## RESPONSE TO TECHNICAL OBJECTORS

1.1 At the present time, approximately 140 letters of objection from local residents have been received. The vast majority of these letters raise genuine concerns of a generic nature which Moorland Energy is confident are, for the most part, addressed in the planning application and the accompanying documentation including the Environmental Statement, and in the reports prepared by Bowles Green on tourism and economic impact and by the Energy Contract Company on the importance of the Ryedale Gas project in terms of need.

1.2 A small number of objectors have raised technical issues and concerns which are in many cases misleading and based on factually incorrect information. These require a clear response in order to satisfy officers and Members of the LPAs, statutory undertakers and the local community that the proposed RGP development is based on sound and up-to-date data.

### Correspondence from Dr M Pitt, dated 21 and 24 June and Mr W B Midgley, 17 June 2010



Use of Chemicals

1.3 Safety is paramount importance to Moorland Energy. A major incident at any gas processing facility has the potential to cause harm to people both on and off site. For this reason, stringent statutory safety standards are applicable to minimise risk. At sites where the inventories of hazardous substances exceed pre-determined levels, the operator must obtain hazardous substance consent from the relevant Authority. The Health and Safety Executive is a statutory consultee in this process. The well test carried out on the Ebberston South-1 well was constrained by planning restrictions to a duration that was too short to allow a steady-state compositional analysis to be obtained. Consequently, the operator cannot be certain of the condensate production rate that should be expected. No condensate was produced during the test but if analogue data from the area is applied, Moorland Energy anticipates that sufficient condensate will be produced to trigger COMAH regulations to apply to the proposed development. If this is the case, then the development will be overseen by an authority jointly comprised of the HSE and the EA. They will assess the safety mitigation measures implemented by the Company, taking into consideration any risks to people living and working in the vicinity as well as any implications for future surrounding land

use. Consequently, the risks of a major incident occurring will be managed by a close working relationship between the Company and the responsible authorities.

Fire Protection

1.4 Dr Pitt makes no mention of the fact that there are numerous pipelines currently operating in the area, which contain a far greater volume of gas than Moorland Energy is currently proposing, including the National Grid NTS pipelines and the NGN distribution pipelines. Dr Pitt raises questions about the ability of the emergency services to control any fires on site and how fire water will be discharged to the drainage system. Emergency planning is at the heart of the civil protection duty on the emergency services and local authorities under the Civil Contingencies Act 2004. The Act requires these organisations to maintain plans for preventing emergencies; reducing, controlling or mitigating the effects of emergencies; and taking action in the event of emergencies.

1.5 In the event that COMAH Regulations apply, they require operators to develop an on-site emergency plan of how they will respond to an incident. The local authority for the area is also required to have in place an off-site emergency plan, prepared in conjunction with the emergency services, to deal with the wider consequences of an incident. The pipelines transporting the gas will fall under the Pipelines Safety Regulations which require the operator of the gas transport pipeline to have emergency procedures in place for dealing with the consequences of a major accident. Local authorities are required to prepare an emergency plan for each major hazard pipeline passing through their area.

1.6 NYCC's Emergency Planning Officer has been consulted about the proposed development and has not raised any formal objections.



Air Quality

*(a) Meteorology*

1.7 Atmospheric studies for the Hurrell Lane Gas Processing Facility were undertaken using meteorological data from Church Fenton. The meteorological data used in dispersion modelling is very detailed and includes wind speed, wind direction, cloud cover, solar radiation and temperature. Sufficiently detailed data is only available from a number of locations in the UK, often Airfield locations. Consequentially, when modelling air quality

impacts for Proposed Developments, care needs to be taken to identify meteorological data that will best represent the site under assessment.

1.8 In this instance, Church Fenton was identified as the most appropriate data. Dr Pitt refers to 'southerly and south-easterly' winds; this is the prevailing wind direction at Church Fenton in several of the years of data considered. Periods of calm conditions are also included in the Church Fenton meteorological data.

*(b) Terrain*

1.9 The consultation response also describes the local topography around the proposed Hurrell Lane Gas Processing Facility, noting slopes of 1 in 20 and 1 in 25. Topography is sometimes included in modelling exercises, although only when terrain is greater than 1 in 10.

*(c) Pollutants*

1.10 The relevant pollutants which could be associated with the small amount of combustion required at the Hurrell Lane Gas Processing Facility, based upon Environment Agency (EA) Guidance, have been assessed. The assessment identified that the concentrations of these pollutants would be insignificant against applicable air quality standards. These standards are developed to be protective of human health including sensitive elements of the population, such as the elderly.



*(d) Odour Management*

1.11 As described above only small amounts of combustion will be required to support gas processing activities at the site. Combustion from these sources will use gas that has already been cleaned of potentially odourous compounds.

1.12 Odourous releases of hydrogen sulphide and mercaptans at the site from other potential sources will be mitigated through the application of Best Available Techniques (BAT) for the installation, with reference to indicative BAT as outlined in the Gasification, Liquefaction and Refining Installations (EPR 1.02) Environment Agency Guidance (dated March 2009).

1.13 The measures to be used will be agreed with the Environment Agency (EA) as part of the environmental permit application process and through the development of a fugitive emissions management plan.

1.14 However, examples of the measures currently envisaged to be used to mitigate fugitive odour releases include pack bed type scrubbers on vents (or other equivalent techniques) and vapour balancing to minimize emissions during loading and unloading. Also, the flare listed in correspondence will only be used in the event that an emergency depressurisation is required and this kind of event would last no more than 15 minutes.

**Well Head and Pipelines**

1.15 Although the wellhead is in a remote area and is intended to be operated unmanned, an intruder detection system will be installed to alert the presence of people intending to gain unauthorised access the site. The main communication link is intended to be fibre optic; however, back-up systems will also be installed to take over when required.

**Noise**

1.16 Moorland Energy's noise consultant has no reason to dispute the noise level readings presented by Dr Pitt, who made measurements of the ambient noise from the Knapton generating station on Thursday 24 June 2010. He would, however, make the following comments:

1 Although the Dawe 1400G sound level meter was subject to calibration check, there is no indication of its last laboratory calibration. On-site checks with a calibrator can identify problems with a sound level meter but do not provide a reliable indication of the absolute levels indicated by the meter, especially on an older meter which is not microprocessor based.

2 Dr Pitt states that the noise levels were 41dB(A) next to the boundary fence at the generating station, 36dB(A) 10m away, and 35dB(A) 750m away. The noise level at the latter location was slightly higher when the body of the operator did not screen the noise from the feed mill; in any event, the general level of ambient noise on summer day would be around 35dB(A) so this tells us very little. If the reading adjacent to the mill was at a similar distance from the noise source as the boundary fence reading for the generating station, it may be deduced that the mill was rather noisier.

3 There is no reason why the noise levels from the gas-fired generating station should be comparable with those from the proposed gas processing facility at Thornton-le-Dale. The nature of operations is different: rather than compressing the gas and using it as fuel to a turbo generator, which is the basis of the Knapton operation, the Hurrell Lane gas processing facility will treat the gas and export it via an adjacent pipeline. The equipment at Knapton has now been operating for 15 years. In contrast, the facilities and equipment to be installed at the Hurrell Lane site will incorporate the latest advances in energy systems technology including noise suppression measures.

4 Dr Pitt refers in paragraph 5 of his covering letter of 21 June 2010 to the 'persistent and continuous low level industrial drone' from the processing facility. This is simply wrong. The proposed detailed design will include noise mitigation measures expressly to prevent such tonal noise emissions (which, were they present, would be likely to amount to a statutory noise nuisance).

5 Section 5 of Dr Pitt's supplementary to his letter of objection simply serves to support the findings of the Noise chapter of the ES. He is mistaken, however, when he suggests that Moorland Energy assumed a figure of 75dB(A) at the centre of the site. Moorland Energy took into account the additive effect of all the potential noise sources, which explains why Dr Pitt's figures at nearby noise-sensitive locations are similar to those recorded by Moorland Energy's noise consultant.

6 The detailed noise assessment will take spectral information into account when calculating the resulting noise levels from the 'real' plant. Nevertheless, the noise assessment took into account the attenuation over distance, which varies with frequency, by assuming typical representative noise spectra for each of the dominant noise sources.



1.17 In conclusion, Dr Pitt's contribution adds little to the noise level 'picture' of the site and its environment. Where he presents any findings that are supported by figures, these confirm the conclusions drawn by Moorland Energy's noise consultant.

**Transport Movement**

1.18 The tanker movements described by Dr Pitt will carry fluids that are no more flammable or noxious than tankers delivering fuel to local distribution sites or farms in the area. He is over-stating the impact that these will have on the local road network.

1.19 Dr Pitt's understanding of the production rate, operation and related requirements suggests an underestimation in vehicle trip generation from the information given in the Transport Assessment. Dr Pitt does not appear to have a specific objection on traffic grounds and, indeed, acknowledges that the traffic is low.

1.20 For the likely traffic movements identified in the ES, the impact is considered to be "minor/negligible". The peak impact is during construction and therefore temporary. This can be mitigated with appropriate traffic management relating to the hours of construction, routes used and management of deliveries and specific management related to the accessing the pipeline route and thrust boring to the A170.

1.21 Moorland Energy is not aware that NYCC Highways has raised any objections on highway grounds.

**Job Creation**

1.22 Dr Pitt is taking a somewhat pessimistic view and assuming that there will be a very few people benefiting from such an apprenticeship scheme, and that they will have little prospect of employment once they qualify. The duration of training that he has assumed is pure supposition, and he has assumed that there will not be other opportunities within the Company for them to train.



**Crime and Security**

1.23 A number of objectors have raised concerns about the possibility that the proposed development will increase the level of risk arising from criminal activities taking place at the wellsite, the GPF or along the pipeline.

1.24 Terrorism is no more likely at the site than it is for one of the pipelines in the area or the Pickering AGI. The security services are involved in deciding appropriate measures combat terrorism. The processing facility and the wellsite will have 2.85m security fencing around the entire length of the boundary and the sites will be secured by locked gates. An intruder detection system will be employed at the well site. Emergency lighting will be installed at the GPF and signage on the site boundary will warn members of the public to stay away. The GPF will be fully manned at all times. Consequently, the security measures proposed by Moorland Energy are considered to be sufficient to minimise the risk of criminal activities taking place.

**Perceived Risk to Public Safety**

1.25 Public safety is clearly a material consideration in determining planning applications. The risk to the public of a leak of gas from the wellsite, the GPF or the pipeline can be divided into the actual level of risk and the public's perception of the level of risk. The Outline Safety Report has demonstrated that the actual level of risk is very low. The high level of regulatory control in respect of gas production and processing is overseen by the HSE. The HSE has not raised any concerns about the proposed development. Further, NYCC's Emergency Planning officer has advised that the proposed development does not present any concern for Emergency Planning.

1.26 Fears and concerns held by members of the public may constitute a material consideration, even if the actual risk is very low. However, in circumstances where the actual risk has clearly been demonstrated to be very low, little weight should be placed on these perceptions.

1.27 Pipelines are a proven safe way of transporting large volumes of gas. In order to reduce the risk to as low a level as is reasonably practicable ("ALARP"), the design of the pipelines and subsequent operating parameters will be specific to the operational requirements of the project. The pipeline design and construction will comply with the Pipelines Safety Regulations 1996.

1.28 Moorland Energy and its contractors will liaise regularly with landowners, tenant farmers, drainage contractors, utilities and developers to ensure that the risk of accidental interference to the pipelines is minimised. Marker posts will be erected and warning signs in place to warn any contractor or farmer excavating that a pipeline is present. Moorland Energy will carry out regular line walks, in addition to aerial maintenance inspections, to ensure that security of the pipeline from deliberate interference is maintained at a high level.

1.29 In summary, the actual risk to the public from the proposed development has been demonstrated to be very low. The perceived risk is a material consideration but this should be given very little weight in view of the very low actual risk.

**Response to TAGS submission, dated 9 August 2010, regarding the proposed height of the stack at Hurrell lane.**

1.30 The proposed design has been compared to other systems currently in operation, although it appears the reference plants may have different types of technology

installed. Before making any direct comparison with other sites it is fundamental that the different types of vent / flare systems are understood and why each one may be selected for a given installation.

1.31 We begin with an overview of the main types of vent and flare systems that are common to the oil and gas industry and any benefits and drawbacks with each option selection. Following this, a summary is given of the proposed ground flare installation at Hurrell Lane and why it is considered best available technology (BAT) for this particular facility, including the technical, environmental and social issues considered during the design process.

(a) Overview of Vent/Flare Systems

1.32 The vent or flare system is a last line of defence in the safe emergency release of inventory in a refinery or chemical plant. Without this facility there is a serious risk of overpressure of plant and pipework in an emergency situation. Although not normally designed to be a continuous operation, a flare/vent system is imperative to ensure the safety of personnel within the vicinity of the plant. It is the responsibility of the designer to assess the best available technology (BAT) for any given facility in full accordance with the prevalent regulations, codes and standards in force.

1.33 There are 3 main types of vent flare systems utilised on oil and gas facilities:

1. *The cold vent.* This allows direct venting of hydrocarbon gases into the atmosphere and is a common feature on many gas sites around the UK which handle clean dry gas, such as NTS gas compressor stations and LNG facilities. This type of system is acceptable given the gas is 'clean' and that it can be demonstrated that any discharges can be kept to an absolute minimum. With this type of vent, as 'pure' hydrocarbon gases are being vented, the height of the stack is imperative to ensure the gases are dispersed into the atmosphere well away from personnel or plant, and to ensure any heat radiation levels are kept to safe levels in the event of the vent igniting (e.g. with a lightning strike). Stack heights of 15 to 30m are typical for this type of vent. For the same reasons, large exclusions zones (or sterile areas) are placed around the stack at ground level (typically with a radius of 25 to 50m) leading to relatively large areas of land required. This type of vent was not considered appropriate for the Hurrell Lane Facility.

2. *The Elevated Flare.* This type of flare is utilised on large scale facilities which process large volumes of untreated gas which should not be vented directly to atmosphere e.g. terminals and refineries. The elevated flare has a flame at its top which is visible at ground level. The chemical process used for flaring is a high temperature oxidation reaction to burn combustible components, mostly hydrocarbons. In combustion, the hydrocarbon gas reacts with atmospheric oxygen to form carbon dioxide ($CO_2$) and water. Low levels of other by products, e.g. carbon monoxide, may be formed dependent upon what is being burned and the efficiency of the combustion within the flare. Typically efficiency of hydrocarbon conversion is over 98%. As with the cold vent, the height of the stack is imperative to protect personnel and plant from thermal radiation and is sized accordingly. Also, the elevated flare is common on large-scale installations which could require venting of large volumes (and flow rates) of gas it is not unusual to see very high vent stacks, sometimes in excess of 75m high.

3. *The Ground Flare.* This type of unit is a compact, fully enclosed unit which can be used instead of an elevated flare for relatively small scale duties. It has the benefits of the elevated flare described above, namely, hydrocarbon gases are converted into relatively harmless by-products which can be released into the atmosphere. Although there are capacity limitations with this type of unit, the flame is fully enclosed and thermal radiation is minimised as the stack is refractory lined, thereby negating the need for it being excessively high. Also, the fact the flame is fully enclosed gives additional benefits from a visual impact point of view. Given the relatively small scale of the Hurrell Lane Facility (compared with a refinery or terminal) a ground flare unit is considered best available technology (BAT) to ensure the facility can be safely depressurised if required.

**Summary of Hurrell Lane Ground Flare Selection Criteria**

| Advantages | Disadvantages |
|---|---|
| Thermal radiation – very low in a ground flare to the extent of allowing an operator to stand safely next to the unit during operation. This is in contrast to the large exclusion zones required around cold vents and elevated flares due to the potential of high levels of thermal radiation. | Gas dispersion – as the ground flare has a larger diameter than the cold vent or elevated flare (to ensure flame is fully enclosed whilst ensuring efficient combustion) the exit velocity is lower, leading to reduced gas dispersion.<br>This is mitigated by:<br>• Gases exiting the stack are relatively harmless, although emissions will be subject to the requirements of IPPC (now Environmental Permitting Regulations 2010), including monitoring.<br>• Ground flare operation is infrequent and likely to last no more than 15 minutes.<br>• A gas dispersion model will be undertaken to optimise the flare design and resulting gas dispersion. |
| Gas composition – hydrocarbon gas for this development contains $H_2S$ and cannot be safely discharged directly into the atmosphere. A ground flare will burn the gas and $H_2S$ giving relatively harmless by-products. | |
| Ozone depleting emissions – the combustion of gas (methane) into $CO_2$ is a major environmental benefit. $CO_2$ is approx 20 times less damaging to ozone than methane. Significant benefit over cold vent. | |

| Advantages | Disadvantages |
|---|---|
| Visual impact – relatively low stack height compared to both cold vent and elevated flare. Additional benefit of enclosed flame, compared with an elevated flare. Very important advantage given the need to mitigate any adverse impact upon the environment. | |
| Noise – relatively quiet operation. The stack is refractory-lined to minimise heat radiation; this has the added benefit of minimising noise generated by flaring. | |
| Land take – relatively small area of land required. Main issue is to have unrestricted air flow into the unit to ensure efficient burning. Cold vents and elevated flares require relatively large sterile areas for the protection of personnel and plant from thermal radiation. | |

(b) Flare Heights

1.34 It should be noted that the flare is principally included in the design for emergency purposes and would rarely if ever be needed. If it does operate it would be for very short periods of time - the required depressurisation time specified in API 521 is 15 minutes (per section of plant).

1.35 The choice between ground flare and elevated flare is chiefly a matter of space and environmental impact considerations. An elevated flare requires a large supporting structure and complex monitoring to ensure the maintenance of an elevated flame. From an engineering perspective, the main issue with an elevated flare is the heat radiation at ground level. To ensure that this is acceptable, the flare stack must either be very tall or have a very large diameter sterile area around its base. In practice the

chosen height and sterile area would involve a trade-off between the two. It is almost certain that the sterile area radius for the Moorland project would be greater than the 15 metres for the proposed ground flare, thus it would take up more space and necessitate a larger site.

1.36 Ground flares are designed to ensure that combustion of the gas is complete, and hence the noxious products will consist of the less toxic oxides of sulphur and nitrogen only, in addition to carbon dioxide which is not regarded as noxious and which is the principal component of all fossil fuel combustion. There is reference in the TAGS note to the emission of other components, such as $H_2S$ and mercaptans, but the purpose of the ground flare, which operates at very high temperatures (to provide effective incineration) is to convert these into the aforementioned sulphur oxides. The buoyancy of the hot combustion products also greatly assists the dispersion of the exhaust gases.

1.37 Moorland Energy, as Operator of the facility, will require an Environment Permit from the Environment Agency before being allowed to operate the facility. This permit now incorporates the IPPC consent and the waste disposal licence into a single licence. To secure the Environmental Permit, Moorland Energy will be required to demonstrate that the ground level concentrations of any noxious substances do not breach the appropriate limit. The required dispersion modelling is only usually carried out following the detailed engineering design stage of the project, as this allows it to be as accurate as possible. Detailed ground level concentration modelling has, therefore, not been carried out at this stage, but for the short periods of operation envisaged it is very unlikely that statutory concentration limits (which are usually time averaged in any case) would be breached.



1.38 Moorland Energy is very aware of the need to mitigate any environmental impact, and has selected a Totally Enclosed Ground Flare (TEGF) for this facility. This type of flare allows gas to be evacuated from the system in the required time, while providing a smoke-free burn during which no flame is visible. The flare stack will be refractory lined to minimise noise.

(c) Reference to other sites

1.39 The TAGS note refers to stacks at Barrow and Point of Ayr. Moorland Energy has contacted the operator of the Barrow Terminal. The operator has confirmed that the 30m stack at South Barrow is, in fact, a vent and not an elevated flare. The stack incorporates a bursting disc in the base, and is therefore not normally open to atmosphere. This disc would burst in the event of an emergency, releasing gases to

atmosphere, but not igniting them. This explains the height, which is required to ensure adequate atmospheric dispersion. There are two other terminals at Barrow, namely North Barrow and the Rivers terminal. The operator has confirmed that both of these have box flares, which is a type of ground flare, and not elevated flares, as asserted by TAGS.

**Application of the COMAH Regulations to Moorland's proposal**

**Part 1 of TAGS note**

1.40 Part 1 of the TAGS note is correct in that the requirements for top tier sites are more onerous than for bottom tier, and include the preparation of a safety report and for on-site and off-site emergency planning. However, these comments simply re-iterate the COMAH regulations as written.

1.41 TAGS appears to have misunderstood the significance of the COMAH regulations. These regulations are about *Safety Management* and more specifically about how the operator will demonstrate that the appropriate management systems and controls are in place to ensure safe operation. They are not about plant integrity, design standards or operating procedures; such requirements are necessary whether COMAH applies or not. COMAH regulations were introduced to ensure that operators demonstrate compliance and document the mitigating measures put in place to deal with incidents, in the unlikely event that things go wrong.

1.42 In the event that hazardous substance inventories dictate it, Moorland Energy accepts that the COMAH regime will apply. In such circumstances, the Company will submit the Site's emergency planning procedures for the relevant scrutiny of the HSE and the EA.

**Part 2 of TAGS note**

1.43 Part 2, of the TAGS note is correct in that one option for the HSE would be to deal with the project, i.e. well site, pipeline and main site, as a single entity, in which case the top tier duties would have a greater chance of applying. This option was discussed with the HSE on behalf of Moorland Energy during the preparation of the Safety Report that accompanied the planning application. There is no precedent for this approach being adopted. The HSE opinion at the time was that the facility locations i.e. well head and main site were too far apart to be considered as a single entity.

1.44 If COMAH applied to the whole development as a single entity then Pipeline Safety Regulations (PSR) would not apply to the pipeline, and the HSE view was that there was a preference for the pipeline to remain subject to PSR. In any event, PSRs applicable to pipelines are as onerous as COMAH.