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Geoff Underwood
Examining Authority
National Infrastructure Planning
Temple Quay House
2 The Square
Bristol, BS1 6PN

Our Ref: CDP/EX/10

29 January 2025

Dear Mr Underwood,

EN010128: APPLICATION BY CORY ENVIRONMENTAL HOLDINGS LIMITED FOR AN ORDER GRANTING DEVELOPMENT CONSENT FOR THE CORY DECARBONISATION PROJECT – RESPONSE TO RULE 17 AND GENERAL UPDATE

I write on behalf of the Applicant, Cory Environmental Holdings Limited, to provide:

- the Applicant's response to the ExA's Rule 17 Request of 22 January 2025 in respect of Landsul/Munster Joinery's request for cross-examination to take place at the forthcoming CAH2;
- the Applicant's response to the ExA's Rule 17 Request of 22 January 2025 in respect of correspondence it had received from Southern Gas Networks ('SGN'); and
- to otherwise update on some matters that may be of assistance to the ExA in finalising its agenda for the forthcoming Hearings.

Landsul/Munster Joinery

SoCG Update

Before turning to cross-examination matters, the Applicant considers it would be helpful to update the ExA on progress in the discussions between the parties in Examination to date, acknowledging that there have been previous oral submissions as to the possibility of submitting a Statement of Common Ground ('SoCG') between the Applicant and Landsul/Munster Joinery into the Examination.

The Applicant has been seeking to work with Landsul/Munster Joinery on such a document. A draft was sent by the Applicant to them on 18 December. A meeting was then held on 8 January to discuss the draft SoCG, where Landsul/Munster Joinery presented on screen (and then subsequently sent the document to the Applicant) the

changes they wanted to make the SoCG, involving a fundamental restructure of the document.

At that meeting, it was agreed that the Applicant would seek to amend the front-end of the document (which it did and reverted on 10 January), whilst Landsul/Munster Joinery were to aim to send back the substantive discussion tables within the document by 15th January, to seek to get to a position where a SoCG could potentially be submitted by 24 January. This was dependent on the Applicant's ability to be able to reflect an initial response to Landsul/Munster Joinery's Deadline 3 submission within that time period.

The revised SoCG was then received by the Applicant on 17th January, with a number of changes; alongside Landsul/Munster Joinery's substantial Deadline 3 submission which was reflected in the expression of their position in the draft SoCG.

Having initially reviewed that Deadline 3 submission, the Applicant considered that it was unable to meaningfully update the SoCG in that time period.

In that context, whilst a SoCG was not able to be submitted on 24th January, both parties are keen to assist the ExA in setting the agenda and focussing its questions at the Hearing.

To that end, the parties have agreed that the below 'List of Issues' are the issues in which the parties are 'not agreed', and therefore require the ExA to examine and determine its views, in considering whether the Applicant has made out its case for compulsory acquisition of Landsul/Munster Joinery's land. This testing could be undertaken at the Hearing, and/or through written questions through the rest of the Examination period.

Notwithstanding the above, the Applicant is also working on setting out its initial responses to the points raised in Landsul/Munster Joinery's submissions prior to the Hearings so that the ExA, and Landsul/Munster Joinery, are aware of the principles of the Applicant's position on the below issues prior to CAH2. It is aiming to do this by 5 February at the latest.

These 'principles', followed by consideration of what is said at the Hearings, would form the basis of seeking to agree an update to the SoCG, if possible, with Landsul/Munster Joinery, as well as the Applicant's Deadline 4 submissions.

List of Issues

1. Whether Dr Edgar's Alternative Layout is a feasible alternative
2. The approach to managing environmental impacts in the Alternative Layout.
3. The approach to the space requirements for the carbon storage tanks to provide the agreed buffer storage capacity.
4. The approach to electrical distribution and footprint required for electrical switchgear.
5. Whether or not there is sufficient heat demand, separate to the heat demand for heat captured from Riverside 1 and Riverside 2, to justify the inclusion of a heat transfer station for the Carbon Capture Facility.

6. Whether it is necessary to adopt a two line carbon capture facility rather than a single line carbon capture facility as the basis of design.
7. Whether it is necessary to segregate the carbon capture facility from the Riverside 1 and 2 EfW plants and the resultant provision of separate control room, welfare facilities, gatehouse, car parking and operational laydown.
8. Whether it is necessary to have a contiguous site for all of the proposed plant and specifically whether some of the proposed plant could be located to the south of the Landsul land with the balance to the north of it.

Comments on Cross Examination

In the Applicant's view, it is considered that cross-examination is not required.

Paragraph 14 of the April 2024 Guidance on the Examination Stage indicates that *'Hearings are inquisitorial rather than adversarial, with the Examining Authority probing, testing and assessing the evidence through direct questioning of persons making oral representations'*.

The cases referred to by Landsul/Munster Joinery did not arise in the context of section 94 and the aforementioned Guidance and do not take account of the fact that the NSIP regime is set up to be a system where the Applicant's case (and any Interested Party's) is thoroughly tested by an ExA over a six month period, in an inquisitorial fashion.

Both the Applicant and Landsul/Munster Joinery have submitted extensive written submissions into the Examination and will continue to do so. As discussed below, these have been informed by technical expertise and are set out clearly to enable the ExA to understand the parties' position on the key issues under dispute.

In this context, the ExA will be able to probe the adequacy and robustness of each party's submissions – there is no reason that this probing needs to be done by Counsel, when the ExA is able to do so.

As such, the ExA will be able to, in response to Landsul/Munster Joinery's point (i), test the robustness of the expert evidence submitted by both sides.

In this respect, the Applicant notes that paragraph 8 of Landsul/Munster Joinery's request suggests that the Applicant's case is limited to a 'series of assertions'. The Applicant refutes this in the strongest possible terms. Not only has the Applicant provided Landsul/Munster Joinery with detailed technical information (referred to in Dr Edgar's reports) when it has asked for during this Examination period, but it is also the case that, as the Applicant has stated in its submissions to date, the application for the Proposed Scheme has been developed over a number of years, by a multi-disciplinary project team. This team has put together the written submissions in this Examination, which are therefore not 'based on assertion'.

In particular, the technical element has had substantial input from one of the leading CCS engineering experts in the UK, Tony Alderson (whose CV is enclosed with this letter), who spoke at CAH1 and ISH1, together with experts in the various engineering requirements which underpin the Carbon Capture Facility (e.g. water and electricity) and the operational experience of Cory.

In light of the above, the Applicant would also highlight that any cross-examination would need to capture not just Mr Alderson, but the other members of the team who have fed into the requirements developed for the matters set out in the List of Issues. This would be inefficient and demonstrates the unsuitability of it as an approach in this setting – an Examination is not a multi-day adversarial Inquiry where a multitude of witnesses are cross-examined.

In response to Landsul/Munster Joinery's point (ii), the ExA will be able to probe whether the Applicant has made out the case for interfering with convention rights. CAH2 is a compulsory acquisition hearing deliberately timetabled to consider these questions to allow the ExA to report upon them, as happens in NSIP Examinations across the country. The ExA is able to undertake the 'most thorough scrutiny' through orally testing the positions made, as it did at CAH1 and ISH1. The question of whether Landsul/Munster Joinery's land can be avoided turns on the List of Issues, which are focussed on the need for flexibility and demonstrating practical requirements for land. These are questions fundamental to most DCOs (and indeed in the latter case, section 122 of the Planning Act 2008) and which are frequently tested in detail in Examinations. There is no reason that this cannot take place at CAH2 and in the rest of the Examination without the need for cross-examination.

In response to Landsul/Munster Joinery's point (iii), there will be sufficient time for the ExA to consider the specific issues which go to the appropriateness of Landsul/Munster Joinery's land being compulsorily acquired. As can be seen from the List of Issues, it is clear what is in dispute between the parties.

By way of example, the ExA would be able to ask the Applicant to explain why it thinks the difference in size between a single or two line plant would not be determinative of the need for Landsul/Munster Joinery's land, or indeed ask Dr Edgar why he thinks that it would be – it does not require Counsel to do this. With the exception of the Heat Transfer Station and the Control Room/Welfare Facilities and Gatehouse, there is no dispute between the parties as to whether the different aspects of the Carbon Capture Facility are <u>needed</u>, rather the disputes centre on their size and location within the constraints of the SIL land adjacent to Norman Road.

Finally, in response to Landsul/Munster Joinery point (iv), the ExA will be able to test whether the Applicant's evidence has been inconsistent.

In any event on this point, the Applicant refutes fully the suggestion that it has been inconsistent to date on heat. Noting firstly that the Applicant has not yet had the opportunity to respond to Landsul/Munster Joinery's Deadline 3 submissions, the Applicant highlights that it set out its position clearly on the matter of heat networks in its Deadline 1 submissions following ISH1.

Appendix A to its Written Summary of Oral Submissions at Deadline 1 (REP1-026) sets out the interaction of the Proposed Scheme with Riverside 1 and Riverside 2 in relation to heat, so the Applicant is unclear what is meant by the suggestion that the Applicant did not clarify its position in writing.

It is noted that at the meeting of 8 January referred to above, Landsul/Munster Joinery indicated that they intended to submit the Fichtner Report that is included within their Deadline 3 submissions and asked the Applicant to explain if its estimate of heat demand had moved on from that historic report.

The Applicant in response indicated that it would provide a full response as part of the response to Landsul/Munster Joinery's Deadline 3 submission but would set out the headlines of its answer after the meeting. It then did so on 10 January, with the text below. As noted, the Applicant will expand on this at CAH2/Deadline 4, but this clearly demonstrates that the Applicant has answered the questions posed to it, and its position has not been inconsistent.

- *Cory is actively working on heat supply, so as to provide a strategic contribution to the decarbonisation of London's heat. Its active work includes looking at supplying heat towards central London, where demand is very high, and individual property heat decarbonisation solutions are challenging, and there are few other major low heat sources to support heat networks.*
- *Cory are actively engaging with heat consumers, whose forecast demand by the early 2030s is over 1.2TWh per year.*
- *The total heat demand of the City of Westminster is c.4.2TWh, and the total heat demand of the City of London is c.1.3TWh – both are due to be almost entirely zoned as heat networks.*
- *This demand is many times the size of the available heat from Cory previously forecast, but using advanced heat recovery techniques (including recovering heat from CCS) Cory can make a major contribution.*

It is clear, therefore, that the Applicant's extensive written submissions are substantive, consistent and expert-led.

As a predominantly written process, the Applicant considers it appropriate that the parties continue to focus their submissions on substantiating their positions and that the ExA will be able to probe those areas that it considers require further clarification at the Hearing.

Finally, in respect of cross-examination, the Applicant would note:

- if the ExA disagrees with the Applicant's position and determines that cross-examination would be appropriate at CAH2, the Applicant considers that Dr Edgar should also be cross-examined by the Applicant; and
- that if cross-examination is to focussed, given the ability for the ExA to probe each party's position in any event, 90 minutes would seem to be an excessive amount of time.

Southern Gas Networks

The Applicant can confirm that it has exchanged correspondence with SGN's legal representatives following its correspondence with the ExA. It has shared the Protective Provisions contained within the DCO with SGN, and discussions are on-going to ensure that SGN is content that it is adequately protected.

Given the positive outcomes of these discussions on the Riverside Energy Park Order, the Applicant is confident that a resolution will be able to be reached in short order – if not by the Hearings, then shortly after. The Applicant will provide an update on progress with discussions at the DCO ISH.

Update on Other Matters

The Applicant is continuing to discuss matters of concern with Interested Parties to seek to reach resolution to the issues that they have raised.

To this end, enclosed with this letter is an updated draft SoCG with London Borough of Bexley. This has been agreed to be able to be submitted by both parties but is not the final version of this SoCG.

In preparation for the DCO ISH, the Applicant is considering the draft Protective Provisions submitted by the Environment Agency and will be able to provide an update on its view on those provisions at the Hearing.

Similarly, the Applicant is currently considering the draft Protective Provisions that have been provided to it by TWUL and hopes to make good progress in the discussions on them with TWUL prior to the DCO ISH, to also enable an update to be given on those discussions at the Hearing.

Finally, the Applicant has noted that in updating the **Design Principles and Design Code (REP3-009)** at Deadline 3, it omitted to include an update that it had signposted would be included in the next version of that document in Table 2-3-2 of REP2-019 (in relation to generators). As such, this update has been added to an updated version of the document enclosed with this letter.

If you have any further questions, please do not hesitate to contact me or the project team. I can confirm that a copy of this correspondence has been sent to Landsul/Munster Joinery, as requested by the ExA.

Yours sincerely,

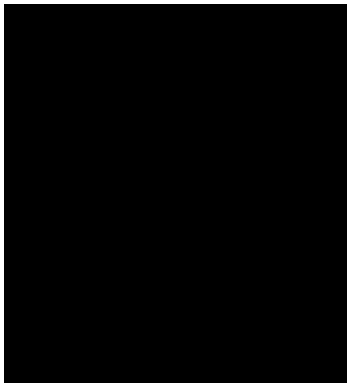
[redacted]

Richard Wilkinson
Project Director
Email: decarbonisation@corygroup.co.uk
Phone: 0330 838 4254

Enclosure: Tony Alderson CV

ANTHONY RICHARD ALDERSON

Associate Director



CAREER SUMMARY

Anthony (Tony) Alderson is a Chartered Chemical Engineer with experience in the provision of engineering design, technical support and specialist consultancy services to the process and energy sectors.

Key skills include:

- Expertise in carbon capture and storage, hydrogen, liquefied natural gas, industrial decarbonisation and industrial symbiosis, Fischer-Tropsch Synthesis/gas to liquids and gasification.
- Technical due diligence, technology evaluation and appraisal
- Process design, evaluation and simulation.
- Project planning, management and financial control.
- Capital cost estimation and economic/techno-economic evaluation.
- Market assessment and competitor/opportunity analysis
- Experienced HAZID/HAZOP chair

11 years with WSP

35 years of experience

Area of expertise

Carbon Capture & Storage

Hydrogen

Liquefied Natural Gas

Industrial Symbiosis

Gasification

Fischer-Tropsch Synthesis

HAZID/HAZOP

Language

English

EDUCATION

BEng Chemical Engineering, University of Birmingham	1988
BA Politics, Philosophy & Economics, Open University	2015

PROFESSIONAL MEMBERSHIPS

Member of the Institution of Chemical Engineers	1995
Chartered Engineer	1995

ANTHONY RICHARD ALDERSON

Associate Director

PROFESSIONAL EXPERIENCE

WSP, UK - Associate Consultant/Associate Director (2012-present)

- Provides technical expertise in carbon capture and storage, hydrogen and liquefied natural gas within the WSP Energy Transition business. Specific experience includes:
- Technical lead for carbon capture in WSP-led team acting as CCUS Technical Advisors to UK Government supporting the commercial-scale implementation of CCUS clusters across the country. This has included technical evaluation of potential capture projects, detailed review of shortlisted projects, technical input into business models, assessing system responsiveness and the techno-economic evaluation of non-pipeline transportation (NPT) options for CO_2 transport, including marine and rail.
- Technical lead for feasibility and pre-FEED studies for carbon capture retrofit at large-scale Energy from Waste (EfW) facility, including CO_2 liquefaction and ship loading facilities for marine transportation, together with provision of technical support to Development Consent Order application, including acting as an Expert Witness.
- Technical lead for carbon capture feasibility study for client in the oil & gas sector. This included evaluation of the viability of rail and road transportation of captured CO_2 from the facility to potential storage clusters.
- Technical advisor for project evaluating the potential utilisation of ports throughout the UK for CO_2 export and import, including determination of required process facilities, space requirements and potential CO_2 throughputs.
- Carbon capture Subject Matter Expert (SME) supporting delivery of feasibility and pre-FEED studies for multiple carbon capture projects in the EfW and biomass power generation sectors.
- Performed Technical Due Diligence for two post-combustion carbon capture projects currently under development.
- Technical lead in feasibility study for development of a hydrogen and CCS cluster in the Southampton region for SGN. Scope includes identification of hydrogen demand from sectors including power generation, industry and transportation and determination of required hydrogen production volumes, technologies and plant locations.
- Technical lead/SME in pre-feasibility studies for blue hydrogen production with carbon capture for two clients in Canada. Scopes of work include development of high-level material balances, feedstock and utility requirements and CAPEX/OPEX estimation.
- Performed technical due diligence evaluation for proposed integrated Allam Cycle power generation / hydrogen-ammonia-urea complex with CCS located in New Zealand.
- Technical lead in pre-FEED design study for demonstration facility for Allam Cycle carbon capture technology, providing key technical oversight and input to multi-disciplinary engineering design team.
- Technical lead in due diligence of new-build oxy-combustion coal-fired power generation CCS demonstration project located in the UK on behalf of Lenders.
- Delivered workshop on hydrogen and CCS technologies, project developments and lessons learnt from UK experience to client's technical team in the Netherlands.

ANTHONY RICHARD ALDERSON

Associate Director

- Technical lead in project lead by Cornwall Insight to develop alternative financial support mechanisms to fund CCS-equipped power generation for BEIS.
- Performed technical review and monitoring of CCUS RD&D projects on behalf of DECC. This included review and approval of project deliverables and milestone reports, production of evaluation reports of each project and attending project progress meetings and providing technical input to the project consortia. One of these projects focussed on the production of hydrogen via electrolysis, followed by reaction with captured CO_2 to produce SNG.
- Technical lead in project developing a long-term CCS strategy for potential implementation in South Africa. This included identifying and identifying power generation and industrial sites with the potential for carbon capture, the determination of total capture potential across the country and the development of capital costs for each capture unit and for offshore storage facilities to feed in to an overall economic model. I presented the results of the project to a government-level conference in South Africa.
- Project managed techno-economic evaluation of algae technology for carbon capture for power project in southern Africa, including technology evaluation and capital and operating cost development of leading algae technologies.
- Provided performance and cost data to updated cost models for low carbon power generation technologies, including waste to energy and CCS, used as cost benchmarks by UK government.
- Performed market identification and evaluation study for emerging carbon capture technology. This included accompanying the client to introductory meetings with potential collaboration partners identified through the project.
- Provided technical consultancy support to company developing novel CO_2 capture & chemical conversion technology, including identification of potential clients and evaluation and recommendation of alternative product options.
- Technical lead for feasibility study into the replacement of existing reforming-based hydrogen production facilities for industrial client. Study includes options for inclusion of carbon capture to decarbonise hydrogen production.
- Delivery of large-scale hydrogen production and export study for confidential client. This has included evaluation of alternative hydrogen export technologies including liquefaction and conversion to ammonia, development of plant plot area requirements, energy demands and capital & operating cost estimates.
- Process lead for feasibility study evaluating alternative storage solutions for small-scale green hydrogen production and export facilities. Scope includes development of design solutions, generation of material balances and vendor engagement to develop capital cost estimates for the alternative process schemes.
- Technical input to appraisal of options for an Innovation Intervention to facilitate industrial decarbonisation. This included participation in stakeholder workshops, identifying the strengths & weaknesses of alternative technology and intervention options and prioritisation of preferred solutions. Participated in delivery of study outcomes in workshop with BEIS.
- Sector technical lead for the cement and glass sectors for 2050 Industrial Decarbonisation Roadmap and Action Plan projects for UK Government. This included the identification and evaluation of existing and novel carbon reduction and energy efficiency technologies, developing technology implementation pathways to achieve a spectrum of decarbonisation

levels and identifying barriers and enablers to the adoption of the technologies within each sector. Key technologies evaluated included CCUS and fuel switching from natural gas to hydrogen fuel. Subsequently developed sector-specific action plans to set out a set of specific activities that the sector and government can agree to in order to progress carbon reduction.

- Sector technical lead for the chemicals, glass and cement sectors for 2050 Industrial Decarbonisation Roadmap project for Zero Waste Scotland. Building on the UK-wide Roadmaps, performed a similar exercise focussing on Scottish industry, developing Roadmaps specific to achieving decarbonisation of each industrial sector in Scotland.
- Incubation Manager for a range of companies receiving Energy Entrepreneurs Fund grant funding from BEIS. This role includes the identification of key areas for technical support and assistance for each company to facilitate their commercialisation, the development of scopes of work and leading their delivery.
- Lead company contribution to EU Framework 7 LOCIMAP project, identifying enhanced opportunities for industrial symbiosis and CO_2 reduction across European industrial parks. This project required my collaboration with partners from across Europe in sectors including chemicals, steel, paper and ceramics and industrial park operators. The project identified technology options to deliver both energy and material stream integration within and between sectors to achieve performance, cost and environmental benefits.
- Performed technology evaluation for small-scale LNG import terminal facility in UK. This included review of alternative LNG storage technology solutions, identification of boil off gas handling requirements and potential integration options with power generation.
- Project managed evaluation of technology options for gas turbine decarbonisation, including the use of biomass/waste via gasification or anaerobic digestion and the implementation of carbon capture for process sector client in north east England.
- Process lead for feasibility study, pre-FEED and FEED for steam turbine based CHP facility within a chemical plant located in north east England. Within the feasibility study, scope included the evaluation of a range of process configurations to identify preferred option and the development of capital cost estimates. Within pre-FEED and FEED, responsible for the production of full suite of process engineering deliverables.
- Process lead for series of plant modifications at LNG import terminal.
- Process lead for concept study for interfacing new CHP facility with existing UK LNG terminal facilities.
- Process lead for detailed engineering design for a series of plant modifications at UK oil refinery.
- Delivery of Business Continuity Management programme for five power/power & water plants in UAE to fulfil requirements of national authorities. This included the delivery of desktop exercises at each site and production of reports on behalf of the clients for submission to government bodies.
- Demolition cost estimation reports for coal fired and natural gas power plants located in Europe.
- Board member of UK CCS Research Centre. Active in identifying future CCS research priorities, with particular focus on industrial decarbonisation.

- Chairs Hazard Studies in support of projects across the WSP Energy business, including:
  - HAZOP for energy from waste power project
  - HAZOP for benzole storage and road tanker loading facility
  - HAZOP for new-build CCGT/CHP plant within an existing industrial facility
  - HAZOP for CCGT repowering project
  - HAZOP for underground gas storage facility decommissioning project
  - HAZOP for district heating scheme energy centre
  - HAZID/HAZOP for modifications to natural gas Above Ground Installation
  - HAZID/HAZOP for two gas engine power generation facilities
  - HAZID/HAZOP for Allam Cycle oxy-combustion CO_2 capture test facility
  - HAZID/HAZOP for modifications to Allam Cycle oxy-combustion CO_2 capture test facility
  - HAZIDs for three post-combustion carbon capture plants
  - HAZID for novel Direct Air Capture technology
  - HAZID for electrolytic “green” hydrogen production facility
  - HAZID for conversion of coal-fired power station to waste derived fuel
  - HAZID for novel thermal energy storage / Organic Rankin power project
  - HAZID focussing on fire risk at industrial manufacturing plant
  - HAZCON for natural gas pipeline modification/hot tapping project
  - HAZCON for natural gas transmission line, including under-river crossing
- Also takes a leading role in business development activities, including the development of proposals, cost, time and resource provision, and customer-facing activities such as presenting WSP's technical capabilities and project proposals to potential clients, generating articles for publication and representing the organisation in industry bodies and at international conferences.

Amec Power and Process Europe, UK - Principal Process Engineer (2010-2012)

- Within the CCS and Clean Energy team of AMEC's Energy Services Division, responsible for the provision of process consultancy and technical input to projects in the fields of hydrogen, LNG, carbon capture and storage, biofuels and bio-energy. Significant projects included:
- Performed review and evaluation of hydrogen production and storage technologies as part of study into use of 'green' hydrogen within UK gas distribution networks.
- Acted as technology consultant within Owner's Engineer team for waste to energy gasification project.
- Performed review of CO_2 compression and pipeline options for potential CCS retrofit project for Combined Cycle Gas Turbine power station.
- Provided process consultancy input to multiple studies for conversion of coal fired power plants to biomass firing.
- Undertook performance trials at LNG importation terminal and identified opportunities for process and operational improvements.
- Performed technical due diligence of third-party FEED study for an Integrated Gasification Combined Cycle power plant with full carbon capture and acted as technical consultant to re-FEED work and capital cost validation.
- Performed technical review of second-generation bio-ethanol technologies.

- Provided technical consultancy services to waste recovery facility, identifying potential solutions to operability problems.
- Also undertook business development activities in areas of technical expertise, including proposal development and representing the company in meetings with potential clients.

Jacobs Consultancy UK Ltd - Senior Consultant (2006-2010)

- Within the Petroleum, Chemicals & Energy Practice of Jacobs Consultancy, responsible for the delivery of technical consultancy assignments in the fields of gasification, Fischer-Tropsch Synthesis, coal-to-chemicals, power generation, natural gas conversion and associated applications. This included acting as Project Manager, leading teams of consultants for the delivery of projects to clients, and providing key technical input to project activities led from international Jacobs Consultancy offices. In the latter respect, acted as technical expert across the entire Consultancy practice. The scope of work for a typical assignment included the generation of a range of technical deliverables including key performance data, cost estimates and financial models, and presentation of the study findings to the client. Significant projects included:
- Project Manager on carbon capture retrofit study on existing pulverised coal power plant located in northern Europe.
- Project Manager on petroleum coke power plant feasibility studies for African client. The studies included down-shot boiler, circulating fluidised bed and Integrated Gasification Combined Cycle (IGCC) configurations.
- Project Manager for feasibility study of IGCC power plant with carbon capture for European power utility.
- Techno-economic evaluation of coal to chemicals opportunities via Fischer-Tropsch Synthesis at several sites for US project developer.
- Feasibility study for coal to liquids project in South Africa, evaluating alternative gasification technologies coupled with selected Fischer-Tropsch Synthesis technology.
- Independent evaluation of novel technology for carbon capture from sour synthesis gas on behalf of technology developer.
- Technical experience included the gasification of coal, petroleum coke and biomass feedstocks, and natural gas conversion for the production of hydrogen, Fischer-Tropsch fuels, chemicals, SNG and power. Carbon capture was a key consideration in many of the assignments. In addition, performed technical due diligence analysis of advanced technologies and fulfilled the role of lenders' technical consultant on major EPC projects. Geographical experience included North and South America, Europe, FSU, the Middle East, Far East and southern Africa.
- Responsible for the provision of business development functions including outward-facing activities such as the delivery of presentations at international conferences, presenting company capabilities to clients, and developing technical and commercial proposals, including the generation of the scope of work, methodology, deliverables lists and cost, time and resource requirements.

Whessoe Oil & Gas Ltd (formerly Skanska Whessoe), UK - Senior Process Engineer / Principal Process Engineer (2002-2006)

ANTHONY RICHARD ALDERSON

Associate Director

- Responsible for process engineering design of LNG and related cryogenic storage and importation EPC and design projects. Clients included Grain LNG, Dragon LNG, Punj-Lloyd, Reliance, Saudi Aramco and Sumitomo. Significant projects included:
- Lead Process Engineer for two LNG importation terminal EPC projects in the UK, including the Phase 1 development of the Grain LNG terminal.
- Lead Process Engineer for modification of the LNG storage tanks at Isle of Grain LNG facility ahead of conversion of the site from a peak shave facility to an import terminal.
- Lead Process Engineer on EPC project for design and supply of a storage facility including multiple atmospheric and refrigerated storage tanks and pressurised spheres, together with refrigeration packages, compressors and pumps associated with the refrigerated storage tanks for major petro-chemical complex in Saudi Arabia.
- Lead Process Engineer for detailed design of LPG storage facility in India.
- Responsibilities included leading a team of process engineers, the development of a process design basis and heat and material balance, sizing and specification of process equipment and safety systems, review of vendor proposals, generation of commissioning and operating procedures, hazardous area classification, HAZOP and SIL review and input into the generation of plant drawings.
- Extensive use of HYSYS simulation package for the modelling of LNG process systems and facilities.

Advantica Technology (formerly BG Technology), UK - Process Engineer / Senior Process Engineer (1989-2002)

- Project led a range of technology development, technical support and consultancy activities in the areas of liquefied natural gas, gas to liquids conversion and natural gas processing.
- Wide experience in LNG. This included the development of capital cost models for LNG terminals, the evaluation of novel liquefaction cycles, identifying and assessing options for integrating LNG import terminals with gas-fired power plant and developing alternative process schemes for LNG boil off gas handling. Performed techno-economic evaluation of process options for the conversion of satellite LNG facilities to operation on LPG.
- Considerable experience in Fischer-Tropsch Synthesis and other gas to liquids (GTL) conversion processes. Developed a detailed understanding of the technology and market sector and established contacts with key industrial and academic players in the field. Visited both commercial scale and demonstration scale Fischer-Tropsch facilities. Generated capital cost and economic models of GTL conversion options, and applied these to a range of potential GTL developments for a client. Generated projections for growth of the GTL market over future decades. Presented papers at several international conferences and seminars.
- Performed market analysis and business opportunity studies, including an assessment of the market for the provision of technical services into the refining and petrochemicals sectors in the UK and USA and the identification of key service providers in this sector. Identified and assessed potential acquisition targets. Also performed analysis of the size and growth potential of natural gas based chemicals sectors in key target markets, including an assessment of the wider political and economic context.
- Provided engineering support for Advantica's Catalytic Rich Gas steam reforming technology. This involved reactor design, generation of performance and life guarantees and the review and approval of contractors' drawings and procedures. Also provided a

troubleshooting service to plant operators, identifying causes of problems and recommending solutions.

- Extensive experience in process design, evaluation and simulation. This included the identification of novel schemes for associated gas utilisation and gas liquefaction, including the generation of techno-economic analyses. Evaluation of novel synthesis gas generation schemes. Assessment of biological processes for down-hole gas desulphurisation.
- HAZOP Chair for multiple clients in the offshore and onshore oil and gas sectors.
- Experienced in pilot plant operations, including a large-scale facility for substitute natural gas production from coal. Shift leader on large-scale plant for the production of gas hydrate as a novel gas transportation medium.

British Bakeries, UK, Graduate Trainee (1988-1989)

- Acted as Production Supervisor in the company's Birmingham bakery.
- Evaluated and optimised oven performance over a number of sites.

PUBLICATIONS AND PRESENTATIONS

- Alderson T and Dodero G, "Current Status and Future Technologies for Gas Storage and Transportation: the UK Case" 6th Annual Middle East Gas Summit, Doha, Qatar, 10 October 2000.
- Johns M, Landon P, Alderson T and Hutchings G J, "Decreased Methane Formation from the Hydrogenation of Carbon Monoxide using Zeolite/Cobalt-Manganese Oxide Composite Catalysts" Chem. Commun., 2001, 2454-2455.
- Johns M, Collier P, Spencer M S, Alderson T and Hutchings G J, "Combined Steam Reforming of Methane and Fischer-Tropsch Synthesis for the Formation of Hydrocarbons: A Proof of Concept Study", Catal. Lett, 90 (2003) 187-194 ISSN 1011-372X.
- Alderson T, Scott S and Griffiths J, "Optional Carbon Capture" 8th European Gasification Conference, Antwerp, 10-12 September 2007.
- Alderson T, "Gasification: Petcoke's Future?" Jacobs Consultancy Petcoke Conference, New Orleans, 7-8 March 2008.
- Alderson T, "Gasification: Win-Win-Win for the Refiner" ERTC Coking and Gasification Conference, Rome, 22-23 April 2008.
- Alderson T and Mabey S, "Optimising Capex and Reliability on Gasification Facilities" Gasification Technologies Conference, Washington DC, 5-8 October 2008.
- Alderson T "Introduction to Carbon Capture and Storage" IMechE Power Industries North West Division, Manchester, 14 May 2013.
- Alderson T, "You've Got Your Syngas to the Surface - Now What?" 8th Underground Coal Gasification Association International Conference, London, 5-6 June 2013.
- Alderson T and Slabber S "Techno-Economic Analysis of CCS in South Africa" Third South African Carbon Capture and Storage Conference, Johannesburg, 3-4 October 2013.
- Alderson T, "Production of Clean Fuels from Renewable Hydrogen and Captured CO2" Carbon Dioxide Utilisation Summit 2013, Brussels, 30-31 October 2013.

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- Alderson T, "Carbon capture and storage - magic bullet or white elephant?" Infrastructure Intelligence, 14 May 2014.
- Alderson T, "Getting Started with Industrial CCS" Carbon Capture Journal Conference 'What does Phase 2 and Phase 3 of Carbon Capture in the UK Look Like?', London, 27 March 2015.
- Alderson T, "Getting Started with Industrial CCS" IMechE Power Industries North West Division, Manchester, 24 November 2015.
- Alderson T, “Industrial Decarbonisation” EPSRC Centre for Doctoral Training in CCS and Cleaner Fossil Energy / UK CCS Research Centre Winter School, Nottingham, 13 February 2017.
- Zhang W, Sun C, Snape C, Irons R, Stebbing S, Alderson T, Fitzgerald D and Liu H “Process simulations of post-combustion CO2 capture for coal and natural gas-fired power plants using a polyethyleneimine/silica adsorbent”, International Journal of Greenhouse Gas Control, Volume 58, March 2017.
- Alderson T, “Industrial Decarbonisation” EPSRC Centre for Doctoral Training in CCS and Cleaner Fossil Energy / UK CCS Research Centre Winter School, Nottingham, 12 February 2018.
- Alderson T & Willson P “A3C Carbon Capture” BEIS CCU Industrial Engagement Day, London, 19 April 2018.
- Alderson, T, “Can Hydrogen Power the UK?” Utility Week, 21-27 September 2018.
- Alderson, T, “Zero Carbon Hydrogen – is it Achievable?” WSP Insight Series, 26 Sept 2019
- Alderson, T, “The Role of CCUS and Hydrogen in Industrial Decarbonisation” UK CCUS and Hydrogen Decarbonisation Summit, Birmingham, 4 February 2020.
- Alderson, T, Moore, B, Garrett, K & Steppe, R “Stepping Up Decarbonisation with Carbon Capture and Sequestration” WSP Insight Series, 29 May 2023.