S.37

File With ______

SECTION 131 FORM

Appeal No: PL 17.244473 Defer Re O/H ☐

To. SEO ______

Having considered the contents of the submission dated/received 16-03-15 from Applicant I recommend that section 131 of the Planning and Development Act, 2000 be/~~not~~ be invoked at this stage for the following reason(s): Interests of natural justice / detailed water info

EO: [signature] Date: 19/3/15

To EO: ______

Section 131 not to be invoked at this stage ☐

Section 131 to be invoked - allow 2/4 weeks for reply ☐

SEO: ______ Date: ______

SAO: ______ Date: ______

M ______

Please prepare BP 70 Section 131 notice enclosing a copy of the attached submission

to: parties

Allow 2/3/4 weeks BP 3 weeks

EO: [signature] Date: 19/3/15

AA: [signature] Date: 20-03-15.

CORRESPONDENCE FORM

Appeal No: PL 244473

M _____

Please treat correspondence received on 16/3/15 **as follows:**

1. **Update database with new agent for Applicant/Appellant** _____
2. **Acknowledge with BP** 20 amended
3. Keep copy of Board's Letter ☑

1. **RETURN TO SENDER with BP** _____
2. Keep Envelope: ☐
3. Keep Copy of Board's letter ☐

Amendments/Comments

* Please prepare refund form for a/c's. as fee not required for a response under S129.

4. Attach to file

(a) R/S ☐ (d) Screening ☐
(b) Mapping ☐ (e) Inspectorate ☐
(c) Processing ☐

RETURN TO EO ☑

	Plans Date Stamped ☐ Date Stamped Filled in ☐
EO: Rose O	**AA:** McCleane.
Date: 19/3/15	**Date:** 19-03-15.

Murty Hanly & Associates Ltd.

Consultant Engineers & Project Managers

Ardeevin,
Mullingar,
Co. Westmeath
Tel: (044) 93 42186

16th March 2015

An Bord Pleanala,
64 Marlborough Street,
Dublin 1

Your Ref : PL17.244473
P.A. Reg. Ref: LB/140803
Our Ref: DUNBIA (Slane)

Appeal **Re:-** **Extension to existing meat plant.**
Painstown, Beauparc, Navan, Co. Meath

Dear Sir/ Madam,

Further to your letter dated the 18th February 2015 enclosing a copy of an appeal by third parties to our planning application Meath LB/140803 and advising us of our right to make submissions or observations to the Bord within a four week period we now make the following observations and submissions.

The appeal has been submitted by Frank Burke Chartered Engineer on behalf of

1) Gerry Frawley, Beauparc, Navan, Co. Meath.
2) Thor Born Preisler of Ashfield Cottage, Beauparc, Navan, Co. Meath.
3) Thomas Concannon, Windmill Road, Beauparc, Navan, Co. Meath.

The planning and environmental issues which are raised by Mr Burke are addressed in detail by SLR, my client's Planning and Environmental consultants in the enclosed technical report under the following headings:

1. Unsolicited Further information
2. Validity of Application
3. Water Wells
4. Wastewater
5. Air / Odour
6. Visual Impact
7. Traffic, Roads and Sightlines
8. Noise
9. IE licence
10. EIA Adequacy
11. Waste
12. Miscellaneous
13. Conclusion

As you will see from the enclosed report SLR in their conclusion state:-

The Meath County Development Plan 2013-2019 recognises that food and meat processing activities occur at various rural locations throughout the county and in this regard, policies in the plan actively support and protect this existing economic base where it occurs.

Arising from the conclusion derived from the EIA process and statement, we consider that the proposed development will not have a significant effect on the environment and that it can be deemed to be compliant with the following criteria set out in the ED Pol 18 of the Meath County Development Plan 2013-2019:

- *it has locational requirements that can more readily be accommodated in a rural location than an urban setting and this has been demonstrated to the satisfaction of Meath County Council;*
- *it will enhance the strength of the local rural economy;*
- *it is of a size and scale which remains appropriate and which does not negatively impact on the character and amenity of the surrounding area;*
- *it demonstrates that it has taken into account traffic, public health, environmental and amenity considerations;*
- *it is in accordance with the policies, requirements and guidance contained in the County Development Plan;*
- *it would not generate traffic of a type and amount inappropriate for the character of the access roads or would require improvements which would affect the character of these roads (this policy does not apply to the National Road Network).*

We consider that much of the physical development required to facilitate the proposed intensification of use at Dunbia's plant is already extant and consented and that the amount of new development necessitated by the application is minimal. The Appellants do not acknowledge this reality.
We further consider that the proposed development will not, either on its own or in combination with other plans or projects have a significant effect on the environment.
We respectfully submit that, having regard to information provided in support of this application, the proposed development is consistent with the proper planning and sustainable development of the area and adheres to adopted policies at a national, regional and local level.

It is a matter of serious concern to my clients that that they were invited to a meeting with two of the appellants and advised that they if they received payment for their homes they would refrain from making any objection to my client's planning application to Meath County Council. Mr. Burke accepts that a meeting took place but contests our client's position and asserts that "as the subject matter of the meeting was not a planning issue we would not propose to comment any further on this issue". This comment confirms the fact that the reason why the appellants requested a meeting with our client was not to address any planning concerns which they may have had, but rather was an attempt to use the planning process to their advantage and hold our client to ransom in the context of its live planning application. When our client did not entertain this request, Mr. Burke proceeded to submit an objection to Meath County Council on behalf of Messrs. Frawley and Preisler. Our clients are happy to be guided by the Board as to whether this type of conduct is acceptable to the Board and in accordance with ethical planning and development. We would respectfully request the Board to dismiss the objection insofar as it is made by Mr. Burke on behalf of Messrs. Frawley and Preisler under section 138 of the Planning Acts as it is abundantly clear that both of their objections to Meath County Council and their appeal to the Board are motivated by and made with the sole intention of securing the payment of money from our client.

Separately, the appeal consists of an unwarranted attack by Mr. Burke on the professional planners and engineers of Co. Meath. We note that neither the EPA, the Health Board, nor An Taisce raised an objection to my client's application. We respectfully submit that Meath County Council in granting this application was mindful of the views of the prescribed bodies, its County Development plan, the economic and environmental wellbeing of the local community and the County as a whole. The detailed responses that we have provided to the planning issues raised by the appellants should in our opinion meet the most rigorous scrutiny. For this reason, we would invite you to reject the appeal and to grant permission for my client's planning application.

Should the Board require any further clarification or other information I can be contacted at the above address or by telephone 087 2538383 or Email: murtyhanly@murtyhanlyandassociates.com

Yours Sincerely,

Murty P. Hanly (Agent for applicant)

SLR

global environmental solutions

Dunbia (Slane)

RESPONSE TO PLANNING APPEAL BY FRANK BURKE AND ASSOCIATES

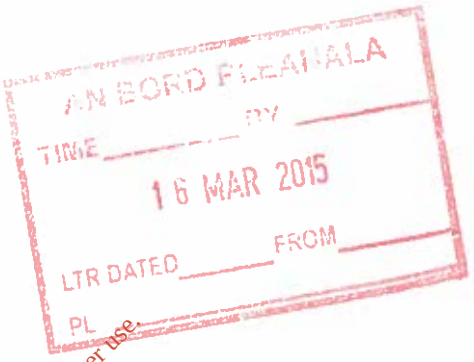
MARCH 2015
SLR Ref: 501.00213.00007.Final

Observation on Third Party Appeal
Dunbia (Slane) Intensification of Use

This report has been prepared as a response to the appeal submitted by Mr. Frank Burke in respect of the grant of planning permission by Meath County Council to our Client, Dunbia (Slane), for the proposed development at its site at Greenhills, Beauparc, Navan, Co. Meath.

The Appellants have raised a broad range of queries, which are contradictory in some cases. For clarity, ease of reference and to avoid repetition we have grouped the various issues raised under the following headings:

1. Unsolicited Further information
2. Validity of Application
3. Water Wells
4. Wastewater
5. Air / Odour
6. Visual Impact
7. Traffic, Roads and Sightlines
8. Noise
9. IE licence
10. EIA Adequacy
11. Waste
12. Miscellaneous
13. Conclusion



We have sought to give a brief but accurate summary of the queries raised and / or complaints made under each of these respective headings.

Where the appeal raises matters other than planning and environmental matters, we have refrained from comment, as is appropriate.

Under each of the above headings, we have pointed out under sub-heading (A) where the question / complaint has already been addressed in the application and accompanying environmental impact statement (EIS) and direct the Board to the relevant section of the application/EIS where the information is located. Where relevant, under sub-heading (B), we have included any additional information which may be of assistance to the Board in undertaking its environmental impact assessment and appropriate assessment screening and / or appropriate assessment of the proposed development.

1.0 UNSOLICITED FURTHER INFORMATION

Mr Burke takes issue with the submission of unsolicited further information and what he perceives to be a denial of his clients' right of reply.

Mr. Burke's claim in this regard is both misleading and disingenuous. Mr. Burke omits to explain that the primary trigger for the unsolicited further information was the need to have part of his submission redacted on the Meath County Council website due to its defamatory nature. As the statement in his submission was indisputably erroneous and had the potential to damage our Client's reputation, our Client's Agent requested Meath County Council to redact this statement or remove it from its website. Our Client is a company which prides itself in professionally serving international clients and it cannot stand idly by when statements such as those made by the applicants are unjustifiably directed at it. Meath County Council redacted Mr. Burke's submission on its website, as was appropriate, in response to our Client's request.

Separately, as was confirmed by correspondence submitted by our Client to Meath County Council on the 22nd October 2015, the other purpose of the submission of unsolicited further information was to

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T: +353 1 296 4667 F: +353 1 296 4676 www.slrconsulting.com

Directors: R. O'Dowd, N. O'Neill, T. Paul (Managing), N. Penhall (British), I. Roberts (British). Secretary: R. O'Dowd
Registered in Ireland as: SLR Environmental Consulting (Ireland) Limited. Registered No.253332. VAT No. 8253332J

'clarify certain queries raised in all four of the submissions made in respect of this application (including the submission made by Frank Burke & Associates...'

For the avoidance of doubt, the letter further stated that 'In all cases, the queries raised relate to details which are set out in the planning application and the accompanying Environmental Impact Statement.' By way of conclusion, the correspondence also highlighted that 'no new information has been provided, rather, we have simply gone about drawing your attention to the locations at which the relevant information can be found in the EIS.'

This is entirely consistent with Section 5.10 of the Development Management Guidelines (DOEHLG, 2007) which in reference to 'unsolicited further information' state that such submissions should only be considered when they relate to non-contentious matters, such as clarification of details already submitted.

As is clear from the provisions of the Planning and Development Acts 2000 to 2014 and Section 34 of this Act, as amended, the decision as to whether or not to make a request for further information together with discretion over the content of that request lies with the planning authority. Under these statutory powers, Meath County Council took the view that the additional information it sought (and was provided with) at RFI stage was significant even though it related to traffic sightlines alone and consequently directed that the RFI submission be publicly notified (which it was and the public was allowed a further opportunity to comment on the RFI submission).

2.0 VALIDITY

The appeal states that they raised issues with the validity of the application as submitted to Meath County Council.

We note that the law governing the validity of planning applications is set out in Article 26 of the Planning and Development Regulations 2001, as amended, (Planning Regulations). On receipt of a planning application, Meath County Council was obliged to consider whether the Applicant had complied with the requirements of articles 18, 19(1)(a) and 22 and, as may be appropriate, of Article 24 or 25. Articles 24 and 25 are not relevant to this application. None of the issues raised by the Appellants cite validation points. We consider that all requirements of the above articles were adhered to by the Applicant, where relevant. As a result, Meath County Council confirmed the validity of our Client's application under article 26 of the Planning Regulations, as appropriate.

3.0 WATER / WELLS

In relation to water and wells, Mr. Burke complains that, in summary:

- *There is limited information in relation to (i) the characteristics of existing plant wells; (ii) quality and water levels of domestic wells in the area of the zone of influence in the EIS.*
- *A proper assessment of all of the wells in the zone of influence of the wells should have been carried out. The EIS indicates that the company was aware of the existence of non-company wells (including Thomas Concannon's well located within 200m of Dunbia's 'new' well) but choose not to assess same as part of the EIS.*
- *testing should have been carried out on the "new" well and in addition to the water output / quality information, also covered water levels before, during and after the pump test on the subject well and adjacent wells.*

3.1 (A) Information contained in the EIS

At the outset, we would point out that the third groundwater supply well (referred to by the Appellants as the 'new' well) is not the subject of this planning application and has, in fact, already been consented (by Planning Reg. Ref. SA14/0210). The two other existing on site wells are long-established.

The potential for significant effects on hydrology and hydrogeology arising from the increase in use in water resources arising from the proposed development is considered in Chapter 6 of the EIS. The

characteristics of existing wells on site and in the vicinity of the proposed development are described and addressed in this chapter, which confirms that:

> 'There are two existing abstraction wells (BW01 and BW02) at the site which currently meet the water supply requirements of the Dunbia plant, the locations of which are shown on Figure 6-2. There are a number of private wells serving residential properties along the public road (Windmill Road) immediately to the east of the site recorded on the GSI well database, refer to Figure 6-10. There are no abstraction wells in the immediate vicinity of the application site recorded in the EPA Abstraction Register.
>
> The application site is not located within any abstraction Source Protection Zone (SPZ) identified or delineated by the GSI or EPA. However, the eastern edge of the site may be within the supply zone for the wells serving the properties to the east of the site, although the extent of these supply zones is likely to be limited.
>
> There is an identified SPZ close to the River Boyne at Slane, approximately 3km to the north of the site, see Figure 6-11. The application site is not located within this identified SPZ, nor is it up-hydraulic gradient of the SPZ.'

As stated, planning permission was previously obtained for the third groundwater supply well and a groundwater abstraction of up to 60m^3/day in 2014 (Reg. Ref. SA14/0210). A hydrogeological assessment, incorporating results of a 7 day pump test, was provided in support of that planning application in early 2014.

The relevant extracts from this hydrogeological assessment presenting the pump test results and assessment of aquifer properties, sustainable well yield and impact on nearby wells and surface water features are presented in Appendix 6C of the EIS.

On the basis of this hydrogeological assessment, Sections 6.124and 6.126 of the EIS concluded that:

> "the operation of a new back-up abstraction well (TW01) at the application site to help secure existing water supplies for the adjoining meat plant should not have any significant drawdown impacts either on the adjacent existing groundwater abstraction boreholes (BW01 and BW02) or on the closest private abstractions located beyond the eastern site boundary. In addition, no resultant impacts are anticipated on surface water flows at and adjacent to the application site.
>
> The delineation of proposed Inner and Outer Source Protection Areas, as identified above for the existing site supply wells (BW01 and BW02) and the proposed back-up groundwater abstraction well (TW01) and the appropriate management of surface activities therein, will ensure that future risks to groundwater supply quality and water levels in the supply wells are minimised."

In a worst case scenario, the nearest existing groundwater well at a residential property 130m away (which is believed to be Thomas Concannon's well) would experience a maximum potential drawdown of just 0.40m on the basis of groundwater being abstracted from the well at a rate 60m^3/day. The effect of this potential drawdown is considered insignificant. The impact on other private wells at a distance of greater than 130m is therefore considered to be lesser again i.e. less than the potential drawdown of 0.40m and therefore also insignificant in nature.

3.2 (B)Additional information in addition to that provided in the EIS

Results of groundwater quality testing undertaken at the time of the pump test in February 2014 were previously presented in a hydrogeological report which accompanied planning application (Reg. Ref. SA14/0210). Notwithstanding the fact that the well and / or additional abstraction do not form part of this application, we enclose a copy of the hydrogeological report for completeness (as **Appendix A**) under cover of this submission. This report presents relevant water quality test results and an interpretation thereof, for the Board's information

Since the submission of the previous planning application in March 2014, no new wells have been recorded in the vicinity of the site on either the GSI well database or in the EPA Abstraction Register. A review of planning applications granted since February 2014 for development along Windmill Road and within the Beauparc area also confirms that the majority of proposed new development will be connected to the mains water supply and that those new developments sourcing water via new on-site wells are located well beyond the 130m stand-off distance for which impact was previously assessed. The potential for cumulative impacts has therefore been fully considered.

Water Quality

Complaint is made that there is very limited information on water quality on any of the existing wells on site.

3.3 (A) Information contained in the EIS

Section 2 of the EIS (entitled 'Existing Site Infrastructure - Water Supply') discusses existing site infrastructure and notes that the quality of groundwater abstracted from the existing groundwater supply wells is generally very good, as indeed it must be for a food processing industry (Para 2.98).

Section 6.125 of the EIS states that

> The water quality analyses collected during the TW01 pumping test programme indicate that the groundwater quality in the limestone aquifer underlying the site is very good, with no indication of any surface pollution impacts associated with agricultural practices. This is considered to reflect the significant thickness (c.50m) of competent limestone and 2m to 3 m of clayey (glacial till) superficial deposits that are protecting the deeper productive limestone aquifer, estimated to extend between c.60mAOD and c.0mAOD.

3.4 (B) Additional information in addition to that provided in the EIS

Results of groundwater quality testing undertaken at the time of the pump test in February 2014 were previously presented in a hydrogeological report which accompanied planning application (Reg. Ref. SA14/0210). Notwithstanding the fact that the well and / or additional abstraction do not form part of this application, we enclose a copy of the full hydrogeological report, which includes relevant water quality test results and an interpretation thereof is provided for completeness (as **Appendix A**) under cover of this submission, for the Board's information.

Perceived Water Demand / Shortage

Complaint is made that there is limited information in the EIS on well output.

3.5 (A) Information contained in the EIS

The projected increase in water demand associated with the proposed development includes an allowance for increased human consumption (please refer to paragraph 2.166 of the EIS).

The increase in potable water demand for an additional 15 workers at the Dunbia facility is minimal (estimated at 15 x 50 litres per day = 750 litres/day or 0.75m^3 /day) and can be comfortably supplied from existing groundwater well capacity.

The Appellants appear to have misread or misunderstood the statement in Section 2 of the EIS, Para 2.169 which states that there will only be a minimal increase in the volume of water required to hose down the lairage each day (given the relatively minor increase in the paved area requiring daily wash down). The "new" well with an output of 60m^3 was provided in order to overcome any potential future shortages, similar to those experienced in 2013. The increased demand indicated in the EIS for wash water for the proposed expansion is 55m^3. No assertion was made to the effect that the overall increase in water consumption is minimal.

As regards the security of water supply, the Board will note that planning permission has previously been obtained for a rainwater harvesting system (Reg. Ref. SA14/0210). As indicated in Para 2.170 and 2.171 of the EIS, while the intention is to initially source the additional water supply required by the proposed intensification of activity at the plant from the third well, in accordance with the previous grant of permission, the Applicant's intention over the short- to medium-term is to install rainwater harvesting facilities at its facility and to collect and use untreated rainwater to wash down the external yard areas and lairage facilities.

The EIS highlights provision for water storage tanks / rainwater harvesting from storage lagoons to relieve potential for any future pressure on water supply (please refer to Chapters 2 and 6 of the EIS). The harvested 'grey water' will supplement the existing supply from the groundwater well and will be used in place of treated potable water for wash down of yards and lairage areas. The yards and lairage areas are washed down once a day after slaughtering has ceased. Although there is a proposed increase in slaughter numbers there is little or no increase in yard and lairage areas. This combined with the switch from potable water to harvested water explains why there is not a pro rata demand for wellwater. (Section 2 of the EIS, Para 2.169)

When the rainwater harvesting infrastructure is installed, it will reduce the demand for, and the cost of, groundwater pumping and treatment. This proposal is consistent with the principles of sustainable development and facilitates resource conservation.

4.0 WASTEWATER

The complaint made in relation to wastewater is, in summary, that: (i) letters of consent from the relevant local authorities have not been provided for the off-site wastewater disposal to municipal wastewater treatment plants at Navan, Dundalk and Ringsend; and (ii) there will be significant increase in the wastewater produced as a result of the proposed intensification and that the municipal wastewater treatment plants need to be assessed as to their ability to cater for the increased load.

4.1 (A) Information contained in the EIS

In response to the queries raised and comments made in relation to wastewater treatment, we would like to confirm the following points:

Wastewater Generation

The subject application and associated EIS estimate that the increase in wastewater production will generate 2-3 additional movements of 25m^3 tankers in and out of the site per day. The implications of the resultant increase in traffic are presented and discussed in Section 12 of the EIS and relevant data on existing / expected future waste movements is provided in Appendix 12-3 to the EIS.

The lined on site lagoons have the capacity to handle the expected increase in wastewater generated by the proposed intensification of activities. The operation of lagoons is subject to oversight by the EPA. Relevant details on emergency storage capacity and management of the lagoons is provided in Chapter 2 of the EIS. More specifically, para 2.180 of the EIS states that the lined on-site lagoons will provide **at least 5 weeks of emergency storage for wastewaters generated at the site** (as required / agreed with the EPA under the terms of the existing IED licence).

Wastewater and sludge disposal arrangements have been agreed and implemented after consultation with the EPA. These arrangements are regulated by the EPA who is the competent authority for this matter under the IED licensing regime.

Sludge disposal is addressed by way of a Nutrient Management Plan which is regularly revised and updated to take account of changing circumstances. All updates and revisions to this plan are subject to oversight and approval by the EPA under the terms of the IE licence.

The disposal of wastewaters to municipal wastewater treatment plants is the subject of commercial arrangements with the operator Irish Water, which has taken over the responsibility for the operation

of municipal waste water treatment plants. There is and will be sufficient capacity provided across plants operating in the Greater Dublin / North-East region for the foreseeable future.

Wastewater Treatment Plants

On the date of the planning application, Dunbia disposed of its wastewater at the Ringsend, Navan, Drogheda and Dundalk treatment plants. For technical reasons, Drogheda and Dundalk wastewater treatment plants are now currently unavailable and the site's wastewater is disposed of using a combination of capacity at the Navan, Ringsend and Leixlip plants. Our Client may revert back to using Drogheda and Dundalk, in addition to or in substitution for, the other wastewater treatment plants, as they become available again in the future.

There are commercial agreements in place with Navan, Ringsend and Leixlip in order to provide the required treatment capacity, and these include sufficient contingency treatment capacity in the event that there is periodic increase in demand, shutdown, maintenance works etc at any one of the wastewater treatment plants. It is considered unlikely that all plants will experience shutdowns or restrict treatment capacity for external users at the same time. This arrangement is considered to be robust, and has proven so since 2010.

The Dunbia plant at Slane and the wastewater treatment plants to which it disposes of its wastewater are all subject to oversight and regulation by the EPA. As explained above, the EPA has approved the off-site treatment of wastewater generated at the Dunbia plant. The prospective increase in wastewater generated by the prospective increase in numbers was taken into account in the sizing and design of the storage lagoons (Ref. Para 2.178 of EIS). Indeed the design and commissioning of the lagoons was subject to EPA review and approval in accordance with the requirements of the existing IE licence.

There are sufficient outlets and storage capacity provided in Dunbia's on site arrangements to ensure that wastewater can be transferred off-site as and when treatment capacity becomes available. Specifically, in this regard, the sizing and management of the 2 existing lined wastewater lagoons at the Dunbia plant provides for at least 5 weeks' emergency effluent storage capacity, if required (Ref. Para 2.122 of EIS), as mentioned above.

The responsibility for the operation of the wastewater treatment plants has been transferred to Irish Water from the relevant local authorities. The issue of reserved functions raised by the Appellants has no substance having regard to the transfer of functions from the local authorities to Irish Water.

Landspreading

Complaint is made that alternative options including the possibility of reverting to the land spreading of wastewater must be included and assessed in the EIS. Contradictory complaint is also made about the use of landspreading.

All additional wastewater generated by the proposed development will be transferred off-site in liquid waste tankers and treated at licensed wastewater treatment plants. As previously noted, it is considered that existing arrangements providing for off-site treatment of wastewater are robust and can be comfortably extended to accommodate the projected increase in wastewater effluent production at this facility. This is considered adequate to provide the required treatment capacity plus sufficient contingency treatment capacity in the event that there is periodic increase in loading, technical difficulties etc. at one or other plant. Again, it should be noted that 2 existing lined wastewater lagoons at the Dunbia plant are managed in a way which ensures that at least 5 weeks' emergency storage capacity is available if required. Landspreading of wastewater does not constitute part of the existing or proposed development and as such was not considered as part of the EIS.

Established wastewater management practices

A detailed outline of established wastewater management practices at the Dunbia plant is provided in Section 2 of the EIS (Para 2.116 to 2.123).

We consider that off-site transfer of the additional wastewater generated by the proposed development, together with the on-site contingency storage capacity at the wastewater lagoons, is a feasible, flexible, robust and proven effective proposal, one which is consistent with established effluent management practices at the facility and one which has been approved by the EPA.

As previously noted, the prospective increase in wastewater generated by on-site activities was taken into account in the sizing and design of the storage lagoons (Ref. Para 2.178 of EIS). The design and commissioning of the lagoons was subject to EPA review and approval in accordance with the requirements of the existing IE licence.

Many licensed industries in non-serviced areas have commercial arrangements which provide for off-site treatment of wastewaters and/or trade effluents at licensed wastewater treatment plants. There is no legal or statutory barrier or impediment to such commercial arrangements.

Surface Water Run-off

A concern was raised in respect of surface water run-off and the perceived lack of information on the quality of the receiving water.

There will be no change in the volume of surface water run-off to the drainage ditch to the south-west of the plant, as all existing and proposed development areas are currently paved and drained. Some minor changes / additions which have been proposed to surface water run-off and drainage infrastructure are referred to in Chapters 2 and 6 of the EIS. We would point out that the EIS concludes that the cumulative impact of the previously consented and further minor changes to surface water run-off and the drainage regimes are minor/insignificant.

The surface water run-off arising from roofs and the external paved areas around the Dunbia plant is treated and passed through a silt trap and hydrocarbon interceptor prior to its discharge to an existing ditch / drain which runs south to the headwaters of the Roughgrange River. There is no surface water quality data provided in respect of the receiving waters up and downstream of the Dunbia facility as there are no receiving waters. The treated surface water run-off either percolates into the underlying soil along the ditch or flows over land toward the Roughgrange River. Off-site discharges are monitored and controlled in accordance with the existing IE licence conditions and are subject to oversight by the EPA. Monitoring data indicates that stormwater discharge is in compliance with licence conditions.

5.0 AIR / ODOUR

Queries were raised in relation to perceived odour impact as well as the air quality assessment more widely in terms of the methodology used.

An assessment of the impact on air quality including the consideration of the effects on odour is set out in Chapter 7 of the EIS (Para 7.58 to Para 7.75). No air quality monitoring is required to be undertaken at the facility, as there are no significant atmospheric emissions. Rather than on site testing which is a standard approach in relation to assessing dust emissions, odour issues are more difficult to capture using this approach. As a consequence the evaluation of these potential effects was based on a qualitative assessment undertaken to determine the potential frequency with which receptors may be affected. The assessment also considered the existing measures that are in place and required for the facility in order to operate in accordance with an IPPC licence. Under these existing and ongoing measures odour generation will be monitored and controlled through a series of abatement measures as part of an Odour Management Plan (OMP).

On the basis of this assessment and the adopted Odour Management Plan, section 7.110-7.115 of the EIS concludes that potential odour associated with the proposed development will be minimised

and adequately controlled. The absence of any recent odour complaints in respect of the existing slaughtering facility is also consistent with this conclusion.

The Appellants also appear to suggest that there is a discrepancy between figures in the receptors used. The dust receptors DR15 to DR17, identified in Section 7 of the EIS (Air Quality), include receptor RA2, identified in Section 8 (Noise). This alleged discrepancy was previously addressed by way of further (unsolicited) information.

6.0 VISUAL IMPACT

Complaint is made that the existing and the proposed development impacts and will continue to impact negatively on the visual environment of the area, that a landscaping plan has been approved but not yet implemented.

In response to comments made in relation to perceived visual impact, there will be minimal change / no significant change to the plant layout or to its visual appearance as a result of the proposed development. This is explained and discussed in Chapter 9 of the EIS.

Much of the development required to facilitate the proposed intensification is already extant and consented. The amount of new physical development necessitated by the application is minimal. The Applicant intends to implement the landscaping works conditioned in accordance with permission SA140210.

7.0 TRAFFIC, ROADS AND SIGHTLINES

Complaint appears to be made that the loss of a residential farmhouse by conversion of same to office use will add to the traffic movements generated and that this perceived increase in traffic has not been taken into consideration in the traffic assessment. Complaint is also made that the volume of non HGV traffic generated by the plant is low and is, on that basis alone, apparently questionable.

Traffic movements associated with the residential farmhouse and employees

This planning application provides for a change of use of the existing residential unit to office use. The existing property is not currently used as an office. No retention application is therefore warranted. It should be noted that those currently working the agricultural lands around the Dunbia facility are not resident at the residential farmhouse. Some administrative staff working in the temporary office structure will be transferred to the refurbished structure on completion of fit-out. There will therefore be no increase or change in existing traffic levels or movements across the local road network associated with the change of use of the farmhouse.

The traffic impact assessment is considered to be robust as it assumes that all employees will travel to work. Post-intensification there will be a total of 87 daily trips for light vehicles (principally passenger cars) for a projected total of 75 employees (equivalent to more than 1 trip per employee per day).

Contrary to any inferences or assertions made by appellants, almost the entire Dunbia workforce remains on site for a full 8 hour work shift, and there are few off-site trips made by employees during lunch or tea-breaks. This position is supported by the traffic survey data presented in section 12 and in Appendix 12-1 of the EIS.

Traffic movements associated with wastewater treatment

The traffic impact associated with the proposed development, including that arising from wastewater disposal, is assessed in Section 12 of the EIS. Trip movements associated with these activities were based on a tanker capacity of 25m^3 as opposed to the 7m^3 capacity tankers referred to by the Appellants.

Traffic survey

Complaint is made that the traffic survey covers a day when the cattle throughput was 186 and not 200 (see section 12.86 of the EIS), as such the traffic figures in the EIS are perceived to be understated.

The application provides for an intensification of activity at the existing plant, with the slaughter rate increasing from a maximum of 200 cattle per day to a maximum of 350 per day, the impact of which has been assessed in the EIS accompanying the planning application. Although the traffic survey was not undertaken on a day when precisely 200 cattle were slaughtered, the baseline traffic flows have been adjusted on a pro-rata basis to facilitate impact assessment for an increase in the slaughter rate from the permitted maximum of 200 to 350.

Access Routes

Complaint is made in respect of the use of the northern section of the Windmill Road by local farmers, and tankers drawing wastewater from the plant to the Navan Wastewater Treatment Plant and that this road along with others was not included in the traffic impact assessment. It is contended that the EIS does not include all routes impacted or likely to be impacted by the proposed development.

The road to the north of the existing site access is only very occasionally used by farmers to bring cattle to the Dunbia plant (refer to traffic survey data in Appendix 12-2 which indicates only 1 light goods vehicle and 2 other goods vehicles travelled south along that section of Windmill Lane and into the Dunbia plant over the entire 24 hour survey period).

The Applicant considers that there will be little or no increase in the number of cattle sourced locally for slaughter when slaughtering / production intensified. Rather the bulk, if not all, of the additional cattle will be brought by dealers in HGVs / cattle trucks from more distant locations. Dunbia is confident that all additional traffic movements generated by the proposed development will travel to and from the plant via the L1013 to the south, and the southern arm of Windmill Lane (as modelled in the traffic impact assessment presented in Section 12 of the EIS).

The impacts of the development related traffic movements over Windmill Lane and the L1013 are addressed in the EIS submitted in support of the planning application. For completeness, it should be noted that the transfer of effluent off-site to the Leixlip Wastewater Treatment Plant will not give rise to any environmental impacts over and above those previously identified in the EIS. As in the case of transfers to other treatment facilities identified in the EIS, tankers transferring effluent to Leixlip will initially travel south along Windmill Lane, before turning left (and east) along the L1013 local road, toward its junction with the N2 National Primary Road at Rathdrinagh Cross Roads. At that point it will turn south onto the N2 and travel over the national road network (N2, M50 and N4) to Leixlip. Effluent transfers to Leixlip are only likely to occur on an occasional or intermittent basis and, as such, the associated impacts on existing road / junction capacity, road condition, level of service or traffic safety across the national road network are considered insignificant.

In its dealings with suppliers, Dunbia specifically instructs suppliers to approach the plant from the L1013, to exit the plant along the same route and not to use the northern section of Windmill Lane. Signs are in place to remind drivers of this and security staff / CCTV monitor compliance. Any driver / supplier found to be repeatedly in breach of Dunbia's instruction is issued with a formal (verbal and/or written) warning and ultimately could have their access to the facility suspended for a period of time. We enclose a colour photograph at **Appendix B** evidencing the signage used to control site traffic.

In view of the low volume of traffic movement currently generated along the northern section of Windmill Lane and the minimal / non-existent increase in traffic movements along it generated by the proposed intensification of activity at the plant, the potential for significant impact was scoped out early on in the Traffic Impact Assessment process. It was therefore considered unnecessary to undertake any baseline survey or traffic impact assessment across this element of the local road network.

Haul Routes

Complaint is made that no "proper scientific structural survey" of the condition of the pavements of the all of the local receiving roads was carried out; that the impact on the structure of the local road pavements from by HGVs generated by the plant and the its proposed intensification should have been fully assessed and should have included a detailed assessment of their pre-application condition and that certain roads require repair.

The impact of the proposed development on the local road network is assessed in Section 12 of the EIS. The impact of the proposed development on the condition of the road network, and Windmill Lane in particular, has been recognised in the EIS.

Findings of a visual inspection of the existing road pavement conditions undertaken by Kieran Boyle Consulting in February 2014 around the Dunbia plant are provided in Appendix 12-1 of the EIS. A detailed scientific structural survey of the southern arm of Windmill Lane (using geophysical survey techniques) was not considered necessary for traffic impact assessment (TIA) purposes, nor is it conventionally undertaken for such assessments. A geophysical survey of the local public roads would not materially alter or change the findings of the inspection.

The available survey data is considered sufficient to assess the likely impact of increased traffic movement generated by the proposed intensification of use. Section 12 of the EIS (Para 12.56) indicated that the section of Windmill Lane from the L1013 to the Dunbia plant requires a structural overlay at a number of locations where it has deteriorated.

The impact of the proposed development on public road infrastructure, presented in Section 11 of the EIS (Para 11.56), recognises that it the absence of any mitigation measures (ie. improvement works), the quality of existing road surfaces, particularly along Windmill Lane, will continue to deteriorate.

The engineering surveys and subsequent detailed design and construction of any improvement works which the Appellants perceive to be required is not within the control of the applicant and must be directed by MCC as owner of the public road.

'Level of Service' Experienced by Public Traffic

Complaint is made that the presence of Dunbia's facility has meant that the level of service experienced and which will be experienced due to the intensification is substantially lower than residents of a comparable area without the facility and the proposed increase in through-put will further decrease this.

It is considered that any comparison as to the relative level of service provided along the local (ie. non-national and non-regional) road network is subject to a myriad of variables other than the presence of a local industrial undertaking. Factors which can impact level of service along local roads include, capacity, safety, horizontal and vertical alignment, intensity of residential development, ground conditions, pavement quality etc).

The impact of the proposed development on the local road network, specifically junction and link road capacity and road safety is presented in Chapter 12 of the EIS, Section 12.149 -12.151 which states:

> The junction capacity analysis demonstrates that both the Site Access / Windmill Road priority junction and the Windmill Road / L1013 priority junction operate comfortably when subject to the existing and proposed conditions during both weekday peak periods.
>
> In terms of the wider road network, the link capacity assessment demonstrates that the N2 operates comfortably within its theoretical capacity when subject to the existing traffic flows, with plenty of headroom for the additional vehicle trips associated with the development proposals.
>
> A review of the accident data has confirmed that road safety will not be compromised by the proposed intensification of slaughtering activities at the application site.

Sightlines and Traffic Safety

Complaint is made that the sightlines at a number of junctions traversed by plant traffic and the forward visibility along sections of the haul roads are substandard and concern is expressed in relation to the traffic safety on the network.

The adequacy of the existing sightlines at the entrance / egress from the Dunbia facility was addressed in detail by way of Dunbia's response to a request for further information issued by Meath County Council.

Section 12 of the EIS (Para 12.40 and 12.41) identifies that sightlines from Windmill Road to the L1013 are of acceptable standard and that while there could be some potential restriction of sightlines by vegetation in summer months (which can be readily managed), this is compensated by excellent forward visibility along the L1013.

The impact of the proposed development on the road network and Windmill Lane in particular has been recognised in the EIS, and addressed by the Planning Authority and Applicant. It is considered that the development proposal would not generate traffic of a type or amount inappropriate for the standard of the access roads. The proposed development is therefore acceptable in the context of ED POL 17 of the County Development Plan.

> "ED POL 17 of the County Development Plan states that "to normally permit development proposals for the expansion of existing authorised industrial or business development in the countryside .... It should be demonstrated that the proposal would not generate traffic of a type or amount inappropriate for the standard of the access roads".

It is considered that the proposed reconfiguration of the site entrance is appropriate for the design speed of vehicles travelling along the section of Windmill Road leading from the L1013 to the Dunbia plant. In response to the further information request received from Meath County Council, our Client engaged with the Road Traffic Section of Meath County Council and provided the solutions that it sought.

Any assertions about the level of traffic hazard presented by existing HGV traffic movements to and from the Dunbia plant do not withstand any objective scrutiny. Information on road accident history along the local road network is presented in Section 12 of the EIS (Para 12.67 to 12.76) and it is concluded on the basis of this evidence that the additional traffic generated by the proposed development will not compromise the safety of other road users.

Impact on Residential Amenity / Human Beings

The impact of the proposed intensification of activity at the Dunbia plant is assessed in terms of residential amenity / human beings in Section 3 of the EIS and cross-references a number of other topics discussed in other chapters (including noise, air quality, visual impact and traffic).

The EIS recognises that there are potential adverse impacts arising from the proposed development, seeks to quantify these and recommends mitigation measures where appropriate. The findings of minor to moderate impact is explained in the EIS and is considered robust, given that the facility is already established at this location. No basis for arguing otherwise is presented by the Appellants.

8.0 NOISE

Complaint is made, in summary, in relation to the noise assessment submitted in the EIS is inadequate as it did not cover maximum impact on residents and to the selection of the sensitive receiver locations used in the assessment.

8A Information contained in the EIS

The existing noise survey data presented in Section 8 of the EIS indicates that much of the noise in the local environment surrounding the application site is associated with intermitted traffic movements

over the local road network. It also finds that there is no tonal or impulsive noise generated by existing site activities at the Dunbia plant.

The impact of noise generated by additional traffic movements across the local road network is assessed in Para 8.56 to 8.61 of the EIS. An assessment of potential noise impacts arising (at any time of the day or night) in a worst case scenario (with 15 No. additional HGV movements per hour), determined that the increase in ambient noise levels at the nearest noise sensitive receptors is barely perceptible. On this basis, the impact of additional traffic noise generated by the proposed intensification was assessed as minor by the EIS. This assessment in the EIS was for the nearest sensitive receptors. would have been taken on board by Meath County Council in its decision to grant planning permission in respect of the proposed development.

The potential for impact on noise levels has been addressed by condition no. 8 in the planning authority's decision to grant. This states that:

> "Activities on-site shall not give rise to noise levels off-site, at noise sensitive locations, which exceed the following sound pressure limits (Leq, I 5 minute):
>
> (i) 8am to 8pm Monday to Friday (inclusive): 55dB(A)
> (ii) 8am to 2pm Saturday: 55dB(A)
> (ii) Any othertime: 45dBfA)
>
> In addition, there shall be no clearly audible tonal component or impulsive component in the noise emission from the site at any noise sensitive location."

It should also be noted that in addition to the results of the assessment and this provision, noise emissions from the Dunbia facility must comply with a daytime limit of 55dB(A)) LAeq and a night time limit of 45dB(A) LAeq as per the existing IE licence issued in respect of the facility by the EPA.

8B Additional information to that provided in the EIS

In this regard, we attach the latest Noise Survey carried out in February 2015 at **Appendix C** which confirms that:

> *" All background noise levels at Noise Sensitive Locations are below the IE Daytime limit of 55dBA and the night time limit of 45dBA. In addition there is no tonal or impulsive noise audible from the factory at noise sensitive locations. Therefore the site is not causing a noise nuisance and the level of noise from the facility is compliant with the limits set in the IPPC licence regarding noise."*

9.0 IE LICENCE

Complaint is made that the planning authority did not require an IE licence to be granted for the increased throughput before they granted permission.

Dunbia's facility holds an IE Licence which was granted by the EPA in 2010 and subsequently amended in 2013 to incorporate the requirements of an IE licence (Ref. no. P0811-01). The Appellants appear to fundamentally misunderstand the planning and environmental licensing process and the fact that the control of emissions arising from the activity is a function of the EPA. It is understood that the increased production can be accommodated within the current IE licencing regime, compliance with which will ensure that there is no significant environmental impact from the facility.

The EPA provided its comments to the Council on the application and the EIS in accordance with section 87(1F) of the EPA Acts 1992, as amended, by way of letter to Meath County Council dated 15 October 2014. Specifically, it confirmed that:

> *"The EIS appears to address the key points in relation to the environmental aspects of the proposed activity which relate to the matters that come within the function of the Agency. It*

also appears to address the direct and indirect effects of the development on the aspects of the environment listed in section 83(2A)(a) of the EPA Acts..."

The EPA makes clear in its correspondence that it will consider and assess "*all matters to do with emissions to the environmental from the activities proposed* " It also confirms that the IE Licence may need to be amended or revised to accommodate the expansion proposed in the planning application and specifically asked the planning authority to note that if a licence revision is required it cannot issue a proposed determination on a licence application until a planning decision has been made.

Ultimately the form of approval required for the intensification is a matter only the EPA can determine. Dunbia will continue to comply with the emission limits (as set out in Schedule B to its IE Licence) if / when the proposed intensification of activity is approved. Note that Schedule B.2 is not applicable as wastewater is disposed off-site at external Wastewater Treatment Plants.

10.0 EIS – ADEQUACY

Complaint is made that particular sections of the EIS is lacking in technical detail as submitted was perceived to be fundamentally flawed. Complaint is also made that no records of cattle throughput or volume of meat produced, volumes of wastewater and other waste outputs were submitted with the application.

The Applicant is seeking planning permission for intensification of activity from 200 cattle / day to 350 cattle / day. We consider that all relevant information in respect of resource consumption, waste quantities, discharges / emissions, traffic volumes etc. arising from this intensification is set out in the EIS in order to facilitate the planning authority in undertaking an environmental impact assessment of the proposed intensification of use.

For commercial sensitivity reasons the Applicant has not provided records of the volume of meat which it produces or the cattle throughput. However, we consider that the environmental impacts of the proposed intensification of cattle throughput have been set out in detail in the EIS as is appropriate in accordance with requirements of the EIA Directive in order to enable the Board to determine whether or not the proposed intensification and associated development are likely to have a significant effect on the environment.

It is noted that the EPA in providing its comments to the planning authority in respect of the EIS was of the view that the EIS appears to address (i) the key points in relation to the environmental aspects of the proposed activity which relate to the matters that come within the function of the Agency and (ii) the direct and indirect effects of the development on the aspects of the environment listed in section 83(2A)(a) of the EPA Acts. As already indicated by the EPA in its letter to Meath County Council in relation to this application, it will consider the emissions associated with the intensification and whether it requires the existing IE licence to be updated.

11.0 WASTE

The Appellants argue on the one hand that consideration should have been given to landspreading but they also appear to simultaneously take issue with landspreading. Concerns are raised in relation to Category 2 material which is currently land spread.

At the present time, all Category 2 organic waste is removed off site from the Dunbia facility by a licensed waste contractor. The Contractor is responsible for the subsequent transport, handling and recovery of this particular waste stream and for ensuring that all such activity (which is classified as a waste activity by national waste management legislation) is fully approved and consented by the local authorities and/or the EPA.

As previously advised in the wastewater section of this submission (Section 6), Dunbia does not currently undertake or manage any landspreading activities on lands within its control surrounding the facility, nor does it intend to do so in the future.

The installation of the new Paunch Press and gantry will provide an increase in efficiency from the current system which will also provide an efficiency in relation to landspreading i.e. there is expected to a be a 50% increase in efficiency in relation to the amount of stomach contents landspread.

The spreading of organic wastes on land is controlled by a Nutrient Management Plan which is agreed and assessed by the EPA under the terms of the IE licence. The plan will be updated to address the management of increased waste quantities produced and will be agreed / approved by the EPA. Dunbia has provided, and abided by, an undertaking to certain local residents that it would not spread organic waste on surrounding lands within its control.

It is noted that the Appellants live in a rural area where the predominant economic activity is farming and agricultural related enterprise. Notwithstanding the fact that Dunbia currently has no plans to landspread effluent on surrounding lands to the facility within its control, the Appellants will recognise and accept that slurry is occasionally spread on grassland surrounding their residential properties and is an established, routine agricultural land improvement and management practice. Spreading of slurry on land is subject to control by regulation (specifically the nitrates regulations) and it is largely immaterial who does it, be it Dunbia, an agricultural / waste contractor or a local farmer.

12.0 MISCELLANEOUS

12.1 Monitoring

Complaint is made that there are no proposals for future monitoring

The existing and comprehensive environmental monitoring and control measures established and implemented under the IE licensing regime will continue in force at Dunbia's facility.

Existing monitoring locations have been chosen on the basis of their proximity to sensitive receptors. Dunbia cannot undertake environmental monitoring at locations beyond its property boundary. The IE licensing regime operates on the principle that environmental emissions beyond the Licensee's site boundary should not exceed permissible limits, thereby removing the requirement for such monitoring at greater distances.

12.2 Development Plan Compliance

Complaint is made that the planning authority ignored ED POL 17 of its Development Plan

Section 12 of the EIS (Para 12.40 and 12.41) identifies that sightlines from Windmill Road to the L1013 are of acceptable standard and that while there could be some potential restriction of sightlines by vegetation in summer months (which can be readily managed), this is compensated by excellent forward visibility along the L1013.

The issue as to the adequacy of the existing sightlines at the entrance / egress from the Dunbia facility was addressed in detail by way of the request for further information issued by MCC and the response thereto.

As the impact of the proposed development on the road network and Windmill Lane in particular has been recognised in the EIS and addressed by the Planning authority and Applicant, we therefore consider that the proposal would not generate traffic of a type or amount inappropriate for the standard of the access roads. The proposed development is therefore acceptable in the context of ED POL 17 of the County Development Plan.

12.3 Loss of Farmhouse

Complaint is made that permission is sought to change the farmhouse from residential to office use and that the farmhouse will be 'lost'.

The applicant is seeking permission for a change of use from residential unit to office. The existing residential unit will not be demolished, rather it will be converted to office use. Granting permission is

within the gift of the planning authority and An Bord Pleanala. There is no provision or requirement in the County Development Plan that refers to the presumption against a change of use request of this nature. The current residential use it at odds with the nature of the established use at this location and the change of use request is entirely justifiable on this basis.

12.4 'Pump House' retention

Complaint is made that the pump house has already been built and that a retention application is required.

The pump house has not been constructed. Permission is being sought for same as part of this application. A well head was constructed following successful well tests and a temporary protective cover was put in place pending grant of planning permission in order to protect the well water source and the associated pumping equipment.

12.5 Development Contributions

Complaint is made that the local authority did not impose development contributions

According to the planner's report of 20 January 2015, the local authority did not impose development contributions as the proposal is an expansion to the existing operations on site and as such contributions are not applicable. Meath County Council's Development Contribution Scheme 2010 – 2015 states that expansions to existing authorised industrial and manufacturing operations shall be exempt from development contributions.

13.0 CONCLUSION

The Meath County Development Plan 2013-2019 recognises that food and meat processing activities occur at various rural locations throughout the county and in this regard, policies in the plan actively support and protect this existing economic base where it occurs.

Arising from the conclusion derived from the EIS, we consider that the proposed development will not have a significant effect on the environment and that it can be deemed to be compliant with the following criteria set out in the ED Pol 18 of the Meath County Development Plan 2013-2019:

- it has locational requirements that can more readily be accommodated in a rural location than an urban setting and this has been demonstrated to the satisfaction of Meath County Council;
- it will enhance the strength of the local rural economy;
- it is of a size and scale which remains appropriate and which does not negatively impact on the character and amenity of the surrounding area;
- it demonstrates that it has taken into account traffic, public health, environmental and amenity considerations;
- it is in accordance with the policies, requirements and guidance contained in the County Development Plan;
- it would not generate traffic of a type and amount inappropriate for the character of the access roads or would require improvements which would affect the character of these roads (this policy does not apply to the National Road Network).

We consider that much of the physical development required to facilitate the proposed intensification of use at Dunbia's facility is already extant and consented and that the amount of new development necessitated by the application is minimal. The Appellants do not acknowledge this reality.

We further consider that the proposed development will not, either on its own or in combination with other plans or projects have a significant effect on the environment.

We respectfully submit that, having regard to information provided in support of this application, the proposed development is consistent with the proper planning and sustainable development of the area and adheres to adopted policies at a national, regional and local level.

We wish to thank the Board for providing us and our Client with the opportunity to address the issues raised by the Appellants in their objection to the proposed development. We trust that the information provide herein reinforces the particular merits of this application and will assist the Board in making an early determination of this appeal.

APPENDIX A Hydrogeological report

SLR

global environmental solutions

Dunbia (Slane)

RESPONSE TO PLANNING APPEAL BY FRANK BURKE AND ASSOCIATES

MARCH 2015
SLR Ref: 501.00213.00007.Final

global environmental solutions

PLANNING APPLICATION FOR EXISTING EXTENSION TO LAIRAGE AND SIDE CHILL, SITE OFFICES, WASTEWATER LAGOONS AND ANCILLARY INFRASTRUCTURE

PAINESTOWN, NAVAN, CO. MEATH

HYDROGEOLOGICAL / WATER SUPPLY REPORT

naturally better...

March 2014
SLR Ref: 501.00213.00006.Rev01

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1.0 INTRODUCTION

1.1 Background

This hydrogeological / water supply report is submitted in support of a planning application to Meath County Council (MCC) by Dunbia (Slane) for retention of existing development at its existing meat processing plant at Painestown, Navan, Co. Meath comprising the following:

(i) retention of extensions to the side chill in three units of c. 155m^2 and c. 143m^2 and c. 46m^2 and extension to the existing lairage of c. 237m^2;
(ii) retention of change of use of separate lairage extension of c. 153m^2 from agricultural use to commercial use;
(iii) retention of ancillary development comprising c. 93m^2 of existing green offal chills, c. 301m^2 of existing office and staff welfare facilities, 3 No. separate surface parking areas to accommodate 51 No. surface car parking spaces and 6 No. delivery / dispatch vehicles, together with lairage yard extension of c. 1025m^2 and associated site infrastructure works.

Planning permission is also sought for minor works required to facilitate rain water harvesting, enhancement of water supply and upgrading of on-site drainage and surface water management infrastructure.

The application site is located approximately 4.5 km south of the village of Slane and 8.5 km east of the town of Navan, Co. Meath. For the purposes of the planning application, the application site is deemed to comprise all buildings and structures which form part of the existing meat processing plant, as well as surrounding lands. The application site, shown in Figure 1, covers an area of 11.5ha. The existing slaughter house structures have a plan footprint of 0.16ha (1640m^2), while the works to be retained have a plan footprint of 0.074ha (740m^2). Existing ancillary development includes office and welfare facilities and car parking as well as integrated constructed wetlands (ICW's) to the rear of the facility which up until recently were used for the treatment of wastewater from the meat processing plant.

There is an existing groundwater supply at the site. It is understood that during the relatively dry summer of 2013, the existing water supply dried up and that Dunbia had to import water to the site in order to keep the facility operational. In light of these difficulties, Dunbia recognised that it needed to develop an additional sustainable source of water for the facility, to supplement its existing supply, as and when required.

The existing plant requires a daily supply of approximately 120 m^3/day (120,000 litres/day). This water is currently sourced from the two groundwater wells located immediately inside the eastern site boundary, identified as BW1 and BW2 on Figure 1. The new well will be installed and tested in order to:

- provide greater security of supply (in case groundwater level falls to exceptionally low levels as it did in late summer 2013); and
- establish the hydrogeological characteristics of the underlying aquifer and provide the information in support of the retention planning application to Meath County Council.

1.2 Purpose of this Report

This hydrogeological / water supply report has been prepared in support of a retention planning application for the existing slaughter house and meat processing facility at Painestown, as outlined above. It provides site-specific hydrogeological information and specifically addresses the comments made by Meath County Council in its 'Further Information Request' dated 20 July 2010 in respect of an earlier retention application which was subsequently deemed to have been withdrawn (Planning Ref. No. SA 100567).

Section 5(a) of the 'Further Information Requests' document specifies the following:

> "*Full details of the water supply to the existing development and of the proposed water supply to the proposed development should be submitted. If the water supply or part of the water supply is from a private well the following information is to be provided-*
>
> *Hydrogeological Report to include location, extent and nature of aquifer, vulnerability of aquifer, sustainable 7 day pump test yield, groundwater source protection plan, zone of contribution, impact on nearby wells, raw water quality results.*"

Dunbia appointed Meehan Drilling Ltd. to drill a new supply well in January / February 2014 and to undertake a pump test on the well. The results of the pump test forms the basis of this hydrogeological report. This report provides information on:

- the extent and nature of the aquifer;
- aquifer vulnerability;
- pump test results for the 7 day continuous pump test;
- zone of contribution to the supply well and source protection area;
- groundwater quality results; and
- hydrogeological impact assessment.

1.3 Existing Processing Activities

Established activities at the Painestown facility comprise animal slaughtering of cattle, subsequent splitting, gutting and chilling of carcasses and the subsequent off-site transfer of associated animal by-products and wastes. Most of the chilled carcasses produced at the plant are dispatched for further processing (boning and packaging) at the company's sister plant in Kilbeggan, Co. Westmeath.

Cattle slaughtering at the Painestown facility involves a number of distinct steps including:

- Intake of cattle to lairage
- Slaughtering
- Bleeding
- Removal of horn, hoof, hide and head
- Trimming and evisceration
- Carcass splitting
- Chilling
- Dispatch.

Cattle imported to the facility are unloaded in an open yard and brought into the lairage where they are housed and tended to prior to slaughter. The lairage is essentially a covered agricultural shed type structure with slatted floors and slurry removal / storage facilities beneath. Slurry from the external pavement and lairage floor is washed down at regular intervals to an external underground tank located beyond the south-west corner of the plant.

The cattle are stunned, shackled and then slaughtered. They are then bled over a blood collection trough and the blood collected in blood storage tanks. The horn, hoof and head are removed and sent for rendering off-site. The hide is removed and sent off-site for further processing. Trimming and evisceration of the carcass then takes place. Major organs (heart, liver, kidneys, tongue etc.) are harvested (as red offal) for human consumption. Other organs from the digestive tract (stomach) are harvested (as green offal).

Any other materials (stomach contents, intestines etc) which are not suitable for human consumption are designated 'animal by-products' and are separated from the animal carcass and sent for off-site processing (such as pet food) or recovery (rendering). The carcasses are then split before being stored in the on-site chill rooms, prior to dispatch off-site.

1.4 Existing Water Demand

The development to be retained requires an average water supply of 120m^3/day. This is currently supplied by the two on-site groundwater wells indicated on Figure 1. In order to provide security of supply, particularly during extended dry summer months, Dunbia considered it prudent to install, test and commission a third groundwater abstraction well to ensure a continuous supply of 120m^3/day is available to it at the Painestown plant. The location of this third well, identified as TW01, is indicated on Figure 1.

Of the daily water demand of 120m^3/day, it is estimated that on average approximately 50% (or 60m^3/day) is required for the evening washdown of the lairage and processing areas. A further 25% of the water supply (or 30m^3/day) is required for the cleaning and washing of animal by-products into in the open dolavs / containers along each of two production lines. Much of the remaining 25% can be accounted for by hosing down of animal carcasses, with a relatively minor volume (of the order of perhaps 2% of this) being required for human consumption, toilet flushing and canteen / kitchen use. Although steps have previously been taken at the plant to identify and repair water leaks, it is possible that minor quantities could still be lost from water supply pipes into the ground.

There will be no increase in water consumption arising from the retention of existing structures and installation of associated site infrastructure, as there will be no increase in the permitted slaughter rate at the facility over and above that previously permitted (1000 cattle / week).

It is anticipated that over time, there will be a reduction in water demand at the facility, as provision is made in the planning application for harvesting of rainwater (grey water) from the covered wastewater lagoons. Scope also exists for rainwater harvesting from existing building roofs and/or the proposed surface water attenuation tank. At the Dunbia site, it is envisaged that the captured rainwater will be used for washing down the external yard areas, lairage areas and livestock vehicles. It is not intended that the captured rainwater be recycled as potable or process water, as this would require a sophisticated water treatment system and ongoing monitoring. Further detail in relation to proposed water substitution and demand reduction measures are provided in the Storm Water Drainage and Attenuation Report submitted in support of the planning application.

1.5 Existing Water Treatment

The quality of groundwater abstracted from the existing groundwater supply wells is generally very good, with no indication of any surface pollution impacts associated with agricultural practices. This is considered to be reflective of the significant thickness of competent limestones overlying the abstraction zone and approximately 2m to 3 m of clayey (glacial till) superficial deposits that are protecting the deeper productive limestone aquifer.

At the present time, all water supplied to the plant is treated prior to use. It is first passed through a duplex water softening plant which exchanges calcium and magnesium ions in the groundwater supply (which typically measures at 400ppm to 450ppm of total hardness) with sodium ions (from softeners, essentially ion-exchange resins) to give a resulting total hardness of <10ppm. Water softening is required to prevent limescale build up and potential blocking and corrosion of pipework. All water stored on the site is also dosed with liquid sodium hypochlorite (chlorine) to achieve a target of 0.5ppm to 0.7ppm of free chlorine to keep the system free from bacteria.

The water treatment system at the Dunbia plant is regularly maintained by an external Contractor and both incoming and outgoing supplies are regularly tested to consistent water quality is being supplied to and from the system. Water supplies are tested for a range of parameters including, pH, conductivity, total hardness, total alkalinity, chloride, iron and coliforms.

1.6 Waste Management

Although no toxic or hazardous waste is produced during the operation of this plant, it does generate a number of animal by-products that require treatment and disposal. The solid waste principally comprises

- Category 1 material (which includes specified risk material, soft offal and bones);
- Category 2 material (which includes stomach contents / bellygrass, digestive wastes); and
- Category 3 material (which includes soft offal, trimmings, floor waste and fat).

All the above categories of waste are removed from the site frequently as required, by an authorised waste collector. Category 2 waste is classified as organic waste and can be recovered as fertiliser through landspreading on agricultural lands in accordance with a Nutrient Management Plan approved by the EPA.

In terms of liquid waste, wash waters from the external yards, lairage and processing floor constitute the most significant waste stream / potential emission arising from slaughter and processing activities at the plant. Up to relatively recently, a series of Integrated Constructed Wetlands (ICWs) were used to partially treat these wash waters before being tankered off-site for further treatment. The ICW's are currently being replaced with 2 No. recently constructed lined and covered wastewater storage lagoons (one of which is completed and approved by the EPA, the second of which is under construction). Both storage lagoons are lined with HDPE at their base and sides and will, in future, hold all wastewater from the facility pending its transfer off-site to licensed wastewater treatments plants. As and when weather conditions permit, sludge from the storage lagoons will also be spread on surrounding farmland in accordance with a Nutrient Management Plan (NMP) approved by the EPA.

The location of existing on-site waste storage facilities and infrastructure is indicated on Figure 1. Additional information on procedures for managing solid and liquid wastes generated by slaughtering and processing activities at the plant is presented in a separate Waste Management Report which accompanies this planning application.

As previously noted, the proposed development will not lead to any intensification of waste managment activity at the facility over and above existing levels. This retention application will not lead to any signficant intensification of waste managment activity over and above existing levels at the facility. Over time, the lined lagoons will eliminate discharges to groundwater, facilitate the decommissioning of the existing ICWs and lead to an improvement in the quality of the underlying groundwater resource.

1.7 Sewage

At the present time, sewage from the toilet block in the site offices is discharged into a foul drain which falls to the screen and large external underground waste water tank located at the south-west corner of the plant. At this location, the sewage is passed through the step screen which retains the solid fraction. The liquid fraction mixes with wash waters from sections of external pavement, the lairage and processing plant and is pumped to the drum screen to the north of the meat plant, where additional solids are removed before it is discharged to the ICW's / wastewater storage lagoons and ultimately tankered off-site to municipal wastewater treatment plants.

1.8 Surface Water (Stormwater) Drainage

At the present time, off-site discharges of surface water are treated via a settling tank and hydrocarbon interceptor prior to being discharged off-site to local drainage ditches which fall to the headwaters of the Roughgrange River and ultimately to the River Boyne. Off-site discharges are monitored and controlled in accordance with existing IPPC licence conditions (Ref. P0811-01) and are subject to oversight by the EPA.

In addition to existing infrastructure, this planning application incorporates additional drainage infrastructure which provides for

- additional treatment and attenuation of surface water from recently paved areas (to be retained) and from the covered wastewater storage lagoons and
- rainwater harvesting.

These elements are expected to further reduce development related impacts on surrounding watercourses and the local surface water drainage network. Further details on surface water drainage at the plant are provided in the Stormwater Drainage and Attenuation Report which accompanies the retention planning application.

2.0 HYDROGEOLOGICAL SETTING

This section of the report details the hydrogeological setting of the application site at Painestown in terms of the following:

- rainfall;
- recharge potential;
- surface water catchment;
- geological setting;
- aquifer characteristics;
- aquifer vulnerability;
- groundwater abstractions and source protection zones; and
- existing abstractions.

2.1 Rainfall

The Average Annual Rainfall (AAR) in the area around Painestown is c.868 mm/yr for the period 1981-2010 (Met Eireann, 2012). The monthly average rainfall values for 1981-2010 are shown in Table 1 below.

Table 1
Monthly Rainfall Averages (mm) 1981-2010 for Painestown

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
80	60	63	62	66	70	63	73	70	91	82	84

Actual Evapotranspiration (AE) is of the order of 450 mm/yr. in the area around Painestown. Therefore, the average potential recharge in the region (AAR-AE) is about 418 mm/yr.

2.2 Recharge Potential

The groundwater recharge potential has been modelled by the Geological Survey of Ireland (GSI) based on subsoil characteristics, aquifer type, soil drainage and bedrock geology. The recharge for the area around the application site is shown in Figure 2.

The groundwater recharge beneath the site is assessed as being between 385mm/yr and 400 mm/yr by the GSI. This is slightly lower than the average *potential* recharge in the region derived from evapotranspiration data, which as previously noted is about 418 mm/yr.

2.3 Surface Water Catchment

The application site at Painestown is located within the catchment of the River Boyne and the sub-catchment of the Roughgrange River. All stormwater run-off collected around the Dunbia site falls to a low point beyond the south-western corner of the plant and from there, it is discharged to a land-drain / ditch which drains southwards and passes beneath the L1013 local road (which runs east-west between the N2 National Primary Road with the R153 Regional Road). Thereafter the drain merges with the headwaters of the Roughgrange River and flows eastwards and north-eastwards towards its confluence with the River Boyne at Roughgrange, see Figure 3.

The application site borders two river catchments and the following water management units (WMU) apply;

- The Boyne Upper WMU to the north of the site; and
- The Rathdrinagh Upper WMU in which the site is located (and includes the Roughgrange River).

2.4 Geological Setting

The bedrock geology map of the area published by the Geological Survey of Ireland (GSI) indicates that the bedrock underlying much of the application site comprises carboniferous limestone and shales from the Loughshinny Formation, with a small area of Namurian shales from the Donore Formation occurring around the eastern site boundary. An extract from the bedrock geology map of the area is presented in Figure 4. The geological succession in the immediate vicinity of the site is summarised within Table 2, below.

Table 2
Geological Setting

Period	Epoch / Series	Formation	Description
Quaternary	Pleistocene	Glacial Till	Boulder clay derived principally from limestone
Lower Carboniferous	Silesian	Balrickard Formation (Namurian)	Sandstone and shale
		Donore Formation (Namurian)	Sandstone, shale and limestone
	Dinantian	Loughshinny Formation (Visean)	Micrite, calcarenite and shale

The bedrock strata dip to the south-east, and are affected by faulting throughout the region. The GSI mapping indicates a large regional NNW to SSE trending fault crossing below the eastern corner of the application site, faulting the younger Donore Formation (to the east of the fault) against the Loughshinny Formation (to the west of the fault).

The subsoil map of Ireland created by Spatial Analysis Unit of Teagasc, in collaboration with the Geological Survey of Ireland (GSI) and published on the Environmental Protection Agency (EPA) website (www.epa.ie) indicates that rock occurs at or close to the surface at the Painestown facility and that subsoils are therefore thin, or absent, as shown in Figure 5. Recent well drilling undertaken in the field to the north and east of the meat plant indicated that the underlying subsoils comprised described as sandy gravelly clay (glacial till / boulder clay) and were between 2m and 3m deep.

2.5 Aquifer Characteristics

The application site is underlain by the Trim groundwater body, while the Donore groundwater body is located to the east of the large regional NNW – SSE trending fault that is shown crossing the eastern corner of the site, see Appendix A.

The GSI characterises the Trim groundwater body as follows:

- main aquifer lithology comprises Dinantian Upper Impure Limestones (Calp Limestones) which are typically impure limestones and limestones interbedded with calcareous shales;
- extremely heterogenous, with highly variable karsification and structural deformation (folded and faulted) throughout the area;
- a locally important aquifer ('Lm' aquifer classification) which is generally moderately productive, although also comprises small areas (<5km^2) of regionally important karstified aquifer dominated by diffuse flow (Rkd), and small generally unproductive areas (7km^2) (Pl) except for local zones (Ll);

- Slane Water Scheme, Co. Meath, pumping tests indicate a permeability range of 70 to 200m^2/day (PW1) and specific yield of 0.002 (Trial Well No. 2), representing unconfined aquifer conditions;
- Dunshaughlin Water Scheme, Co. Meath, pumping tests indicate a permeability range of 50 to 60m^2/day;
- Stokes Well pumping test provided a specific yield of 0.0004, indicating confined or locally confined aquifer conditions in the vicinity;
- groundwater flows from the areas of high recharge in the uplands, where soils are thin, to the main surface water bodies overlying the aquifer (e.g. River Boyne);
- variable aquifer thickness, due to highly variable structural and weathering influences on the bedrock across the region;
- evidence of groundwater inflows from cavities 50m below ground level (at Summerhill and Enfield, Co Meath).

At the application site the Glacial Till overlying the unconfined bedrock aquifer is up to 3m in thickness. There is no overlying sand and gravel aquifer at the site. Figure 6 identifies the bedrock aquifer characteristics and is taken from the GSI website[1]. The groundwater contours across the application site are shown in Appendix B.

A review of the GSI karst database indicates that there are no karst landforms or features within 5 km of the application site.

2.6 Aquifer Vulnerability

Mapping published on the GSI website classifies the groundwater vulnerability beneath the application site as 'Rock near surface – X' or 'Extreme - E', as shown in Figure 7. The groundwater vulnerability classification in the wider area around the application site ranges between High (H) and low (L), reflecting the increasing protection afforded by the greater depth of overlying soil cover (glacial till) away from the site.

Driller's logs for the four wells installed at the application site in February 2014 indicate that there is between 2m and 3 m of sandy gravelly clay subsoils (glacial till) overlying the bedrock at the application site, which offers some protection to groundwater from potential contamination from human activity at the ground surface.

2.7 Groundwater Abstractions and Source Protection Zones

The GSI national well database does not record any private wells in the vicinity of the site. There are no records of any permitted groundwater abstractions in the EPA abstractions register[2].

There are two existing abstraction wells (BW01 and BW02) at the site which currently meet the water supply requirements of the Dunbia plant, the locations of which are shown on Figure 1. There are a number of private wells serving the properties along the public road (Windmill Road) immediately to the east of the site which have been recorded on the GSI well database, refer to Figure 8. There are no abstraction wells in the immediate vicinity of the site recorded in the EPA Abstraction Register.

The application site is not located within any abstraction Source Protect Zone (SPZ) identified or delineated by the GSI or EPA. However, the eastern edge of the site may be within the supply zone for the wells serving the properties to the east of the site, although the extent of these supply zones is likely to be limited.

There is an identified SPZ close to the River Boyne at Slane, approximately 3km to the north of the site, see Figure 9. The application site is not located within this identified SPZ, nor is it up-hydraulic gradient of the SPZ.

[1] www.gsi.ie
[2] www.epa.ie

3.0 AQUIFER TEST DETAILS

3.1 Well Locations and Construction

Four wells were installed by Meehan Drilling at the application site during January and February 2014 for the purpose of this hydrogeological assessment. The wells comprise a pilot well (PW01), a test well (TW01) and two additional monitoring wells (MW01 and MW02). All four wells were used for groundwater level monitoring during a pump test undertaken to determine the hydrogeological characteristics of the underlying aquifer.

The locations of these four newly installed wells and the existing abstraction wells (BW01 and BW02) are shown in Figure 10. Construction details are summarised in Table 3 below. Geological logs and a schematic cross section are included in Appendix B.

Table 3
Summary Well Details

Well ID	Well Name	Location (ITM)	Well Depth (m)	Ground level (m OD)	Drilled Well Diameter (mm)	Diameter of Well Casing (mm)
PW01	Pilot Well	695161E 769975N	117.5	109.92	125	50
TW01	Test Well (Pumped)	695164E 769978N	118.5	110.15	200	125
MW01	Monitoring Well	695176E 769990N	118.5	111	110	50
MW02	Monitoring Well	695124E 769932N	118.5	107.06	110	50

3.2 Pumping Test Programme

TW01 was installed with temporary submersible pumping equipment by Meehan Drilling, and the following pumping test programme was then carried out under the supervision of SLR Consulting Ireland Limited.

TW01 Constant Rate

Test Started:	08:06, 20th February 2014
Test Stopped:	08:10, 27th February 2014
Test Duration:	7 days and 4 mins.
Pumping Rate Average:	15.6 m^3/hour

TW01 Recovery Test

Test Started:	08:10, 27th February 2014
Test Stopped:	17:10, 6th April 2014
Test Duration:	7 days

3.3 Discharge Arrangements

During the pumping test programme, the discharge rate was determined using the inline flow meter within the discharge pipework, together with a number of manual flow measurements. The pumping rate was c. 15.6 m^3/hr as measured manually using a fixed volume device.

All pumped water from the test borehole (TW01) was discharged to a field drain, see Figure 10, which flows in a southerly direction across the application site facility to the Roughgrange River, located approximately 1.1km to the south of the discharge point. This field drain flows across

clayey, impermeable subsoils which are visible in the banks of the ditch, and is therefore considered to be perched above the groundwater table. A small flow of c. 0.25 l/s was present in the field drain during the pump test. It is considered likely that this flow corresponds to run-off draining from the upstream surface water catchment following heavy rainfall prior to the commencement of the pump test programme.

3.4 Monitoring Programme

A groundwater monitoring programme was undertaken prior to, during and following the pumping test programme in order to assess the zone of influence of the new abstraction well (TW01). Groundwater level data collected within the wells TW01, PW01, MW01 and MW02 are shown graphically in Appendix C. Monitoring locations are shown in Figure 10, and details are summarised in Table 4 below.

Table 4
Monitoring Locations

Well ID	Radial Distance from TW01 (m)	Datum Point - Top of Casing (mOD)	Comments
TW01	0	110.56	This is the test well.
PW01	3.9 W	110.42	This well was drilled as a pilot well before the larger diameter test well (TW01) was drilled.
MW01	17.5 E	111.38	This monitoring well is located between TW01 and the properties to the north-east of the site.
MW02	61 W	107.57	This monitoring well is located between the test well and the integrated constructed wetlands ICW's, to the west.

3.5 Background Influences on the Pumping Test

3.5.1 Rainfall and Barometric Pressure

Daily rainfall and barometric pressure measurements have been obtained from Dunsany Synoptic Station (Automatic).

These data are shown graphically in Appendix C. A possible slight barometric influence is suggested by comparing the monitoring data for MW02 with the barometric pressure readings. This relationship is manifested by a slight rise in groundwater levels under low barometric pressure conditions, and slight decline of water levels under high barometric pressure conditions, with a maximum fluctuation of approximately 0.10m. This effect is typical in confined aquifers. A direct correlation between rainfall and groundwater levels is not evident.

Neither a barometric nor a rainfall recharge influence in groundwater levels during the pumping and recovery tests is evident for the other monitoring locations. In light of this, it is considered that no corrections are required for barometric pressure changes during the pumping test programme.

3.5.2 Existing Abstractions

Throughout the pumping test programme on TW01, the two existing water supply wells (BW01 and BW02) continued to operate in order to meet the water supply requirements of the processing plant. The locations of these wells are also shown on Figure 10.

There are no indications of any significant interference drawdowns within the four newly constructed wells (TW01, PW01, MW01 and MW02) that could be attributed to the operation of these existing supply wells, or any other off-site abstractions.

3.5.3 Equipment Failures

The following equipment failures were reported during the pumping test programme:

- The in line flow meter on the discharge from the pump showed a consistent pumping rate of c. 11 m3/hr. The pumped discharge was also measured manually using a bucket, which gave a pump discharge rate of c. 15.6 m3/hr. The flow meter appeared therefore to be consistently underestimating / recording the pumped discharge;
- The pump had to be switched off for 2 minutes on 20/02/2014 at 13:17 to replace a coupling on the flow meter which was about to fail. No further issues were encountered with the coupling during the pump test.

3.5.4 Maximum Drawdown

The maximum change in groundwater levels observed during the pumping test programme are summarised below in Table 5.

Table 5
Groundwater Level Change

Monitoring Point	Maximum Groundwater Level Change below Pre-Test Static Water Level (m)
Test Well - TW01	c. 43.13
Pilot Well - PW01	c.41.81
Monitoring Well - MW01	c. 9.40
Monitoring Well - MW02	c.0.7

3.5.5 Test Well Efficiency

The hydraulic efficiency of the test well (TW01) during the constant rate test (pumping rate of 15.6m^3/day) is considered to be good, based on the following:

- the water level responses within TW01 do not show a sharp and dramatic change in water levels, and the initial water level data follows the expected drawdown curve for confined aquifer conditions. If the test well was operating in an inefficient manner, then the change in water level within TW01 could be expected to jump very quickly immediately following the start of the drawdown or recovery phases of the test;
- the drawdown in the test well (TW01) is similar to that in the nearest observation well (PW01), which is located just 4m away. The water levels in PW01 should not be affected by any hydraulic inefficiency, as it was not being pumped at the time of the test.

Therefore, it is considered that the analysis using the groundwater level data from TW01 provides a good indication of the aquifer hydraulic properties at this location, without the need for any corrections to take account of poor hydraulic efficiency of the well.

3.6 Aquifer Test Analysis

Aquifer properties have been estimated using the Theis time–drawdown and recovery methodologies[3] for confined aquifer conditions and the Cooper-Jacob straight line method[4].

These methodologies are considered to be appropriate, given that the drawdown data suggest confined aquifer conditions. The confined nature of the aquifer is also supported by the comment made by the driller that the upper limestone is 'competent', and that groundwater inflows during drilling were noted at depths greater than 50m below the ground surface (between c.60mAOD and c.0mAOD). The slight barometric influence on groundwater levels observed within MW02 is also suggestive of confined aquifer conditions.

Graphical analyses are shown in Appendix D, and results are summarised in Table 6 below.

Table 6
Summary of Aquifer Properties

Borehole	Transmissivity (m^2 day)	Permeability (m s)	Storage Coefficient (dimensionless)	Method Used (See footnotes 3 & 4 below)
TW01 (Test Pumped Well)	9.5×10^{-5}	1.6×10^{-6}	N/A	3 (Pumping)
	1.3×10^{-4}	2.2×10^{-6}		3 (Recovery)
	1.1×10^{-4}	1.8×10^{-6}		4
PW01	8.5×10^{-5}	1.4×10^{-6}	1×10^{-3}	3
	1.1×10^{-4}	1.8×10^{-6}	7×10^{-4}	4
Monitoring Well (MW01)	9.8×10^{-4}	1.6×10^{-5}	4×10^{-3}	3 (pre-barrier)
	2.2×10^{-4}	3.7×10^{-6}	3×10^{-3}	3 (post-barrier)

Note : N/A - as is the case for all pumping tests, the aquifer analysis methodology used does not allow accurate calculation of storage coefficient using data from the pumping well (TW01) alone.

The transmissivity values determined from the pumping test range between 2.2×10^{-4} m^2/sec and 8.5×10^{-5} m^2/sec, resulting in a corresponding permeability ranging between 1.4×10^{-6} m/sec and 4×10^{-6} m/sec, assuming an aquifer thickness of approximately 60m. The estimated storage coefficient ranges between 7×10^{-4} and 3×10^{-3}, which suggests confined to leaky confined conditions.

The drawdown responses within the monitored wells during the pumping stage of the test also indicate the following aquifer conditions:

- The early stages of the test within TW01 and PW01 suggest a source of groundwater recharge is locally influencing the aquifer, thereby temporarily slowing down the rate of drawdown in these wells. The source of this recharge could be either vertical leakage from the overlying 'competent' limestone bedrock aquitard, or a localised groundwater filled fracture or fracture zone which has been intercepted by the advancing drawdown cone;

[3] Theis, C.V., 1935. *The relationship between the lowering of the piezometric surface and the rate and duration of discharge of a well using groundwater storage*, Am. Geophys. Union Trans., vol. 16, pp. 519-524.
[4] Cooper, H.H. and C.E. Jacob, 1946. *A generalized graphical method for evaluating formation constants and summarizing well field history*, Am. Geophys. Union Trans., vol. 27, pp. 526-534

- However, after approximately 5.5 hours, there is a sudden increase in drawdown rate, suggesting that this groundwater recharge effect has stopped, and a barrier boundary has been intercepted, resulting in a reduced lateral groundwater flow rate toward the pumping well (TW01). An alternative scenario is that the aquifer drawdown is being influenced by partial drawdown effects, as the groundwater levels in TW01 and PW01 steadily decline;
- The early drawdown response within MW01 suggests that this well is located in a more transmissive part of the aquifer, with a higher inferred permeability (1.6×10^{-5} m/sec) and storage coefficient (4×10^{-3});
- The groundwater recharge effect suggested above in TW01 and PW01 is not seen in the MW01 drawdown data. However, very quickly a series of barrier boundaries are suggested by the rapidly increasing drawdown response in MW01, and the estimated aquifer permeability value (4×10^{-6} m/sec) eventually declines to be closer to the estimated permeability values obtained from the drawdown data for TW01 and PW01, as shown in Table 6 above;
- The groundwater levels within TW01, PW01 and MW01 continued to drop throughout the 7 day pumping test, with no obvious indications of stabilising. This indicates that the aquifer is unable to maintain the test pumping rate of c.15.7m^3/hour (4.4l/s), and is effectively being permanently dewatered (mined);
- The monitoring data from MW02 do not suggest a consistent drawdown that can be confidently attributed to the pumping test, and so have not been utilised for estimation of aquifer hydraulic parameters. However the lack of any significant drawdown in this well which can be attributed to the pumping test in TW01 suggests that the drawdown cone is of relatively localised extent in this south-westerly direction away from TW01.

The recovery phase of the pumping test indicates the following aquifer conditions:

- The groundwater levels within TW01, PW01 and MW02 do not return to the same elevations as monitored prior to the start of TW01 pumping test. Even after a 14 day period since the end of pumping, the groundwater elevations remain c.16.3m and c.16.5m below the pre-test static groundwater levels within TW01 and PW01, respectively. The groundwater level in MW01 is also c.3m below the pre-test elevations in this monitoring well after 14 days;
- This type of response confirms that the aquifer is unable to sustain the test pumping rate, i.e. the sustainable yield of aquifer at TW01 is less than c.15.7m^3/hour (4.4l/s);
- However, following cessation of pumping, the groundwater levels within TW01 and PW01 rose after just 12 hours by c.17.8m in PW01 and c.19.3m in TW01. Groundwater levels in MW01 also rose by c.3.3m following 12 hours of recovery from the end the pumping test.

3.7 Conceptual Hydrogeological Model

Based on the above, the following conceptual model is suggested within the immediate vicinity of the application site. A schematic cross section through the recently constructed wells at the application site is included in Appendix B, together with copies of the drillers borehole logs.

3.7.1 *Extent and Nature of Aquifer*

The productive part of the limestone aquifer underlying the site is located at a depth of at least 50 metres below ground level (60mAOD), with the base elevation around 0 mAOD. The hydraulic properties of the aquifer are associated with discontinuities and possible solution features, which are typical of the wider Trim groundwater body.

A large regional fault may be located in close proximity to the proposed production well TW01, possibly being intercepted by the monitoring well MW01 given the initial higher estimated

permeability at this location. However, the influence of the fault on aquifer yield at the application site is likely to be limited, given the drawdown and recovery responses observed within this well and the relatively consistent, low transmissivity and permeability values calculated from the pumping test data.

The pump test results suggest confined and/or leaky confined aquifer conditions. Transmissivity values range between 2.2 x 10^{-4} m^2/sec and 8.5 x 10^{-5} m^2/sec, resulting in a corresponding permeability ranging between 1.4 x 10^{-6} m/sec and 4 x 10^{-6} m/sec, assuming an aquifer thickness of approximately 60m. The estimated storage coefficient ranges between 7 x 10^{-4} and 3 x 10^{-3}.

3.7.2 *Vulnerability of the Aquifer*

The pumping test results suggest that the productive part of the limestone aquifer underlying the application site is protected from surface pollution impacts due to substantial thickness (c.50m) of overlying 'competent' limestone strata. Vertical travel times through this aquitard are expected to be significant.

It is possible that the regional fault that may be present in the vicinity of the application site and could provide a localised direct vertical pathway from the ground surface down to the productive part of the limestone aquifer. However, the pumping test results do not indicate that significant vertical leakage via such a pathway is likely to be present.

Additionally, as noted within Section 2.6 above, the well drilling at the site has indicated that there is between 2m to 3 m of clayey (glacial till) subsoil overlying bedrock, which affords the groundwater some protection as bedrock is not exposed at the surface.

The above conclusions are supported by the groundwater quality analytical results for TW01 collected during the pumping test, as discussed within Section 3.7.5, below. No indications of pollution impacts are evident within these groundwater samples.

3.7.3 *Sustainable 7 Day Pump Test Yield*

As discussed in Section 3.7 above, the pumping test results indicate that the aquifer at TW01 is unable to maintain the test pumping rate of c.15.7m^3/hour (4.4l/s).

Given the above, an assessment of the sustainable yield using the pumping test results has been completed as follows:

- As noted in Section 3.6 above, the groundwater level recovered by c.19m within TW01 over a 12 hour period, following cessation of the 7 days pumping at a constant rate of c.15.7m^3/hour (4.4l/s).
- Assuming that the operational regime at the well over a continuous daily 24 hour period is 12 hours pumping followed by 12 hours recovery, and assuming the pumping rate will need to ensure that a rebound of at least c.19m is achieved within TW01 during the 12 hour recovery period, then a maximum pumping rate of 120m^3/day should be achievable.
- This pumping regime should provide a continuous supply of 60m^3/day (i.e. 120m^3/day x half a day pumping at this rate, followed by half a day of recovery back to the pre-pumping water level).
- This predicted rate is based on the aquifer hydraulic parameters calculated from the TW01 constant rate pumping test. The drawdown calculations and distance drawdown predictions are included within Appendix E.

It is noted that the above approach provides an approximation only of sustainable yield, given the fact that the aquifer had not yet fully recovered back to pre-test groundwater elevations in any of the wells monitored during the pump test.

The primary limitation of the pumping test is considered to be the fact that the test was completed during the winter months, following one of the wettest periods on record, and so may not be representative of low recharge (drought) conditions.

However, the approach taken to assess the long term sustainable yield of TW01 is considered to be reasonable, in view of the following:

- the assessment is based on the initial recovery of groundwater elevations from an elevation of c.52mAOD, following 7 days of pumping from TW01 at a significantly higher rate (c.374 m^3/day) than that required (120 m^3/day). Therefore the groundwater level recovery rates are likely to reflect the deeper parts of the limestone aquifer;
- the influence of the localised recharge seen in the early part of the pumping test has also been ignored; and
- the distance-drawdown predictions are based on the worst case lower permeability and storage coefficient values estimated for the aquifer.

3.7.4 *Impact on Nearby Wells and Surface Water Features*

The radius of drawdown influence, assuming a pumping rate of 120m^3/day for a 12 hours followed by 12 hours of recovery, is shown graphically in Appendix E.

Assuming this pumping regime is adopted, the maximum predicted theoretical drawdown at a distance of 200m is estimated to be less than 0.10m. This negligible level of drawdown can therefore be anticipated within the existing groundwater wells that currently meet the water supply requirements of the site, the nearest of which (BW2) is located at a radial distance of c.190m from TW01.

There is no available information for the well construction or aquifer used by nearest private wells, located to the north-east of the application site. However, based on available published information, these wells are indicated to be located within a different groundwater body (the Donore groundwater body). As a worst case, if it were assumed that the Donore and Trim groundwater bodies are in hydraulic continuity, as would be reasonable, and assuming a radial distance from TW01 of c.130m to the nearest private well, then a potential drawdown of c.0.40m is estimated at the nearest private well, as indicated within Appendix E.

Given the confined condition and significant depth of the aquifer, it is considered extremely unlikely that groundwater abstraction from TW01 will have any significant influence on the flow rates of any surface water bodies in the immediate vicinity of the application site.

3.7.5 *Raw Water Quality Results*

Groundwater samples were collected from TW01 on the first and penultimate days of the 7 day constant rate pumping test (20th and 26th February 2013). The water samples were analysed by Fitz Scientific Laboratory, at Drogheda, County Louth, which is a UKAS accredited testing laboratory.

The water analyses, included within Appendix F, indicate the following:

- groundwater quality is generally very good for both samples;
- there are no indications of surface contamination, with no faecal coliforms detected in either sample. Sodium, chloride and nitrate concentrations are also low, suggesting no road salt or agricultural impacts; and
- iron, manganese, magnesium, calcium, potassium, sodium, sulphate and chloride concentrations all increase slightly over the test period, together with conductivity. However, there is a decrease in concentrations for the majority of other parameters.

4.0 GROUNDWATER SOURCE PROTECTION PLAN

The following section of this report addresses groundwater protection around supply wells and is based on guidance provided by Department of the Environment and Local Government, Environmental Protection Agency and Geological Survey of Ireland (1999) on Groundwater Protection Schemes[5].

Groundwater Protection Schemes involve the delineation of Source Protection Areas (SPA's) around significant groundwater supply sources. The SPA's are typically subdivided into Inner and Outer protection areas, based on the 100 day time of travel (TOT) and the catchment area respectively, and the associated vulnerability is superimposed on these sub-divisions. The 100 day TOT is chosen as a relatively conservative limit in order to account for the heterogeneous nature of Irish aquifers and to reduce the risk of groundwater pollution by bacteria and viruses.

It is noted that no karstic features have been identified within the limestone aquifer underlying the application site, either during drilling or by published GSI mapping. The lack of karstic conditions is also suggested by the relatively poor aquifer yield as indicated by the TW01 pumping test programme. Therefore, the recommended approaches for delineating the Inner and Outer protection areas, as detailed within the guidance provided on Groundwater Protection Schemes is considered to be appropriate.

4.1 Outer Protection Area (SO)

In accordance with guidance on Groundwater Protection Schemes[5], the Zone of Capture (ZOC) (also known as 'the complete catchment area') of the groundwater source is defined as the area needed to support the abstraction from long-term groundwater recharge i.e. the proportion of effective rainfall that infiltrates to the aquifer water table.

As recommended in the guidance, a safety factor of 50% should be included when deriving the ZOC. Given a proposed sustainable abstraction rate of 60m^3/day, which is then increased by 50%, an abstraction rate of 90m^3/day has been used to delineate the ZOC. This approach makes allowance for possible future increases in abstraction and expansion of the ZOC in dry periods.

The ZOC area is therefore calculated as follows:

$ZOC = Q_{Max} / E_R$

where

Q_{Max} = maximum abstraction rate = 60m^3/day x 150% = 90m^3/day
= 32,850m^3 / year

E_R = Effective groundwater recharge rate = 0.38m / year (see Section 2.2, above)

$$\text{Therefore } ZOC = \frac{32{,}850 m^3 / year}{0.380 m / year}$$

$$= 86{,}447 m^2$$

Assuming the ZOC is essentially circular, the radius of influence, r, can be calculated as follows:

$A = \pi \times r^2$

where:

A = area of ZOC = 86,447m^2 (and π = 3.14159)

Therefore r^2 = (86,447 / 3.14159)

r = 165.9m

[5] Department of the Environment and Local Government, Environmental Protection Agency and Geological Survey of Ireland (1999): *Groundwater Protection Scheme.* Report No. ISBN 1-899702-22-9

4.2 Inner Protection Area (SI)

The Inner Protection Area is defined a 100 day time of travel (TOT) from any point below the water table to the abstraction point.

With regard to the proposed abstraction well TW01, the time of travel is calculated based on the following equation (Darcy's Law):

$V = (k / n_e) \times i$

Where:

V = *average groundwater velocity within the saturated zone of the aquifer;*

k = *aquifer permeability = 0.346 m/day (or $4x10^{-6}$ m/sec) based on worst case maximum maximum estimate from TW01 pumping test (see Section 3.6 above);*

n_e = *effective porosity of the aquifer assumed as 1% (0.01) as a worst case for fracture flow;*

i = *hydraulic gradient of the groundwater within the saturated zone of the aquifer = 0.036 (based on groundwater contours produced for the application site within preliminary hydrogeological investigation report[6].*

Therefore V = 1.24m/day
= 124m for 100 day time of travel (TOT)

4.3 Assessment

It is noted that Inner and Outer Protection Areas for the two existing groundwater supply wells (BW01 and BW02) have not been determined. Therefore it is proposed that the Inner and Outer Protection Areas defined for the proposed new groundwater supply well (TW01) are expanded in order to include these two existing abstractions. This approach is suggested in the absence of well specific pump test data and is likely to be a reasonable first approximation (which will be reviewed and updated on receipt of further information on well performance).

Based on the information above, the proposed combined Inner and Outer Protection Areas for all three groundwater abstraction wells at the application site are shown in Figure 11. The delineation of these protection areas takes the following information into account:

- the proximity of the application site to the groundwater catchment divide, which is likely to reflect the topographic divide, located immediately north of the application site boundary (see Figure 3);
- the Teagasc subsoils mapping, and GSI Groundwater Vulnerability mapping (Figure 5 and Figure 7);
- the predicted extent of the Zone of Capture and 100 day Time of Travel, as calculated in Sections 4.1 and 4.2, above; and

[6] AWN Consulting Limited (January 2010): *Preliminary Hydrogeological Investigation at Dunbia, Beauparc, Navan, Co. Meath* Report No. DB/11/5336/WR

5.0 IMPACT ASSESSMENT

5.1 Hydrology

It is considered that the pre-existing development at Dunbia Painestown and the development to be retained demonstrably complies with the relevant policies in respect of surface water management. At the present time, off-site discharges of surface water are treated via a settling tank and hydrocarbon interceptor prior to being discharged off-site to local drainage ditches which ultimately flow to the Roughgrange River and ultimately to the River Boyne. Off-site discharges are monitored and controlled in accordance with the existing IPPC licence issued by the EPA.

In addition, it is proposed that the new drainage infrastructure providing for additional treatment and attenuation of surface water from paved areas and rainwater harvesting will reduce development related impacts on surrounding watercourses and the local drainage network.

5.2 Hydrogeology

The published and site specific hydrogeological information for the application site and surrounding area has allowed a comprehensive understanding of the hydrogeological setting at Dunbia's slaughter house and processing plant at Painestown.

The determination of aquifer conditions and hydraulic parameters via the 7 day constant rate pumping test programme completed during February 2014, and reported in earlier sections of this report, confirms that the operation of a new back-up abstraction well (TW01) at the application site to help secure existing water supplies for the adjoining meat plant should not have any significant drawdown impacts either on the adjacent existing groundwater abstraction boreholes (BW01 and BW02) or on the closest private abstractions located beyond the eastern site boundary.

Additionally, no impacts on flows within surface water features at and adjacent to the application site are anticipated.

The water quality analyses collected during the TW01 pumping test programme indicate that the groundwater quality in the limestone aquifer underlying the site is very good, with no indication of any surface pollution impacts associated with agricultural practices. This is considered to reflect the significant thickness (c.50m) of competent limestone and 2m to 3 m of clayey (glacial till) superficial deposits that are protecting the deeper productive limestone aquifer, estimated to extend between c.60mAOD and c.0mAOD.

The inclusion of proposed Inner and Outer Source Protection Areas, as identified above for the existing wells BW01 and BW02, and the proposed back-up groundwater abstraction well TW01, will ensure that future risks to groundwater quality and water levels in these supply wells are minimised.

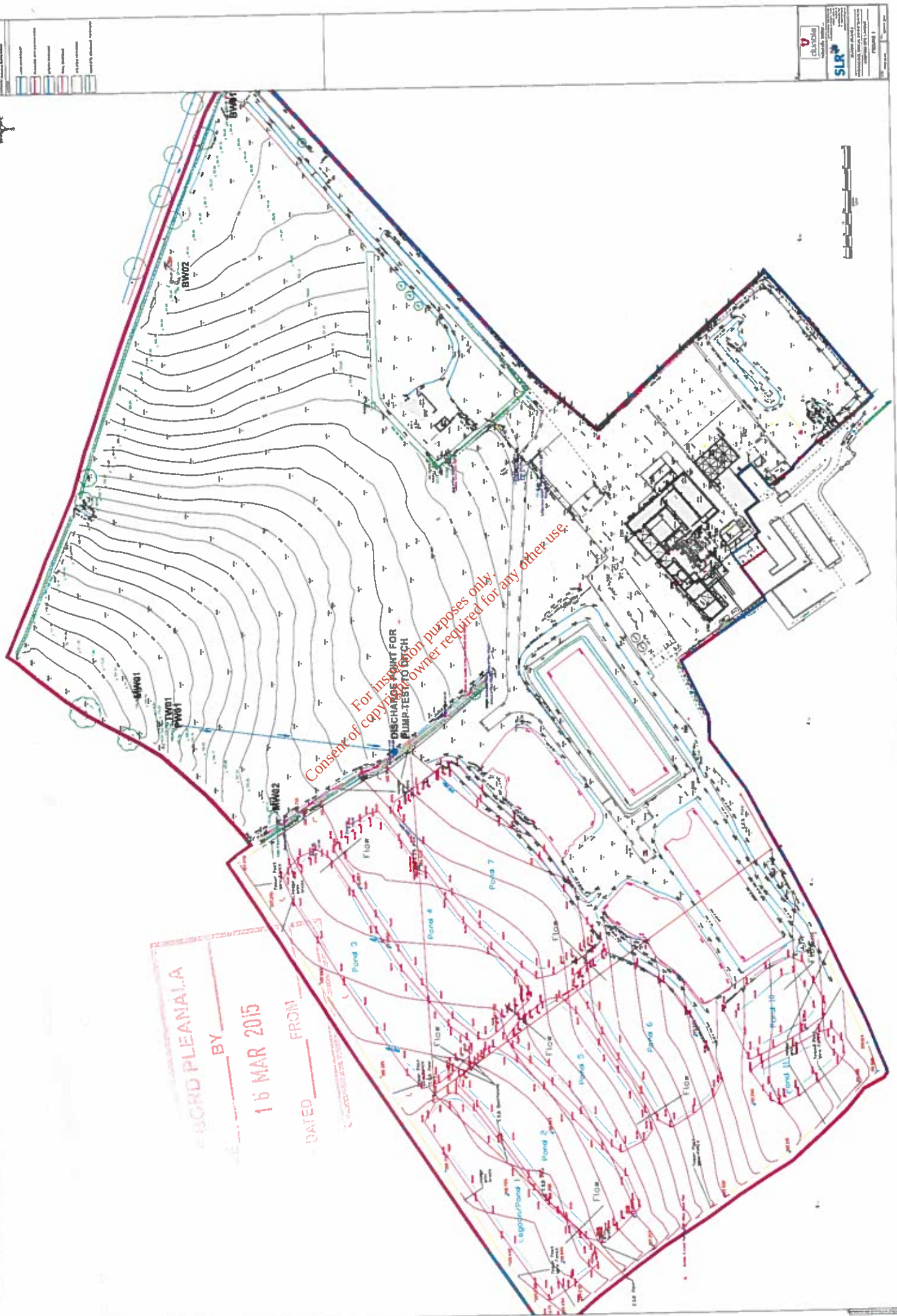
6.0 CLOSURE

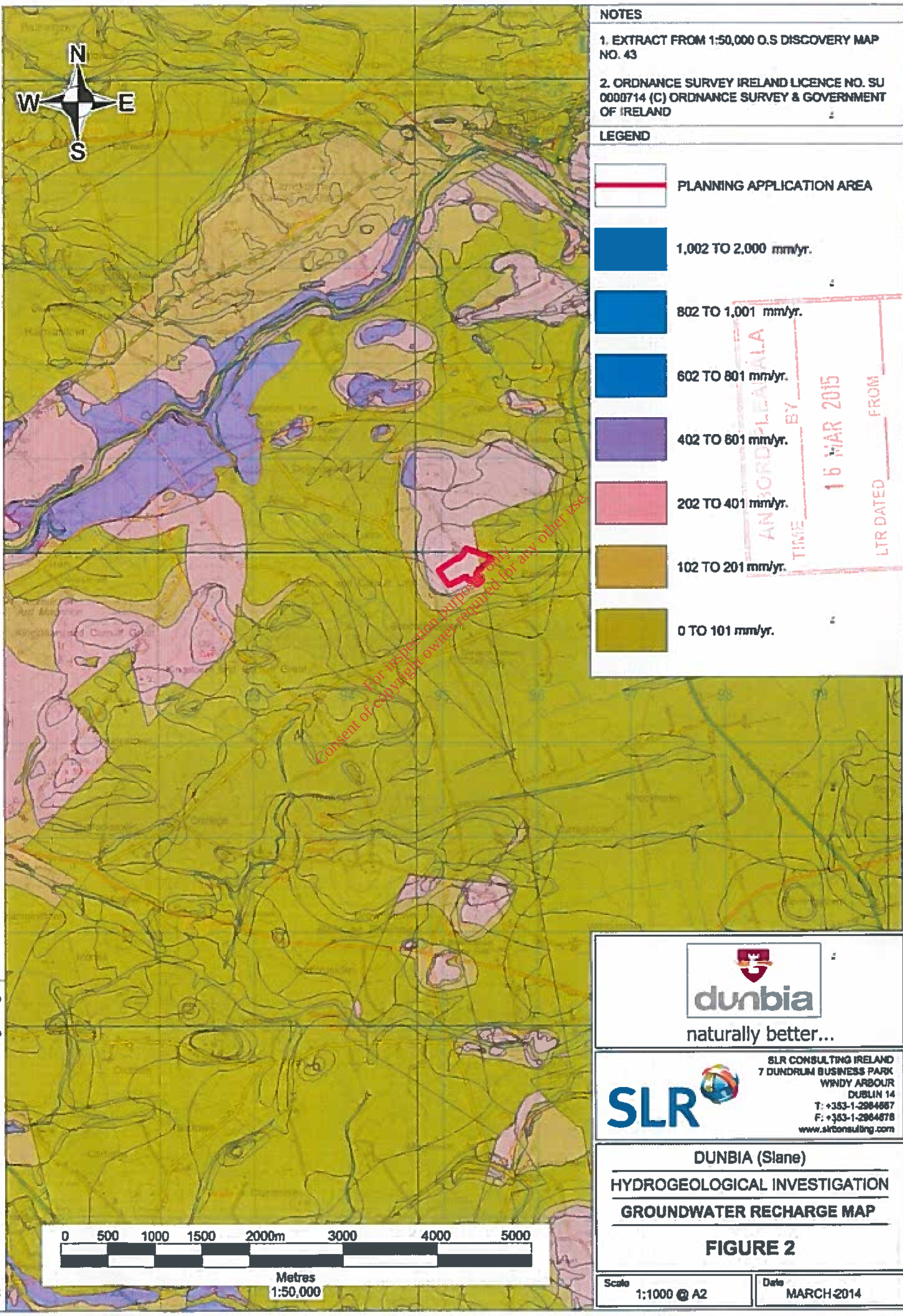
This report has been prepared by SLR Consulting Ireland with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the Client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Dunbia (Ireland) Ltd. and no warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR Consulting Ireland.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

FIGURES





NOTES

1. EXTRACT FROM 1:50,000 O.S DISCOVERY MAP NO. 43

2. ORDNANCE SURVEY IRELAND LICENCE NO. SU 0000714 (C) ORDNANCE SURVEY & GOVERNMENT OF IRELAND

LEGEND

- PLANNING APPLICATION AREA
- 1,002 TO 2,000 mm/yr.
- 802 TO 1,001 mm/yr.
- 602 TO 801 mm/yr.
- 402 TO 601 mm/yr.
- 202 TO 401 mm/yr.
- 102 TO 201 mm/yr.
- 0 TO 101 mm/yr.

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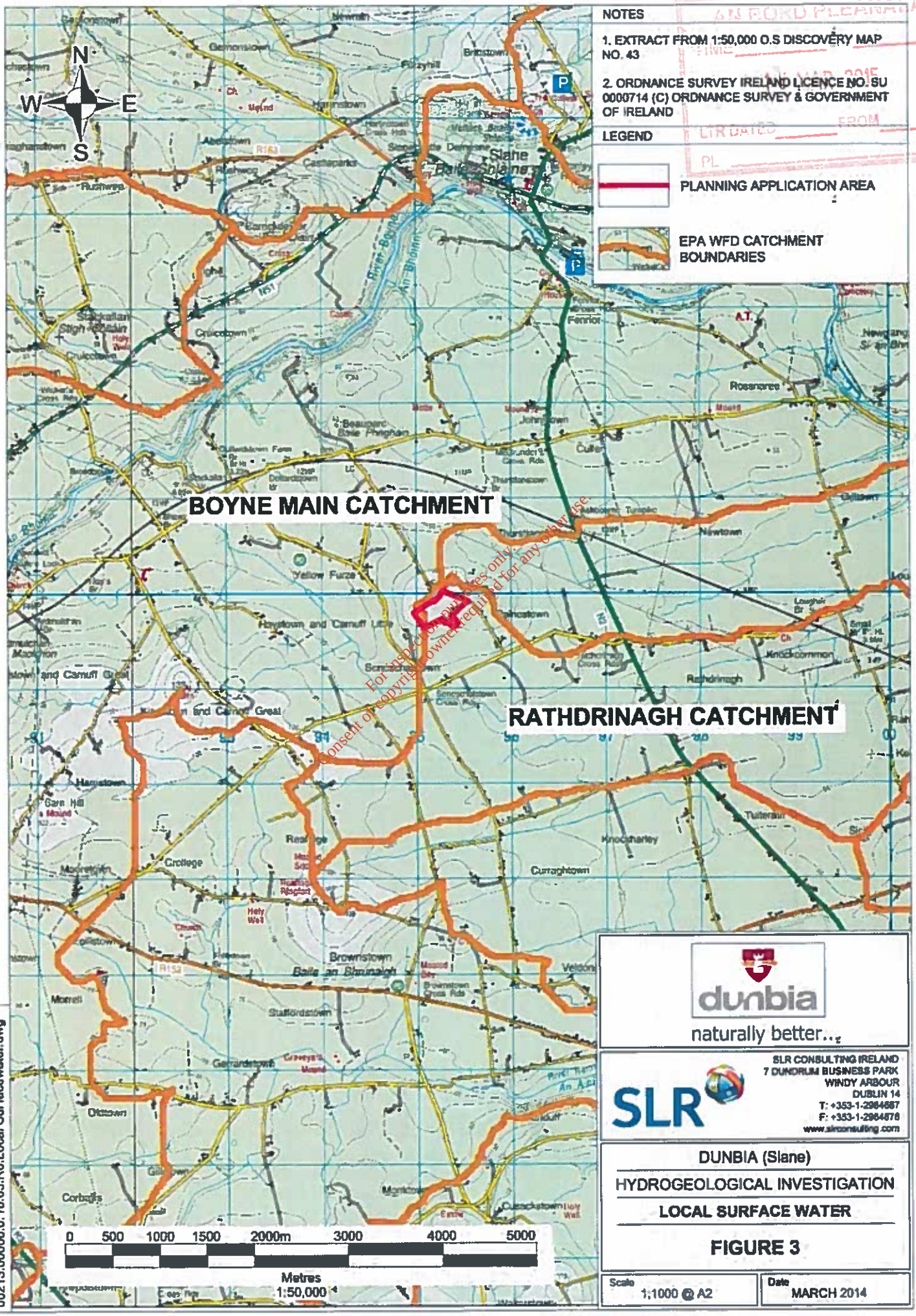
DUNBIA (Slane)

HYDROGEOLOGICAL INVESTIGATION

GROUNDWATER RECHARGE MAP

FIGURE 2

Scale	Date
1:1000 @ A2	MARCH 2014



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DUNBIA (Slane)

HYDROGEOLOGICAL INVESTIGATION

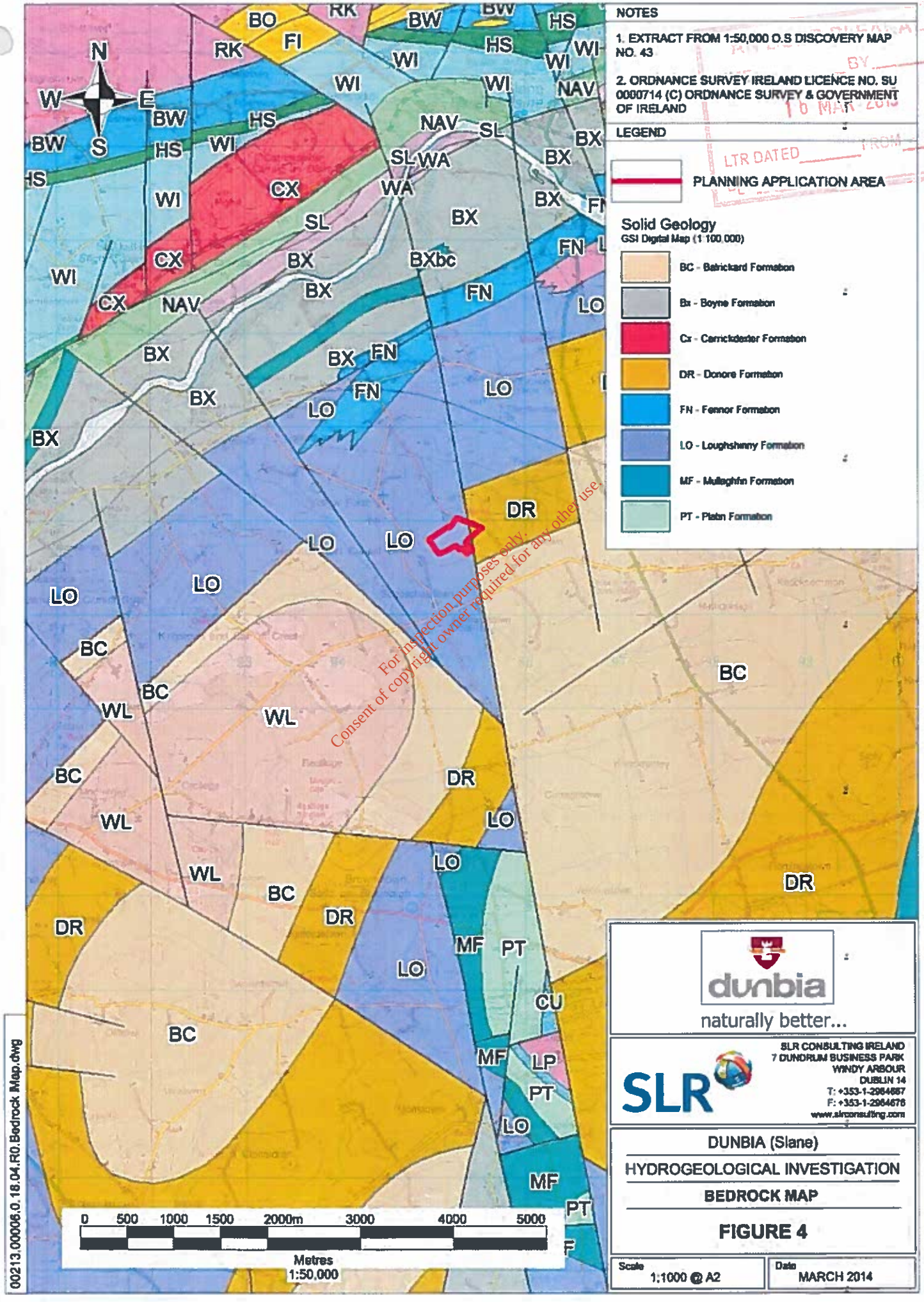
LOCAL SURFACE WATER

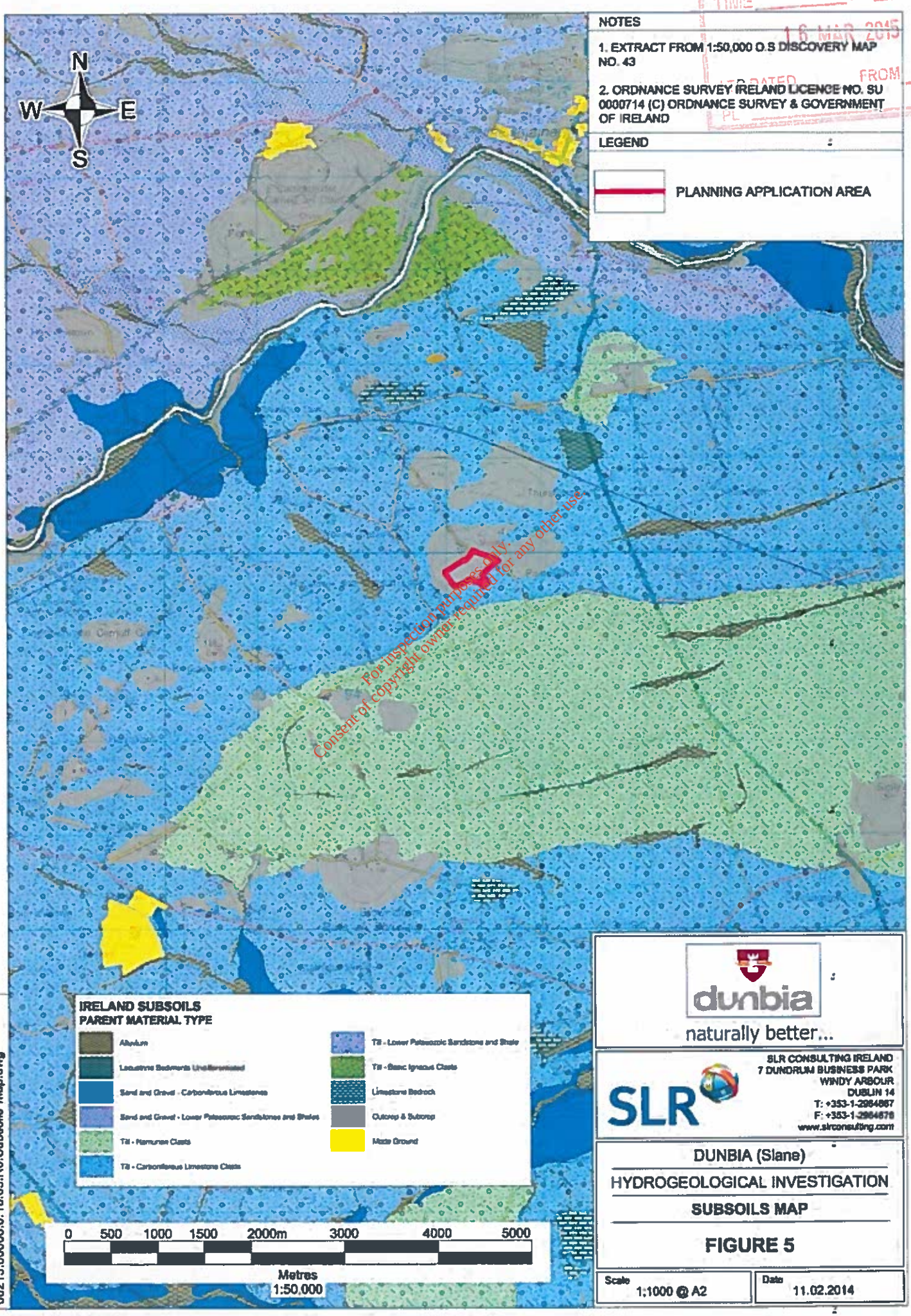
FIGURE 3

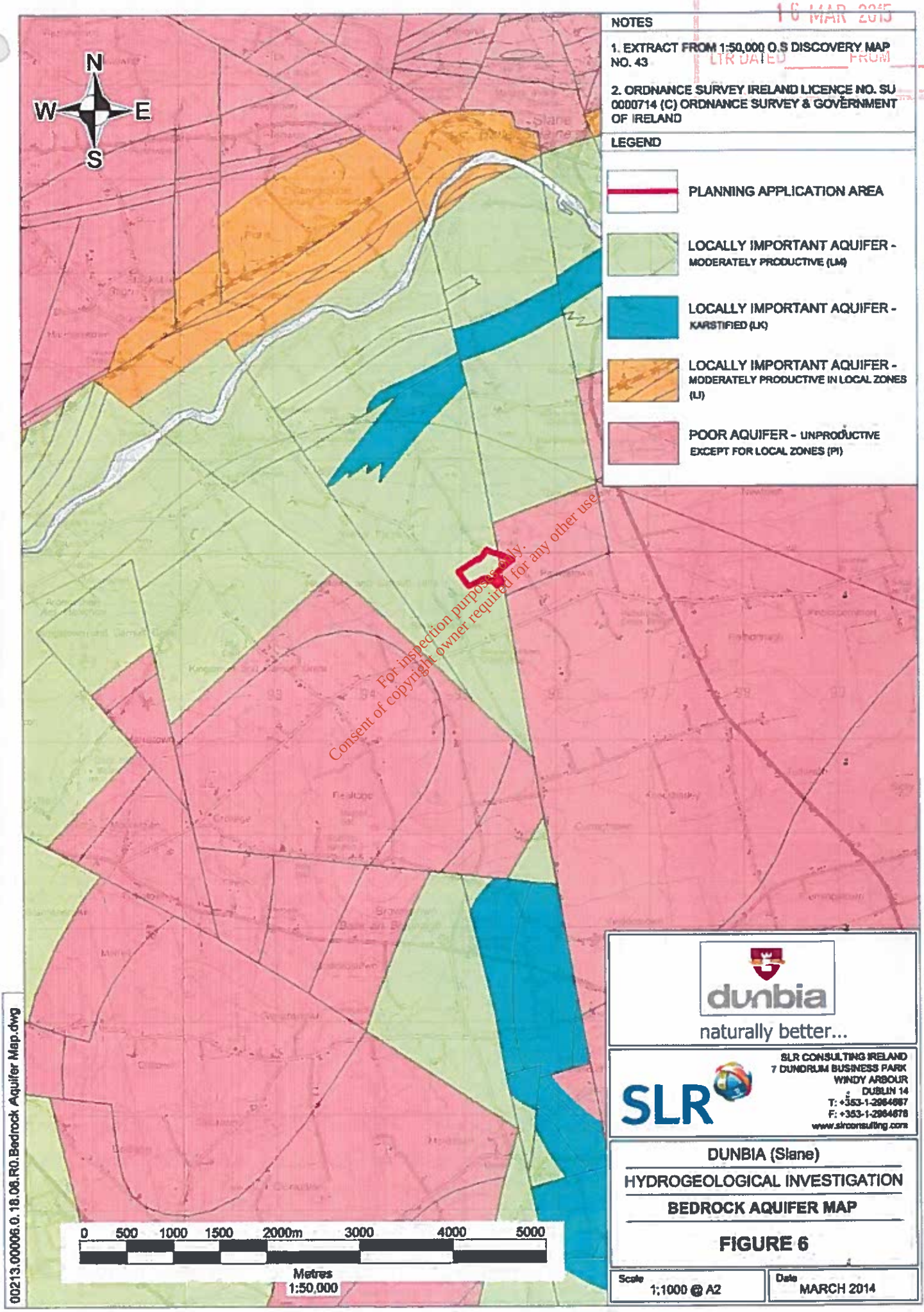
Scale 1:1000 @ A2

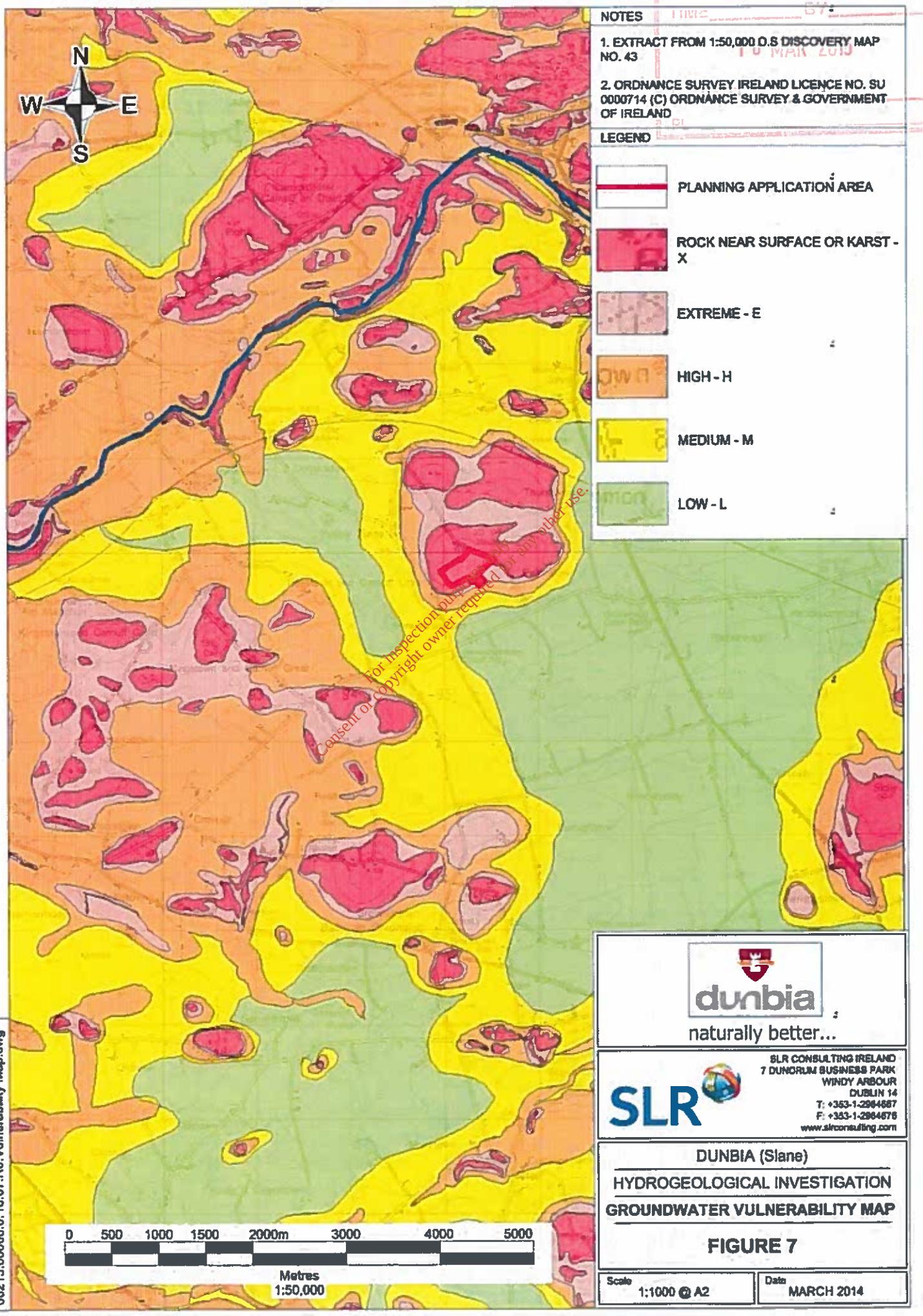
Date MARCH 2014

00213.00006.0.18.03.R0.Local Surfacewater.dwg









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DUNBIA (Slane)

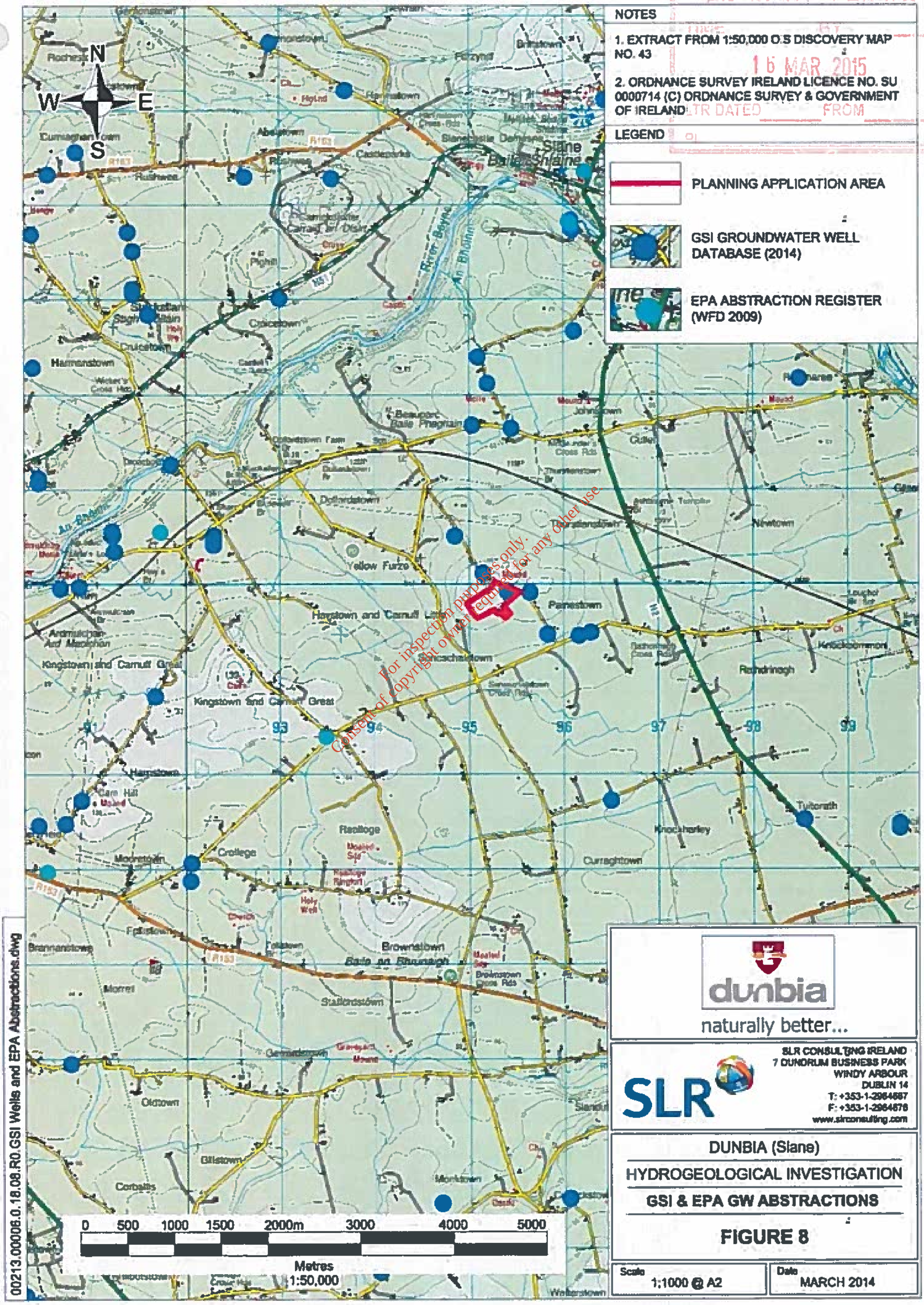
HYDROGEOLOGICAL INVESTIGATION

GROUNDWATER VULNERABILITY MAP

FIGURE 7

Scale	Date
1:1000 @ A2	MARCH 2014

00213.00008.0.18.07.R0.Vulnerability Map.dwg



NOTES

1. EXTRACT FROM 1:50,000 O.S DISCOVERY MAP NO. 43

2. ORDNANCE SURVEY IRELAND LICENCE NO. SU 0000714 (C) ORDNANCE SURVEY & GOVERNMENT OF IRELAND

LEGEND

PLANNING APPLICATION AREA

GSI GROUNDWATER WELL DATABASE (2014)

EPA ABSTRACTION REGISTER (WFD 2009)

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DUNBIA (Slane)

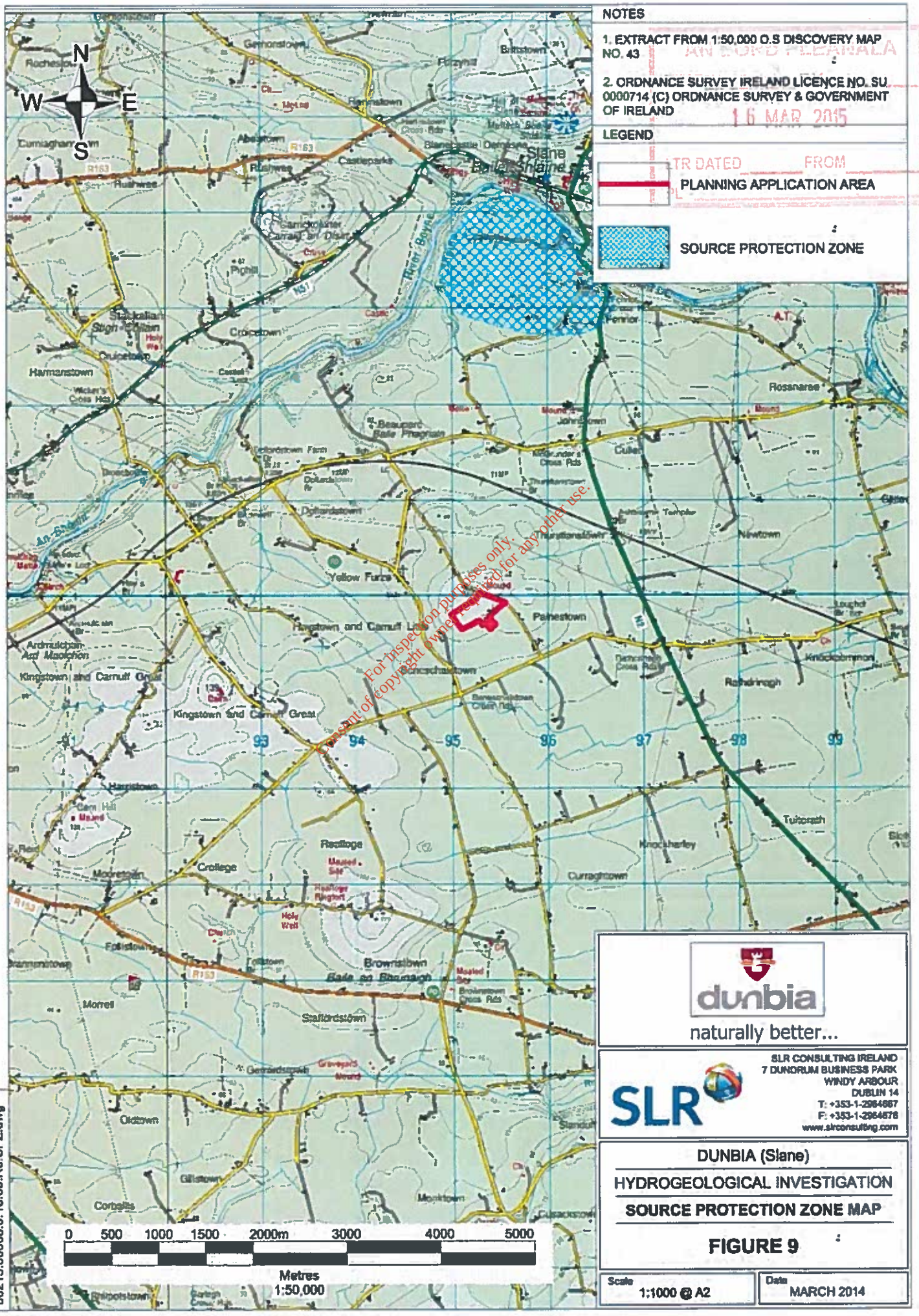
HYDROGEOLOGICAL INVESTIGATION

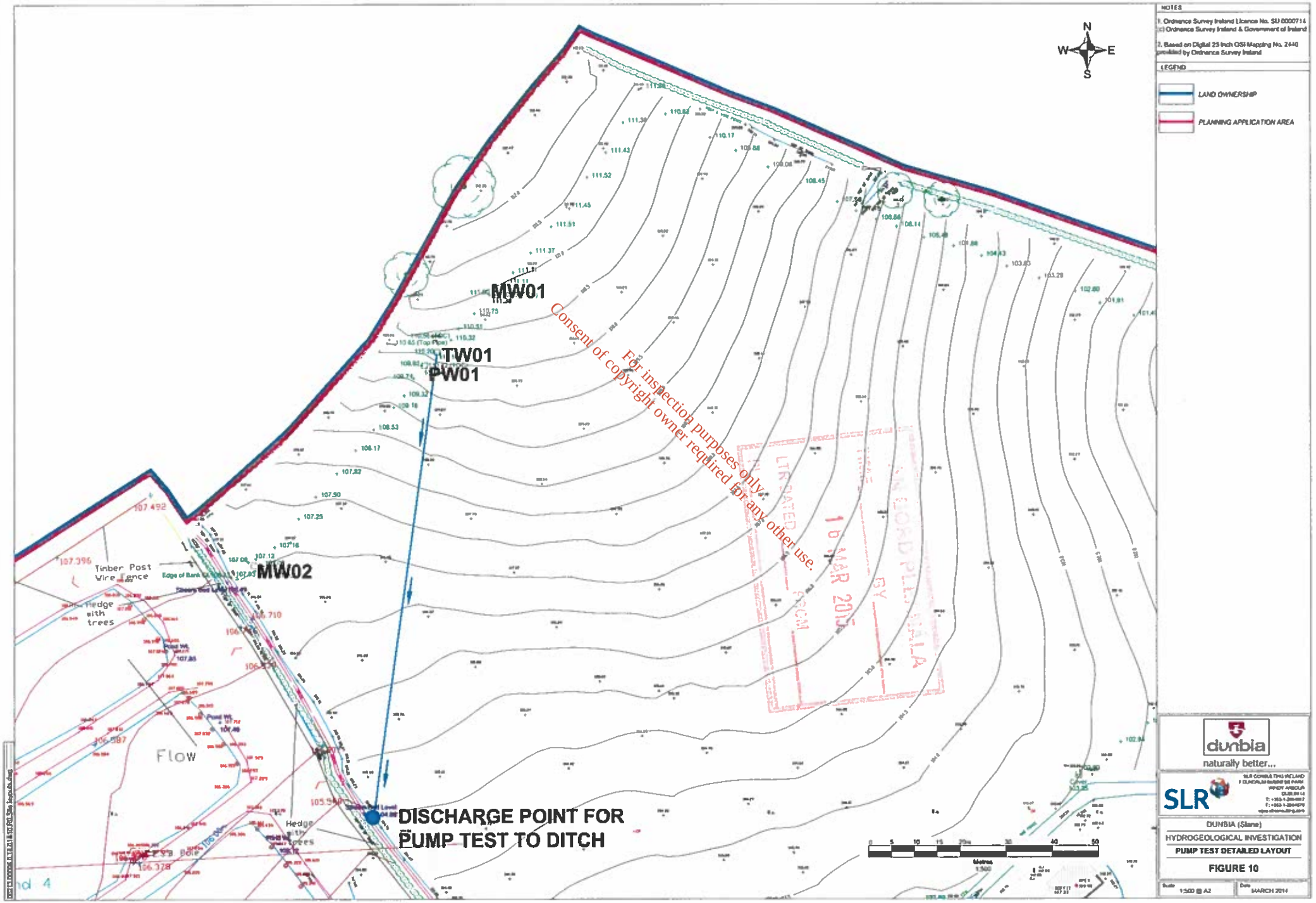
GSI & EPA GW ABSTRACTIONS

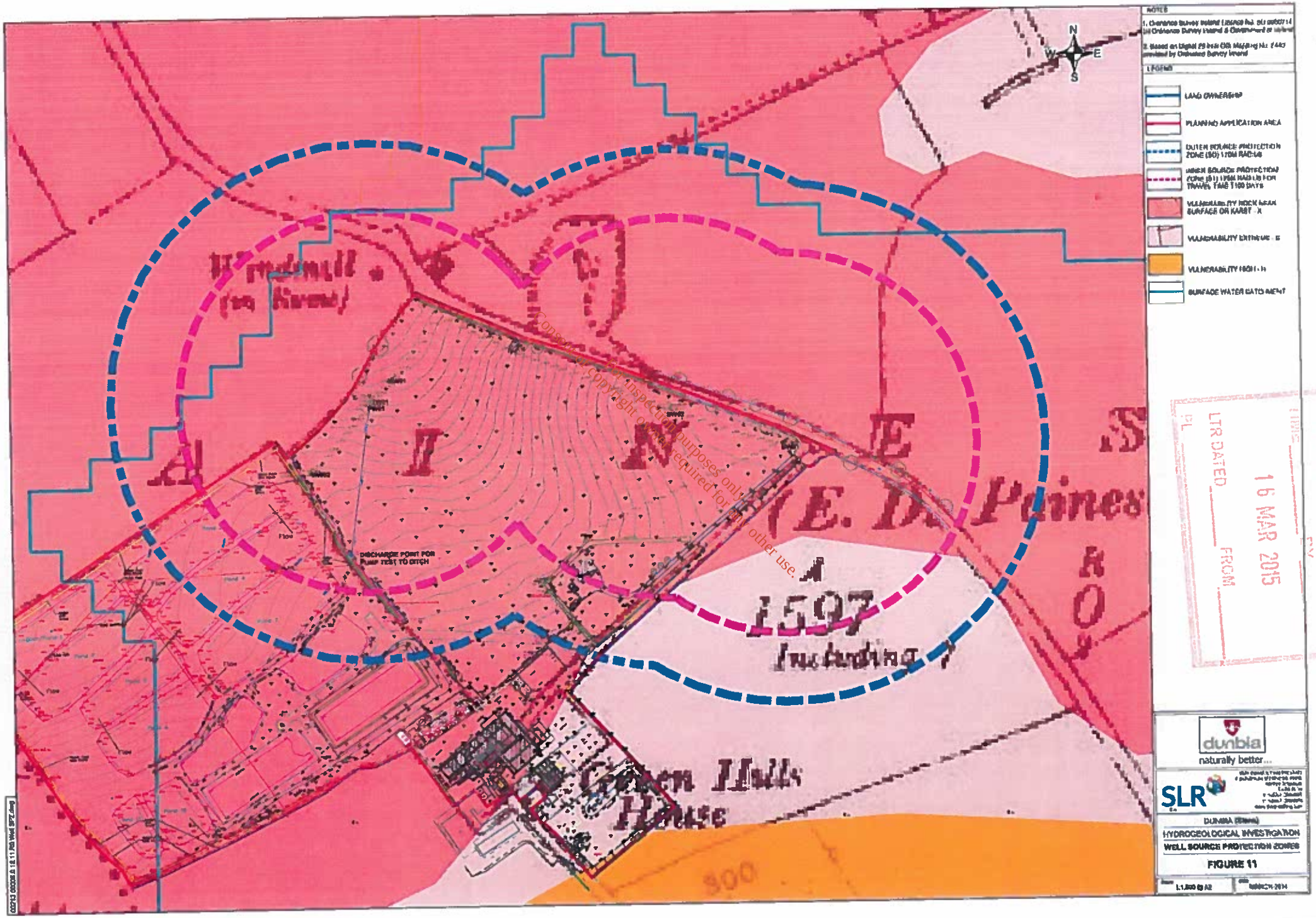
FIGURE 8

Scale 1:1000 @ A2

Date MARCH 2014







APPENDICES

Appendix A
Groundwater Bodies

Diagram A.1 -
Groundwater Bodies (Source: EPA)

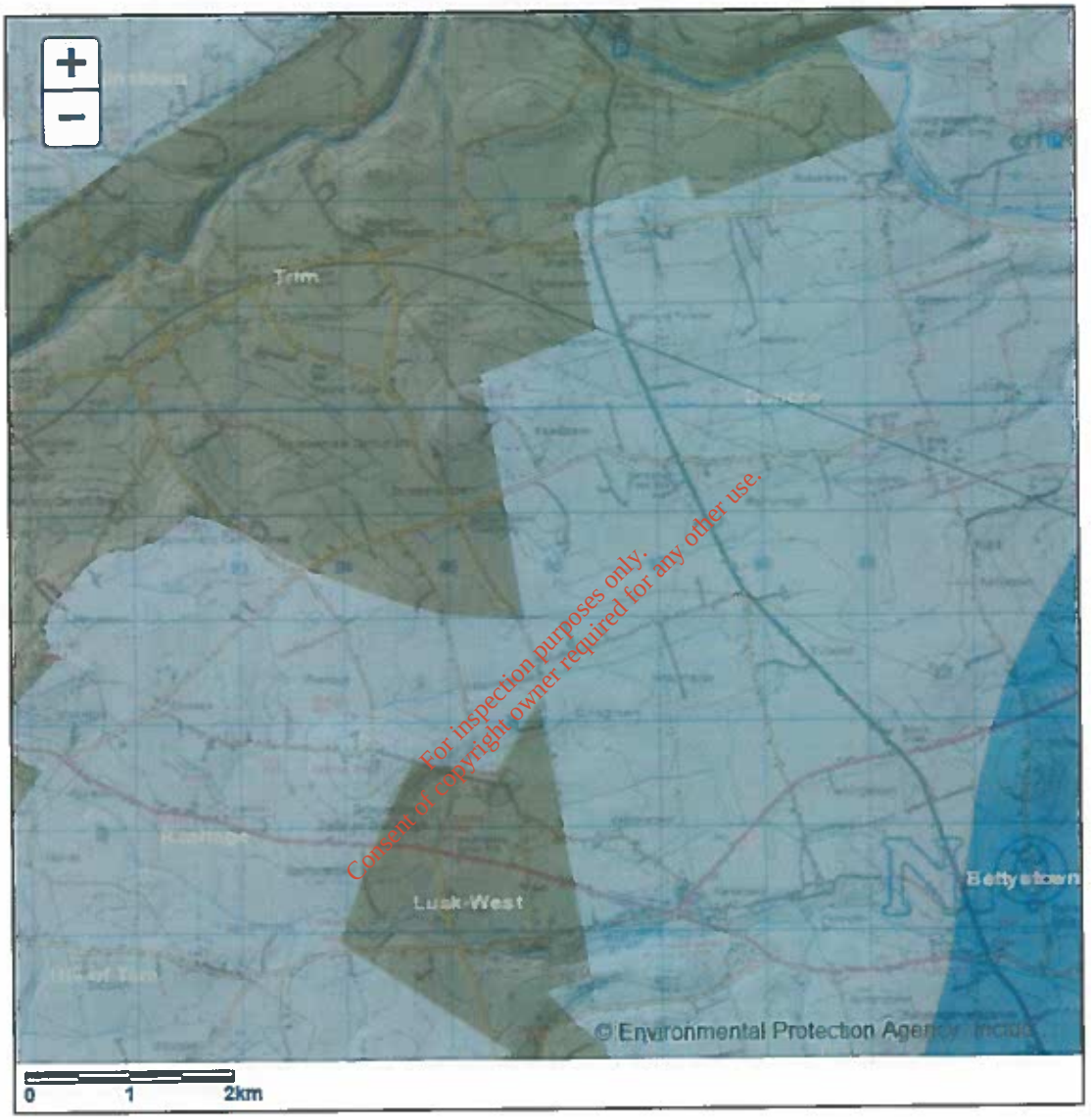
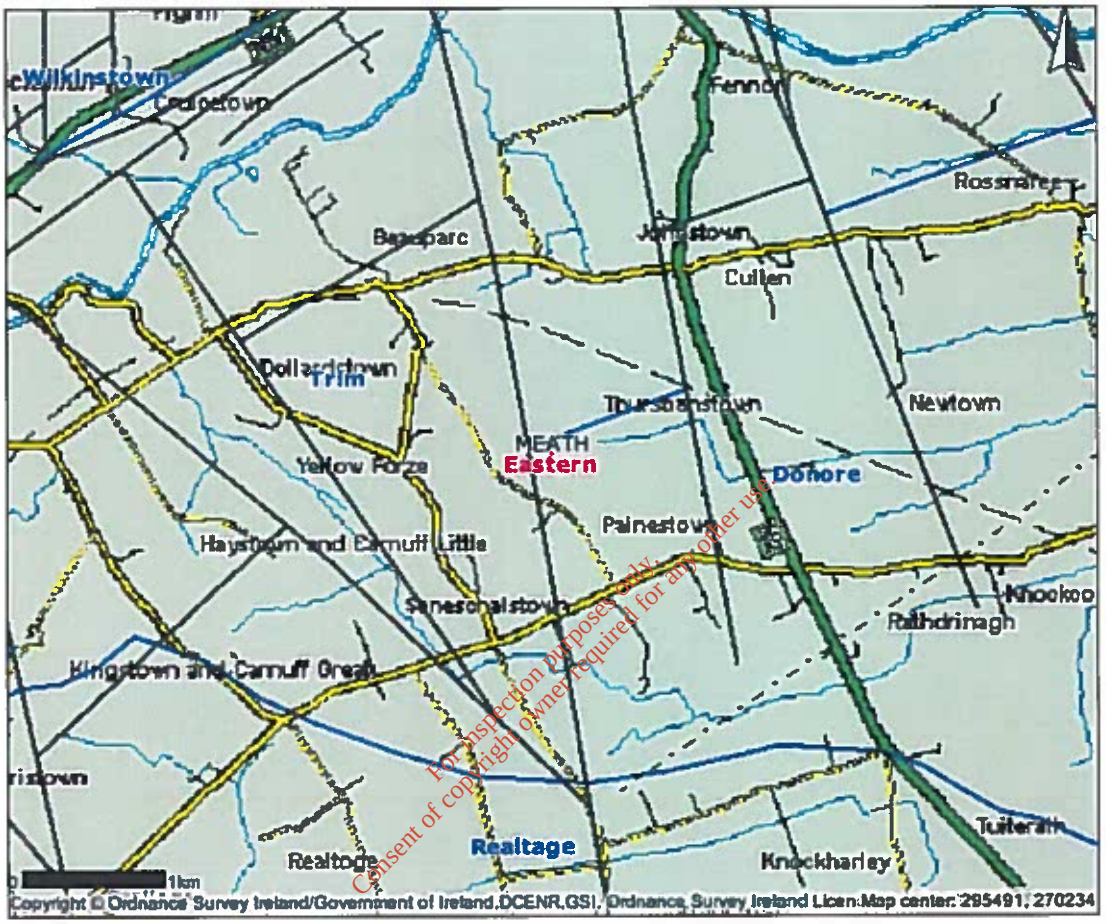


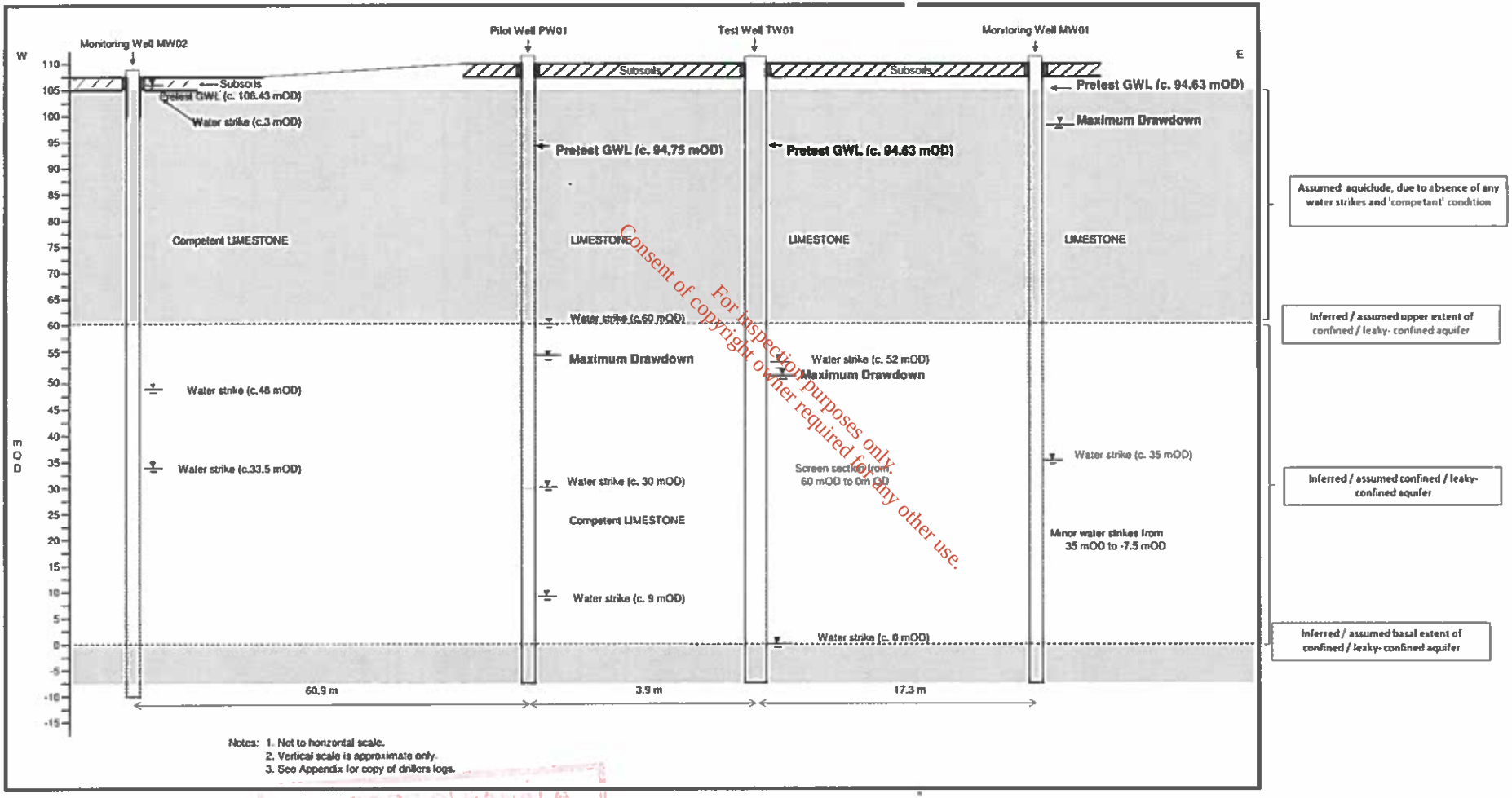
Diagram A.2 -
Groundwater Bodies (Source: GSI)

Diagram A.3 -
Groundwater Bodies with Geological Faults Superimposed (Source: GSI)

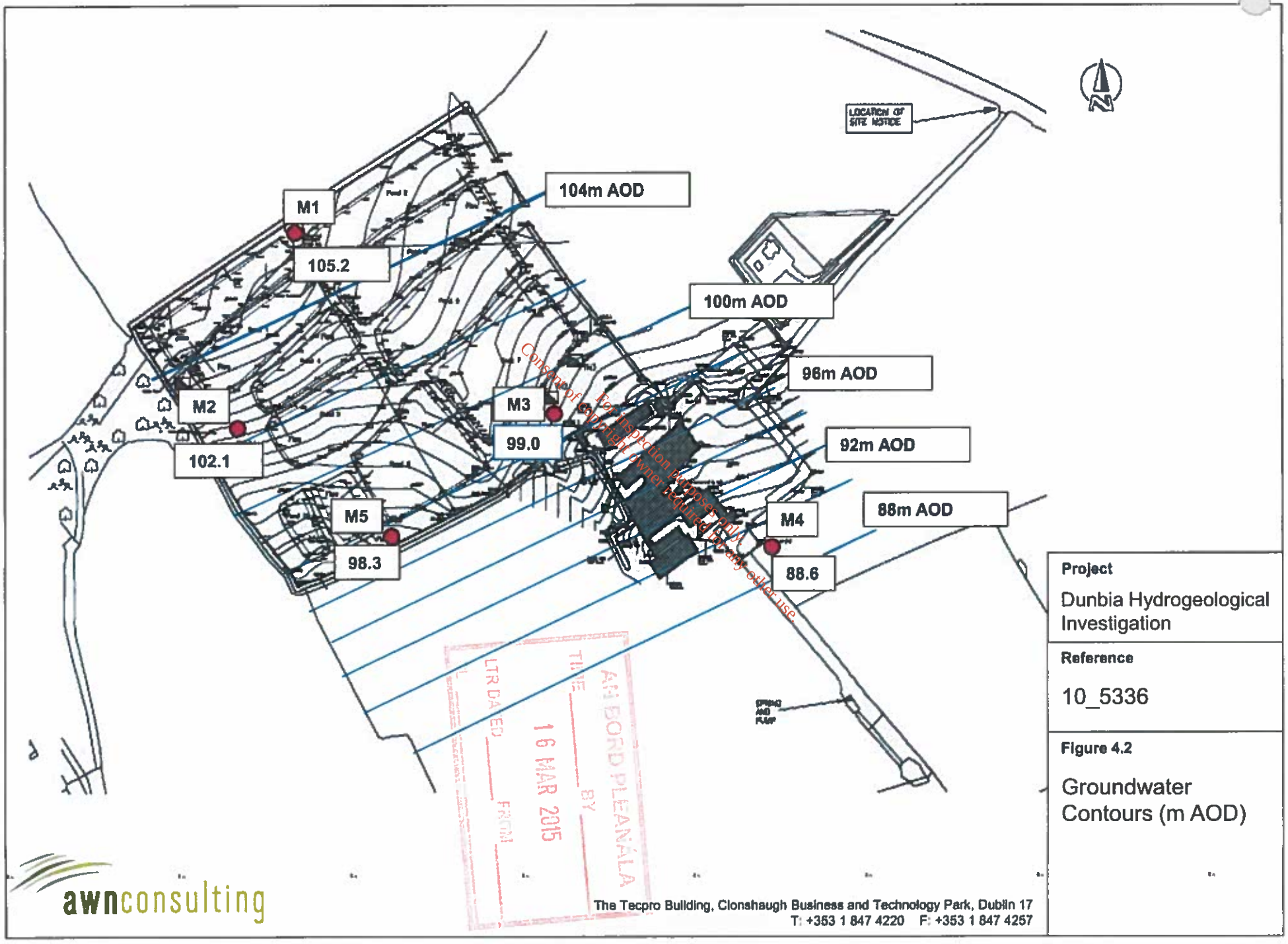


Appendix B
Conceptual Site Model, Groundwater Contours and Borehole Logs

Dunbia Pumping Test Programme: Schematic Hydrogeological Cross-Section



Notes: 1. Not to horizontal scale.
2. Vertical scale is approximate only.
3. See Appendix for copy of drillers logs.



112 84.

MEEHAN DRILLING

MEEHAN DRILLING LTD. WW · 5947

BOREHOLE LOG

Phone: 042 - 9372220. Email: info@meehandrilling.com. Website: www.meehandrilling.com

Borehole Ref.: EN[illegible] 11147 - W711 Drilling Date: 22 - 1 - 14

Client: [illegible] Phone: 086 797 8536

Address: [illegible], Co. [illegible]

Location of Borehole: Field South of [illegible]

Private / Commercial / Government (Specify): Production Borehole

Date of Drilling	Depth (from to) metres / feet	Actual Drilling Diameter	Drilling Conditions / Water Strike
22-1-14	0 - 3 metres	300mm o/h	Clay
	3 - 6 metres	"	Limestone
24-1-14	6 - 118.5 metres	200mm o/h	Limestone.
			Water strikes @
			58m (4 m³/hr)
			110m (30 m³/hr)
	Note - PVC casing, bottom 9 metres plain		
		, screened	section
		110m →	50m.
		• plain casing	from 50m → 0m.

Overburden (O/B):

Drilling Method Used: Mud Rotary / (DTH Hammer) / Simultaneous Casing System / Air Rotary

Depth of O/B: 3 metres Grouted to Bedrock? Yes

Steel Casing (Dia / Depths): 6 metres of 219mm (5mm wall)

Bedrock:

Drilling Method Used: Mud Rotary / (DTH Hammer / Air Rotary)

Depth of Bedrock: 115.5 Development: 2 Hours

Water Turbidity Content (Approx): Clear Estimated Yield: 30 m³/hr

PVC Casing (Dia / Depths): 165mm PVC 70metres Screen, 50metres plain Plain / Screen

Gravel / Bentonite Backfill: None Lockable Cap: (Yes) No

Standing Time (Hrs): N/A Total Depth of Well: 118.5 metres Static Water Level: 15m

Comments: (e.g. any unusual features / explanations)

Signed: ______________________ (Client)

Signed: [signature] (Supervisor / Driller / Operator)

MEEHAN DRILLING

MEEHAN DRILLING LTD. WW 5693

BOREHOLE LOG

Phone: 042 - 9372220. Email: info@meehandrilling.com. Website: www.meehandrilling.com

Borehole Ref: W700 Drilling Date: 13-12-13

Client: SEAN CULLEN (DOMESTIC) Phone:

Address: PAINSTOWN CO. MEATH

Location of Borehole: TOP OF FIELD

Private / Commercial / Government (Specify): COMMERCIAL

Date of Drilling	Depth (from to) metres /	Actual Drilling Diameter	Drilling Conditions / Water Strike
13-12-13	0 - 6 m	200 mm	Boulder Clay to 2½m
			then Limestone Rock
17-12-13	6 - 80 m	125 mm	Limestone Rock drilling
1-14	80 - 117½	125 m	Limestone Rock drilling
			Good hard competent
			Rock
			Water Strike
			50m = 250 Ltr per hour
			80m = 3500 Ltr per hour
			100 m+ = 3000+ Ltr per hour

Overburden (O/B):

Drilling Method Used: Mud Rotary / (DTH Hammer) / Simultaneous Casing System / Air Rotary

Depth of O/B: 2½ m Grouted to Bedrock? YES

Steel Casing (Dia / Depths): 168 x 4mm 6m

Bedrock:

Drilling Method Used: Mud Rotary / (DTH Hammer) / Air Rotary

Depth of Bedrock: 115 m Development: 7 Hours

Water Turbidity Content (Approx): 5% Estimated Yield: MAX 12 m³/HR

PVC Casing (Dia / Depths): NONE Plain / Screen

Gravel / Bentonite Backfill: NONE Lockable Cap: Yes / (No)

Standing Time (Hrs): ✓ Total Depth of Well: 117.5m Static Water Level: 7m BC

Comments: (e.g. any unusual features / explanations)

80m+ WATER INCREASING AS DRILLING PROGRESSED TO 117½m WITH OUTCOME OF 12 m³/HR MAX = 7-8 m³/HR SUITABLE

Signed: (Client)

Signed: N. M (DRILLER) (Supervisor / Driller / Operator)

MEEHAN DRILLING

MEEHAN DRILLING LTD. WW 5948

BOREHOLE LOG

Phone: 042 - 9372220. Email: info@meehandrilling.com. Website: www.meehandrilling.com

Borehole Ref: EN10726-W710 Drilling Date: 10-2-14

Client: Dubin Phone:

Address: Paustown, Slane, Co. Meath

Location of Borehole: 15m east of production borehole.

Private / Commercial / Government (Specify): Monitoring hole.

Date of Drilling	Depth (from to) metres / feet	Actual Drilling Diameter	Drilling Conditions / Water Strike
10-2-14	0-3 metres	200mm o/H	Clay
	3-6 metres	200mm o/H	Limestone
11-2-14	6-118.5 metres	110mm o/H	Limestone
			Water strike @
			75 metres (4 m³/hr)
			Other small ingress
			between 75 & 118
			but difficult to
			define where
	Piezo casing Screen	from	118.5 → 18 m.
	Plain	from	18 m → 0 m

Overburden (O/B):

Drilling Method Used: Mud Rotary / DTH Hammer / Simultaneous Casing System / Air Rotary

Depth of O/B: 3 metres Grouted to Bedrock? Yes

Steel Casing (Dia / Depths): PVC casing 6 metres & 15m

Bedrock:

Drilling Method Used: Mud Rotary / (DTH Hammer / Air Rotary)

Depth of Bedrock: 155.5 metres Development: 1 Hours

Water Turbidity Content (Approx): Clear Estimated Yield: 4 m³/hr.

PVC Casing (Dia / Depths): 63mm Piezo tubes Plain / Screen

Gravel / Bentonite Backfill: No Lockable Cap: (Yes) No

Standing Time (Hrs): N/A Total Depth of Well: 118.5m Static Water Level: 4.5 metres

Comments: (e.g. any unusual features / explanations)

N/A

Signed: [signature] (Client)

Signed: ______ (Supervisor / Driller / Operator)

MEEHAN DRILLING

MEEHAN DRILLING LTD.

WW 5949 11285

BOREHOLE LOG

Phone: 042 - 9372220. Email: info@meehandrilling.com. Website: www.meehandrilling.com

Borehole Ref: W712. Drilling Date: 13-2-14

Client: Dublin Phone:

Address: Priests Slane, Co. Meath

Location of Borehole: Field next to the barn.

Private / Commercial / Government (Specify): Monitoring borehole.

Date of Drilling	Depth (from to) metres / feet	Actual Drilling Diameter	Drilling Conditions / Water Strike
13-2-14	0 - 2 metres	200mm o/h	Clay
	2 - 2½ metres	200mm o/h	Limestone
	2½ - 3½ metres	200mm o/h	Cavity filled with broken limestone
			water approx.
			80 l/hr
	3½ - 6 metres	200mm o/h	Competent limestone
	6 - 118.5 metres	119mm o/h	Competent limestone
			First strike 59m
			@ 1 m³/hr.
			2nd 74m @ 1 m³/hr.

Overburden (O/B):

Drilling Method Used: Mud Rotary / DTH Hammer / Simultaneous Casing System / Air Rotary

Depth of O/B: 2 metres Grouted to Bedrock? Yes.

Steel Casing (Dia / Depths): 6m of 125mm PVC blue casing

Bedrock:

Drilling Method Used: Mud Rotary / DTH Hammer / Air Rotary

Depth of Bedrock: 116.5 metres Development: 1 Hours

Water Turbidity Content (Approx): Clear Estimated Yield: 2 m³/hr

PVC Casing (Dia / Depths): 63mm pegs screen 3 - 118.5m, 3m plain 3m to surface Plain / Screen

Gravel / Bentonite Backfill: N/A. Lockable Cap (Yes) / No

Standing Time (Hrs): N/A Total Depth of Well: 118.5 metres Static Water Level: 7.5 metres

Comments: (e.g. any unusual features / explanations)

Signed: ____ (Client)

Signed: ____ (Supervisor / Driller / Operator)

DUNNES DRILLING

Log No: 5368

DRILLERS LOG

WELL DRILLING AND HORIZONTAL DRILLING ENGINEERS
Dublin Road, Dromiskin, Dundalk, Co. Louth.
E-Mail: info@dunnesdrilling.com website: www.dunnesdrilling.com
Tel: +353 42 9372188 Fax: +353 42 9372714

Borehole for: Newgrange Meats
at Beauparc
Slane
Co. Meath

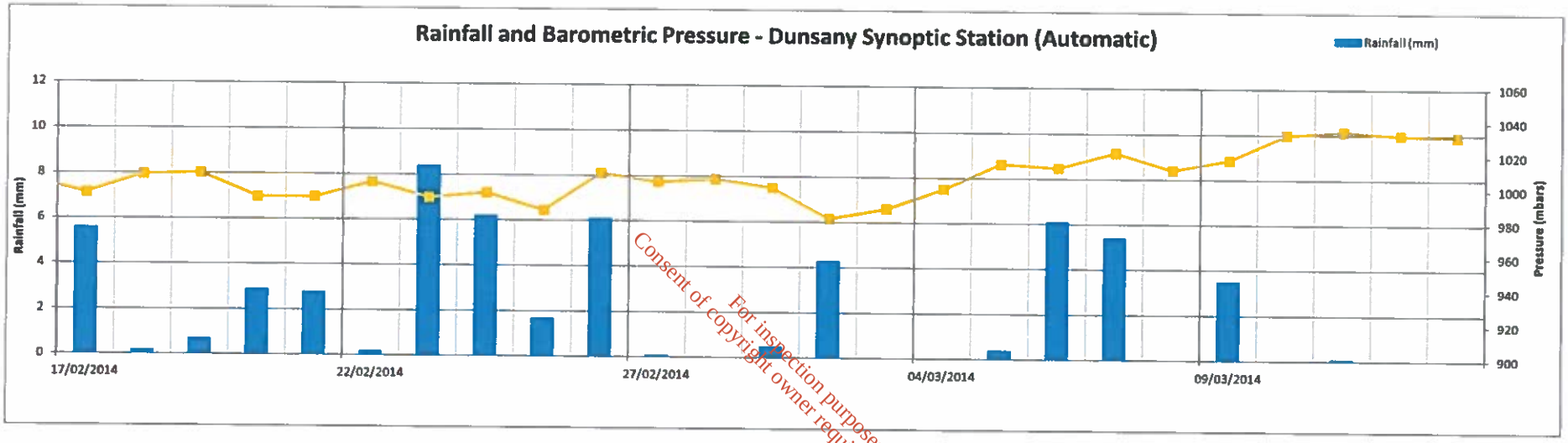
Date	Depth ft	Diam	Conditions
12/09/2012	0 - 12	12"	Clay. Install 12ft of 12"steel lining.
	12 - 39	12"	Grey rock. Install 40ft of 8" steel lining & bentonite pellets.
13/09/2012	39 - 100	8"	Grey / Black rock.
	100 - 150	8"	Black rock.
	150 - 225	8"	Black rock. Soft and hard bands.
	225 -250	8"	Black rock - broken, water inflow from 240ft.
	250 - 300	8"	Black rock.
	300 - 375	8"	Black rock - water increasing.
14/09/2012	375 - 400	8"	Black rock. Estimated yield 1,200gals/hr. Install 150mm PVC lining - slotted.

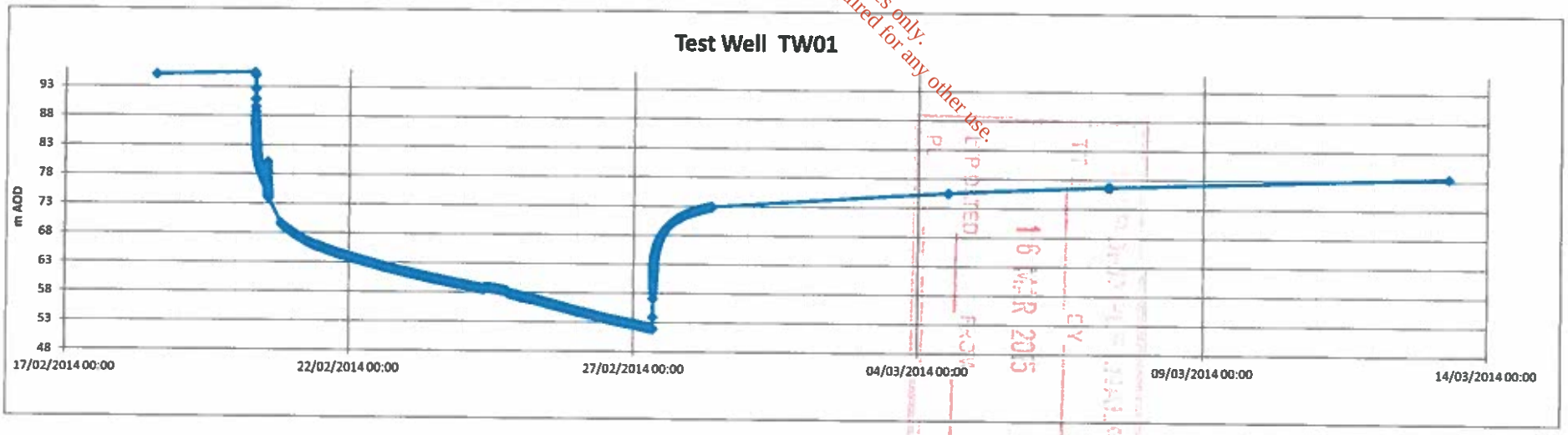
Total depth of well	400ft
Estimated yield	1,200GPH
Depth to rock	12ft
Steel casing installed	12ft of 12" steel and 40ft of 8" steel
PVC casing installed	400ft of 6" PVC
Well screen	PVC slotted manually
Other remarks	Bentonite pellets installed to base of annulus.

Operator Eugene Mc Cabe

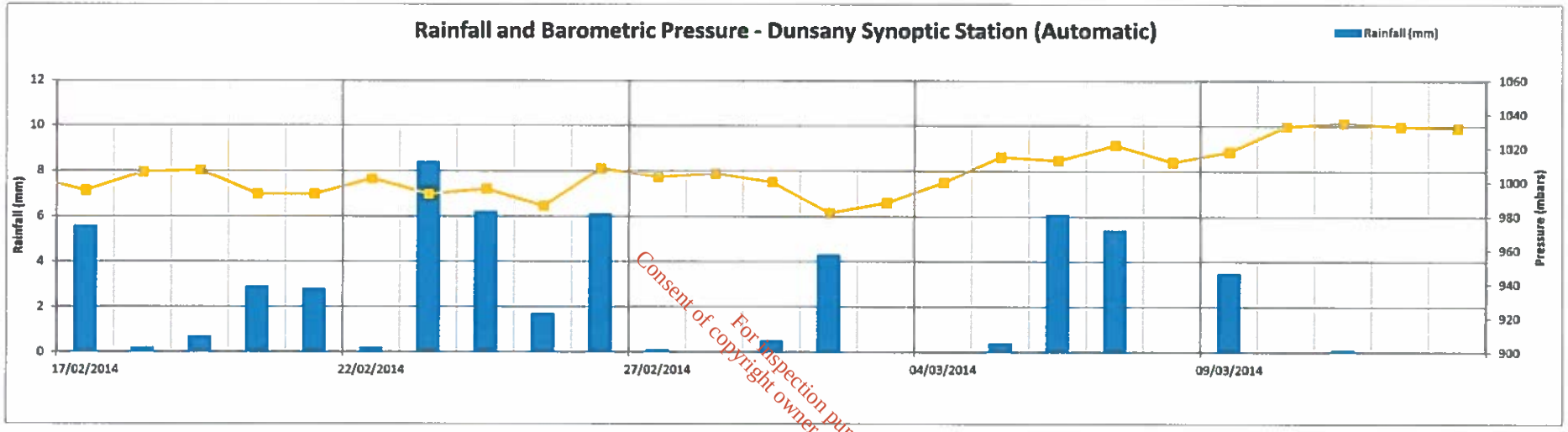
Appendix C
Groundwater Hydrographs

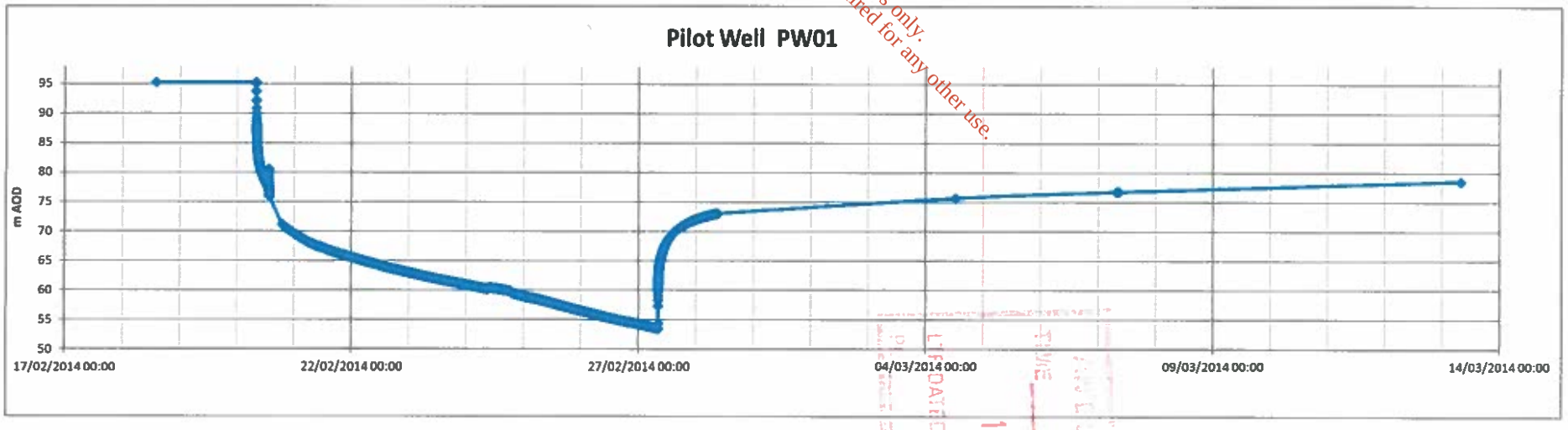
Groundwater Level Monitoring During Dunbia Pumping Test Programme



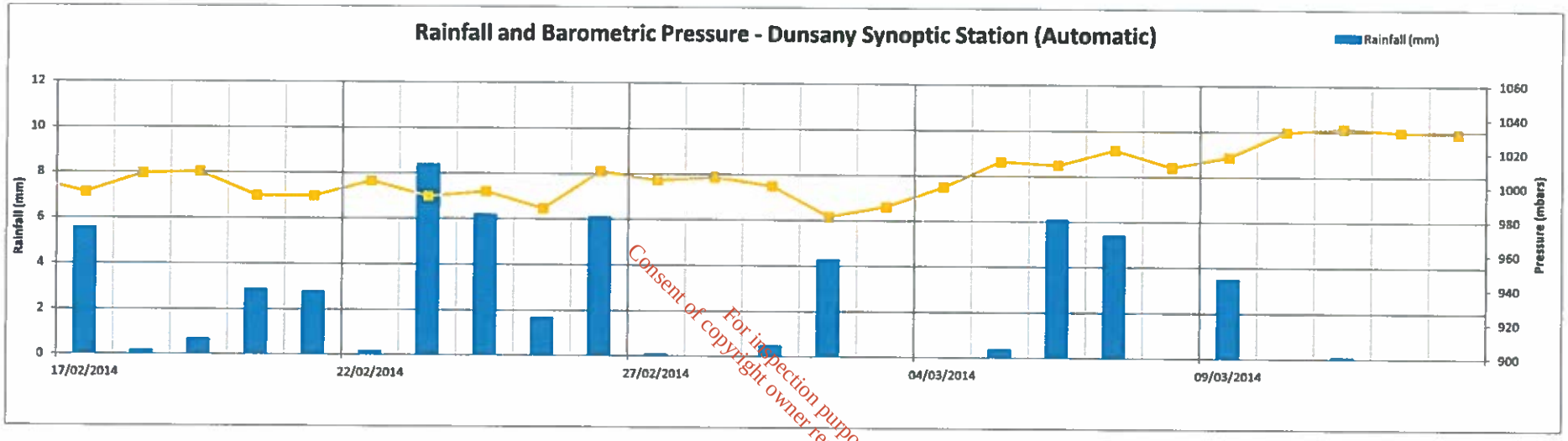


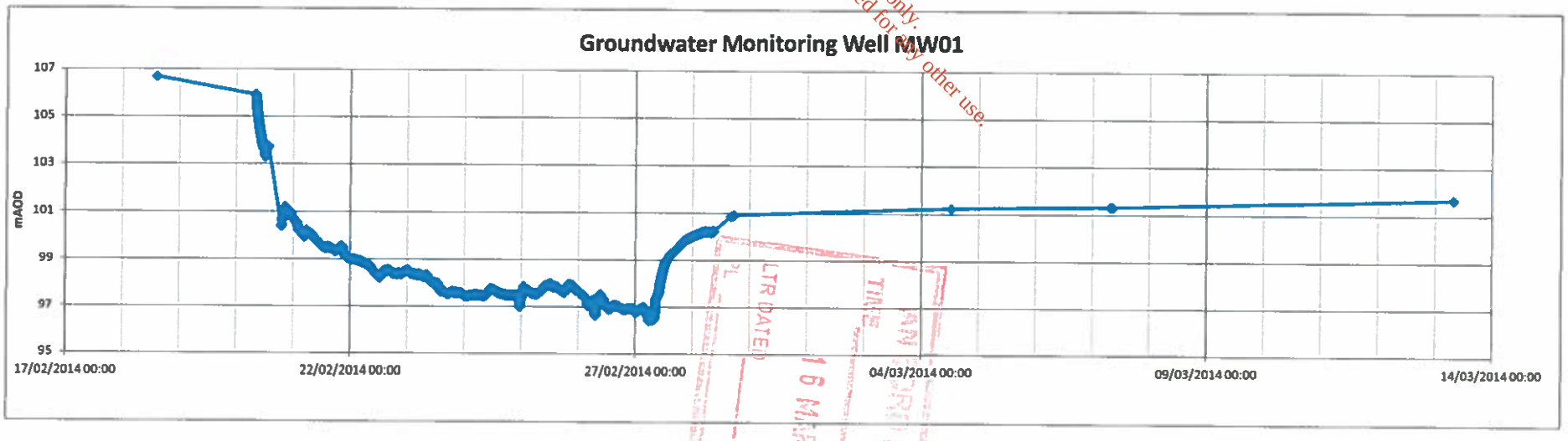
Groundwater Level Monitoring During Dunbia Pumping Test Programme



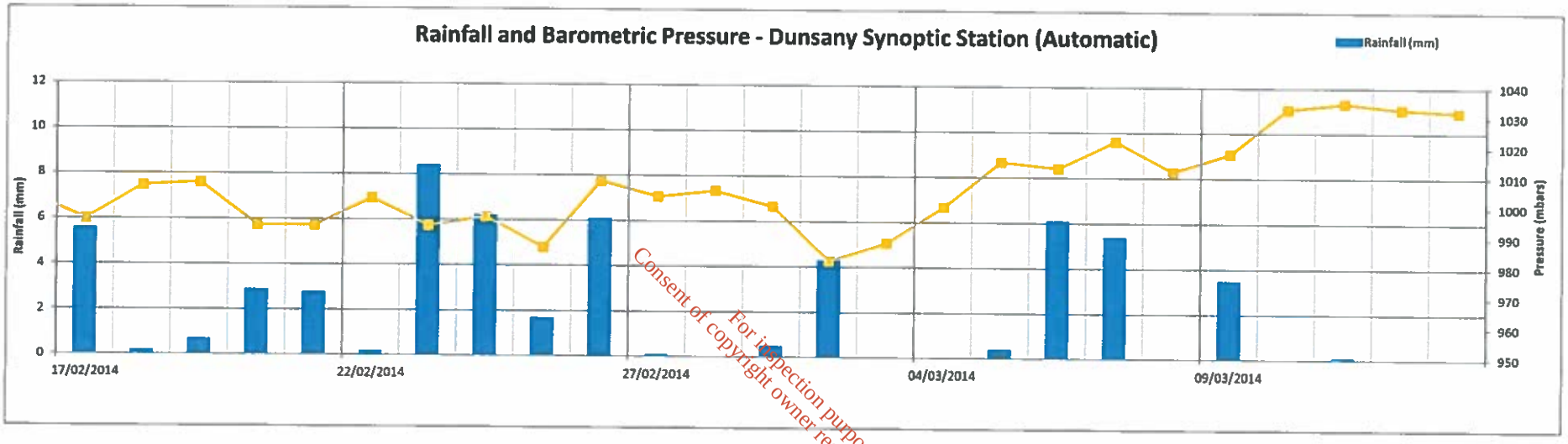


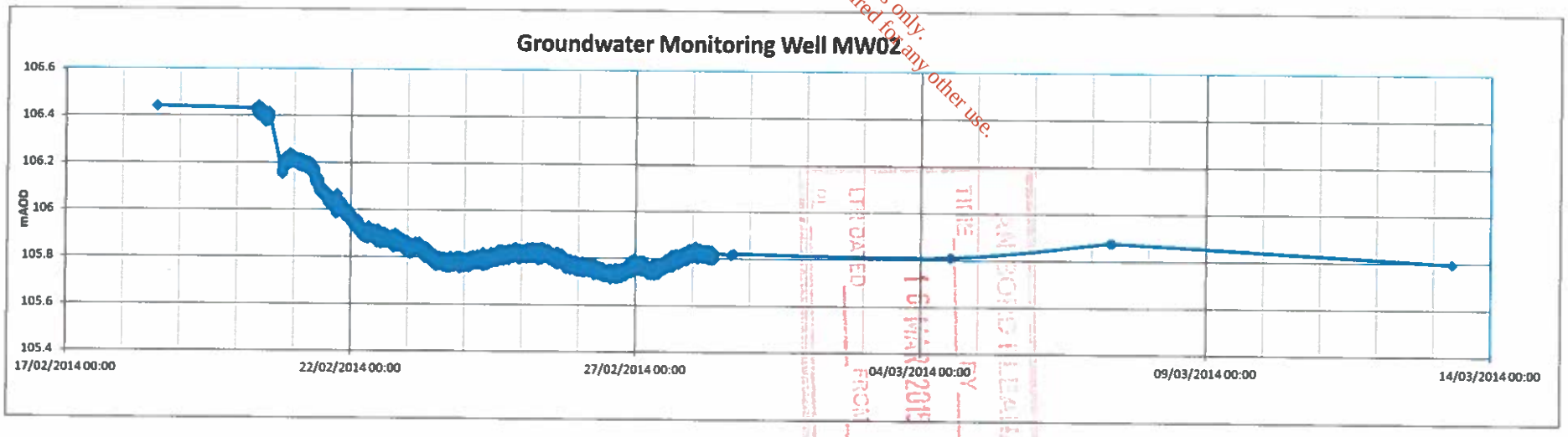
Groundwater Level Monitoring During Dunbia Pumping Test Programme



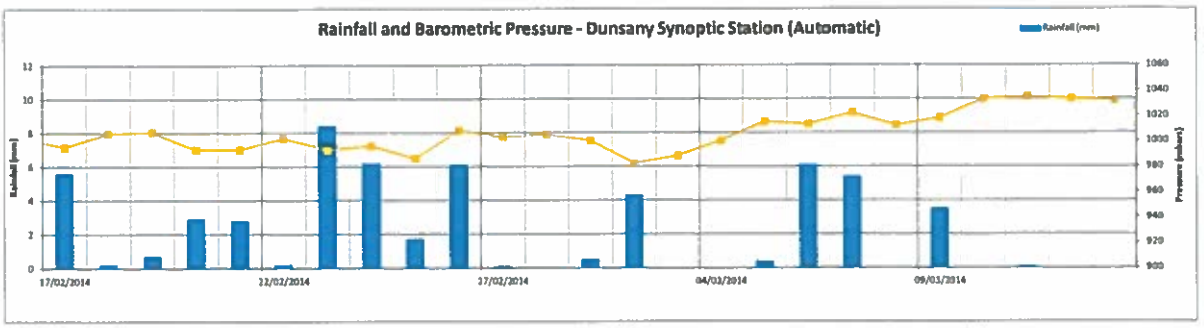


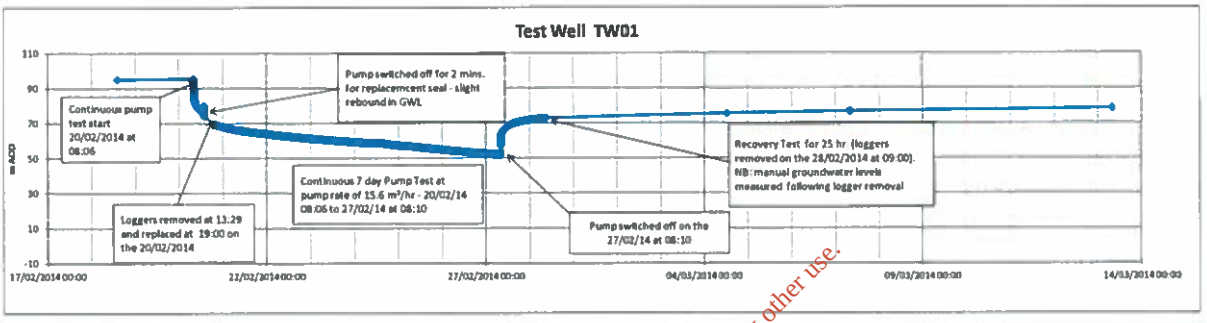
Groundwater Level Monitoring During Dunbia Pumping Test Programme

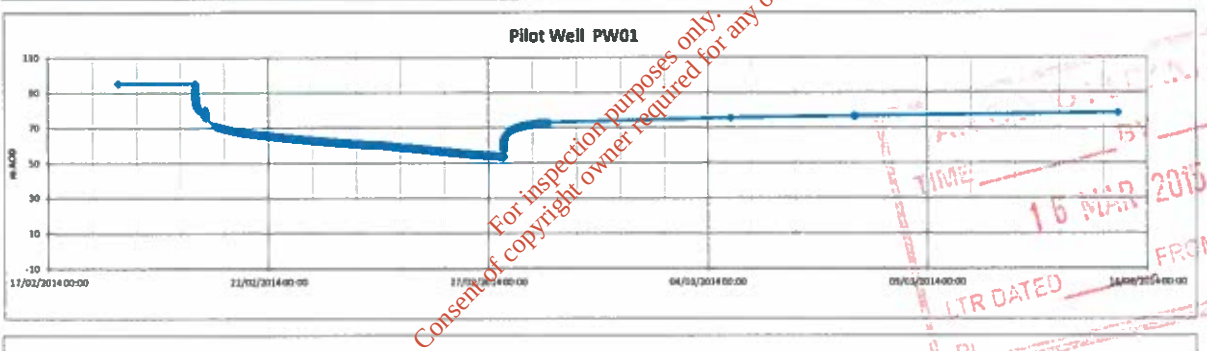


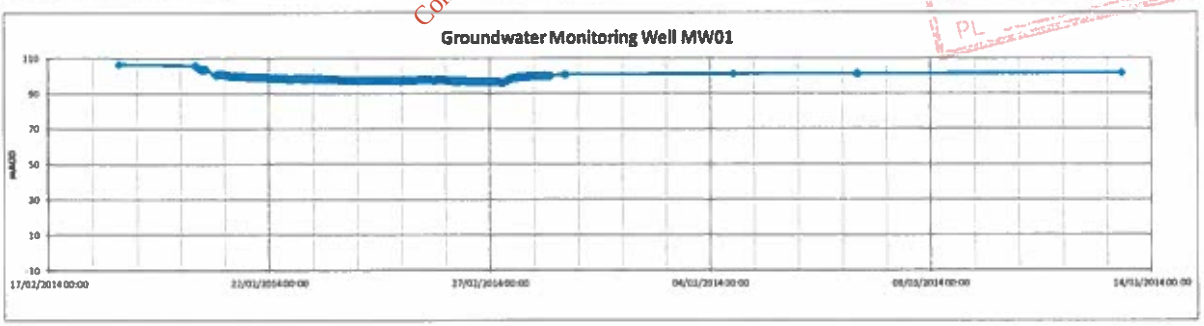


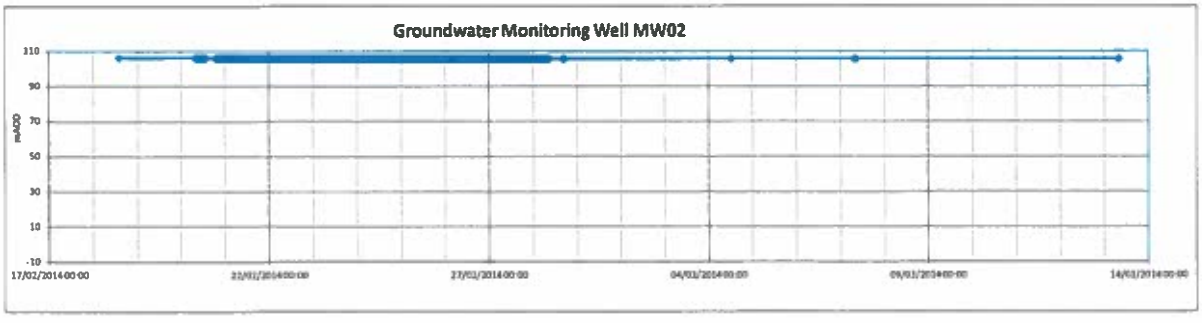
Groundwater Level Monitoring During Dunbia Pumping Test Programme



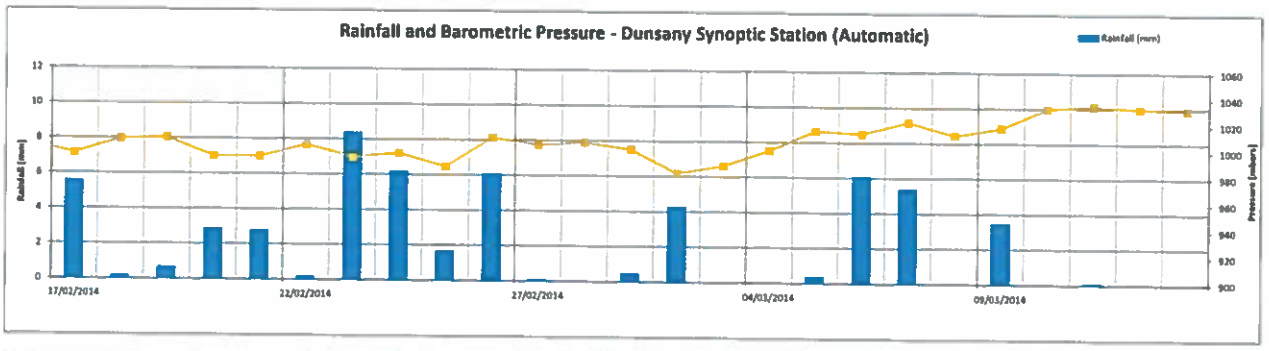


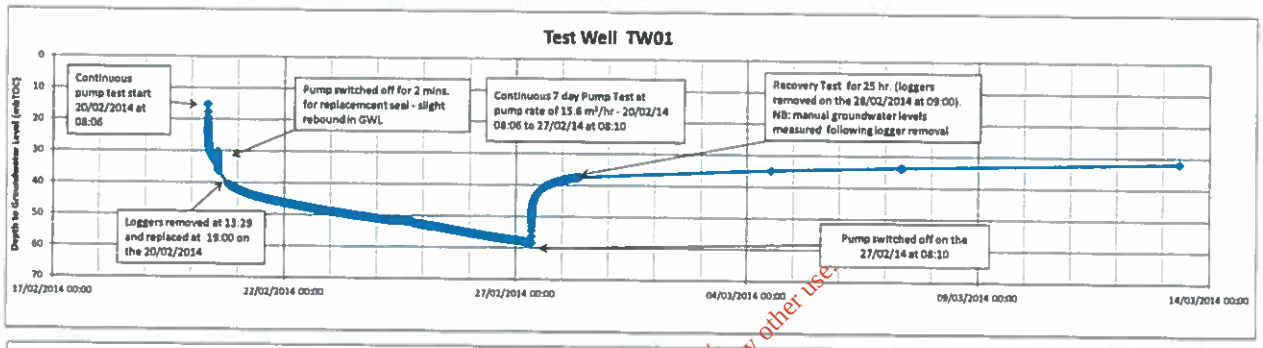


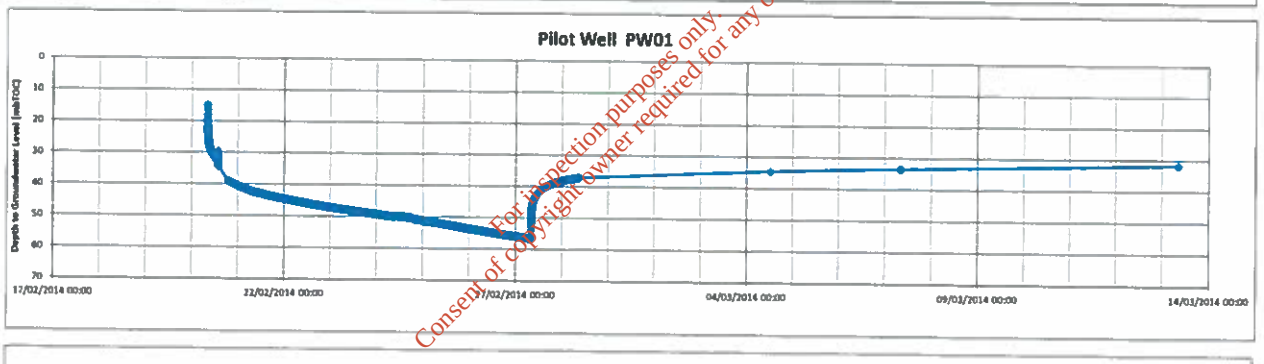


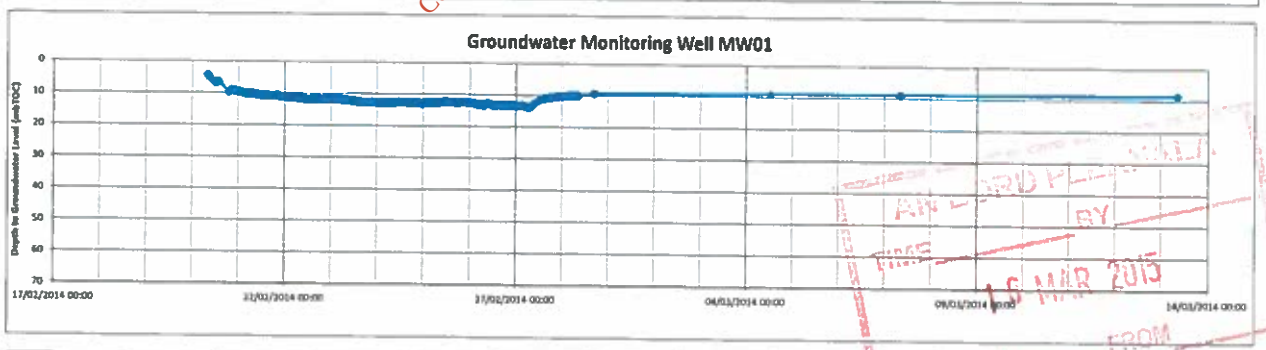


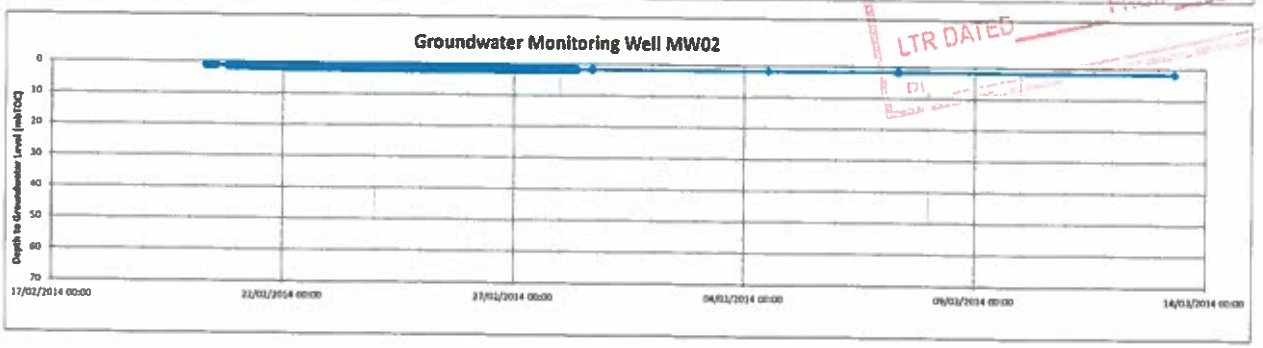
Groundwater Level Monitoring During Dunbia Pumping Test Programme



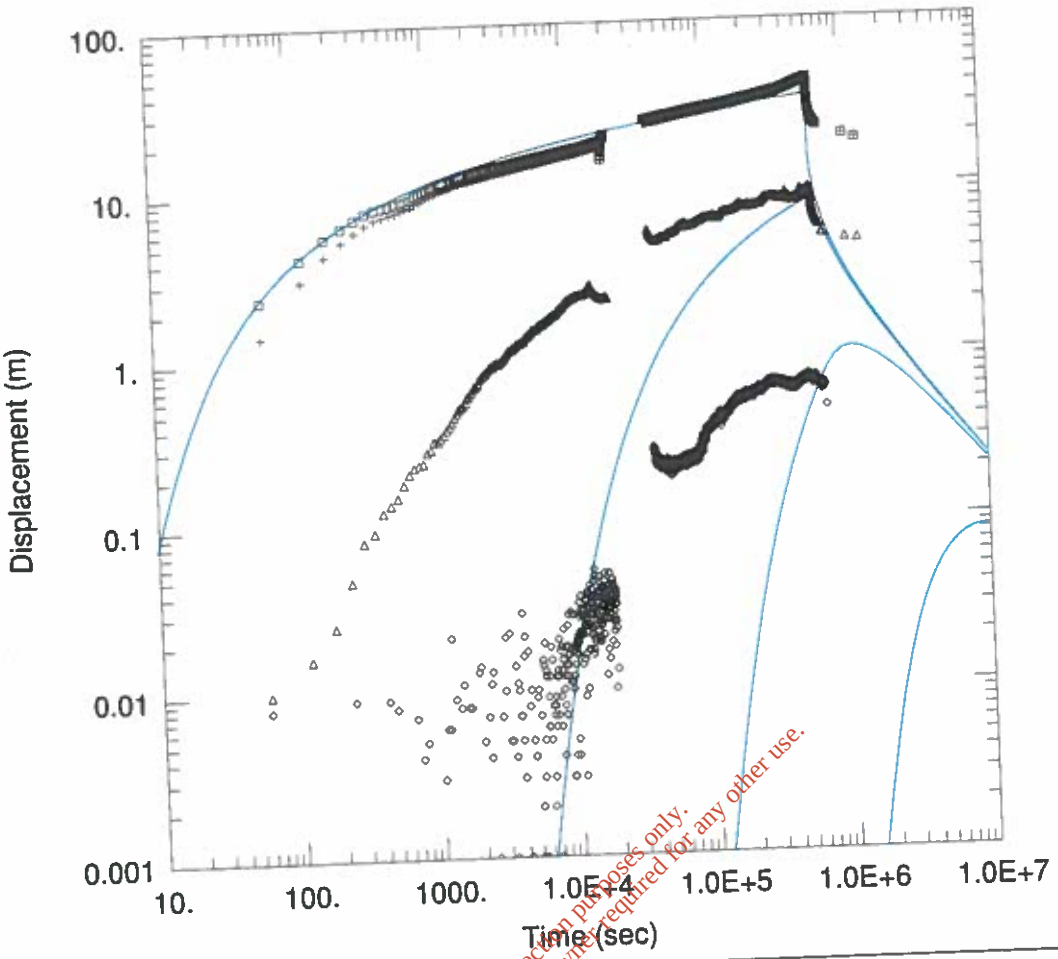








Appendix D
Aquifer Analysis



DUNBIA (SLANE) SLAUGHTERHOUSE WATER SUPPLY

Data Set: C:\...\140305_TW01_Combined_Test.aqt
Date: 03/17/14
Time: 16:44:27

PROJECT INFORMATION

Company: SLR
Client: Dunbia Slane
Project: 4SA.02036.0028
Test Well: TW01
Test Date: 20 February 2014

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
TW01	0	0
PW01	3.9	0
MW01	17.13	0
MW02	60.88	0

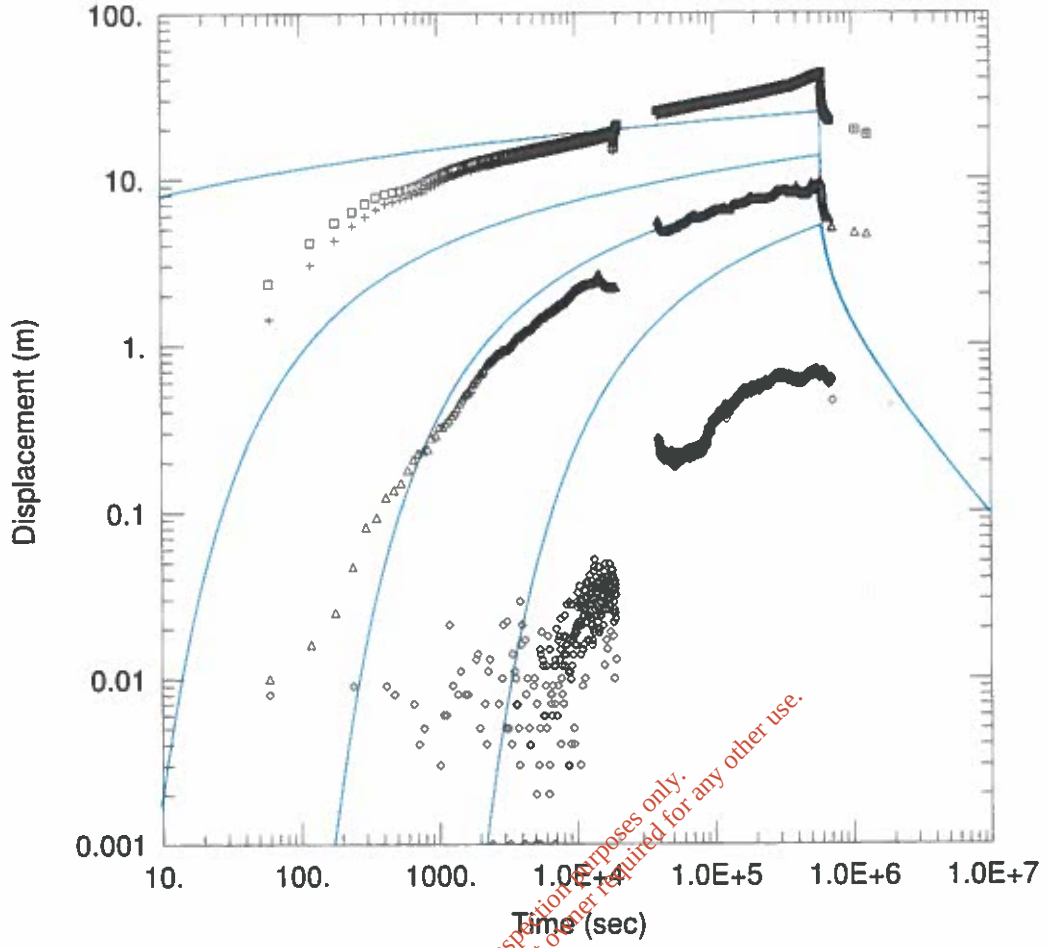
Observation Wells

Well Name	X (m)	Y (m)
□ TW01	0	0
+ PW01	3.9	0
△ MW01	17.13	0
◇ MW02	60.88	0

SOLUTION

Aquifer Model: Confined
T = 9.54E-5 m^2/sec
Kz/Kr = 1.

Solution Method: Theis
S = 0.9972
b = 60. m



DUNBIA (SLANE) SLAUGHTERHOUSE WATER SUPPLY

Data Set: C:\...\140305_TW01_Combined_Test.aqt
Date: 03/17/14 Time: 16:58:39

PROJECT INFORMATION

Company: SLR
Client: Dunbia Slane
Project: 4SA.02036.0028
Test Well: TW01
Test Date: 20 February 2014

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
TW01	0	0
PW01	3.9	0
MW01	17.13	0
MW02	60.88	0

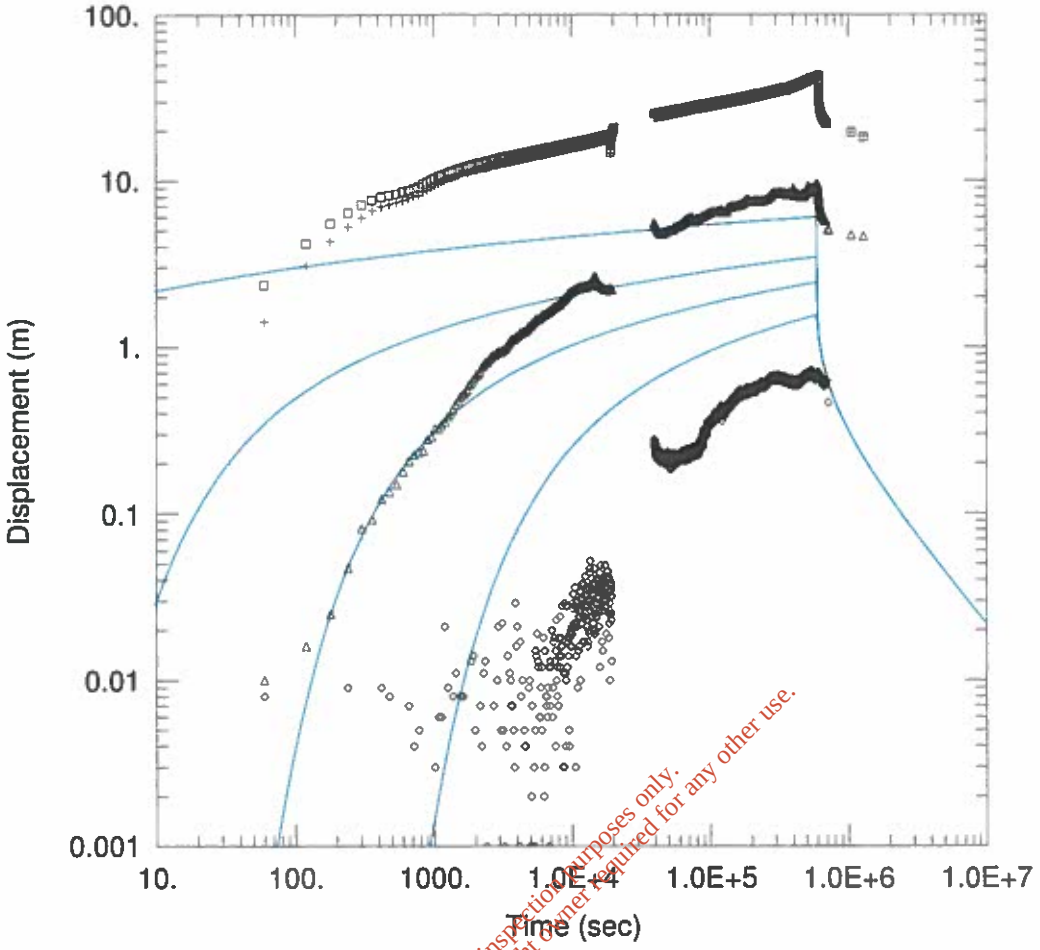
Observation Wells

Well Name	X (m)	Y (m)
□ TW01	0	0
+ PW01	3.9	0
△ MW01	17.13	0
◇ MW02	60.88	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.0002215 m^2/sec
S = 0.002938
Kz/Kr = 1.
b = 60. m



DUNBIA (SLANE) SLAUGHTERHOUSE WATER SUPPLY

Data Set: C:\...\140305_TW01_Combined_Test.aqt
Date: 03/17/14 Time: 17:27:35

PROJECT INFORMATION

Company: SLR
Client: Dunbia Slane
Project: 4SA.02036.0028
Test Well: TW01
Test Date: 20 February 2014

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
TW01	0	0
PW01	3.9	0
MW01	17.13	0
MW02	60.88	0

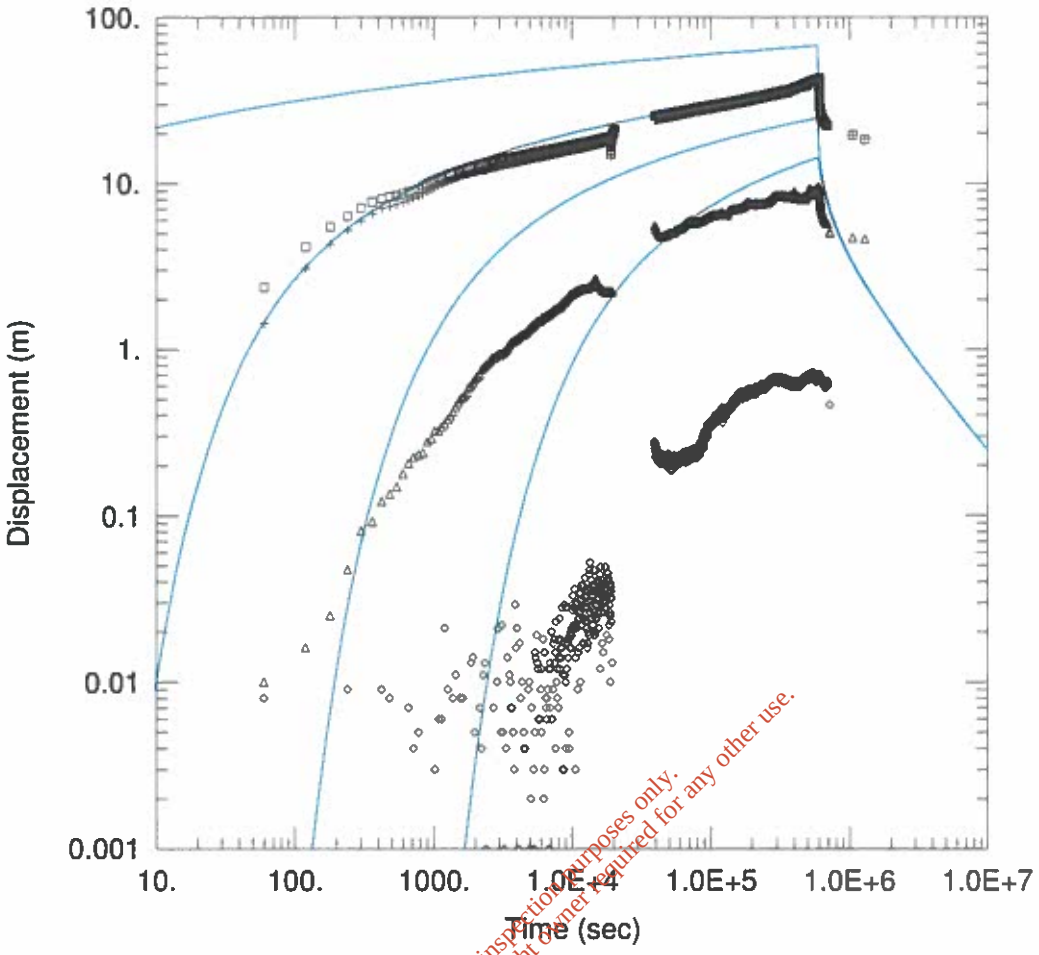
Observation Wells

Well Name	X (m)	Y (m)
□ TW01	0	0
+ PW01	3.9	0
△ MW01	17.13	0
○ MW02	60.88	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 0.0009836 m^2/sec
S = 0.004273
Kz/Kr = 1.
b = 60. m



DUNBIA (SLANE) SLAUGHTERHOUSE WATER SUPPLY

Data Set: C:\...\140305_TW01_Combined_Test.aqt
Date: 03/17/14 Time: 16:46:17

PROJECT INFORMATION

Company: SLR
Client: Dunbia Slane
Project: 4SA.02036.0028
Test Well: TW01
Test Date: 20 February 2014

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
TW01	0	0
PW01	3.9	0
MW01	17.13	0
MW02	60.88	0

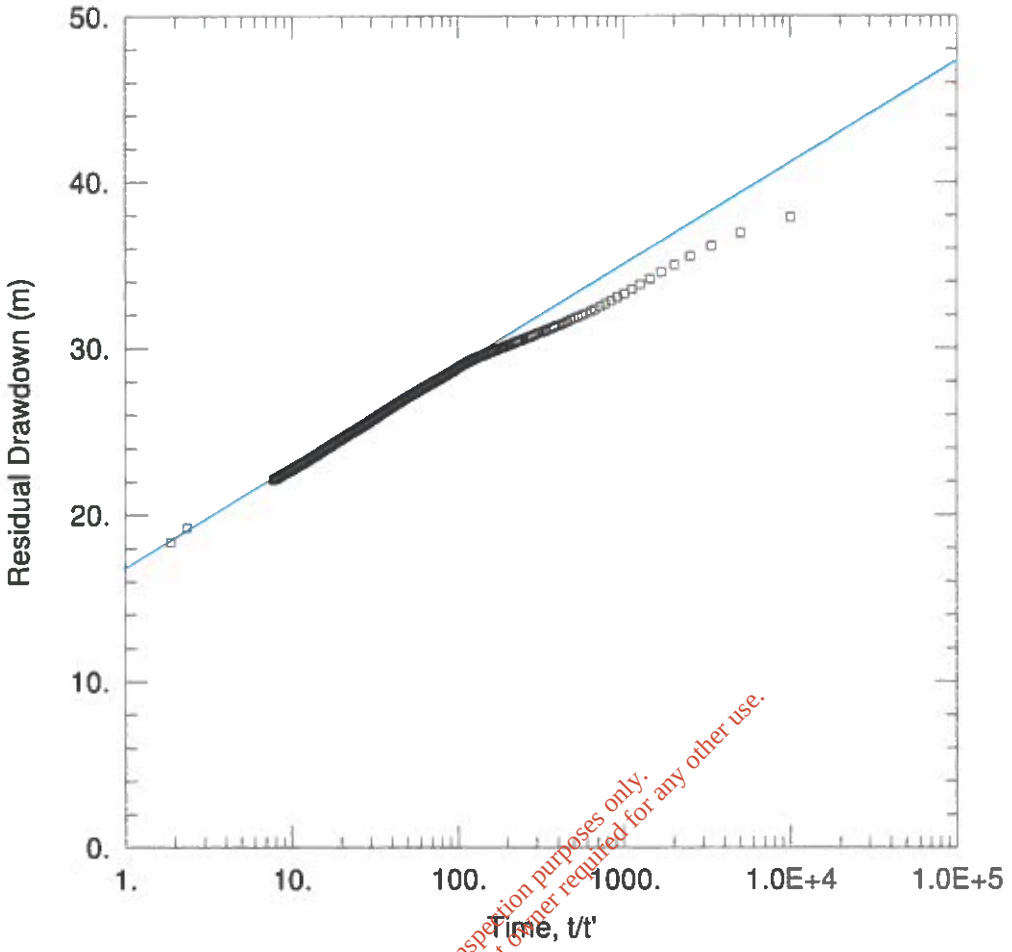
Observation Wells

Well Name	X (m)	Y (m)
□ TW01	0	0
+ PW01	3.9	0
△ MW01	17.13	0
◇ MW02	60.88	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 8.462E-5 m^2/sec
S = 0.0009924
Kz/Kr = 1.
b = 60. m



DUNBIA (SLANE) SLAUGHTERHOUSE WATER SUPPLY

Data Set: C:\...\140305_Main-Test_tw01_Maumau-Logger-Recovery_Data.aqt
Date: 03/17/14 Time: 16:30:54

PROJECT INFORMATION

Company: SLR
Client: Dunbia Slane
Project: 4SA.02036.0028
Test Well: TW01
Test Date: 20 February 2014

AQUIFER DATA

Saturated Thickness: 60. m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
TW01	0	0

Observation Wells

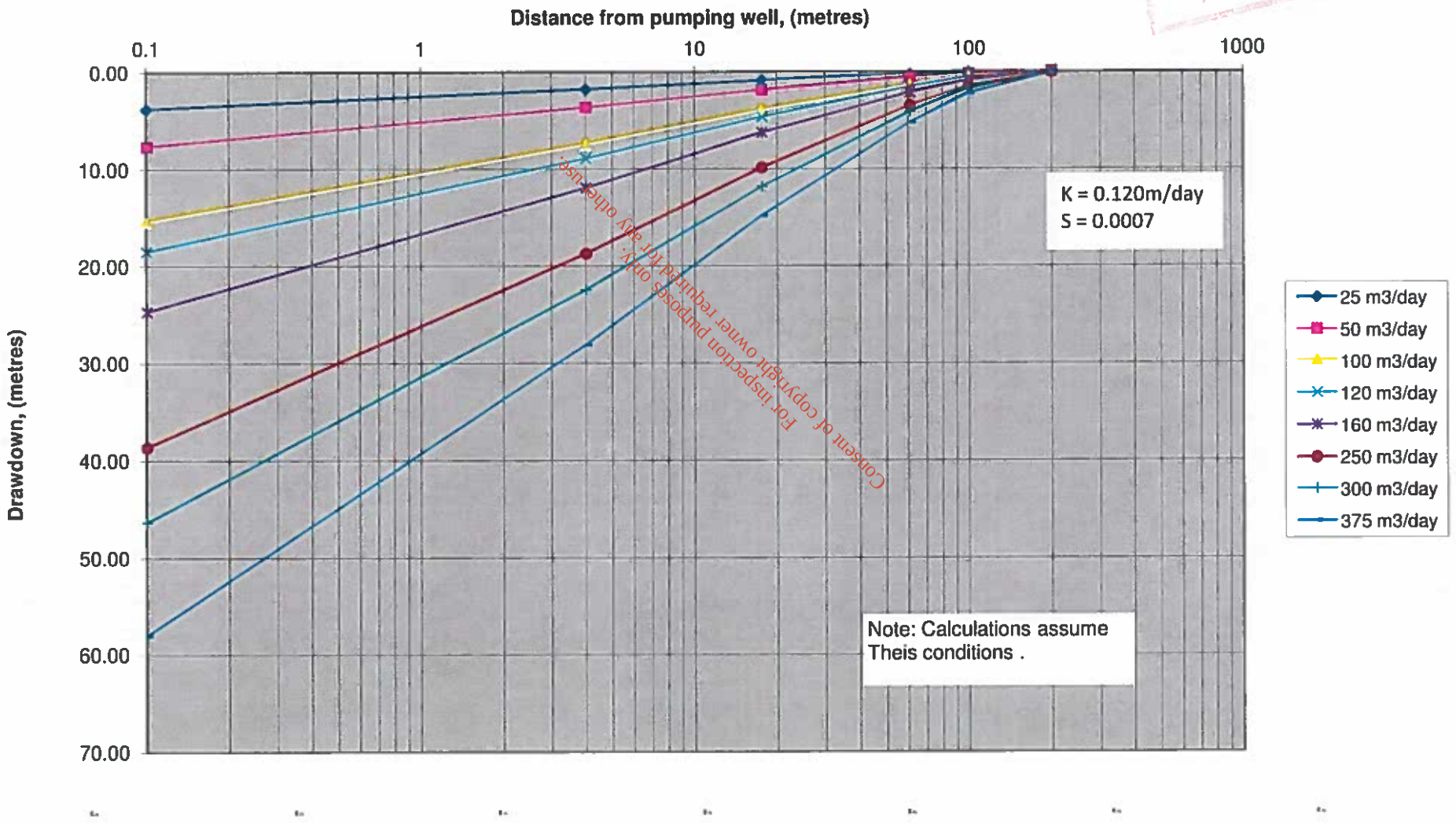
Well Name	X (m)	Y (m)
TW01	0	0

SOLUTION

Aquifer Model: Confined Solution Method: Theis (Recovery)

T = 0.0001302 m^2/sec S/S' = 0.001817

Appendix E
Groundwater Drawdown (Theis)



Calculation of Drawdowns at Various Distances for Range of Pumping Rates using the Theis Method
(assumes minimum calculated permeability and storage coefficients calculated from the TW01 constant rate test)

Where:

	Value	Derivation
S = Storativity	7.00E-04 dimensionless	Estimated from TW01 constant rate test for TW01
b = aquifer thickness	60 metres	Estimated from Drillers Logs for TW01, PW01, MW01 and MW02
K = Hydraulic conductivity	0.120 metres per day	Estimated from TW01 constant rate test
T = Transmissivity	7.2 square metres per day	= K x b
t = Time	0.5 days	Assumes 12 hours pumping and 12 hours recovery from TW01

then calculate:

$u = r^2S/4Tt$	dimensionless	calculated
W(u) = Well Function of u	dimensionless	from published tables
s = Head change at distance r	metres	calculated
r = Distance from TW01	metres	various selected
Q = Pumping Rate from TW01	cubic metres per day	various selected

Given $S = 4Ttu/r^2$
and $s = Q^*W(u)/4\pi T$

then $u = r^2S/4Tt$
calculate S/4Tt
(per square meter)

r	r^2	u	W(u)	$1/4\pi T$	drawdwon (s) in metres for the stated Q, in cubic metres per day							
					25 m^3/day	50 m^3/day	100 m^3/day	*120 m^3/day*	160 m^3/day	250 m^3/day	300 m^3/day	375 m^3/day
m	sq m											
0.1	0.01	4.86E-07	14	0.0111	3.87	7.74	15.47	***18.57***	24.76	38.68	46.42	58.03
4	16	7.78E-04	6.8	0.0111	1.88	3.76	7.52	***9.02***	12.03	18.79	22.55	28.18
17.5	306.25	1.49E-02	3.6	0.0111	0.99	1.99	3.98	***4.77***	6.37	9.95	11.94	14.92
61	3721	1.81E-01	1.3	0.0111	0.36	0.72	1.44	***1.72***	2.30	3.59	4.31	5.39
100	10000	4.86E-01	0.58	0.0111	0.16	0.32	0.64	***0.77***	1.03	1.60	1.92	2.40
200	40000	1.94E+00	0.055	0.0111	0.02	0.03	0.06	***0.07***	0.10	0.15	0.18	0.23

Reference: Theis, C.V., 1935. The relationship between the lowering of the piezometric surface and the rate and duration of discharge of a well using groundwater storage, Am. Geophys. Union Trans., vol. 16, pp. 519-524.

Appendix F
Groundwater Quality Results

Fitz scientific
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Drogheda,
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Ireland
Tel: +353 41 9845440
Fax: +353 41 9846171
Web: www.fitzsci.ie
email info@fitzsci.ie

A copy of this certificate is available on www.fitzsci.ie

Customer	Tony Brennan Meehan Drilling Ltd Castlecourt Castlebellingham Co. Louth	**Lab Report Ref. No.**	9530/045/01
		Date of Receipt	20/02/2014
		Sampled On	20/02/2014
		Date Testing Commenced	20/02/2014
		Received or Collected	Delivered by Customer
		Condition on Receipt	Acceptable
Customer PO		**Date of Report**	18/03/2014
Customer Ref	Dunbia - Slane	**Sample Type**	Groundwater
Ref 2			

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Alkalinity (Ground Water)	102	Colorimetry	329	mg/L CaCO3	UKAS
Aluminium (Ground Water)	177	ICPMS	9.913	ug/L	UKAS
Ammonia (Ground Water)	114	Colorimetry	0.055	mg/L as N	UKAS
Antimony (Ground Water)	177	ICPMS	29.19	ug/L	UKAS
Arsenic (Ground Water)	177	ICPMS	14.93	ug/L	UKAS
Cadmium (Ground Water)	177	ICPMS	<0.09	ug/L	UKAS
Calcium (Ground Water)	184	ICPMS	95.83	mg/L	UKAS
Chloride (Ground Water)	100	Colorimetry	25.03	mg/L	UKAS
Chromium (Ground Water)	177	ICPMS	<2.14	ug/L	UKAS
Chromium (VI)	146	Colorimetry	<10	ug/L	
Chromium III	177	ICPMS	<2.14	ug/L	
COD (Ground Water)	107	Colorimetry	5	mg/L	UKAS
Coliforms (Faecal)	140	Filtration/ Incubation 44C/ 24H	0	cfu/ 100ml	
Conductivity (Ground Water at 20C)	112	Electrometry	593	uscm -1@20C	UKAS
Copper (Ground Water)	177	ICPMS	8.488	ug/L	UKAS
Cyanide	138	Colorimetry	<5	ug/L	
Fluoride (Ground Water)	115	Colorimetry	0.55	mg/L	UKAS
Hardness Total (Ground Water)	111	Colorimetry	355	mg/L CaCO3	UKAS
Iron (Ground Water)	177	ICPMS	13.48	ug/L	UKAS
Lead (Ground Water)	177	ICPMS	4.859	ug/L	UKAS
Magnesium (Ground Water)	184	ICPMS	28.89	mg/L	UKAS
Manganese (Ground Water)	177	ICPMS	22.72	ug/L	UKAS
Mercury (Ground water)	178	ICPMS	<0.04	ug/L	UKAS
Molybdenum	228	ICPMS	31.06	ug/L	

Signed : A Harmon

Aoife Harmon - Technical Supervisor

Date : 18/03/2014

Acc. : Accredited Parameters by ISO 17025:2005
PVL - Parametric Value Limit as per EU Drinking water Regulations (SI 278 2007)
All organic results are analysed as received and all results are corrected for dry weight at 104 C
Results shall not be reproduced, except in full, without the approval of Fitz Scientific
Results contained in this report relate only to the samples tested
(P) : Presumptive Results
**The analytical result for this parameter may not be reflective of the concentration present at the time of sampling. The maximum recommended preservation time for this parameter has been exceeded.

UKAS
2802

Fitz scientific
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Fax: +353 41 9846171
Web: www.fitzsci.ie
email info@fitzsci.ie

A copy of this certificate is available on www.fitzsci.ie

Customer	Tony Brennan Meehan Drilling Ltd Castlecourt Castlebellingham Co. Louth	**Lab Report Ref. No.**	9530/045/01
		Date of Receipt	20/02/2014
		Sampled On	20/02/2014
		Date Testing Commenced	20/02/2014
		Received or Collected	Delivered by Customer
		Condition on Receipt	Acceptable
Customer PO		**Date of Report**	18/03/2014
Customer Ref	Dunbia - Slane	**Sample Type**	Groundwater
Ref 2			

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Nickel (Ground Water)	177	ICPMS	15.94	ug/L	UKAS
Nitrate (Ground Water)	103	Colorimetry	0.300	mg/L as N	UKAS
Nitrite (Ground Water)	118	Colorimetry	0.008	mg/L as N	UKAS
pH (Ground Water)	110	Electrometry	7.4	pH Units	UKAS
Phosphate (Total) Ground Water	166	Colorimetry	0.053	mg/L as P	UKAS
Potassium (Ground Water)	184	ICPMS	3.915	mg/L	UKAS
Selenium (Ground Water)	177	ICPMS	2.03	ug/L	UKAS
Sodium (Ground water)	184	ICPMS	11.27	mg/L	UKAS
Solids (Total Dissolved)	105	Filtration/ Evaporation @ 180C	421	mg/L	
Sulphate (Ground Water)	119	Colorimetry	43.42	mg/L	UKAS
Sulphide	121	Titrimetry	<0.010	mg/L as S2-	
Total Organic Carbon	316	TOC analyser (NPOC)	5.36	mg/L	
Zinc (Ground Water)	177	ICPMS	24.54	ug/L	UKAS

Signed : A Harmon
Aoife Harmon - Technical Supervisor

Date : 18/03/2014

Acc. : Accredited Parameters by ISO 17025:2005
PVL - Parametric Value Limit as per EU Drinking water Regulations (SI 278 2007)
All organic results are analysed as received and all results are corrected for dry weight at 104 C
Results shall not be reproduced, except in full, without the approval of Fitz Scientific
Results contained in this report relate only to the samples tested
(P) : Presumptive Results
**The analytical result for this parameter may not be reflective of the concentration present at the time of sampling. The maximum recommended preservation time for this parameter has been exceeded.

UKAS TESTING
2802

Fitz scientific
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email info@fitzsci.ie

A copy of this certificate is available on www.fitzsci.ie

Customer	Tony Brennan Meehan Drilling Ltd Castlecourt Castlebellingham Co. Louth	**Lab Report Ref. No.**	9530/046/01
		Date of Receipt	26/02/2014
		Sampled On	26/02/2014
		Date Testing Commenced	26/02/2014
		Received or Collected	Delivered by Customer
		Condition on Receipt	Acceptable
Customer PO		**Date of Report**	18/03/2014
Customer Ref	Dunbia - Slane (Test 2)	**Sample Type**	Groundwater
Ref 2			

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Alkalinity (Ground Water)	102	Colorimetry	345	mg/L CaCO3	UKAS
Aluminium (Ground Water)	177	ICPMS	<0.79	ug/L	UKAS
Ammonia (Ground Water)	114	Colorimetry	0.077	mg/L as N	UKAS
Antimony (Ground Water)	177	ICPMS	4.306	ug/L	UKAS
Arsenic (Ground Water)	177	ICPMS	5.829	ug/L	UKAS
Cadmium (Ground Water)	177	ICPMS	<0.09	ug/L	UKAS
Calcium (Ground Water)	184	ICPMS	115.50	mg/L	UKAS
Chloride (Ground Water)	100	Colorimetry	46.39	mg/L	UKAS
Chromium (Ground Water)	177	ICPMS	<2.14	ug/L	UKAS
Chromium (VI)	146	Colorimetry	<10	ug/L	
Chromium III	177	ICPMS	<2.14	ug/L	
COD (Ground Water)	107	Colorimetry	<5	mg/L	UKAS
Coliforms (Faecal)	140	Filtration/ Incubation 44C/ 24H	0	cfu/ 100ml	
Conductivity (Ground Water at 20C)	112	Electrometry	654	uscm -1@20C	UKAS
Copper (Ground Water)	177	ICPMS	1.009	ug/L	UKAS
Cyanide	138	Colorimetry	<5	ug/L	
Fluoride (Ground Water)	115	Colorimetry	0.49	mg/L	UKAS
Hardness Total (Ground Water)	111	Colorimetry	373	mg/L CaCO3	UKAS
Iron (Ground Water)	177	ICPMS	26.48	ug/L	UKAS
Lead (Ground Water)	177	ICPMS	1.79	ug/L	UKAS
Magnesium (Ground Water)	184	ICPMS	48.34	mg/L	UKAS
Manganese (Ground Water)	177	ICPMS	24.46	ug/L	UKAS
Mercury (Ground water)	178	ICPMS	<0.04	ug/L	UKAS
Molybdenum	228	ICPMS	5.435	ug/L	

Signed : A Harmon

Aoife Harmon - Technical Supervisor

Date : 18/03/2014

Acc. : Accredited Parameters by ISO 17025:2005
PVL - Parametric Value Limit as per EU Drinking water Regulations (SI 278 2007)
All organic results are analysed as received and all results are corrected for dry weight at 104 C
Results shall not be reproduced, except in full, without the approval of Fitz Scientific
Results contained in this report relate only to the samples tested
(P) : Presumptive Results
**The analytical result for this parameter may not be reflective of the concentration present at the time of sampling. The maximum recommended preservation time for this parameter has been exceeded.

UKAS TESTING 2502

Fitz scientific
Monitoring and Testing Services

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Customer	Tony Brennan Meehan Drilling Ltd Castlecourt Castlebellingham Co. Louth	**Lab Report Ref. No.**	9530/046/01
		Date of Receipt	26/02/2014
		Sampled On	26/02/2014
		Date Testing Commenced	26/02/2014
		Received or Collected	Delivered by Customer
		Condition on Receipt	Acceptable
Customer PO		**Date of Report**	18/03/2014
Customer Ref	Dunbia - Slane (Test 2)	**Sample Type**	Groundwater
Ref 2			

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Nickel (Ground Water)	177	ICPMS	2.847	ug/L	UKAS
Nitrate (Ground Water)	103	Colorimetry	<0.110	mg/L as N	UKAS
Nitrite (Ground Water)	118	Colorimetry	0.005	mg/L as N	UKAS
pH (Ground Water)	110	Electrometry	7.0	pH Units	UKAS
Phosphate (Total) Ground Water	166	Colorimetry	0.033	mg/L as P	UKAS
Potassium (Ground Water)	184	ICPMS	6.909	mg/L	UKAS
Selenium (Ground Water)	177	ICPMS	<0.47	ug/L	UKAS
Sodium (Ground water)	184	ICPMS	19.01	mg/L	UKAS
Solids (Total Dissolved)	105	Filtration/ Evaporation @ 180C	453	mg/L	
Sulphate (Ground Water)	119	Colorimetry	45.88	mg/L	UKAS
Sulphide	121	Titrimetry	<0.010	mg/L as S2-	
Total Organic Carbon	316	TOC analyser (NPOC)	3.01	mg/L	
Zinc (Ground Water)	177	ICPMS	16.72	ug/L	UKAS

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UKAS TESTING 2802

SLR

global environmental solutions

APPENDIX B Colour photograph of traffic signage used to control site traffic

APPENDIX C Noise Survey carried out in February 2015

Noise Survey Report 2014

for

Dunbia (Slane)
Greenhills
Beauparc
Navan
Co. Meath

IPPC Licence No. P0811-01

by

Q.E.D. Engineering Ltd
Unit 5
M-TEK Building 1
Armagh Road
Monaghan
Co. Monaghan
Tel: 047 72060

February 2015

Table of Contents

1. Introduction

Dunbia (Slane) is a meat processing facility involved in the slaughter of beef. Production hours at the site are generally 7.00am to 6pm, but unloading of cattle can take place outside these hours. During the night time refrigeration and boilers are operational.

The site obtained IPPC Licence No. P0811-01 on 5th March 2010. Condition 6.16 of the licence requires that "*the licensee shall carry out a noise survey of the site operations annually*". Condition 4.5 requires that "*noise from the installation shall not give rise to sound pressure levels (Leq, T) measured at the noise sensitive locations adjacent to the installation which exceed the limit value(s) specified in Schedule B.4 Noise Emissions.*" Schedule B.4 specifies a Daytime (30 minutes) limit of 55dB(A) L_{Aeq} and a night time (30 minute) limit of 45dB(A) L_{Aeq}. In addition it specifies that there shall be no clearly audible tonal component or impulsive component in the noise emission from the activity at any noise sensitive location.

Daytime noise levels were measured at Dunbia (Slane) at noise sources and at noise sensitive locations between 12:00–17:00 on the 05th February 2015. Night time noise levels were measured at noise sensitive locations on 05th – 06th February 2015 between 23:20-01:45. The 2014 noise survey was carried out in February 2015 due to a lack of availability of noise surveyor's in December 2014. The surveys were conducted by Anthony Meehan, BSc, of Q.E.D. Engineering Ltd.

Noise measurements were taken at fourteen noise sources and four noise sensitive locations (houses). The results at the noise sensitive locations are directly comparable to the EPA daytime noise limit of 55dBA and night time limit of 45dBA.

The work was conducted in line with the EPA's NG4 "*Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities*", and accompanying *Frequently Asked Questions on NG4*.

2. Methodology and Instrumentation

Noise monitoring was carried out by Anthony Meehan, BSc in Environmental Science & Technology, of Q.E.D Engineering Limited.

Noise monitoring was carried out using two noise meters as follows;

1. Rion NA-27 Real Time 1/1, 1/3 Octave Band Logging SLM, Serial No. 00380685. This meter was last calibrated on 01/07/14.
2. Castle GA123 Integrated Data-logging Octave Band Sound Level Meter, Serial No. 036015 and microphone Serial No. 27101. This meter was last calibrated on 30/01/13.

A GA607 Dual Level Calibrator, Serial No. 036341 was used to calibrate both sound level meters and this was also last calibrated on 04/07/14. A calibration check to 94dBA was undertaken on both meters before and after measurements and was found to be satisfactory. The Certificate of calibration of the noise meters is provided at the end of the report.

Weather conditions during daytime monitoring were dry and overcast with a slight breeze from the northwest, and an average wind speed of 1.0m/s, rising to 1.5m/s towards the end of the survey. Weather conditions during night time monitoring were dry, with a light breeze from the northwest. The average wind speed was 0.6m/s. Weather conditions were recorded during the survey using a portable Kestrel 3000 Weather Meter (Serial No. 1637619). A standard windshield was used on both instruments during the survey.

Measurement periods were appropriate to establish a typical noise level reading at each location. For noise sensitive locations, the measurement duration was 30 minutes as specified in Schedule B.4 of the licence. During daytime, 3 x 30minute readings were taken at each sensitive location and during night time 2 x 30minute readings were taken at each location. For noise sources during the daytime, readings were taken for 1minute.

Monitoring results are given in L_{eq} i.e. continuous equivalent sound level. In addition, the L_{A90} and L_{A10} are also given. L_{A90} is the noise level exceeded for 90% of the measurement time and the L_{A10} is the noise level exceeded for 10% of the measurement time. The L_{A90} is generally indicative of the background noise level. The L_{A10} is generally indicative of intermittent noise (e.g. traffic). 1/3 octave readings were also taken at noise sensitive locations to measure any tonal component to the noise. The presence/absence of intermittent noise was noted by the surveyor.

3. Results

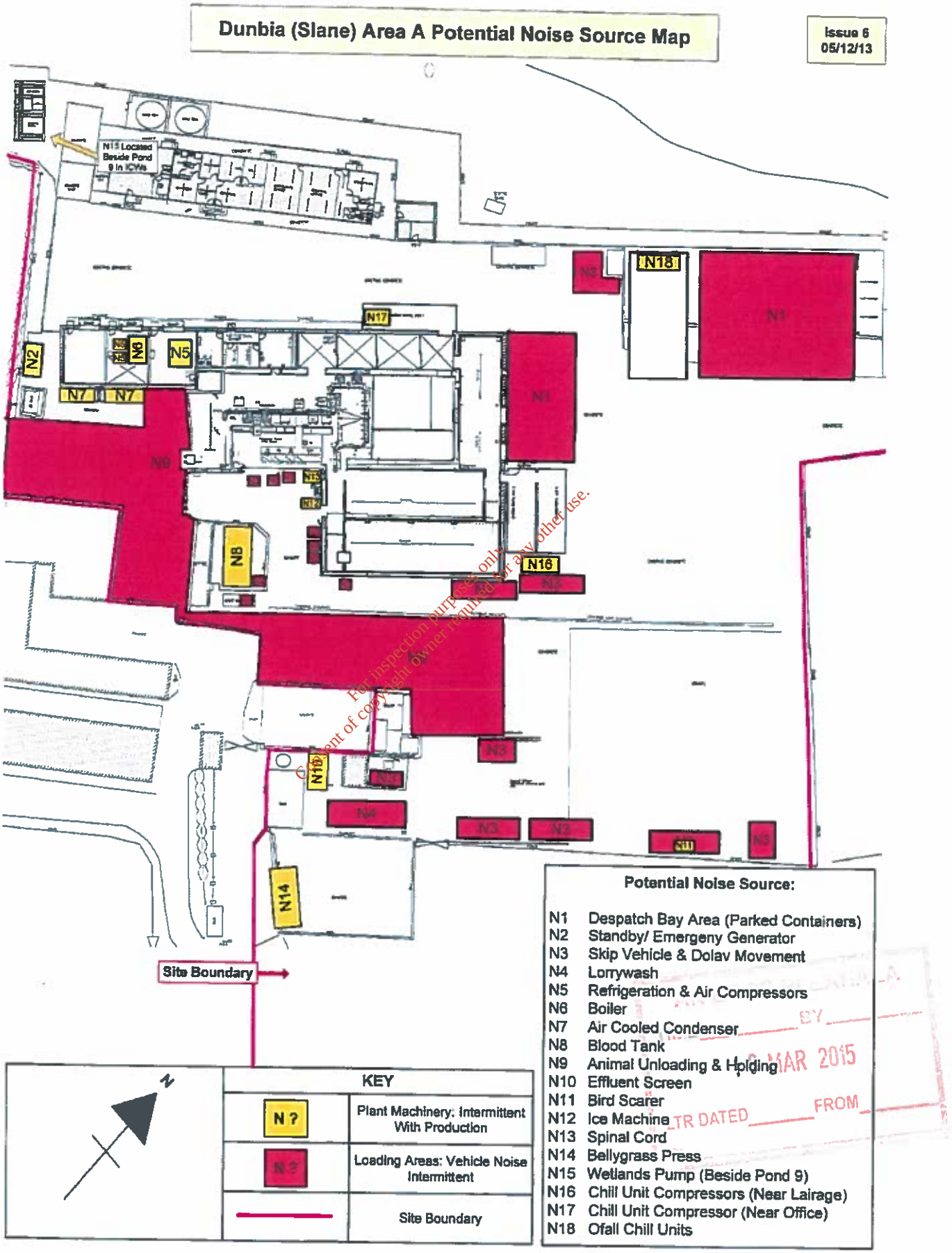
3.1 Noise Sources

Fourteen noise sources were measured as part of this survey, chosen from walking around the site and observing potential noise sources that could contribute to ambient noise. A summary of the noise sources measured and the sound pressure level Leq (dBA) recorded at 1m from each source (where possible) is presented, along with comments. A site map showing noise sources is provided in Figure 1.

Source	Emission point Ref. No	Sound Pressure dBA at 1m	Impulsive or tonal qualities	Comments
Despatch Bay Area (Parked Trailers)	Area N 1	61	No Tonal Noise No impulsive noise.	Forklift moving
Generator (2012 reading)	Area N 2	82	No Tonal Noise No impulsive noise.	Intermittent operation. Was not operating during assessment.
Skip Vehicle & Dolav Movement	Area N 3	71	No Tonal Noise No impulsive noise.	Forklift moving
Refrigeration Compressors	Area N 5	75	Tonal Noise No impulsive noise.	Very loud hum
Boiler & Air Compressor	Area N 6	72	Tonal Noise No impulsive noise.	Low hum of boiler & air compressor
Air Cooled Condenser	Area N 7	80	No Tonal Noise No impulsive noise.	Measurement taken under condenser
Blood Tank	Area N 8	61	No Tonal Noise No impulsive noise.	Clicking noise, tank filling
Animal Unloading & Holding (2013 reading)	Area N 9	80	No Tonal Noise No impulsive noise.	Cows in shed, digger operating nearby laying concrete
Effluent Screen	Area N 10	59	No Tonal Noise No impulsive noise.	Running water noise
Bird Scare (2013 reading)	Area N 11	83	No Tonal Noise No impulsive noise.	Bird scare on roof, noise level standing on ground. Digger operating nearby
Ice Machine	Area N12	65	No Tonal Noise No impulsive noise.	CAT 1 removal machine audible in background
Spinal Cord	Area N 13	76	No Tonal Noise No Impulsive Noise	Motor noise from this machine audible
Compressors for Trailer Units (near Lairage)	Area No 16	71	Tonal Noise No Impulsive Noise	Low hum
Compressors for Trailer Units (near office)	Area No 17	59	No Tonal Noise No Impulsive Noise	Hum audible

The highest noise sources on the site are the generator, condensers and the Bird Scare.

Figure 1. Dunbia Site Map Showing Noise Sources



3.2 Noise Sensitive Locations

Four noise sensitive locations were measured as part of this noise survey. These locations are shown in Figure 2. Details of the tonal noise assessment at each location is provided in the following section, in both tabular and graphical format.

Ref. No.	Location	Day / Night	Time	L_{Aeq} dBA 30 min	L_{A90} dBA 30 min	L_{A10} dBA 30 min	Tonal/ Impulsive	Comments
RA1	House along roadway leading to site, east of site ~300m from site	Day	13.51-14.21	54	40	54	No	Site visible from this house. Minor road, hedgerow and field between this house and the site. Some lorry movement audible on-site and passing road traffic noise.
			14.23-14.53	50	38	48		
			14.53-15.23	52	39	49		
			Arithmetic Average Day	***52***	***39***	***50***		
		Night	00.38-01.08	47	36	44	No	
			01.09-01.39	48	35	41		
			Arithmetic Average Night	***48***	***36***	***43***		
RA2	House along roadway leading to site, north of site ~ 250m from site	Day	12.14-12.44	47	37	44	No	This house is elevated from the site. Some site noise audible from lorry loading at WWTP. Between house and site there is a minor road, hedgerows and fields. The house lies right along the road, so road traffic is audible. Birds and cattle in field also audible during the day.
			12.46-13.16	49	38	43		
			13.16-13.46	45	36	40		
			Arithmetic Average Day	***47***	***37***	***42***		
		Night	23.19-23.49	41	36	40	No	
			23.52-00.22	38	36	39		
			Arithmetic Average Night	***40***	***36***	***40***		
RA3	House along roadway leading to site, north of site ~ 300m from site	Day	12.05-12.35	49	35	52	No	Some site noise audible from lorry loading at WWTP. The house lies right along the minor road, so road traffic is audible. Birds and cattle in field also audible during the day.
			12.35-13.05	48	38	52		
			13.05-13.35	50	36	54		
			Arithmetic Average Day	***49***	***36***	***53***		
		Night	11.24-11.54	38	32	40	No	
			00.00-00.30	38	31	39		
			Arithmetic Average Night	***38***	***32***	***40***		
RA4	House along roadway leading to site, south east of site, near crossroads ~520m from site	Day	13.42-14.12	61	38	57	No	Site noise is not audible at this house, given the distance from here to the site. Fields and hedgerow lie between this house and the site. House beside agricultural sheds and public road so some farm noise and traffic noise audible.
			14.16-14.46	60	40	51		
			14.46-15.16	61	38	57		
			Arithmetic Average Day	***61***	***39***	***55***		
		Night	00.41-01.11	45	28	39	No	
			01.11-01.41	47	25	38		
			Arithmetic Average Night	***46***	***27***	***39***		

3.3 Tonal Noise Assessment

The Environmental Noise Standard ISO1996-2:2007(E) details that a prominent, discrete tonal component may be detected in one-third octave spectra if the level of a one-third octave band exceeds the level of the adjacent bands by some constant level difference.

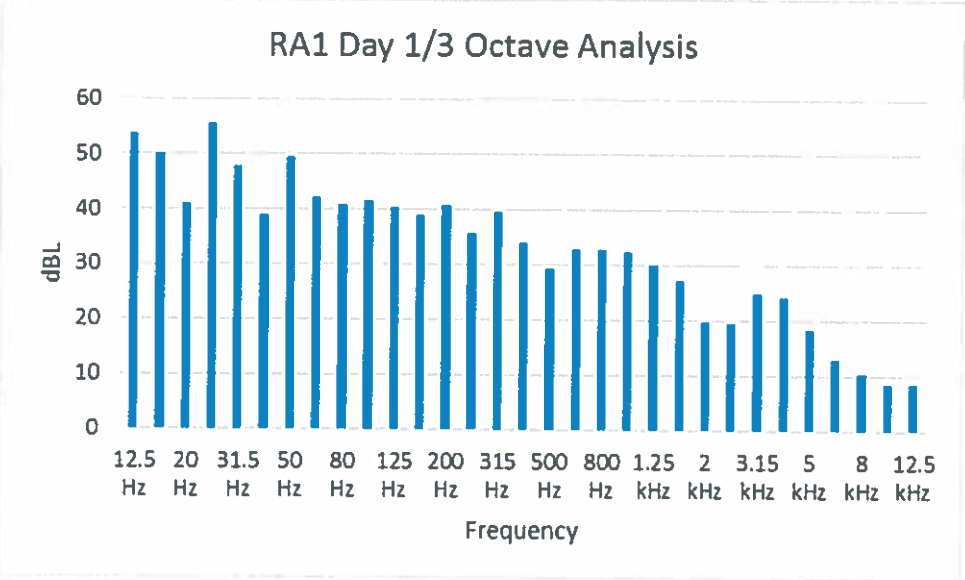
The appropriate level differences vary with frequency. They should be greater than or equal to the following values in both adjacent one-third-octave bands:

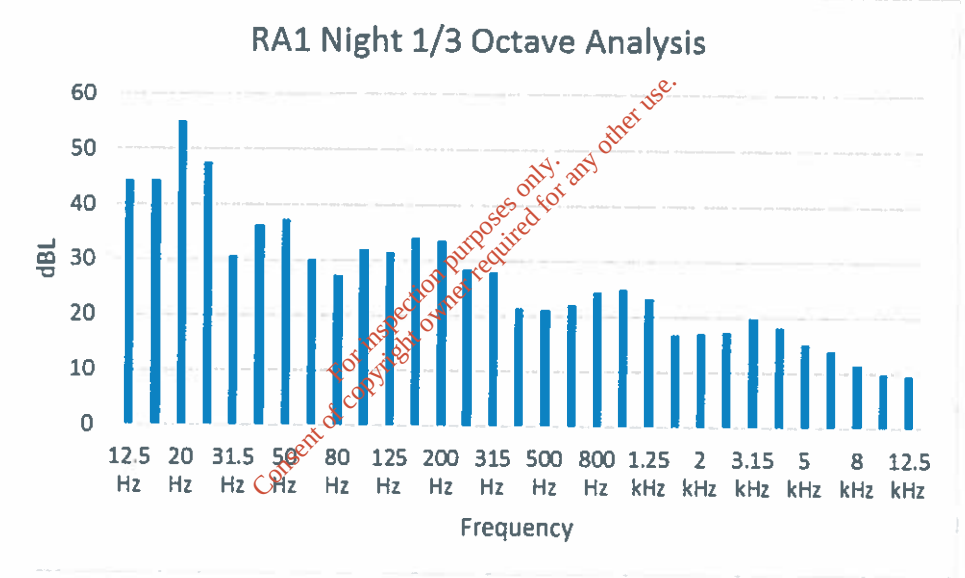
- 15dB in low-frequency one-third-octave bands (25Hz to 125Hz);
- 8dB in middle-frequency bands (160Hz to 400Hz), and;
- 5dB in high-frequency bands (500Hz to 10,000Hz).

Results of 1/3 octave analysis for all noise sensitive locations, day and night is provided in the following section. Graphical printouts are also provided with an assessment of tonal noise.

	RA1	dBL	RA2	dBL	RA3	dBL	RA4	dBL
Hz	*Day*	*Night*	*Day*	*Night*	*Day*	*Night*	*Day*	*Night*
12.5 Hz	53.6	44.2	49.6	49.3	48.4	49.1	57.1	43.3
16 Hz	50	44.3	53.6	52.1	53.4	49.1	55.3	44.3
20 Hz	41	55	50	56	50.6	51.8	57.8	49.4
25 Hz	55.3	47.5	44.9	46	46.1	40.7	40.4	47.1
31.5 Hz	47.8	30.6	45.8	34.9	37.2	36.8	34.6	38.6
40 Hz	38.8	36.2	48	38.4	37.6	36.4	37.7	34.1
50 Hz	49.3	37.3	47.1	42.1	43.3	38.9	34.4	34.4
63 Hz	42.2	29.9	54.7	39.4	43.9	35.6	33.2	33
80 Hz	40.6	27.1	36	28.9	35.1	28.5	34.8	30.2
100 Hz	41.3	31.8	42.3	29.5	36.2	31.1	32.5	33.1
125 Hz	40.3	31.4	45.3	29.5	34.1	34.8	38.5	33.4
160 Hz	38.9	33.9	41	30.8	33	31.9	37.2	39.3
200 Hz	40.6	33.38	42.7	35.5	39.6	34	36.3	38.2
250 Hz	35.6	28.4	36	31.2	35.4	34.4	35.2	28.3
315 Hz	39.6	27.8	37	32.2	37.1	38.8	43.8	37.8
400 Hz	34	21.3	32.9	23.4	33.4	31.2	36.8	31.4
500 Hz	29.4	21.1	28.6	22.1	29.2	33.8	29.5	27.8
630 Hz	32.7	22	28.7	19.9	28.8	33.8	35.5	27.9
800 Hz	32.8	24.4	29.8	22.6	33.4	41.3	37.4	32.2
1 kHz	32.4	24.9	31.1	24.9	31.2	43.7	38.7	34.7
1.25 kHz	30	23.3	27	23.9	27.4	36.5	35.2	27.6
1.6 kHz	27.3	16.7	24.9	20.8	22.4	32.8	32	29.6
2 kHz	19.8	16.9	21.2	26.3	19.6	30.1	21.7	25.7
2.5 kHz	19.4	17.1	18.6	25.8	22.2	25.2	18.1	21.7
3.15 kHz	24.8	19.8	22	23.2	20.7	25.4	20.5	22.7
4 kHz	24.2	18.1	16.9	23.2	19.5	22.5	20.4	22
5 kHz	18.4	15	15.5	22.2	19.3	20.7	18.4	18.7
6.3 kHz	12.9	13.9	13.6	22.6	21.7	19.8	16	18
8 kHz	10.5	11.3	10.2	17.4	18.2	16.8	10	13.5
10 kHz	8.5	9.7	9.5	16.7	12.6	13.3	9.2	11.8
12.5 kHz	8.5	9.5	8.5	12.5	10.5	10.9	8.5	10

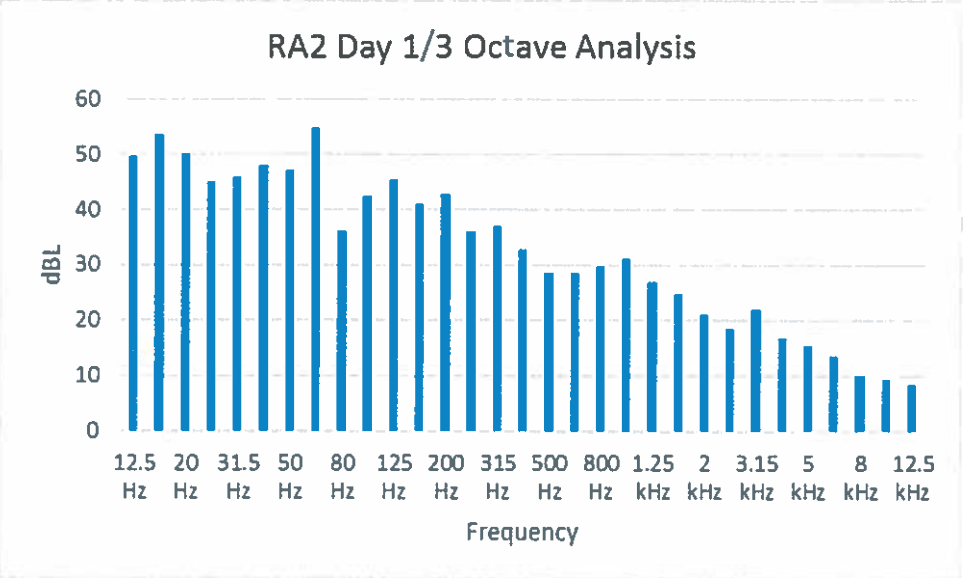
Tonal Noise Assessment RA1

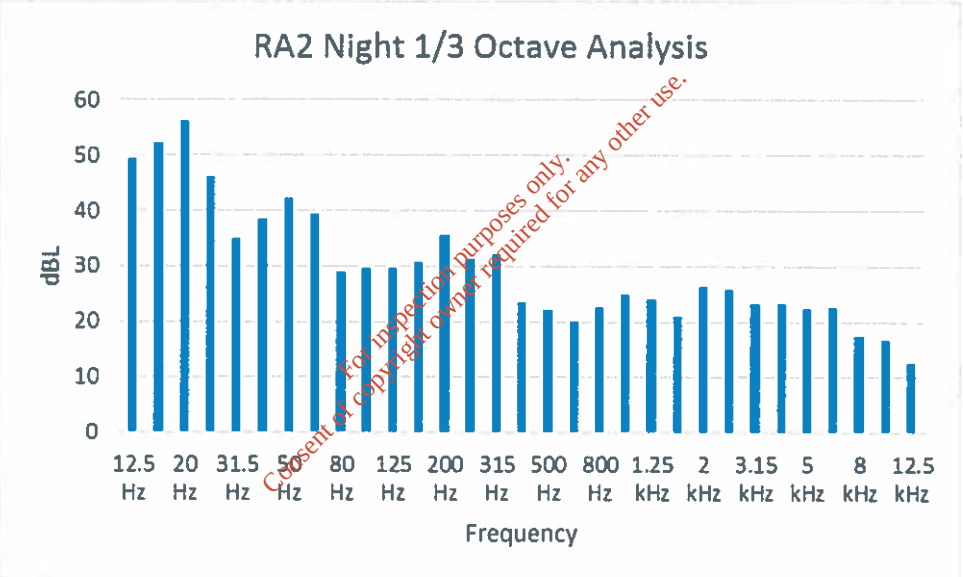




Location	RA1	
Period	Day	Night
Time	15.28	00.37
Suspected 1/3 octave band frequency of tone, Hz	None	None
Magnitude of tone dB Leq	-	-
Is the magnitude greater than the threshold of hearing?	-	-
Level change from preceding 1/3 octave band, dB Leq	-	-
Level change from following 1/3 octave band, dB Leq	-	-
Are the level changes greater than or equal to; 15dB (low frequency), 8dB (middle frequency), 5dB (high frequency)	-	-
Conclusion	***No tone present***	***No tone present***

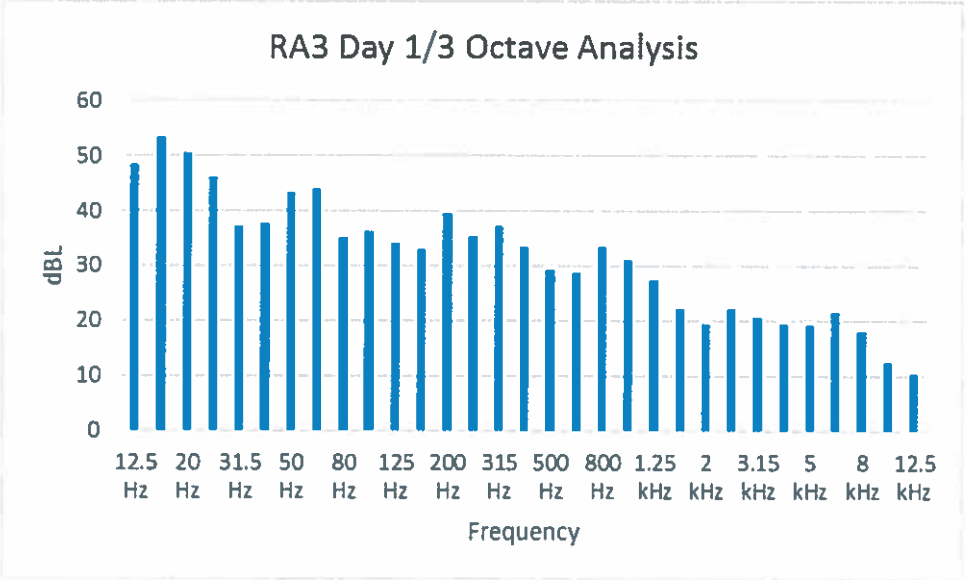
Tonal Noise Assessment RA2

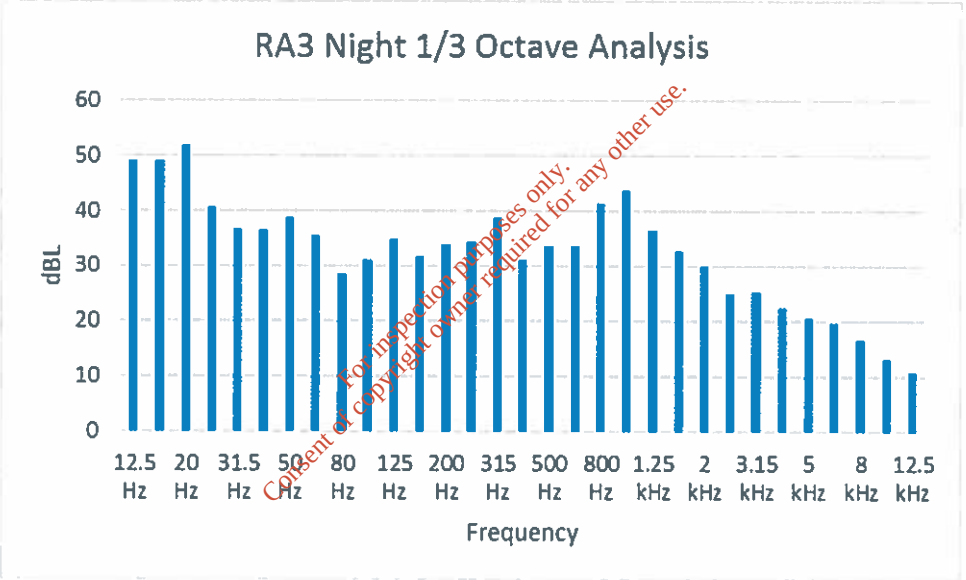




Location	RA2	
Period	Day	Night
Time	15.49	00.32
Suspected 1/3 octave band frequency of tone, Hz	None	None
Magnitude of tone dB Leq	-	-
Is the magnitude greater than the threshold of hearing?	-	-
Level change from preceding 1/3 octave band, dB Leq	-	-
Level change from following 1/3 octave band, dB Leq	-	-
Are the level changes greater than or equal to; 15dB (low frequency), 8dB (middle frequency), 5dB (high frequency)	-	-
Conclusion	***No tone present***	***No tone present***

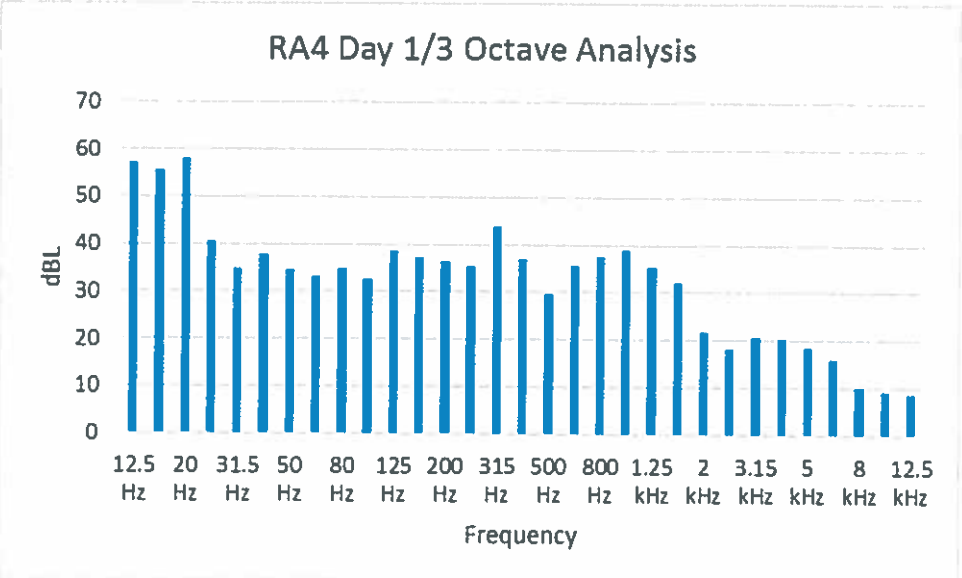
Tonal Noise Assessment RA3

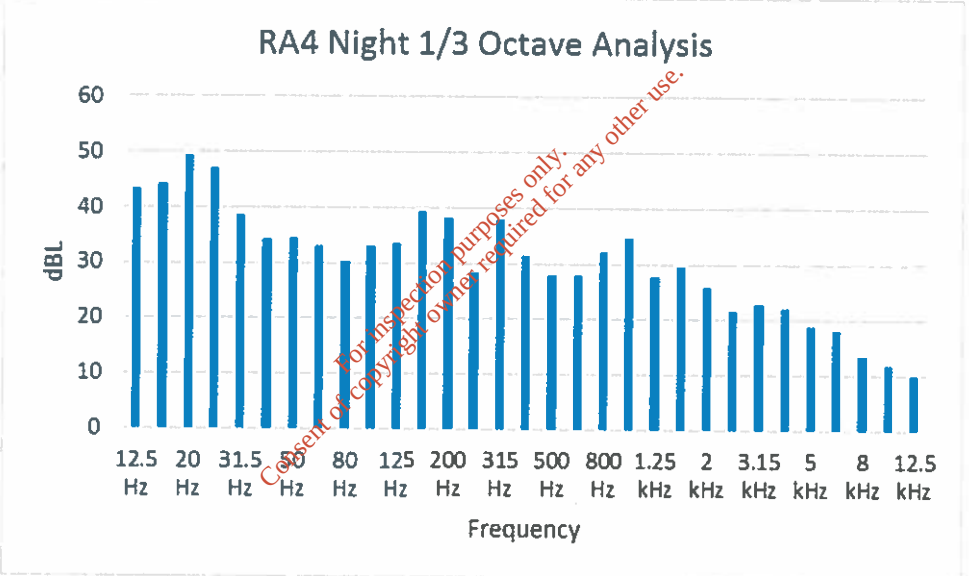




Location	RA3	
Period	Day	Night
Time	15.27	00.33
Suspected 1/3 octave band frequency of tone, Hz	None	None
Magnitude of tone dB Leq	-	-
Is the magnitude greater than the threshold of hearing?	-	-
Level change from preceding 1/3 octave band, dB Leq	-	-
Level change from following 1/3 octave band, dB Leq	-	-
Are the level changes greater than or equal to; 15dB (low frequency), 8dB (middle frequency), 5dB (high frequency)	-	-
Conclusion	***No tone present***	***No tone present***

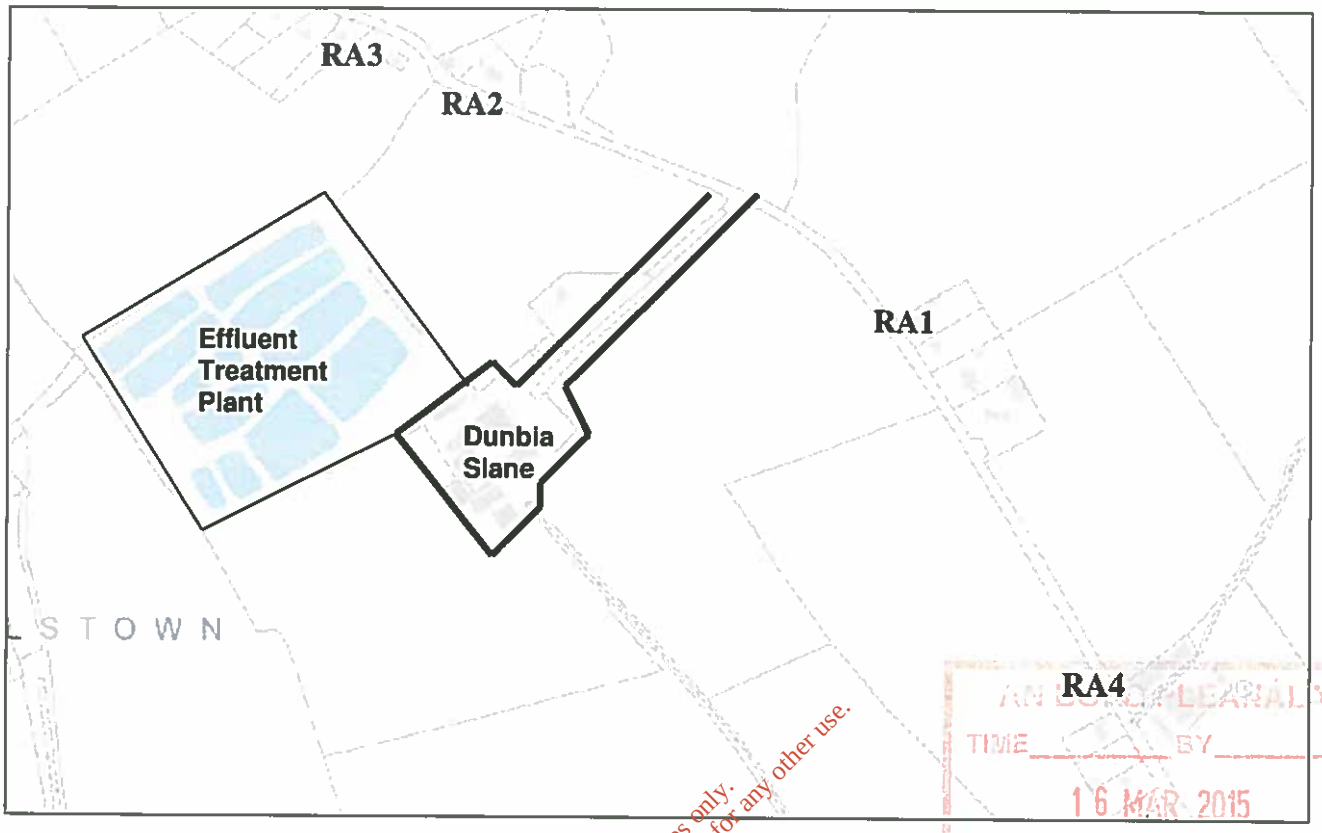
Tonal Noise Assessment RA4





Location	RA4	
Period	Day	Night
Time	15.22	00.39
Suspected 1/3 octave band frequency of tone, Hz	None	None
Magnitude of tone dB Leq	-	-
Is the magnitude greater than the threshold of hearing?	-	-
Level change from preceding 1/3 octave band, dB Leq	-	-
Level change from following 1/3 octave band, dB Leq	-	-
Are the level changes greater than or equal to; 15dB (low frequency), 8dB (middle frequency), 5dB (high frequency)	-	-
Conclusion	***No tone present***	***No tone present***

Figure 2. Location of Noise Sensitive Locations near Dunbia, Slane



4. Discussion

RA1 is located directly east of the site, approximately 300m from the site boundary and the site is visible from this location. This location had an average L_{Aeq} reading of 52dBA during the daytime. The difference of 11dBA between the average L_{A10} reading of 50dBA and the average L_{A90} reading of 39dBA indicates the presence of a lot of intermittent noise at this location, provided by road traffic. This location had a night time average L_{Aeq} reading of 48dBA. The difference of 7dBA between the average L_{A10} reading of 43dBA and the average L_{A90} reading of 36dBA indicates the presence of some intermittent noise at this location, provided by road traffic. The average L_{Aeq} daytime reading of 52dBA is within the IPPC Daytime limit of 55dBA. Given that the average L_{A90} night time reading was 36dBA at this location, it can be reasonably assumed that this is the typical background noise level at this location, in the absence of road traffic. In this instance it is appropriate to compare the background L_{A90} reading at this location with the IPPC night time limit of 45dBA and the night time average L_{A90} reading of 36dBA is well within this limit. No impulsive or tonal noise was audible at this location.

RA2 is located north of the site, approximately 250m from the site boundary. This location had an average daytime L_{Aeq} reading of 47dBA. The difference of 5dBA between the average L_{A10} reading of 42dBA and the average L_{A90} reading of 37dBA indicates the presence of some intermittent noise at this location, provided by road traffic. This location had a night time average L_{Aeq} reading of 40dBA. The difference of 4dBA between the average L_{A10} reading of 40dBA and the average L_{A90} reading of 36dBA indicates the presence of a small amount of intermittent noise. The average L_{Aeq} daytime reading of

47dBA is within the IPPC Daytime limit of 55dBA. The average L_{Aeq} night time reading of 40dBA does not exceed the IPPC night time limit of 45dBA. No impulsive or tonal noise was audible at this location.

RA3 is located north of the site approximately 300m from the site boundary. This location had an average L_{Aeq} reading of 49dBA during the daytime. The difference of 17dBA between the average L_{A10} reading of 53dBA and the average L_{A90} reading of 36dBA indicates the presence of a lot of intermittent noise at this location, provided by road traffic. This location had an average night time L_{Aeq} reading of 38dBA. The difference of 8dBA between the average L_{A10} reading of 40dBA and the average L_{A90} reading of 32dBA indicates the presence of some intermittent noise at this location, provided by road traffic. The average L_{Aeq} daytime reading of 49dBA is within the IPPC Daytime limit of 55dBA. The average L_{Aeq} night time reading of 38dBA is within the IPPC night time limit of 45dBA. No impulsive or tonal noise was audible at this location.

RA4 is located south east of the site near the crossroads, approximately 520m from the site boundary. This location had an average L_{Aeq} reading of 61dBA during the daytime. The difference of 16dBA between the average L_{A10} reading of 55dBA and the average L_{A90} reading of 39dBA indicates the presence of a lot of intermittent noise at this location, provided by road traffic and farm machinery nearby. This location had an average night time L_{Aeq} reading of 46dBA. The difference of 12dBA between the average L_{A10} reading of 39dBA and the average L_{A90} reading of 27dBA again indicates the presence of a lot of intermittent noise at this location, provided by road traffic. Given that the average L_{A90} daytime reading was 39dBA and the night time average L_{A90} was 27dBA at this location, it can be reasonably assumed that this is the typical background noise level at this location, in the absence of road traffic. In this instance it is appropriate to compare the background L_{A90} reading at this location with the IPPC daytime limit of 55dBA and the IPPC night time limit of 45dBA and both readings are well within these limits. No impulsive or tonal noise was audible at this location.

5. Conclusion

All background noise levels at Noise Sensitive Locations are below the IPC Daytime limit of 55dBA and the night time limit of 45dBA. In addition there is no tonal or impulsive noise audible from the factory at noise sensitive locations. Therefore the site is not causing a noise nuisance and the level of noise from the facility is compliant with the limits set in the IPPC licence regarding noise.

Certificate of Calibration of Castle GA123 Noise Meter

Calibration Certificate

With Results

Issued By: Castle Group Ltd

Date Of Issue : 30/01/13
Certificate No : 036015/58910

Page 1 of 4

All instruments are tested to check compliance with particular specifications. These specifications may be appropriate British Standards, or if the instrument was not originally designed to meet any British Standard, or when the instrument was originally manufactured a relevant British Standard did not exist, the instrument will be tested to the manufacturer's original specification.

Absolute acoustic calibration of acoustic calibrators and sound level meters is checked at one or more standard frequencies against an independent sound source with calibration directly traceable to the National Physical Laboratory (NPL) in the United Kingdom. The NPL reference applicable for the calibration of the test equipment is shown below.

The performance of the instrument was determined by comparison with the manufacturers' specification as found in the instrument handbook or other technical publication. Any significant uncertainty of the measuring system will also be included.

The instrument was allowed to stabilise for a period of 30 minutes prior to measurements made.

The ambient temperature and relative humidity throughout calibration were 23 ±2 °C and 33% RH respectively.

Instruments used to carry out this calibration are as follows: -
Multifunction Calibrator 4226 Serial No: 2019693
Applicable Reference: S6193.

Subject of Calibration: GA123.
Instrument: Integrating Octave Band Sound Level Meter, Type 1.
Serial No: 036015

Microphone Data
Microphone Type: MK75
Microphone Serial No: 27101

Basis Of Test: Compliance to Manufacturer's Original Specification

Calibrated By:
M. Mann
(Approved Signatory)

Checked By:
O. L. Wrighteon
(Approved Signatory)

Date of Calibration: 30 Jan 2013

Recalibration Due: 01 Mar 2014

Completed Status: Pass

Client: QED Engineering Ltd
Address: M-TEK Building 2
Armagh Road
County Monaghan

Client Reference:

Castle Group Ltd
Selter Road, Scarborough Business Park, Scarborough, North Yorkshire YO11 3UZ United Kingdom
t: +44 (0)1723 584250 f: +44 (0)1723 583728 e: sales@castlegroup.co.uk
www.castlegroup.co.uk

Certificate of Calibration of Rion NA-27 Noise Meter

CERTIFICATE OF CALIBRATION

Issued By PASS Ltd - www.calibrate.co.uk
Date of Issue 01 July 2014

Certificate Number
STD39922

PASS
Portable Appliance Safety Services
1 Alberto Street
Stockton On Tees
Teesside. TS18 2BQ
TEL 0845 365 39 44

Approved Signatory

☐ I.Ibrahim ☐ D.Kendrew

Customer : QED Engineering Ltd
M-TEK Building 1, Armagh Road
Monaghan Ireland

Date Received : 30 June 2014

Instrument -

System ID :	ID28321	Job Number :	J53025-1
Description :	Sound Level Meter		
Manufacturer :	Rion	Site :	
Model Number :	NA-27	Location :	
Serial Number :	00380685		
Procedure Version :	1.00_14		

Environmental Conditions

Temperature :	20°C +/- 3°C	Mains Voltage :	240V +/- 10V
Relative Humidity :	50% +/- 15%	Mains Frequency :	50Hz +/- 1Hz

Comments

Procedure written to specification of ±0.3db.
Instrument was placed in lab and allowed to stablise before calibration.

Traceability Information

Instrument description	*Serial number*	*Certificate number*	*Cal. Date*	*Cal. Period*
13056 Sound Level Calibrator	040903651	U13991 / U13992	08/07/2013	52

Calibrated By : I.Ibrahim **Date of Calibration :** 01 July 2014

CERTIFICATE OF CALIBRATION

Certificate Number
STD39922

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AFTER ADJUSTMENT RESULTS

Test Title	Tolerance	Applied Value	Reading	Pass/Fail
General Operation Test				
Display & Control	—	—	Pass	
Sound Tests				
94db	300mdb	94db	94.0db	Pass
104db	300mdb	104db	104.0db	Pass
End of results				

Uncertainties

dB	0.01dB

Certificate of Calibration of Castle Calibrator

CERTIFICATE OF CALIBRATION

Issued By PASS Ltd - www.calibrate.co.uk
Date of Issue 04 July 2014

Certificate Number
STD40083

Page 1 of 2 Pages

PASS
Portable Appliance Safety Services
1 Alberto Street
Stockton On Tees
Teesside. TS18 2BQ
TEL 0845 365 39 44

Approved Signatory

☑ P.Beswick ☐ I.Ibrahim ☐ D.Kendrew

Customer : QED Engineering Ltd
M-TEK Building 1, Armagh Road
Monaghan Ireland

Date Received : 30 June 2014

Instrument -

System ID :	ID28322	Job Number :	J53026-1
Description :	Acoustic Calibrator		
Manufacturer :	Castle	Site :	
Model Number :	GA607	Location :	
Serial Number :	036341		
Procedure Version :	1.00_14		

Environmental Conditions

Temperature :	20°C +/- 3°C	Mains Voltage :	240V +/- 10V
Relative Humidity :	50% +/- 15%	Mains Frequency :	50Hz +/- 1Hz

Comments

Procedure written to manafactures specification.
Specification reference: Castle (GA607) Instruction Manual
Instrument was placed in lab and allowed to stablise before calibration.

Traceability Information

Instrument description	*Serial number*	*Certificate number*	*Cal. Date*	*Cal. Period*
GA116b Digital Sound Pressure Meter C1	069235	069235/60141	28/10/2013	52

Calibrated By : J.Maidens **Date of Calibration :** 04 July 2014

CERTIFICATE OF CALIBRATION

Certificate Number
STD40083

Test Title	Tolerance	Applied Value	Reading	Pass/Fail
General Operation Test Control	—	—	Pass	
Range 94dB 94db	300mdb	94.0db	94.0db	Pass
Range 114dB 104db	2db	104.0db	104.1db	Pass
End of results				

Uncertainties

dB 0.01dB