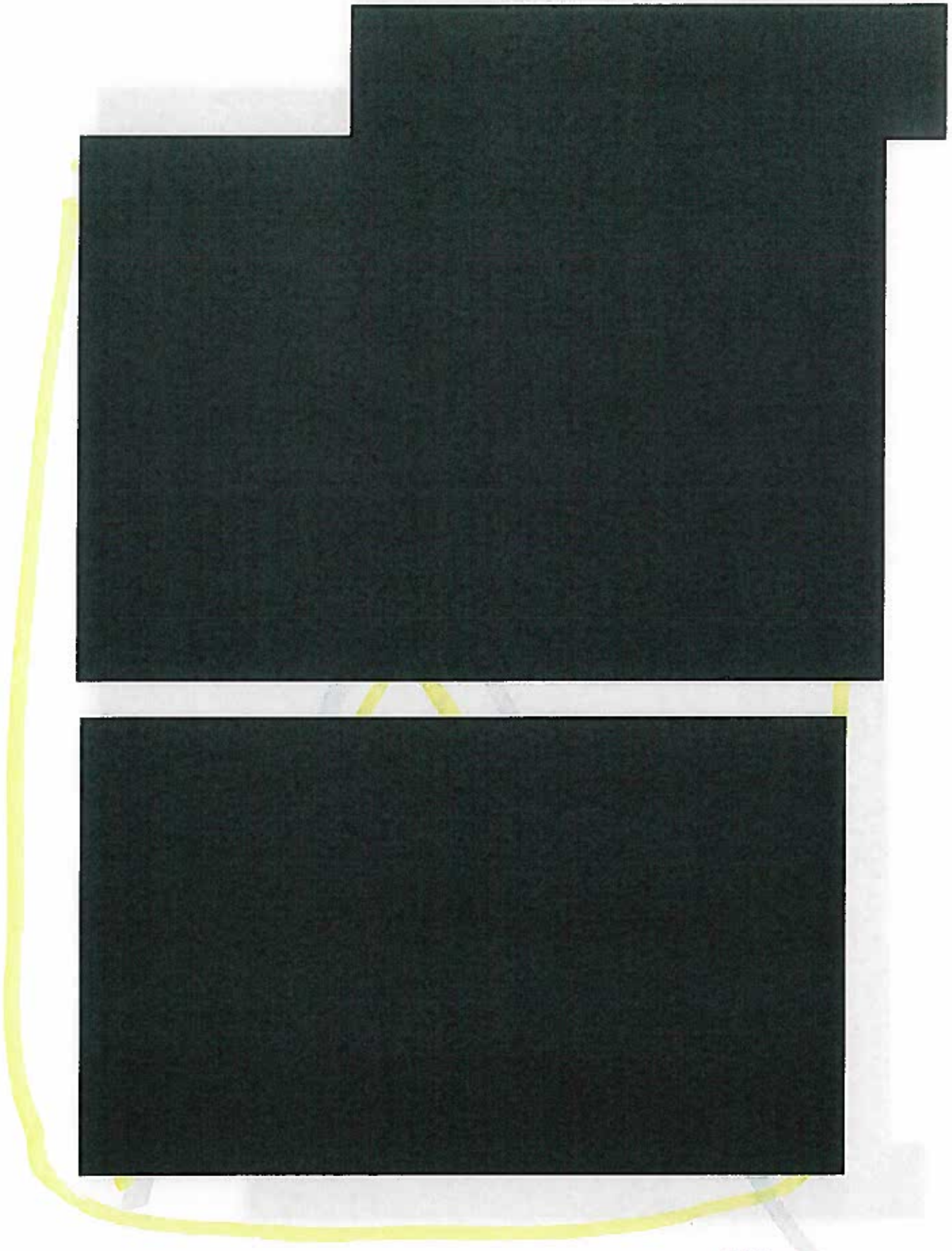
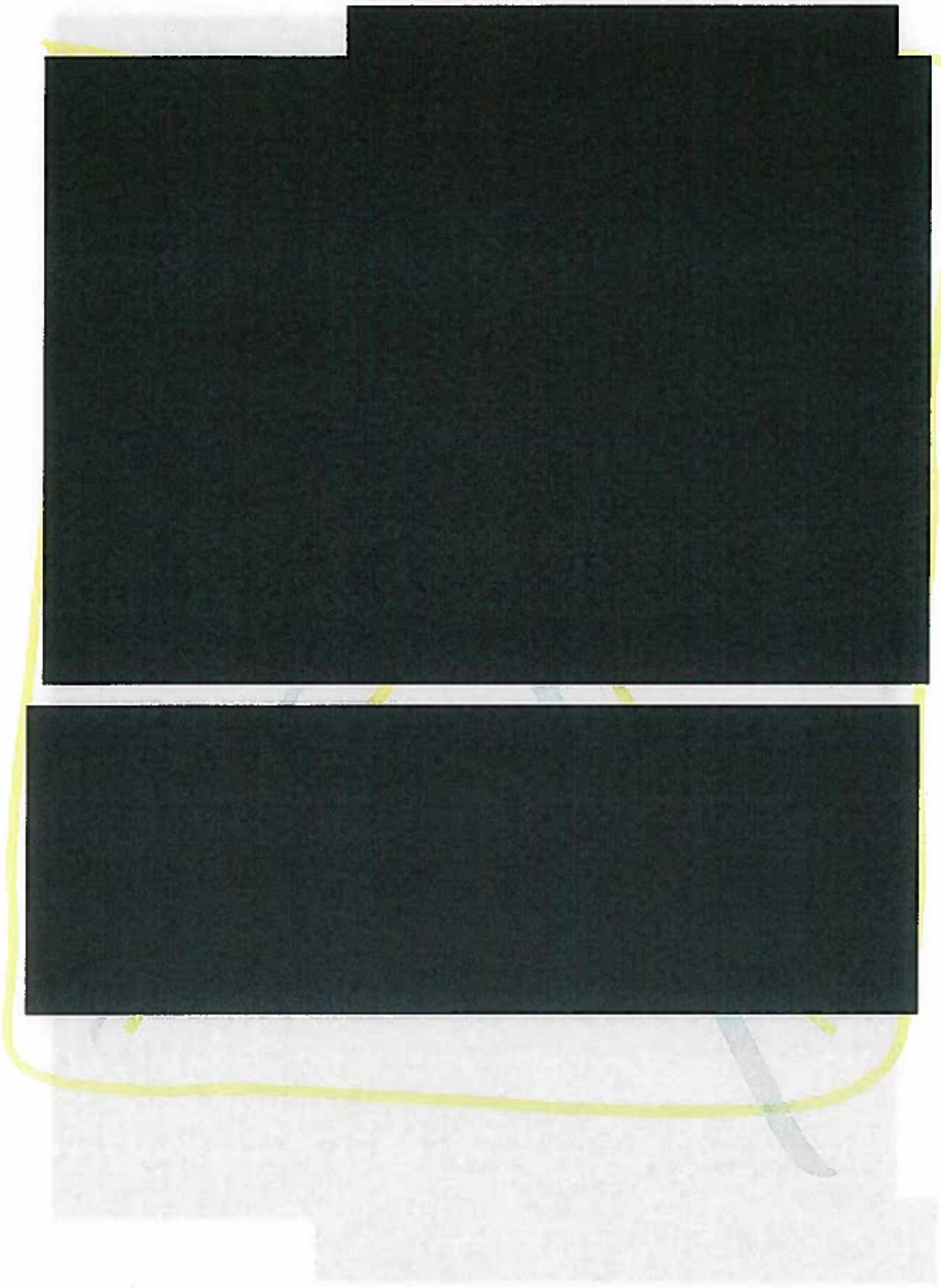
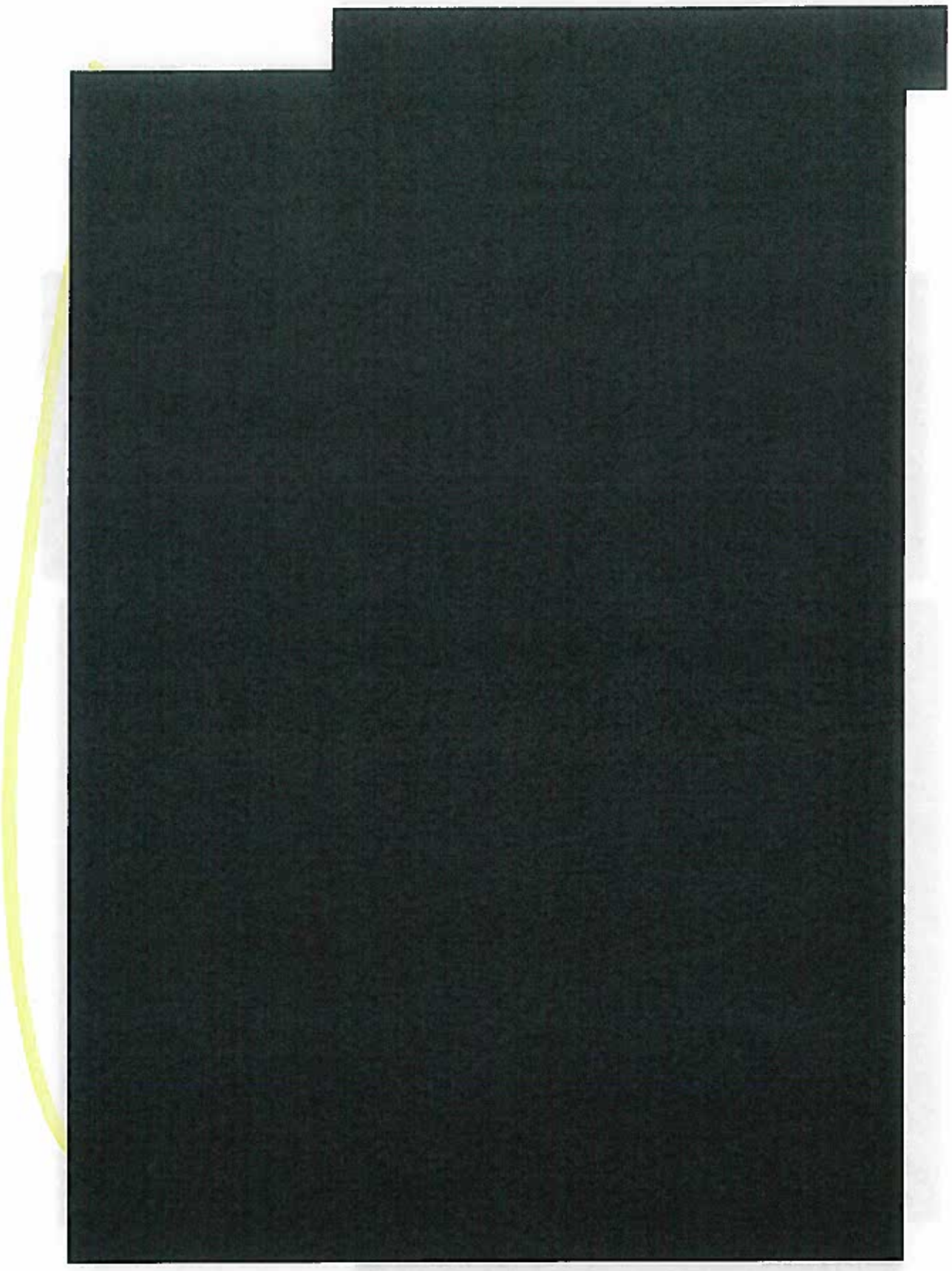
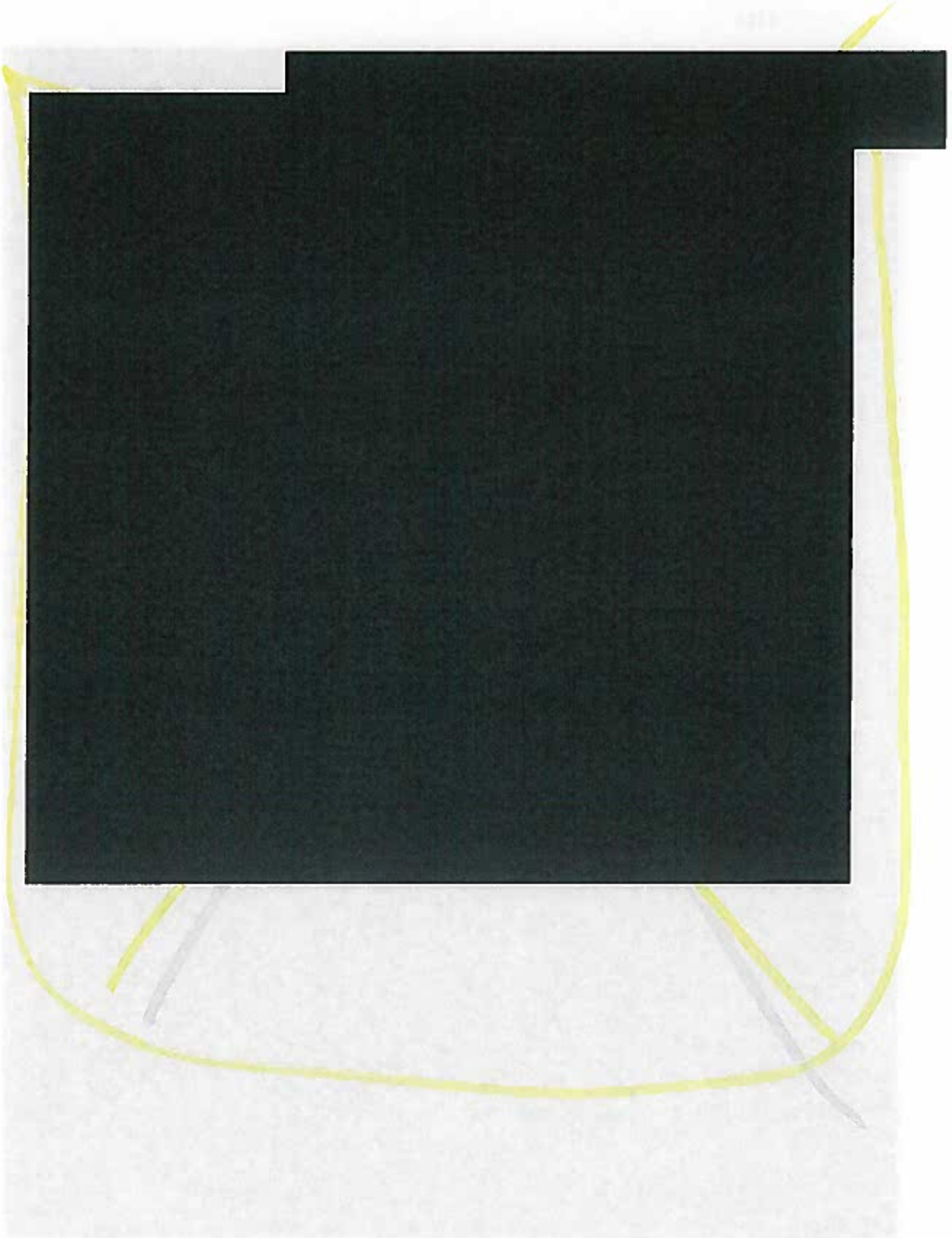
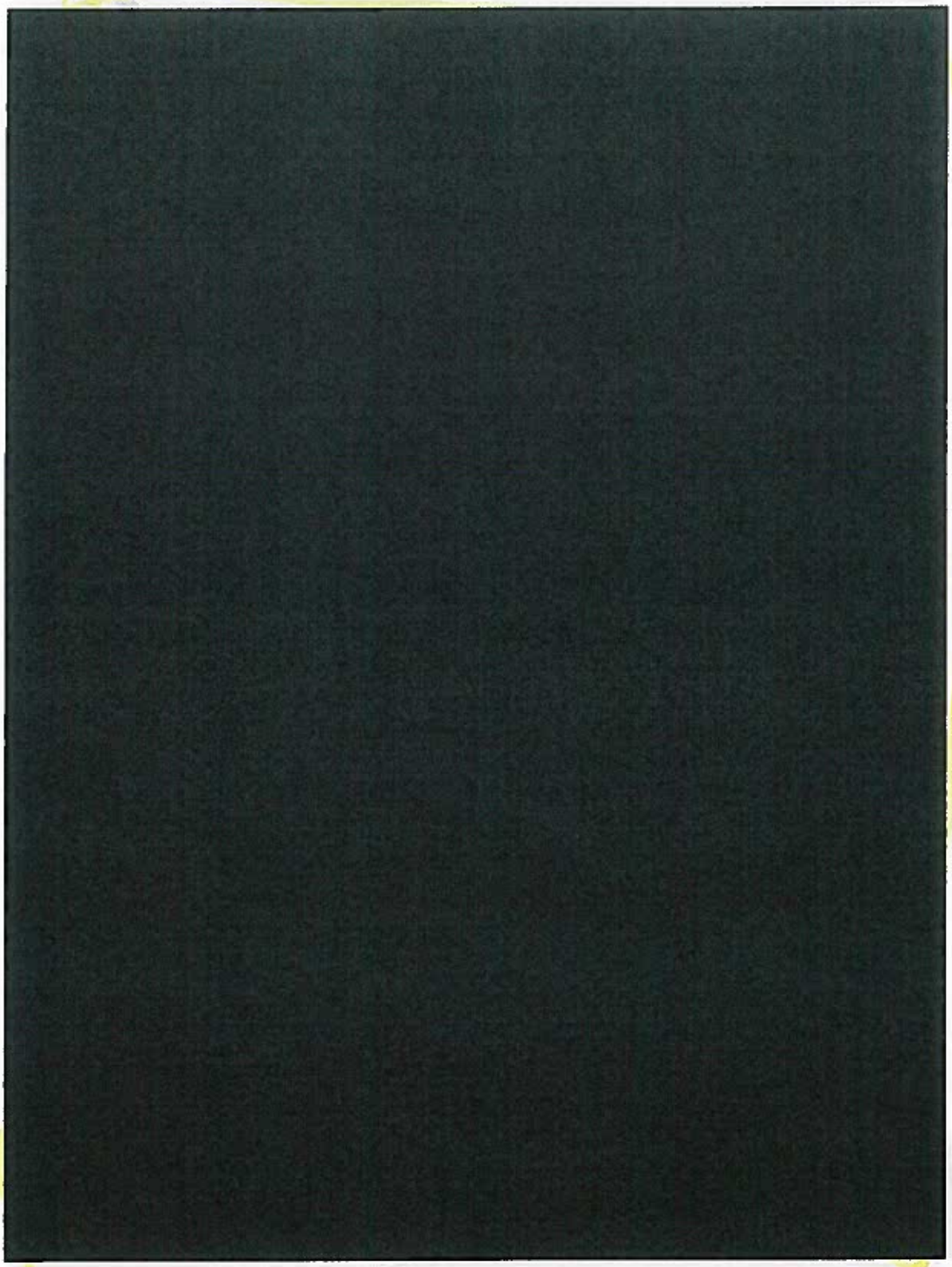
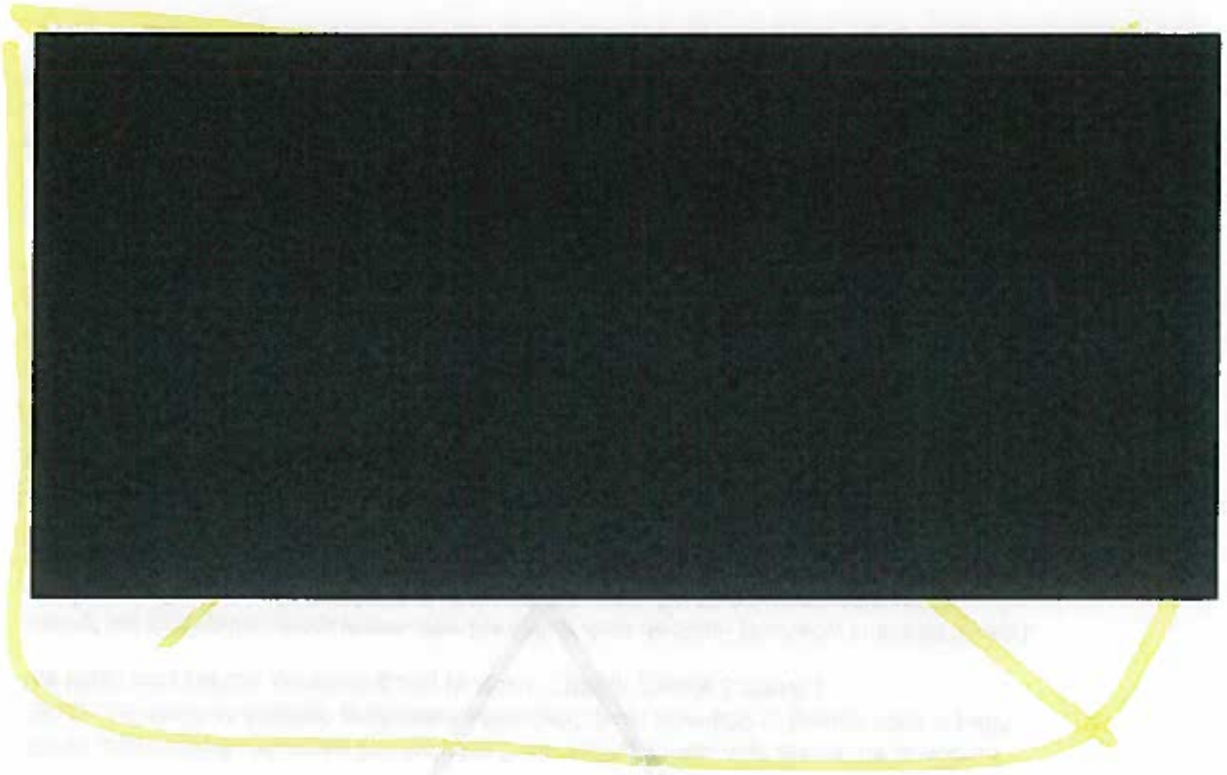












POSTSCRIPT to Appendix B

The application is for natural gas early stage exploration in Northern Ireland. The purpose of the exploration is to determine details of the potential hydrocarbons within the shale rocks, something never attempted before in this country. Accordingly there are a greater number of uncertainties than usual that need to be resolved by the exploration. Forecasts/estimates without detailed drilling data of our own have to be based on comparison with exploration/production from similar rocks in North America.

It should be noted that in the last couple of years technological advances mean the percentage of natural gas retrieved from shale has more than doubled, if not tripled. Also the well life has been extended. Well pad numbers and drilling costs have been considerably reduced. Techniques in the process of hydraulic fracturing/well construction have also advanced.

The background we give in this appendix is similar to that given in Licence PL2-10 although the work programme proposed is different. The latter benefits from previous experience but the background and gas volume projections in County Fermanagh, as mentioned above, are subject to uncertainties and variables that are the very reason for the exploration and rock analysis. Accordingly we do not consider it helpful to try to make new estimates but repeat those given by an independent appraisal of the Tamboran Resources Pty Ltd conclusions (Competent Persons Report by [redacted] Despite the fact the licence area applied for in this new application is a bit smaller the potential gas resource is we consider probably similar. The following is noted for possible discussion when the licence application is being considered:

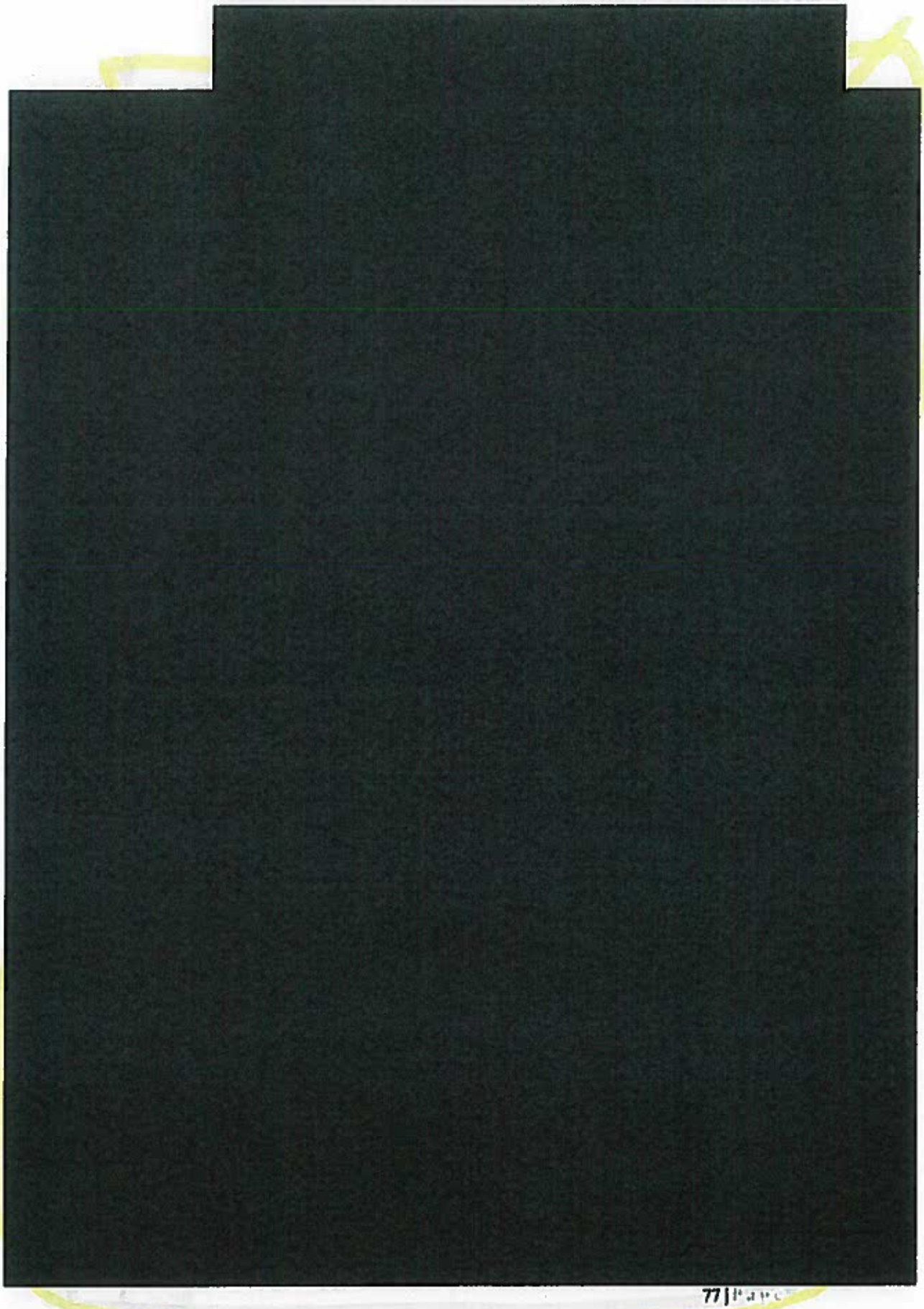
Given a geological sequence that includes thick sealing shales high above the Bundoran Shale, the depth of detailed exploration will extend down from 600 m (nearly 2000 ft.) with the initial rock sample borehole going to about 1,500 m (nearly 5,000 ft.).

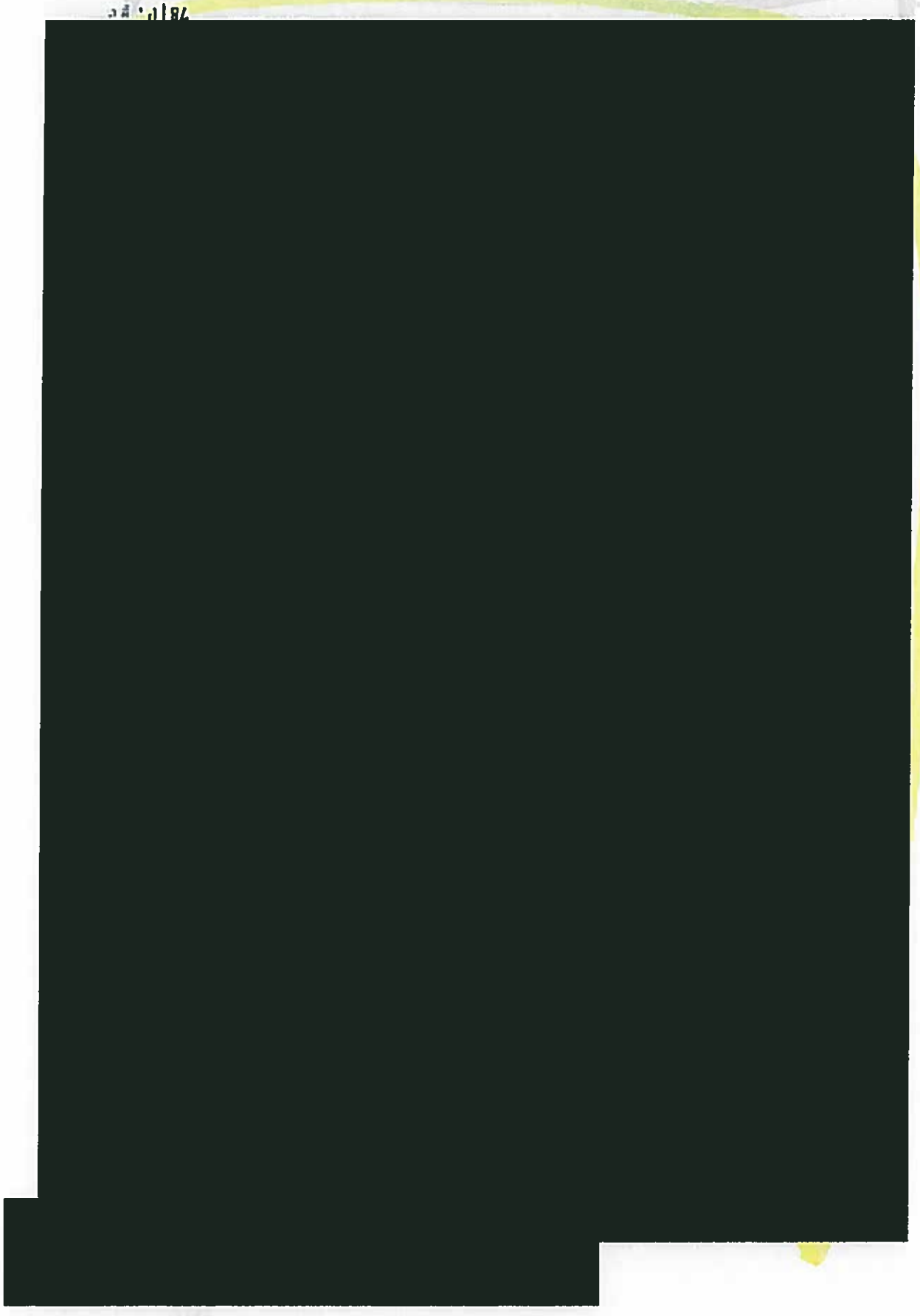
Part of the exploration programme after the drill or drop decision (probably in the third year) will be to further examine the faulting in the licence area. Faulting is generally less pronounced than further north. There are two main sets of faults; normal faults that are on the line of ancient structures (Caledonian) and that were reactivated in late Palaeogene time, and small strike-slip faults caused by compressive forces in Eocene to Miocene time. Detailed 3-D seismic studies will show their precise nature which is unlikely to be deleterious to the project.

Past seismic records show the licence area is tectonically relatively stable compared with Britain. This is a very positive factor. No significant earth tremors have been recorded in the past and certainly none at the level of the English midlands. It indicates the rocks are under little or no tension and will not be vulnerable to drilling activities.

We do not go into details of the methods used to test for natural gas because that will not be happening until after a drill or drop decision in the third year when full planning permission will be required to test. Suffice to say the company has explained publicly on many occasions the techniques it plans to use and that they will incorporate all industry safeguards/government requirements. It is confident that if an economically viable resource

is present it can be extracted entirely to the benefit of Northern Ireland and the local community.





Appendix B4 - Operator competence and technical capacity

The Company will have in place, apart from those named in this application (Appendix B2), a team that includes financial and legal staff. The technical experts (listed elsewhere) hold relevant degrees and professional qualifications (such as chartered status) which require continual professional development. All are encouraged to keep abreast of the most recent developments in the business.

In addition to the staff named in this licence application there will be more working for its consultants. It will be seen that the named staff are all highly qualified in areas relevant to shale gas exploration both locally and internationally.

Every member of Tamboran Resources (UK) Limited and its consultants will be responsible for HSE awareness and adherence. The HSE programme will be overseen by our Engineering & Operations Manager [redacted] and developed, implemented, audited and improved by our HSE consultants, [redacted] Tamboran has developed its own internal HSE management system that has been followed by TRUK and is UK compliant. It is designed to ensure the service providers have existing HSE systems that are specific to their expertise, are up to date, actively adhered to and that those systems comply with existing regulation.

Environmental and regulatory services are provided by [redacted] is a leading environmental consultancy and truly international with 77 offices across Europe, North America, Asia Pacific and Africa [redacted] operates throughout Ireland and Northern Ireland. [redacted] is not only able to assist with identification of regulatory and environmental requirements, but also design and provide the monitoring and follow up work to ensure compliance. The regulatory side of [redacted] work and preliminary environmental work such as scoping and field studies will be overseen by [redacted] Integration of the environmental requirements for the field operations will be overseen by [redacted] and audited by the HSE manager/consultant for a record of performance and to ensure early compliance.

The Drilling & Completions company will provide drilling and well related project management services. Specifically well design, procurement of supplies, tender, review and award of contractor services, logistics planning and execution, inspection personnel, and ongoing engineering support/change management during drilling or completion operations. The company will probably be that awarded the contract for drilling in licence PL2-10 although the work will go out to competitive tender with the chosen company being the best for the job – not necessarily the lowest price. In 2014 the consultants which Tamboran utilised took the drilling location to drill-ready status. It was a UK based company and highly qualified having worked with many UK based oil and gas projects in recent years.

Tamboran Resources (UK) Ltd was extremely pleased with the performance of the drilling company and the professional manner demonstrated by all contractors and personnel involved with Licence PL2-10. This also included all the non- scientific service providers such as PR/Communications (Weber Shandwick) and security.

Following the "dry-run" in summer 2014 the company is confident in the selection and use of these contractors once again for future work. It has to emphasise its unique experience in operating in County Fermanagh (since April 2011), including holding public meetings, communicating with local councils and people, and operating with all the regulatory authorities. It is pleased to be able to continue working with the international professionals at Weber Shandwick in Northern Ireland, Republic of Ireland and throughout the UK.

Part B5 Declaration

A duly authorised officer must approve the information given in this form.

I hereby declare that the information given in Appendix B is correct:

Name	Signature	Capacity	Date
[redacted]	[redacted]		9 September 2016

Tamboran Resources UK
Energy for Northern Ireland

Tamboran Resources (UK) Limited

Application for Petroleum Licence - Lough Allen Basin North

Submitted to Petroleum and Minerals Branch, Department for the Economy

Appendix C: Environmental Awareness Statement

APPLICATION FORM FOR PETROLEUM LICENCE
Petroleum (Production) Act (Northern Ireland) 1964.
Appendix C: Environmental Awareness Statement

Appendix C Environmental Awareness Statement

Two statements are provided: The Health & Safety Policy and The Environmental Policy. Previous versions of these statements are being updated so the current versions have the status of draft policy statements. Final versions are not expected to vary significantly from the original versions and will be forwarded on as soon as they are available.

1. Health and Safety Policy

Tamboran Resources (UK) Limited is committed to achieving a high standard of health and safety performance for its employees, contractors, service providers, visitors and affected communities involved in, or impacted by, its operations and work activities.
Tamboran Resources (UK) Limited will:

- Create, implement and maintain a Health, Safety and Environment Management System to prevent injury or ill health to employees and others affected by the undertaking
- Ensure continuous improvement of the Health Safety and Environment Management System through the auditing process, consultation with its employees and regular reporting of performance in the management review process
- Seek every reasonable means and required resources to provide a safe work environment for all workers
- Use practices and procedures that meet or exceed relevant health and safety statutory and regulatory requirements as well as recognised industry standards
- Encourage the active participation and support of its employees in promoting and implementing an effective safety programme
- Set and review objectives and targets to achieve the aims of this policy and monitor performance against the targets, revising them as required
- Commit management and supervisory personnel to have a direct responsibility for ensuring that these objectives are met
- Create a culture of work where it is understood that no task is too important that time cannot be taken to ensure the task is performed safely
- Facilitate the recovery and return to work of any injured employee
- Require all contractors and service providers to manage their health and safety using standards and practices in-line with this Policy
- Communicate this policy to employees, contractors and service providers by displaying it prominently in Company premises and informing other stakeholders through publishing the policy on websites and in information literature specific to the location

2. Environmental Policy

Tamboran Resources (UK) Limited is committed to minimising the impact of its activities on the environment while managing all operations economically and efficiently.
Tamboran Resources (UK) Limited will:

- Comply with applicable environmental legislation, industry standards, and its own policies in order to prevent pollution and prevent unacceptable impacts on the Environment
- Define strategic objectives and set targets to meet those objectives, measure and monitor performance and progress against targets, including revising targets where necessary to ensure continual improvement in both management systems and environmental performance
- Conduct a Management Review Meeting, attended by top management, at regular intervals (never more than one year apart)
- Integrate environmental considerations into its planning process
- Seek and implement reasonable means to minimise resource usage and disturbance to ecosystems
- Promptly provide relevant information to all stakeholders affected by its operations and to be responsive and sensitive to legitimate stakeholder concerns
- Identify and mitigate the adverse impacts of its operations on the environment in keeping with good environmental and business practices
- Respond to environmental emergencies in a prompt and efficient manner through the development of appropriate response plans based on significant environmental aspects
- Ensure that its employees, contractors, service providers and site visitors are fully informed of their responsibilities to comply with Company environmental management plans to protect the environment while performing their duties
- Inform all stakeholders of this policy and of any potential environmental impacts or controls that they must implement or which may affect them

Position	Signature	Date	Review Date

Both policies will be formally signed off as above and regularly reviewed.

Department for the Economy
www.economy-ni.gov.uk

Petroleum Licence Application PLA2/16

Technical Overview

Summary

The Department has received an application for a Petroleum Licence covering a large area to the west of Upper Lough Erne and south of Lower Lough Erne. This area overlies part of a geological basin, with deeply buried sedimentary rocks that are likely to include organic rich source/reservoir rocks and reservoir sealing rocks. The underlying geology means that there may potential for natural gas to be present. This document provides you with detailed information about the geology, the history of exploration in this area and the Applicant's proposed work programme.

Location and Geology

The area under consideration in this application comprises approximately 650 sq. km. to the west of Upper Lough Erne and south of Lower Lough Erne in County Fermanagh. This area forms part of the geological Lough Allen sedimentary basin[1] in counties Fermanagh, Leitrim and Cavan, which is known to contain rocks of Early Carboniferous age. In the deepest parts of the basin there are successions of Carboniferous and possibly older Devonian sedimentary rocks more than 3.5 kilometres thick. In terms of petroleum geology the Carboniferous strata contain organic-rich shales (potential source rocks and reservoirs), limestones, sandstones (potential reservoir rocks) and mudrocks (potential caprocks or seals).

Unlike in some other parts of Northern Ireland, the Carboniferous shales are known to have been buried for long enough and deep enough for some of the organic matter to have been converted to gas and there may be sufficient gas remaining within the shale for it to be considered as a shale gas reservoir. Chemical and thermal analysis of the shales suggest that the rocks now at the surface are mature for oil and gas and those at depth are mature for wet or dry gas. Significant uplift of the area after deposition and erosion of overlying sediments means that these rocks are no longer generating oil or gas. Much of the gas that

[1] The Lough Allen sedimentary basin is itself part of a larger sedimentary basin complex sometimes termed the Northwest Irish Carboniferous Basin

was originally generated from the shales may have migrated up to the surface and escaped to the atmosphere during periods of uplift and tectonic faulting in the distant geological past.

Figure 1 below shows the Generalised stratigraphy for the Lough Allen Basin in the west of Co. Fermanagh. The units are depicted at their maximum known thickness in that area to form a stratigraphic column. Not all units are present across the area and there is some variability with the lower formations.

Figure 1 Stratigraphy for the Lough Allen Basin

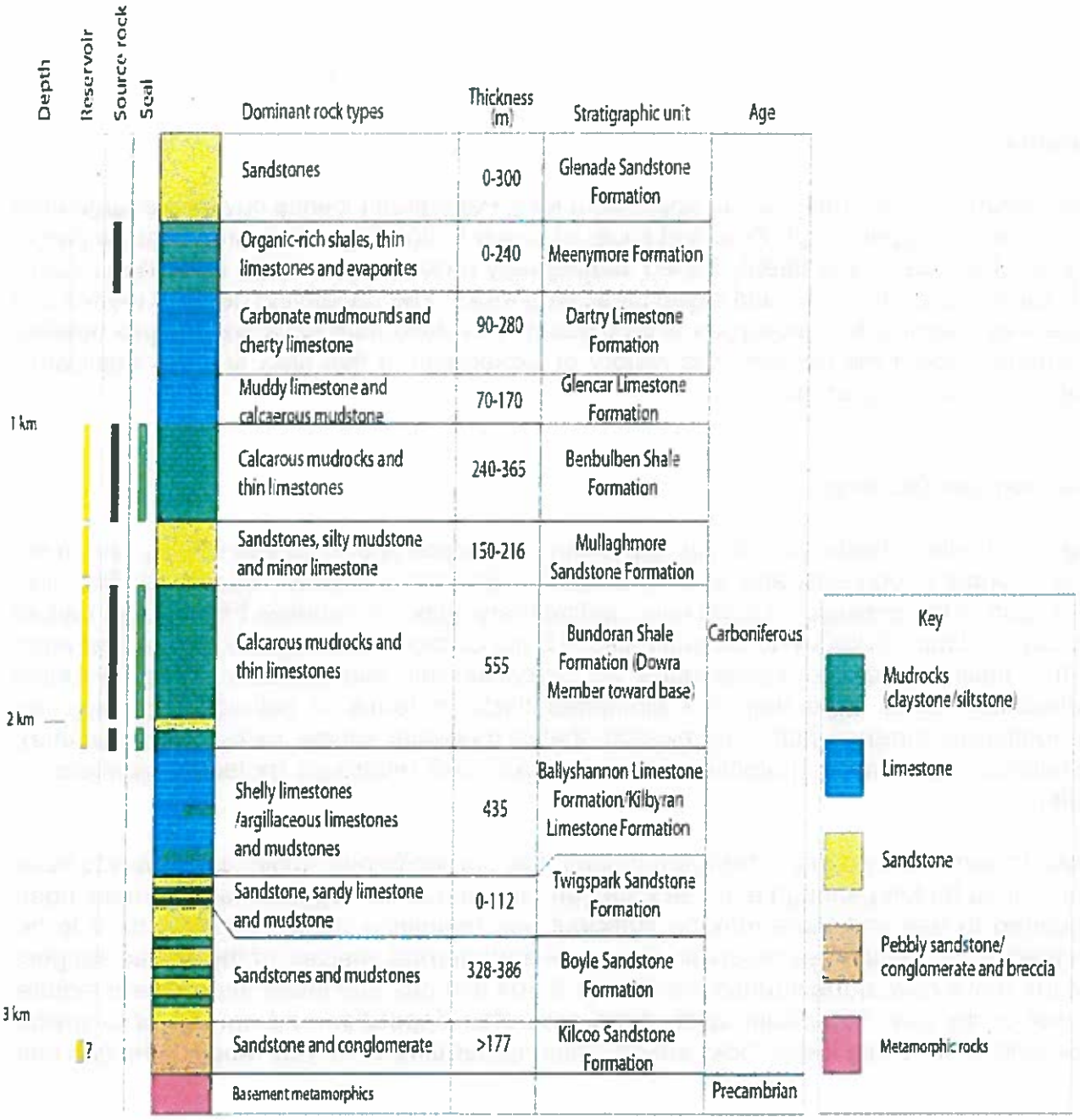
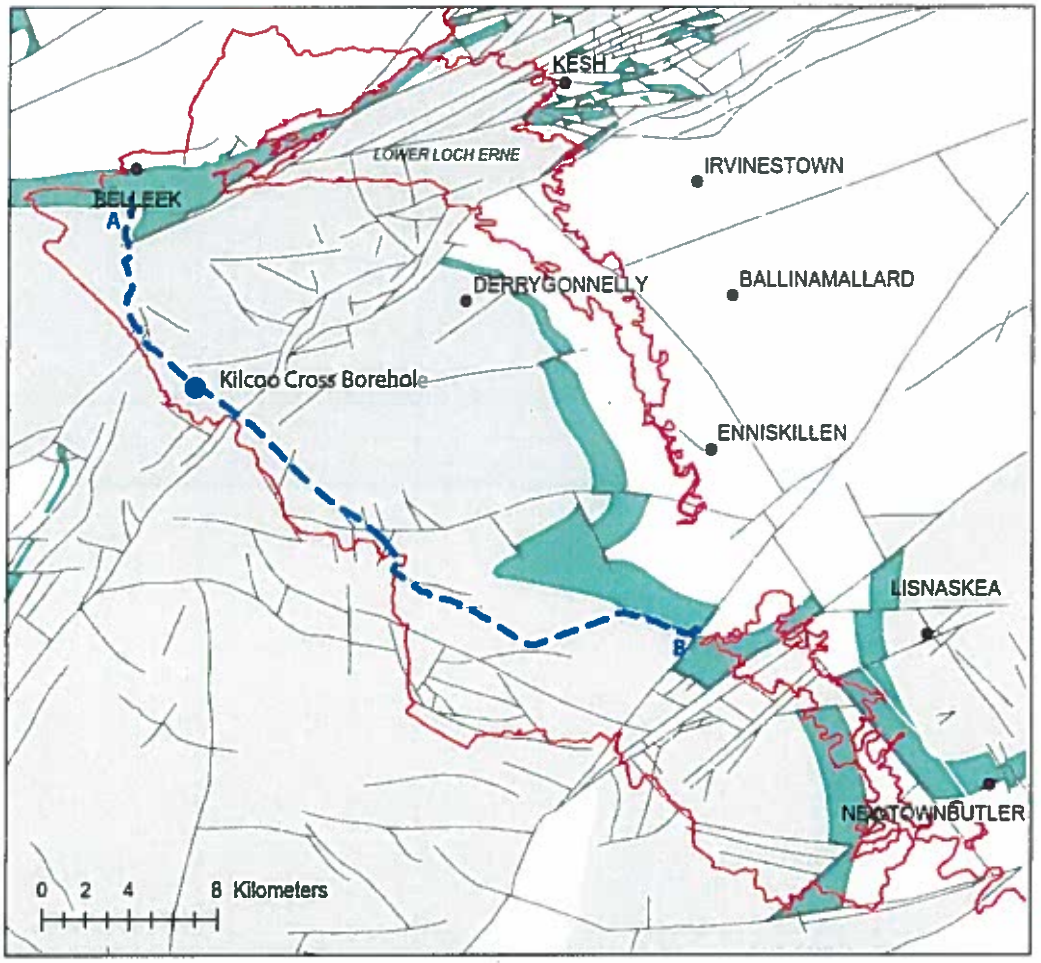
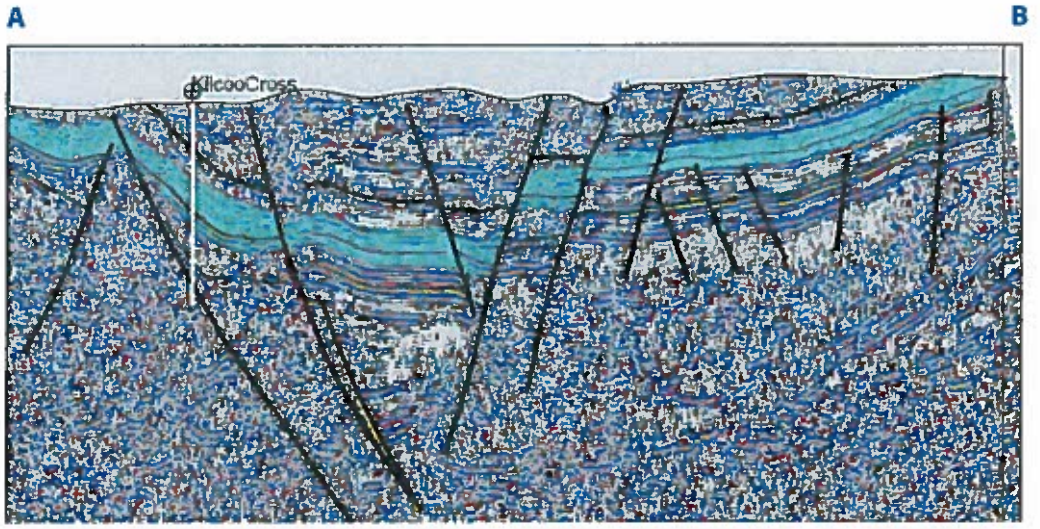


Figure 2 below shows the distribution of the Bundoran Shale at the surface (dark green) and beneath the surface (light green). In general the depth to the top of the shale increases towards the west. The lower image is a seismic reflection line (marked on the map as a thick dashed line from A to B). It shows how a number of large faults (thick black lines) have brought the Bundoran Shale Formation (shaded green) up to the surface at the margins of the basin.

Figure 2 Distribution of the Bundoran Shale





Previous exploration in the area

The area has previously formed part of Petroleum Licences in the 1960's, 1980's and 2000's (Licences PL1/65, PL4/81, PL1/00, PL2/00 and PL3/00). The first exploration wells in the area, Big Dog No. 1 and Owengarr No. 1, drilled in 1965, proved that gas was present, but were plugged and abandoned. In 1981 two sandstone intervals in the Dowra No. 1 well, drilled in 1963 in County Cavan, were hydraulically fractured resulting in a tenfold increase in flow rates. On their own these results did not indicate a commercially viable gas discovery but they did encourage further exploration. A regional seismic survey was shot across the basin in 1981 and two further wells were drilled in 1984-85 (Kilcoo Cross and Slisgarrow). All these wells (Figure 3) had shows of gas from various horizons, including shales and limestones as well as the target sandstone intervals.

Figure 3 Map of Hydrocarbon Exploration Wells in the Lough Allen Basin

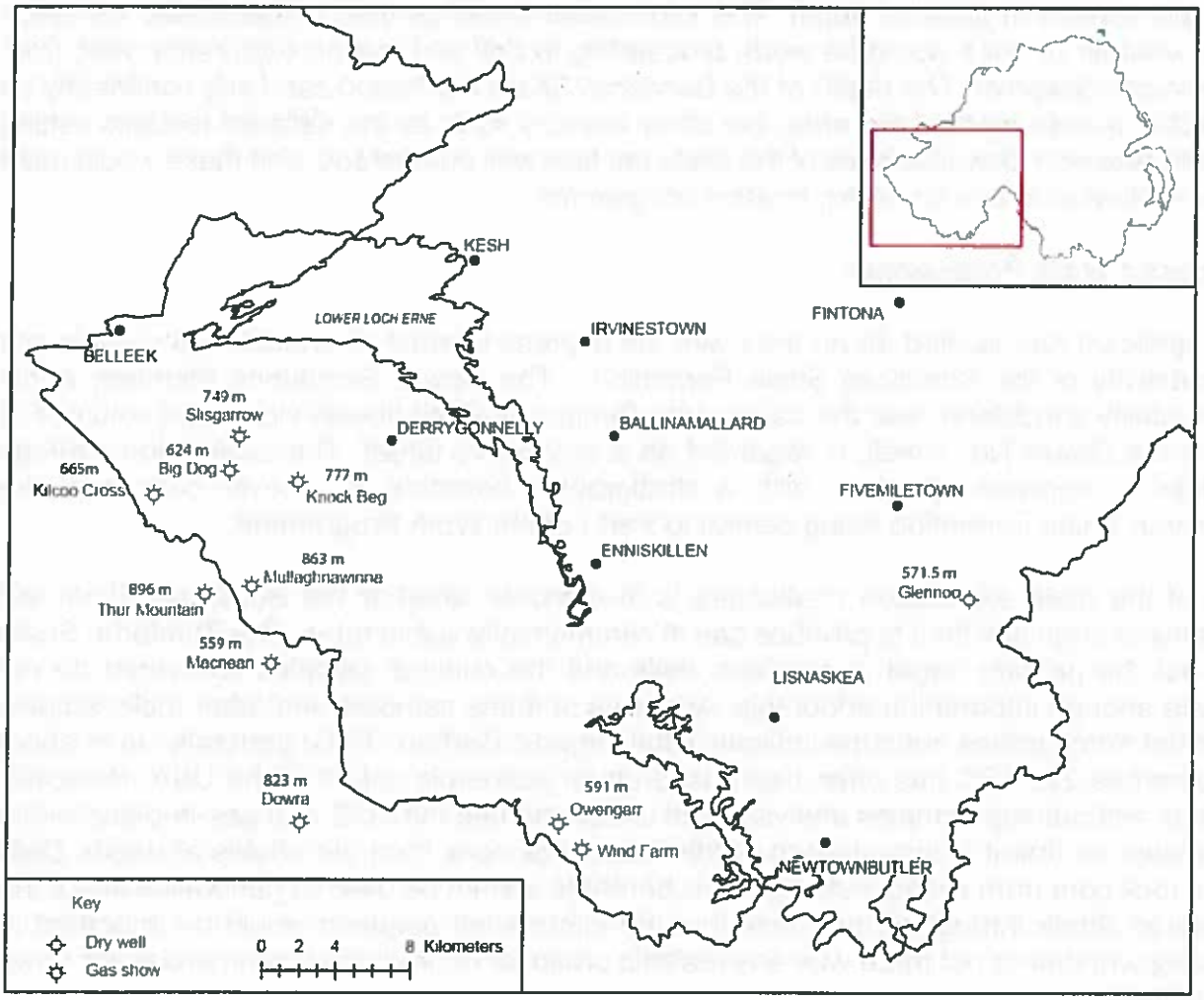


Figure 3 above shows the location of hydrocarbon exploration wells in the Lough Allen Basin, in Northern Ireland and the Republic of Ireland. The depth in metres from the ground surface to the top of the Bundoran Shale Formation is shown above the well. All wells recorded gas shows apart from Glennoo, drilled to the east in South Co. Tyrone.

The primary target Mullaghmore Sandstone Formation reservoirs displayed poor reservoir quality and the gas that was present either did not flow to the surface or was not present in economic volumes. In 2000 Evergreen Resources, a US company with experience of producing gas from similar 'tight gas' sandstones, was granted licences in the Lough Allen basin and drilled four new wells in Fermanagh. The company hydraulically fractured selected intervals in the Mullaghmore Sandstone Formation and ran extended well tests but gas flowed at non-commercial rates. Modelling suggested that significantly better flow rates could be achieved by hydraulically fracturing the sandstone in horizontal wells (all wells drilled to date have been vertical), but Evergreen Resources decided to relinquish the licences without further drilling.

Tamboran Resources (UK) Ltd were awarded a licence (PL2/10) in 2011, with the aim of exploring for shale gas in the Bundoran Shale (Figure 2). The company carried out desk studies and analyses of shale samples but the licence terminated when the company failed to complete Part I of the Work Programme within the required timescale. The main uncompleted component of the Work Programme was the drilling of a stratigraphic borehole to collect fresh core samples of the Bundoran shale in order to ascertain the organic carbon and gas content in place at depth. This information would provide a reasonable indication as to whether or not it would be worth proceeding to drill and test an exploration well, from a technical viewpoint. The depth of the Bundoran Shale Formation can fairly confidently be predicted across most of the area, but other aspects such as the detailed tectonic setting and the reservoir characteristics of the shale are less well understood, and these would need to be evaluated in any future exploration programme.

Proposed Work Programme

The applicant has applied for an area with the express interest of evaluating the shale gas prospectivity of the Bundoran Shale Formation. The Dowra Sandstone Member, a low permeability sandstone near the base of the Bundoran which flowed significant volumes of gas in the Dowra No. 1 well, is regarded as a secondary target. The exploration strategy involves a stepwise approach with a stratigraphic borehole to recover core from the Bundoran Shale Formation being central to Part I of the Work Programme.

One of the main exploration challenges is to discover whether the Bundoran Shale still contains enough gas for it to produce gas at commercially viable rates. The Bundoran Shale was not the primary target in previous wells and the cuttings samples recovered do not provide enough information about this. Analyses of these samples and other rock samples collected from surface outcrops indicate Total Organic Carbon (TOC) generally up to about 1% whereas 2% TOC has often been used as an economic cut-off in the USA. However, cuttings and outcrop samples analyses can underestimate the TOC and gas-in-place within the shales so that it is important to obtain fresh rock core from the shales at depth. Data about rock core from a single stratigraphic borehole cannot be used to generalise about the Bundoran Shale throughout the basin but the information acquired would be important in deciding whether or not there was any realistic prospect of producing commercial gas flows in the basin.

Although the production of oil and gas from shales has increased markedly in the last 15 years or so (shale gas was 0.5% of global production in 2000 and 13% in 2015), the vast majority of this production has been in the USA and Canada. In North America there is a long history of oil and gas production, a large pool of equipment and experienced personnel

and a generally supportive regulatory regime. In Europe there has been relatively little exploration and production, industry capacity and experience is limited, regulatory restrictions are greater and there is more active opposition to the use of high volume hydraulic fracturing ("fracking"). In addition, many of the areas in Europe with shale gas resources are more densely populated than those in North America and the geological settings are different. Consequently, the initial stages of Tamboran's Work Programme would include a detailed structural interpretation of the area and extensive public engagement. Part I of the Work Programme would not include any fracking. If the results from Part I were favourable, and DfE were satisfied with their performance, the company would decide whether they wished to proceed to Part II which would include the drilling, fracking and testing of at least one exploration well. These operations would be conditional on the company obtaining a number of planning, environmental, technical and health and safety consents, which would involve careful assessment of detailed proposals. In the context of planning permission, it should be noted that Paragraph 6.158 of the 2014 Strategic Planning Policy Statement for Northern Ireland (SPPS) states that "in relation to unconventional hydrocarbon extraction there should be a presumption against their exploitation until there is sufficient and robust evidence on all environmental impacts." The SPPS sets out the regional planning policies for Northern Ireland which must be taken into account in the preparation of Local Development Plans, and are also material to all decisions on individual planning applications and appeals.

Summary of proposed Work Programme

Years 1 – 3 (Part I)

- Initiate public engagement programme.
- Re-analysis of existing exploration data, including structural interpretation.
- Identification of potential drilling sites for a stratigraphic borehole; obtain suitable site, design drilling programme for stratigraphic borehole, carry out baseline environmental monitoring.
- Prepare and submit application for permission to drill stratigraphic borehole.
- Subject to obtaining necessary approvals, prepare site and drill stratigraphic borehole, cut and analyse Bundoran Shale core for gas content, mechanical and chemical properties, run downhole geophysical logs.
- Subject to positive results from the stratigraphic borehole, the company will begin process of selection of exploration well site, design of well operations and environmental baseline monitoring.

Drill or drop decision before end of Year 3 – the company informs DfE of its intention to proceed to part II of the Work Programme or it 'drops' – relinquishes – the licence without drilling an exploration well.

Years 4 – 5 (Part II)

- Carry out an Environmental Risk Assessment for proposed shale gas operations as a first stage risk assessment and starting point for engagement with regulators and local communities.
- Complete and interpret a 3D seismic survey over areas of interest.

- Complete plan & design of exploration well, including fracking and testing programme, and all associated monitoring programmes.
- Submit applications for all permits associated with proposed well operations (including planning, technical, environmental, Health & Safety)
- Subject to obtaining all necessary permits, drill exploration well, carry out hydraulically fracturing and testing.
- Analyse results.
- Plug and abandon well, restore wellsite or, if successful, complete well for possible future production.

Depending on the results from the exploration well, the company would inform DfE of their intention to proceed to the Second Term of the Licence, to appraise the drilling results, or relinquish the Licence. In any event the company would relinquish at least 50% of the Licence area.

This is outlined in the following legislation-

http://www.legislation.gov.uk/nisr/1987/196/contents/made
http://www.legislation.gov.uk/nisr/2010/169/regulation/2/made

Annex C

Petroleum Licence Application PLA2/16

Company Brief

Tamboran Resources UK

Energy for Northern Ireland

Company Profile

About Tamboran Resources (UK) Limited

Tamboran Resources (UK) Limited (TRUK) is a UK & Irish owned natural gas company which plans to evaluate natural gas in County Fermanagh for commercial extraction.

In September 2016, TRUK applied to the Department for the Economy (DfE) for a Petroleum Licence to carry out a 5 year, £30 million exploratory Work Programme.

Based on existing geological data and information from the 14 wells previously drilled (5 of which were fracked), TRUK believes there to be significant natural gas reserves in Fermanagh which could provide a local solution for security of supply in Northern Ireland for years to come.

Whilst gas production is at least 5 years away, the company plans to generate employment and cultivate a specialist local supply chain.

TRUK has a Senior Management Team and network of consultants and contractors with extensive experience of working in oil and gas exploration.

Senior Management Team

- **Karl Prenderville - Chief Executive**

  Karl Prenderville became the Chief Executive following a management buyout of the company in July 2016. From 2011, he was Tamboran's Commercial Director, UK and Ireland, and the Commercial Director of TRUK. He has wide-ranging international and Irish experience, having acted as Commercial Director for Dublin-based Island Oil and Gas PLC until 2008, Rockfield Oil and Gas Limited until 2011 and is a senior member of the Irish oil and gas business community. Previously, with Enterprise Energy Ireland Limited, he was responsible for establishing the Dublin operational base for the Corrib project, which currently provides the Republic of Ireland with up to 50% of its natural gas. He has extensive experience in setting up and managing start-up operations across the world, having worked for Enterprise Oil plc for 18 years. He is based in Dublin.

Senior Management Team

- **Dr. Tony Bazley - Director of Environmental, Community and Technical**

  Tony Bazley was Tamboran's Director of Environmental, Community and Technical from 2011 and has been a Director of TRUK since 2013, with responsibility for operational, environmental and technical matters. He is a Chartered Geologist and a Senior Fellow of the Geological Society of London. He was Honorary Professor at both the University of Wales and Queen's University Belfast and has held a number of other senior positions, including President of the Belfast Geologists' Society in 1999 and 2009, Member of the Northern Ireland Council for Nature Conservation and the Countryside from 2009 to 2013 (advising the Northern Ireland government) and Director of the Geological Survey of Northern Ireland from 1993 to 1998. He is a founding member of the Earth Science Ireland Group and Editor-in-Chief of Earth Science Ireland Magazine. He is based in Northern Ireland.

Senior Management Team

- **Jeremy Deeley - Director, Legal and Commercial**

Jeremy Deeley has been the Legal and Commercial Director of TRUK since July 2016. Previously the Managing Counsel for Mobil UK, he has acted at senior legal consultant level since 1999 for a number of companies including Enterprise Oil, Shell and Tullow. He has significant experience of working in Ireland, having worked from 2000 to 2002 for Enterprise Energy Ireland on Corrib gas transportation and sales, as General Counsel for Island Oil and Gas from 2007 to 2010, Rockfield Oil and Gas from 2011 and Ardilaun Energy from 2015 to 2016. He has also worked as a consultant at partner level in the London energy practices of CMS Cameron McKenna, Hogan Lovells LLP and Stephenson Harwood solicitors, engaged on various international petroleum, mergers and acquisitions, and gas pipeline projects. He is based in London.

Senior Management Team

- **Professor Garth Earls - Senior Geologist and Community Engagement**

  Prof. Garth Earls has provided technical expertise to TRUK since July 2016. He is a Fellow of the Society of Economic Geologists, an accredited European Geologist and a member of the Institute of Geologists of Ireland. He has acted in a number of key roles, including Chairman of the Royal Irish Academy National Geoscience Committee from 2002 to 2010, President of the Belfast Geologists Society Committee in 2007 and as Adjunct Professor, University College, Cork from 2012 to date. He was Director of the Geological Survey of Northern Ireland from 2002 to 2010 where he was responsible for the implementation and delivery of the Tellus Project. Professor Earls is also a former Managing Director of Dalradian Gold. Since 2000, he has sat on the Earth Science Ireland Committee. He is based in Northern Ireland.

Company History

- TRUK was previously owned by Australian oil and gas company Tamboran Resources Pty Limited and is now under local ownership. A brief chronology is as follows:

2010	June	The then Department for Enterprise Trade and Investment (DETI) published a Notice (2010/C169/4) in the Official Journal of the European Union announcing the availability of all of onshore Northern Ireland for Petroleum Licence applications
	August	Tamboran applied to DETI for a Petroleum Licence for exploration in the Lough Allen Basin
2011	April	DETI issued Petroleum Licence 2/10 (Lough Allen Basin - North) to Tamboran
2014	July	PL2/10 Licence assigned to TRUK, Tamboran's wholly owned UK subsidiary
	September	PL2/10 Licence determined
	October	Irish investors, Ardilaun Energy, acquired a majority interest in TRUK
2016	July	TRUK acquired by UK and Irish investors via management buyout
	September	TRUK submitted an application to the Department for the Economy (DfE) for a new Petroleum Licence covering substantially the same area as PL2/10, minus certain areas close to Lough Erne
2019	May TBC	DfE commenced consultation process in relation to TRUK's new Petroleum Licence application

Tamboran Resources UK

Benefits of Natural Gas from Fermanagh

Employment and Training

- If the economically recoverable gas is available in the quantities TRUK believes likely, it anticipates creating thousands of direct and indirect jobs both within the industry and through service industries. A more accurate figure will be informed by further test results and a full development plan.
- TRUK is committed to ensuring that communities local to the project receive the maximum benefit possible and will support training of local workers and use local suppliers as far as possible.
- Northern Ireland could develop shale gas expertise that would put it ahead of most of Europe and potentially create international opportunities for experienced shale gas workers in the same manner that has enabled Aberdeen to develop as a specialist offshore oil and gas services and operations centre.
- During the PL2/10 Licence, TRUK received several hundred enquiries from local residents, and people working in other shale projects or wanting to come home from Australia, Canada and the USA.

Benefits of Natural Gas from Fermanagh

Local Gas Supply

- Fermanagh natural gas should be cheaper and better for the environment than international imports, reducing transportation costs and CO2 emissions.
- Buying imported natural gas means the money leaves the country and transportation costs have to be paid on top. Domestic natural gas production results in Corporation Tax, VAT, PAYE and other domestic taxes being paid to the Government, which would stay within the country.
- Were domestic gas production to apply downward pressure on gas prices, this could help those in fuel poverty, attract new industries and provide well-paid jobs. On numerous occasions, the Northern Ireland manufacturing sector has cited high-energy prices as a reason for companies relocating, downsizing or even closing. Conversely, lower gas prices in the USA has seen major industries relocating back to America from around the world.
- At present, all of Northern Ireland's natural gas is imported via the pipeline from Scotland. Fermanagh natural gas has the potential to provide a secure supply of natural gas for decades to come.

Benefits of Natural Gas from Fermanagh

Inward Investment

- A local supply of natural gas attracts other industries that require a secure and reliable gas supply. This could in turn provide much needed revenue for things like road repairs, infrastructure, the health service and rural schools. This has been the experience in Pennsylvania, where manufacturing is on the rise again after years of decline, and the industry has spent millions upgrading the roads.

Community Benefit Fund

- Should TRUK proceed to the development stage, the company is committed to a local community benefit fund which should see schools, community groups, sports clubs and other projects receive support directly. This is likely to follow the lines of the proposed UK Shale Wealth Fund, which TRUK fully supports.

Work Programme

As part of the Petroleum Licence application process TRUK has submitted a five-year Work Programme, which is currently under consultation. The proposed work programme is in two parts:

Part 1

- There will be no hydraulic fracturing in Part 1 of the Petroleum Licence.
  Instead, TRUK will drill a stratigraphic borehole to collect rock samples, which will provide better insight into the volumes of gas contained below the surface.

Part 2

- TRUK will acquire, process, and interpret 3D seismic, which will be used to determine the drilling location.
- A planning application and Environmental Impact Assessment (EIA) will be submitted to the Planning Authority. This would be subject to expert and public scrutiny.
- Once the necessary consents are in place, a borehole will be drilled to test the natural gas potential of the Bundoran Shale Formation using hydraulic fracturing.
- If results are positive and the company wishes to progress beyond the initial 5 year exploration period, TRUK will have to submit a second Work Programme to the Department for the Economy.

Contact Us

To find out more about TRUK's exciting plans to explore for natural gas from shale in County Fermanagh, you can visit the company website, which includes a section on Frequently Asked Questions.

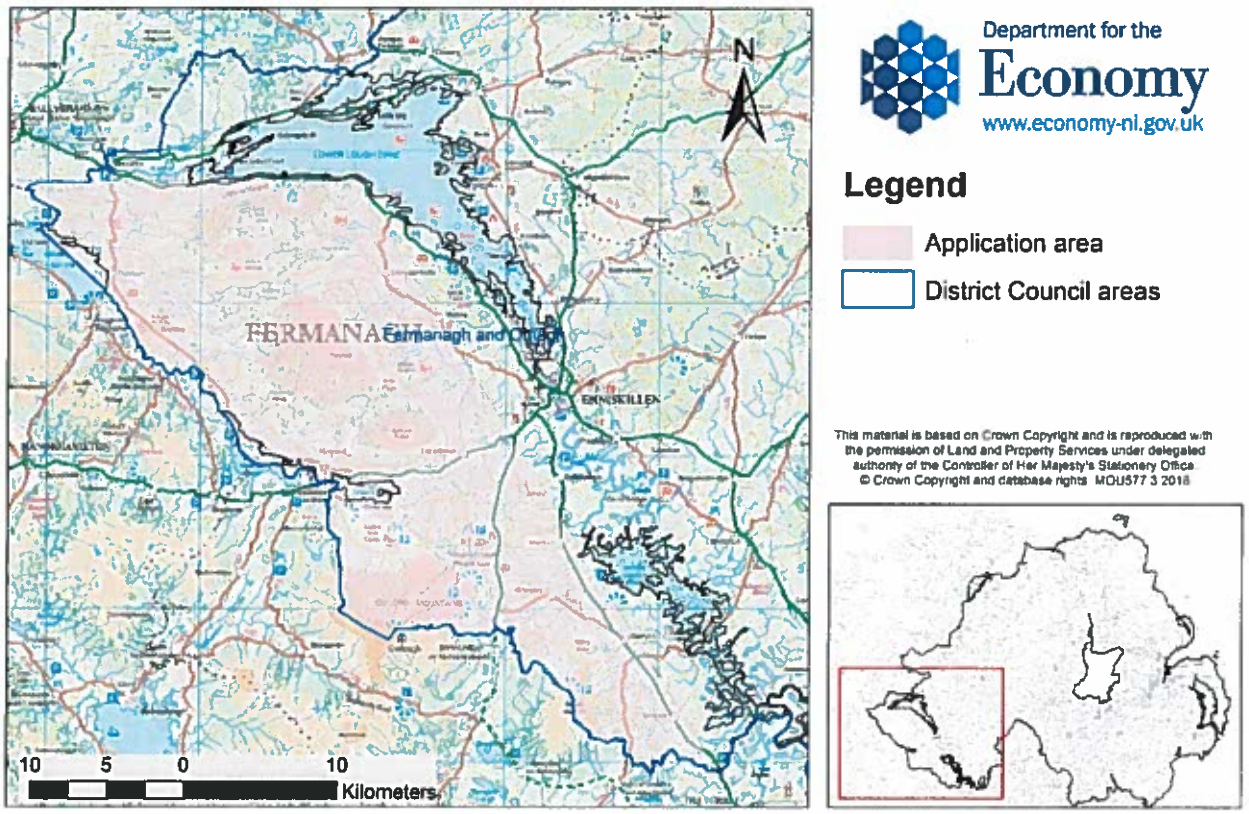
- **Contact Address:**

  Tamboran Resources (UK) Limited
  Scottish Provident Building
  7 Donegall Square West
  Belfast BT1 6JH

- **W:** fermanaghnaturalgas.com
- **T:** 02890 912 839
- **E:** ni@trukni.co.uk

Petroleum Licence Application PLA2/16

Area Under Consideration



This Licence application covers all, or part of, the following wards (all wards are within the Fermanagh and Omagh local government district):

Belcoo and Garrison
Belleek and Boa
Boho Cleenish and Letterbreen
Derrygonnelly
Derrylin
Florence Court and Kinawley

Department for the
Economy
www.economy-ni.gov.uk

Petroleum Licence Application PLA2/16

Petroleum (Production) Act (Northern Ireland) 1964 (1964. Ch.28.)

In exercise of its powers in the above Act under section 2(1), the Department for the Economy is considering a Petroleum Licence Application (PLA2/16) within the County of Fermanagh.

Details of the application, including a map showing the area covered by the proposed licence, may be inspected at the addresses below between Monday and Friday, 9.30 am to 12.30 pm and 2.00 pm to 4.30 pm.

Department for the Economy,
Minerals and Petroleum Branch, Dundonald House, Upper Newtownards Road, Belfast, BT4 3SB

Fermanagh and Omagh District Council,
Townhall, 2 Townhall Street, Enniskillen, Co Fermanagh, BT79 7BA
The Grange, Mountjoy Road, Lisnamallard, Omagh, Co Tyrone, BT79 7BL

This information has also been made available at:
https://www.economy-ni.gov.uk/consultations/petroleum-licenceapplication-pla216

Any person may make representations to the Department about the petroleum licence application by 05 July 2019 either by email to minerals@economy-ni.gov.uk or by post to the above address.

Please quote the reference PLA 2/16 in your representation.