ASSESSMENT OF PROCESS POLLUTION

FOR

THE PROPOSED EXTENSION TO

YENNADON QUARRY, IRON MINE LANE,

DOUSLAND, DEVON, PL20 6NA

3rd July 2015 **7397/PP.Rev.A**

John Grimes Partnership Ltd ♦ Leonards Road Ivybridge Devon PL21 0RU
Tel: 01752 690533 ♦ www.johngrimes.co.uk ♦ post@johngrimes.co.uk ♦ Registration No: 4184549

Directors:
J Hearn BSc CEng MIStructE ♦ **J Grimes** BSc MSc PhD CEng MICE FGS RMaPS

Associate Directors:
M Burrows BEng (Hons) MSc CEng MICE ♦ **S Lambshead** BEng (Hons) ♦ **J Lings** MEng CEng MIStructE ♦ **M Owen** BSc (Hons) FGS
A Robertson BEng (Hons) ACSM FGS ♦ **R Smith** BSc (Hons) CGeol CSci FGS ♦ **T White** BA BAI MICE

QUALITY CONTROL

This report has been prepared in accordance with John Grimes Partnership Ltd Quality Control Management System to British Standard EN ISO 9001: 2000

Report Status:	Revision A. Issued		
Project Number:	**7397**		
	Engineer	Signature	Date
Report by:	**A. M. Robertson Associate Director**		**3rd July 2015**
Approved for issue by:	**M. Owen Associate Director**		**3rd July 2015**
	For and on behalf of John Grimes Partnership Ltd		

nqa. ISO 9001 Registered

UKAS QUALITY MANAGEMENT 015

CONTENTS

FIGURES

APPENDICES

1.0 INTRODUCTION

1.1 Overview

1.1.1 An assessment of the quarry processes and associated process pollution has been prepared by John Grimes Partnership Ltd on behalf of Yennadon Stone Ltd. to accompany the Environmental Statement in support of the extension to Yennadon Quarry.

1.1.2 This report describes the existing quarry processes; provides an assessment of any potential pollution and the impacts of the proposed quarry extension.

1.2 Aims of the Assessment

1.2.1 In line with the scoping requirements, the purpose of this assessment is to:

- Assess the adequacy of the existing quarry arrangements [to control pollution]; and
- Assess the potential for the proposal to result in an increase in dust generation.

1.2.2 This report provides an assessment of the quarry process, with consideration given to controlling air emissions and other potential sources of pollution associated with the quarry process.

2.0 METHODOLOGY

2.1 Assessment Methodology

2.1.1 The data for the assessment of existing conditions was obtained from a review of current quarrying activity at Yennadon Quarry, which over the past seven years has produced on average approximately 5,500 tonnes per annum. A maximum potential future production level of 10,000 tonnes per annum has been proposed, a reduction from 14,000 tonnes per annum stipulated in the current planning conditions.

2.1.2 A site conceptual model has been developed that describes the potential pollutants associated with the quarry process. This report provides:

- an assessment of the quarry process, with consideration given to controlling air emissions and other potential sources of pollution; and

- an assessment of any potential impacts associated with the development of the proposed quarry extension based on a maximum potential output of 10,000 tonnes per annum.

2.1.3 Mitigation measures have been considered based on Best Available Techniques (BAT) for preventing or reducing air emissions.

3.0 BASELINE CONDITIONS

3.1 Current Operations

3.1.1 Yennadon Stone operates a "Hard Rock" quarry that produces dimension stone for natural stone building material and walling purposes. The quarrying operation maximises the material suitable for sale, with approximately 40% of the stone excavated being non-saleable waste. Small quantities of waste stone are sold; however, most of the waste stone is stockpiled on site and will be used for landscaping during phased site restoration.

3.1.2 Yennadon Quarry produces dimension stone using low technology extraction and processing methods. It does not employ 'prescribed' quarry processes[1] that necessitate Local Air Pollution Control (LAPC) or Local Air Pollution Prevention and Control (LAPPC) permits. Prescribed quarry processes include drilling and blasting techniques, mechanical crushing and screening plant and transportation of stone using conveyor belts and chutes.

3.1.3 The quarry process at Yennadon is shown in Figure 7397/PP/01 and is briefly described below. The whole process is contained within the quarry. A photographic record of production items is provided in Appendix PP/A.

3.1.4 Yennadon Quarry can be divided into three working areas:

1. Main Quarry / Extraction Area
2. Processing Area / Saw Shed
3. Office Compound (including welfare unit, workshop and storage container).

[1] Secretary of State's Guidance for Quarry Processes: Process Guidance Note 3/8 (04)

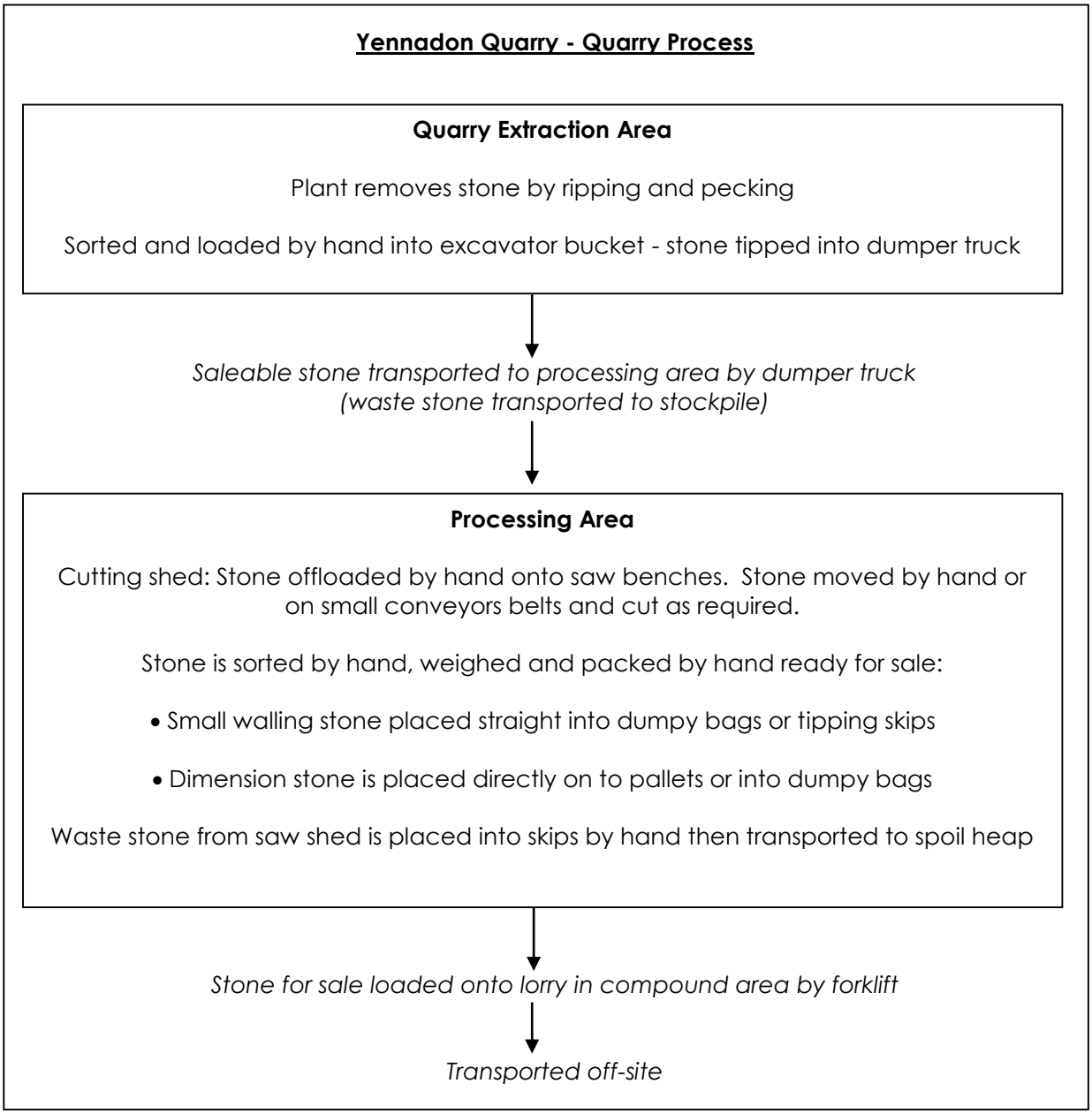


Figure 7397/PP/01: Flowchart of Quarry Process

3.1.5 Within the main quarry area, stone is removed by tracked excavators with either ripper or pecker attachments, supported by similar machines with bucket attachments.

3.1.6 For efficient operation, two working faces are advanced at the same time. Stone is pre-sorted by hand at the face before being loaded by hand into an excavator bucket which transfers the stone into a small dumper truck. The stone is then transported either to a stockpile or directly to the processing area.

3.1.7 At the cutting tables, each slate block is cut with a diamond impregnated circular saw blade running under constant water spray. There are five cutting tables in the saw shed, with small conveyor belts to reduce manual handling. Cut stone is stockpiled onto pallets or in dumpy bags; whereas loose walling stone is placed into dumpy bags or into 1.5t tipping skips for loading direct into the Heavy Goods Vehicle (HGV). The pallets and dumpy bags are taken by forklift from the processing area to the site office compound where they are loaded onto the non-articulated HGV and transported off-site.

3.1.8 There is a visitor car park area adjacent to the quarry entrance. All visitors and employees use this car park area for their private vehicles. The car park area comprises compacted stone.

3.1.9 There is an inner compound adjacent to the site offices where company vehicles are parked, including the HGV. The inner compound is covered in compacted crushed rock, which can be muddy following wet weather.

3.1.10 Yennadon Stone Ltd currently employs 27 full time operatives at Yennadon Quarry including face workers, saw operators and excavator drivers. The number of operatives is not expected to significantly increase to achieve the maximum permitted production limit (which will be 10,000t/a under the new proposals).

3.2 Plant

3.2.1 Mobile Plant at Yennadon Quarry comprises:

1. Four excavators: All are based in the 'Quarry Extraction Area'. Only two excavators are usually in operation at one time, using either a breaker (pecker) attachment or a ripper-tooth attachment. There is one screening bucket attachment known as a spinner, which enables the excavator to remove (sieve) smaller stones. This spinner replaced the riddling bucket, which was discarded in October 2012 as it was noted during noise surveys as being a dominant source of noise within the quarry. All excavators also have standard bucket attachments (into which the stone is loaded prior to being placed in the dumper trucks). Excavators are used intermittently and turned off when not in use. In general, excavators are used 20% - 25% of the working day Monday – Friday (i.e. approximately 2 hours during a 9 hour working day) and 5 hours on Saturday during 'muck shift'.

2. Two 6 tonne dumper trucks: These operate approximately 50% of the time (4.5 hours per day) and are mainly used to transport stone from the 'Quarry Extraction Area' to the 'Processing Area'.
3. Two forklifts: These are used to transport loaded pallets and dumpy bags from the 'Processing Area' to the HGV loading area. The forklifts are used on average only 20% of the working day (just under 2 hours per day).
4. One HGV: It will carry a maximum 16 tonne load (giving total weight of 26 tonnes). The HGV takes 2 – 3 loads off-site each working day.

3.2.2 All mobile plant is fitted with reversing alarms.

3.2.3 Static Plant at Yennadon Quarry comprises:

1. Four generators [one at 40 kva and three at 27 kva], all of which are housed in acoustic chambers. The generators only operate during site hours and they occasionally operate one overnight during freezing conditions.
    a. the first generator powers the site offices, one borehole abstraction pump and one saw;
    b. the second powers two saws and a second borehole abstraction pump;
    c. the third generator powers two saws and the workshop; and
    d. the fourth generator powers a mobile saw and the container.

2. 6" pump: Used to direct water from the base of the quarry to soakaway, usually only operational during and following wet weather. It is only occasionally operated overnight.

3.2.4 There are short conveyor belts between workbenches and saws in the processing area. These conveyor belts are horizontal and there are no drops or chutes that could generate dust. All cutting is conducted under a water spray to prevent dust generation.

3.2.5 Yennadon Quarry operates a strict equipment maintenance programme. This involves conducting daily maintenance checks on both mobile and static plant, as well as regular detailed maintenance, e.g. changing filters, oil changes, use of drip trays, etc. All plant has independent annual engineering inspections conducted for insurance purposes. Six weekly VOSA safety inspections are a legal requirement.

3.3 Fuel Storage

3.3.1 Fuel is delivered weekly and stored within a 2500 litre bunded above ground fuel storage tank. The tank is inspected annually by independent engineers for insurance purposes.

3.3.2 Two generators are located close to the fuel tank and re-fuelled using hoses. Two of the generators require refuelling once a week; the other two need refuelling twice a week. Other mobile equipment is tracked to the tank for re-fuelling. The only item re-fuelled *in-situ* is the 6" pump, which is re-fuelled using portable fuel cans. Spill kits are kept adjacent to the tank and are taken with portable fuel cans during re-fuelling.

3.3.3 Oils are stored within the workshop in a bunded area.

3.4 Litter

3.4.1 Yennadon Stone Ltd has a strict in-house policy where all litter is binned and skipped. All paper and general waste is kept within the canteen / site office area. This policy keeps wind-blown litter to a minimum.

3.5 Mud

3.5.1 Within the processing area, the processing of the stone under a water spray produces moderate levels of mud, which is periodically scraped off the concrete hardstanding from around the saw shed. The tailings are placed on spoil heaps. The tailings are covered by larger stones to prevent wind-whipping of dust.

3.5.2 None of the mobile plant that operates within the main quarry area leaves the extraction or processing areas, with the exception of the forklifts. This reduces the transfer of mud into the office compound area.

3.5.3 A minor amount of mud does adhere to vehicles leaving the inner compound; however, due to the length and nature of the compacted stone track / access road, this mud is eroded from tyres prior to vehicles reaching Iron Mine Lane. Yennadon Stone currently maintains the compacted stone access track. During dry weather the access track can be a source of dust, which can be generated by wind whipping, vehicle movements, horses and livestock.

3.6 Utilities

Water Supply:

3.6.1 There are two water abstraction boreholes on site. Groundwater is abstracted for drinking water and sanitation, as well as being used in the 'Processing Area' – sawing is conducted with a water spray as dust suppression. Groundwater quality is tested regularly to ensure it is fit for consumption. In addition to the boreholes, the quarry operators also recycle some of the processing water for re-use in the Processing Area and recycles water from settling pond in the base of the quarry, which is pumped back to the processing area through a 'silt-buster' to reduce abstraction requirements.

3.6.2 The groundwater from the boreholes is pumped to a header tank with a maximum capacity of 17m^3. Water is piped from the header tank to the 'Processing Area'. A full tank has sufficient water for the quarry's daily requirements at reasonable production rates. The offices, mess and toilet are supplied direct from the borehole.

3.6.3 Yennadon Quarry does not require a groundwater abstraction licence as it does not exceed the 20m^3 permitted each day.

Site Drainage

3.6.4 Water from the saw shed (Processing Area) is directed to a container via gulleys, where the silt fraction partially settles out and the water is then pumped to a soakaway. The soakaway is located in the northwest of the existing quarry within the main spoil area.

3.6.5 Foul water from the site offices drains via a sewage system to a storage tank on site, which is emptied approximately every six weeks by a suction tanker.

Electricity Supply

3.6.6 All electricity for the cutting tables, office and mess room is provided on-site by diesel generators.

3.7 Lighting

3.7.1 There are no floodlights in operation within the Quarry Extraction Area. Additional lighting is only used in and around the covered Processing Area and offices during winter months within working hours and only when required.

4.0 ASSESSMENT OF IMPACTS FROM PROCESS POLLUTION

4.1 Site Conceptual Model

4.1.1 A site conceptual model has been produced (Appendix PP/B) that describes the potential pollutants associated with the quarry process at Yennadon Quarry, including the development of the proposed quarry extension and based on a maximum potential output of 10,000 tonnes per annum.

Source	Pathway	Critical Receptor	Significant Pollutant Linkage
Nuisance Dust	Airborne	Employees	*No significant linkage* identified: Employees to wear suitable PPE where required.
		Local Residents	*Potential linkage* - **Assessed in Chapter 9**.
Exhaust Fumes	Airborne	Employees	*Minor linkage* identified: Effective preventative maintenance is currently conducted on all plant and HGV to control emissions. Employees to wear appropriate PPE where required.
		Local Residents	*No significant linkage* identified: All plant (excluding HGV) contained within quarry; HGV undergoes effective preventative maintenance to control emissions.
		Environment	*No significant linkage* identified: No significant impact is expected on local or regional air quality.
Noise	Airborne	Employees	*No significant linkage* identified: Employees to wear suitable PPE where required.
		Local Residents	*Potential linkage* - Assessed in **Chapter 12**.
Vibration	Through the ground	Local Residents	*No significant linkage* identified: Pecking equipment used within quarry area is unlikely to result in significant vibration to nearest receptors.
Light	Radiation	Local Residents	*No significant linkage* identified: All lighting is contained within quarry (i.e. no direct line of site to nearest receptors) - No floodlights are in operation within the extraction area. Lighting is only used in the processing area and offices during winter months within working hours and only when required.
Litter	Wind-blown	Environment	*No significant linkage* identified: Good housekeeping ensures all litter is binned and skipped. All paper and general waste is kept within the canteen / site office area. This policy keeps wind-blown litter to a minimum.
Hydrocarbon Contamination	Infiltration into ground	Environment	*Low risk of significant linkage* identified: Fuel / oils are stored in appropriate bunded areas and are frequently monitored. Appropriate spill kits are kept adjacent to the tank and are taken with the portable fuel cans during re-fuelling. All plant are maintained and controls implemented during maintenance.

Table PP/01: Summary of Potential Pollutants Identified From Conceptual Model

4.1.2 The conceptual model has highlighted the following potential source contaminants:

- Nuisance dust (including mud / tailings)

- Exhaust fumes
- Noise
- Vibration
- Light
- Litter
- Hydrocarbon contamination

4.1.3 Table PP/01 provides a summary of the significant potential pollutants identified in the site conceptual model and the significant linkages to sensitive receptors.

4.2 Nuisance Dust

4.2.1 The site conceptual model has identified a number of potential sources of nuisance dust that could be generated by the quarry process at Yennadon. These are discussed below:

- Stripping of topsoil / overburden during development stage of proposed extension – There is the potential for the stripping of topsoil and overburden to result in the generation of wind-blown dust during dry weather. All stripping works should be conducted in accordance with good practice guidelines (MAFF 2000: Good practice guide for handling soils) to minimise dust generation.

- Pecking / ripping in the quarry extraction area – Extraction of stone using a pecker has the potential to produce minor amounts of wind-blown dust. However, pecking is usually limited to the lower levels within the quarry where the discontinuities within the rock are tight and ripping is not practical. Ripping, which occurs at higher levels, generates less dust. The ground investigation for the proposed quarry extension did not identify any significant variation in ground conditions to existing; therefore, there is not expected to be an increased requirement for pecking to occur at higher levels within the quarry.

- Rock falls – Any major rock falls have the potential to generate moderate levels of wind-blown dust. There is no increase in the risk of potential rock falls associated with the proposed extension. Yennadon Stone Ltd. undertake regular Geotechnical Appraisals and Geotechnical Assessments as required under the Quarries Regulations 1999 to ensure risk from rock falls are addressed. It is considered the risk of a major rock fall occurring is negligible.

- Un-vegetated stockpiles / bunds – The spoil produced from quarry waste is generally cobble-sized slate fragments (i.e. very little fines) and is considered unlikely to generate excessive airborne dust. Spoil within the quarry area should not give rise to visible dust emissions. However, the topsoil and overburden material, which will be used for restoration, contains more fine material and can be a potential source of dust prior to becoming vegetated. Guidance in MAFF 2000 (Good practice guide for handling soils) should be followed to reduce wind whipping of particles and minimise dust generation.

- On-site transfer of materials (loading, unloading and transportation) – There is the potential for minor amounts of dust to be generated by materials handling on-site. The stone material excavated is generally cobble to boulder-sized pieces of slate, which are unlikely to generate excessive airborne dust. The quarry process utilises minimal mechanical handling. No material is dropped from excessive heights.

- Roadways (including haulage roads) – Within the quarry extraction area, haulage roads have the potential to produce minor amounts of dust. At the deeper levels within the quarry, groundwater issues usually result in the ground and lower haulage roads being damp. Within the processing area, the water used in the saw sheds result in the ground and roadways to the front being wet throughout the year, which prevents significant dust generation. The compacted stone access track has the potential to produce visible dust emissions following vehicle movements during prolonged dry weather.

- Processing – All stone cutting is conducted under a water spray, which reduces dust generation. However, tailings removed from the processing area and placed on spoil heaps can be a source of dust once dried. Yennadon Stone Ltd. currently covers the tailings with larger waste rock to mitigate the risk of wind-whipping.

4.2.2 A detailed assessment of dust emissions is provided in Chapter 9. It addresses current emissions and the potential impacts of dust associated with the proposed extension.

4.3 Exhaust Fumes

4.3.1 The site conceptual model has identified the potential for plant at the site to produce exhaust fumes. Current exhaust emissions derive from static and mobile plant. Yennadon Stone currently manages emissions by ensuring that all equipment at the site is maintained to a high standard.

4.3.2 Currently plant operation varies greatly depending on factors such as depth of working; i.e. the stone is harder at depth and requires breaking out for longer. Operating hours given in Section 3.2 are considered to be the maximum hours that plant will operate under normal working conditions.

4.3.3 There will be no increase in the number of either static or mobile plant required as a result of the proposed extension; the existing plant is considered sufficient to achieve the maximum permitted output of 10,000 tonnes per annum. Therefore, it is considered that there will be no significant increase in emissions from the plant, with the exception of the dumper trucks which will have a slight increase in movements; i.e. further distance to travel between working faces and processing area. Dumper truck movement currently accounts for approximately 16% of the plant hours on site (excluding the HGV). Taking into account the additional distance that the dumper trucks will travel, it is estimated that this would result in the dumper trucks potentially accounting for up to 20% of the plant hours on site; an increase of 4%. This potential increase in emissions is considered to be minor.

4.3.4 Under the current proposals, Yennadon Stone Ltd. wish to reduce permitted maximum HGV movements from 35 in a week down to 30. This will have a positive effect of reducing the potential for exhaust emissions from the HGV.

4.3.5 Local air quality is measured as receptors within a 200m boundary of the source. With regard to potential human receptors; only one residential property (Higher Yennadon) lies within 200m of the existing quarry (142m from existing quarry and 100m from proposed extension boundary). One additional property lies just outside the 200m limit from the proposed quarry extension boundary. No significant sensitive human receptors (e.g. schools / hospitals) have been identified within 200m of the quarry. With regard to environmental receptors, although Yennadon Quarry lies within Dartmoor National Park, which is an Environmentally Sensitive Area (ESA), it is not a designated nature conservation site (i.e. SAC, SPA, SSSIs or Ramsar site); i.e. low

sensitivity. However, based on there being a residential property within 200m of the site, the area is considered to be of 'medium sensitivity'.

4.3.6 With regard to regional air quality; as there is no increase in plant and there is less than a 10% increase in the time period plant could potentially be operating should production reach the maximum permitted limit; therefore no significant impact is expected on regional air quality as a result of exhaust emissions related to the proposed extension.

4.3.7 It is considered that there will be only **minor** potential increases in exhaust emissions affecting site workers as a result of the proposed extension.

4.4 Noise

4.4.1 The site conceptual model has identified the potential for noise pollution to be generated by the quarry process at Yennadon. There is the potential for unacceptable noise levels to be generated during:

- Stripping of topsoil / overburden during development stage of proposed extension – There is the potential for the plant used in the stripping of topsoil and overburden to result in the generation of nuisance noise levels.
- Stone extraction process – The mechanical pecker, ripping bucket and riddling bucket all have the potential to generate nuisance noise levels. The emptying of the stone from the excavator bucket into the dumper trucks can also generate potentially excessive noise levels. The construction of bunds along the western site boundary acts as a noise break to reduce noise from these operations.
- Processing – Employees use appropriate hearing protection to mitigate the impacts of load equipment within the saw sheds. Yennadon Stone Ltd. also ensure their employees undergo regular hearing assessments as part of their Health and Safety Policy.

4.4.2 A detailed noise assessment is provided in Chapter 12. It addresses current noise levels and the potential impacts of noise associated with the proposed extension.

4.5 Vibration

4.5.1 Pecking equipment used within the quarry extraction area has been identified as being a source of vibration. No other quarry processes are considered likely to result in vibration through the ground; i.e. Yennadon Quarry does not employ drilling and

blasting techniques, which are the primary cause of quarry related vibration pollution.

4.5.2 It is considered that the use of a pecker attachment on a mechanical excavator would produce negligible vibration outside of the quarry boundary; i.e. unlikely to result in detectable vibration at the nearest receptors. Therefore, the effect of vibration resulting from the proposed quarry extension is considered to be **insignificant**.

4.6 Light

4.6.1 There will be no requirement for floodlights or other additional lighting as a result of the proposed extension. Lights are currently confined to within the quarry's processing area and site offices during winter months within working hours. It is considered that the effect of light pollution from the quarry will be **insignificant**.

4.7 Litter

4.7.1 Litter on the site is currently well managed. It is considered unlikely that there will be any requirement to change the current waste policy as a result of the proposed quarry extension. This policy keeps wind-blown litter to a minimum. It is considered that the effect of litter from the quarry will be **insignificant**.

4.8 Hydrocarbon Spill / Leak

4.8.1 Leak from fuel tank: Fuel is stored within a 2500 litre bunded above ground fuel storage tank, which is inspected annually. Fuel is delivered on a weekly basis. The fuel level is carefully monitored during each week and any changes to the quantity of fuel used not attributed to production would be investigated by the operators. As the tank is regularly monitored, the risk of a significant leak occurring over a prolonged period is considered to be low.

4.8.2 Fuel spill during re-fuelling: Spill kits are kept adjacent to the tank and are taken with the portable fuel cans during re-fuelling. Yennadon Stone's Environmental Management Strategy (EMS) ensures that employees have the necessary training to conduct refuelling and how to use spill kits in the event of a spillage. It is considered that there is a low risk of a significant fuel spillage at the site.

4.8.3 Other oils/lubricants: Other oils are stored within the workshop in a bunded area. The quantity of oil stored is low. It is considered that there is a low risk of a significant spillage of other oils at the site.

4.8.4 As the volumes of hydrocarbons stored on-site are relatively low, any potential hydrocarbon spill would be local in a geographical context. Providing the current level of management, monitoring, maintenance and training is continued, the risk of a significant spill is considered to be low. Potential impacts of surface water and groundwater are addressed in Chapters 10 and 11. The significance of a potential hydrocarbon spill at Yennadon Quarry is considered to be **minor**.

4.9 Summary of Potential Impacts

4.9.1 Dust and noise are assessed as having the most significant potential impacts and are addressed separately in Chapters 9 and 12 respectively. The significance of the remaining potential impacts are summarised below.

Element	Geographical	Nature of Impact	Duration	Significance
Exhaust Fumes	Local	Adverse	Long-term	Minor
	Regional	Not significant	Long-term	Insignificant
Vibration	Local	Not significant	Long term	Insignificant
Light	Local	Not significant	Long-term	Insignificant
Litter	Local	Not significant	Long-term	Insignificant
Hydrocarbon Contamination	Local	Adverse	Long-term	Minor

Table PP/02: Assessment of Impacts

5.0 MITIGATION STRATEGIES AND RESIDUAL EFFECTS

5.1 Mitigation Strategies

5.1.1 Control measures to address the potential impacts of nuisance dust and noise are detailed in Chapters 9 and 12 respectively.

5.1.2 Yennadon Quarry must ensure that its employees comply with its Environmental Management Strategy (EMS). It is recommended that the EMS continues to be adhered to and is regularly reviewed to ensure environmental impacts are managed. Relevant control measures within the EMS relevant to the potential impacts identified in Table PP/02 include:

- Maintain proper management, supervision and training of quarry processes, with particular emphasis given to control procedures during start-up, shut down and abnormal conditions;
- Ensure staff at all levels have the necessary training and instruction in their duties and the proper use of equipment;
- Conduct effective preventative maintenance on all plant and equipment concerned with the control of emissions;
- Maintain a high standard of housekeeping; and
- Any spillages should be cleaned up promptly using appropriate spill kits and handling methods.

5.1.3 In addition to the above, it is recommended that the location of the site offices and processing areas are kept as existing following development of the proposed quarry.

5.2 Residual Effects

5.2.1 The implementation of the above mitigation measures will provide sufficient mitigation of the potential impacts of process pollution.

5.2.2 It is anticipated that there will be only temporary insignificant impacts on sensitive receptors from the quarry process during the operation of the quarry extension. These impacts would cease upon reinstatement of the site to moorland. No permanent residual effects are anticipated.

APPENDICES

APPENDIX PP/A

Photographic Record of Quarry Process

PHOTOGRAPHIC RECORD

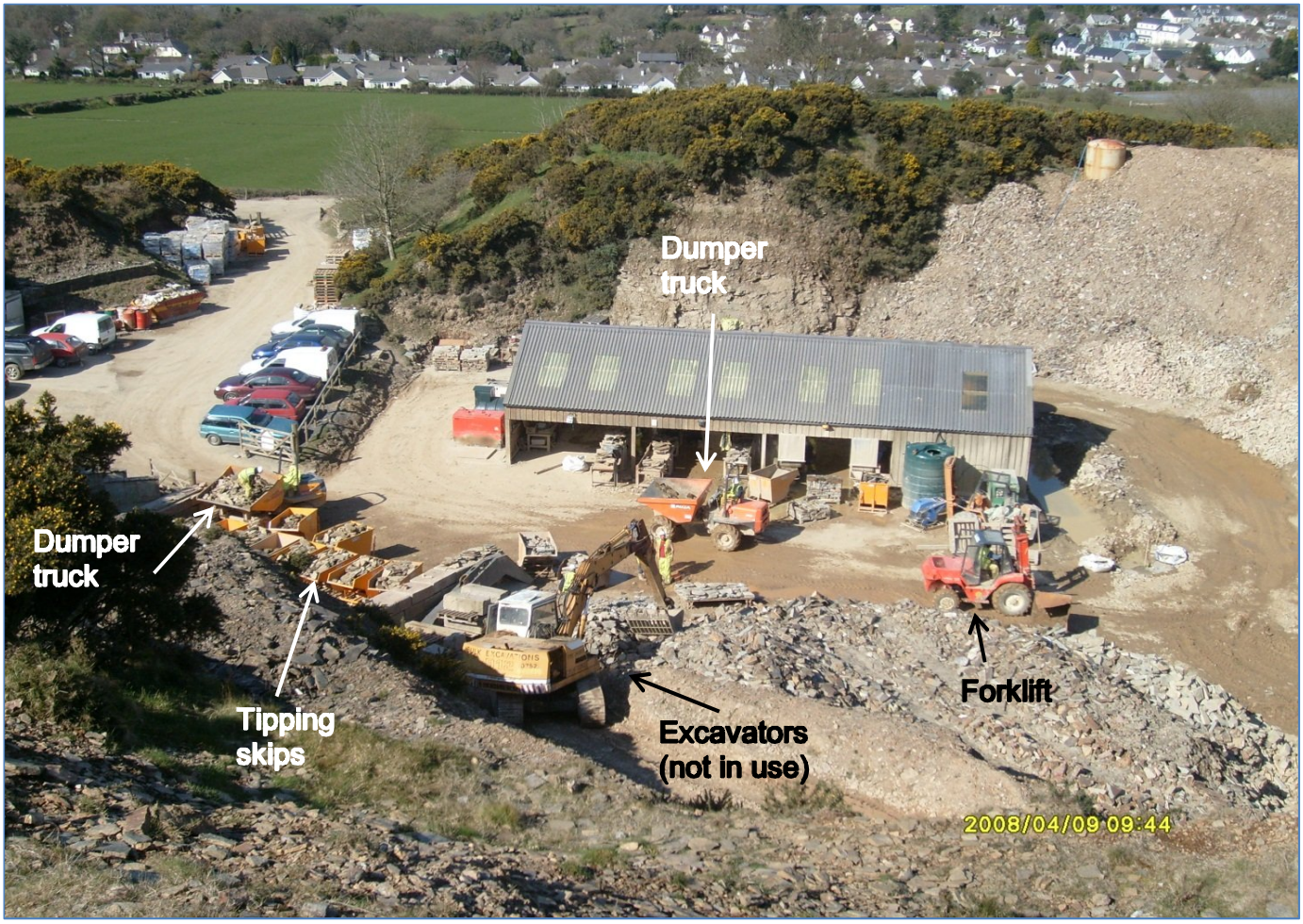


Plate 1: Overview of site in 2008; showing processing area and site office compound area. Note staff parking is now moved closer to site entrance (see Plate PP/3).

Plate 2: Site offices and compound in 2011.

Plate PP/3: Current site entrance, with staff and visitor parking area on either side.

Job: **PROPOSED EXTENSION TO YENNADON QUARRY, DOUSLAND, DEVON**	***John Grimes Partnership Ltd*** Consulting Engineers & Engineering Geologists Tel: (01752) 690533
Client: **YENNADON STONE LTD**	Job No: 7397 Date: 08/02/2012

PHOTOGRAPHIC RECORD

Plate PP/4: View south across Processing Area, showing Forklift in forground and one of the dumper trucks.

Plate PP/5: Front elevation of saw sheds.

Plate PP/6: Rear of saw sheds

Plate PP/7: Saw benches showing stone to be cut.

Plate PP/8: Cut stone loaded by hand onto pallets.

Job: **PROPOSED EXTENSION TO YENNADON QUARRY, DOUSLAND, DEVON**	***John Grimes Partnership Ltd*** Consulting Engineers & Engineering Geologists Tel: (01752) 690533
Client: **YENNADON STONE LTD**	Job No: 7397 Date: 08/02/2012

PHOTOGRAPHIC RECORD

Plate PP/9: View from processing area towards extraction area (30/09/2011).

Plate PP/10: View of eastern face (30/09/2011) with extraction currently underway at base of quarry. Excavator fitted with bucket.

Plate PP/11: View over northern end of existing quarry (30/09/2011).

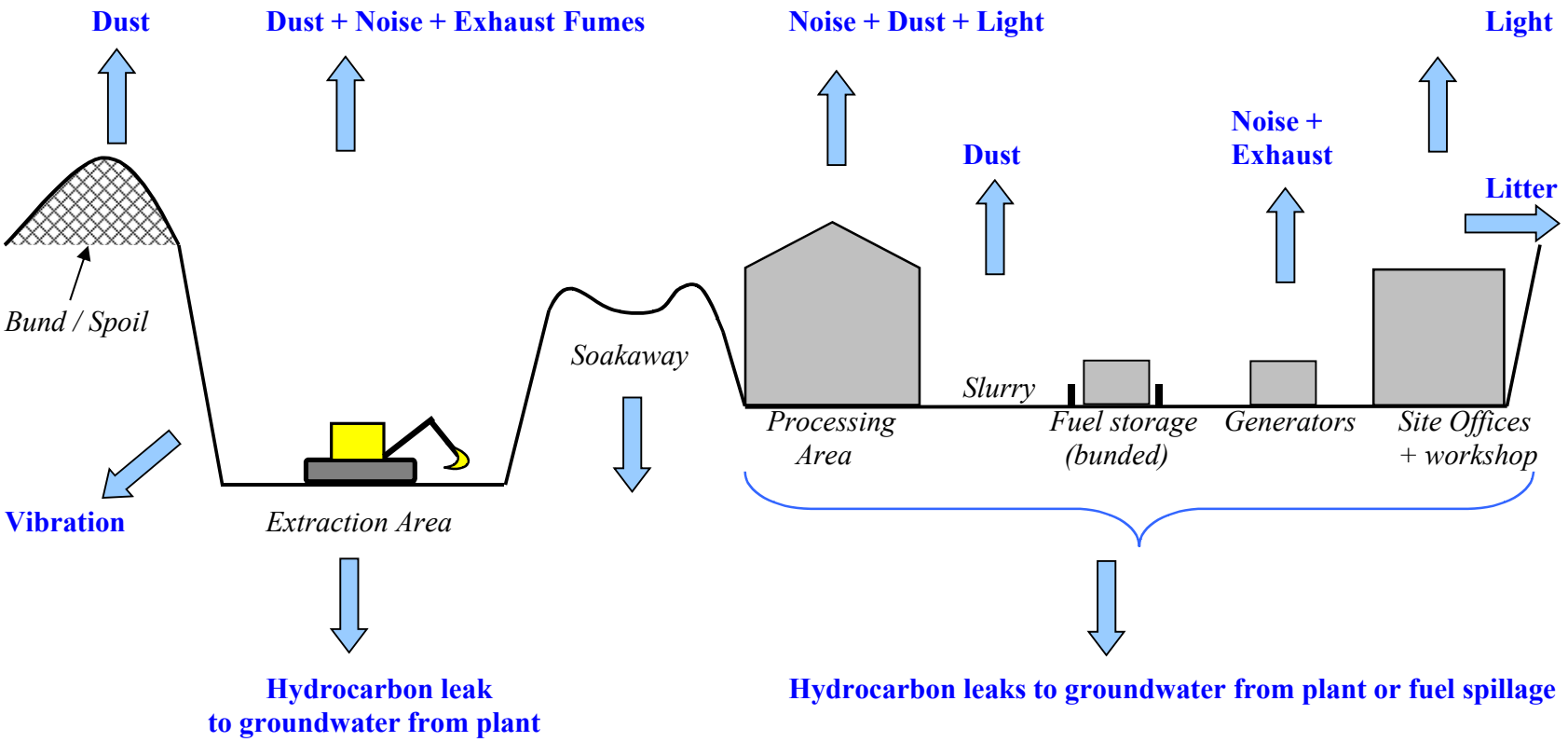
Plate PP/12: Current working face (30/09/2012) in south-east part of quarry.

Job: PROPOSED EXTENSION TO YENNADON QUARRY, DOUSLAND, DEVON	***John Grimes Partnership Ltd*** Consulting Engineers & Engineering Geologists Tel: (01752) 690533	
Client: YENNADON STONE LTD	Job No: 7397	Date: 08/02/2012

APPENDIX PP/B

Site Conceptual Model

Conceptual Model of Potential Pollutants at Yennadon Quarry



Transport offsite:

- **Mud** being tracked onto Highway Network
- **Exhaust** from vehicles
- **Dust** being generated from access track
- Traffic accident (**fuel spill**)

Other sources:

Noise and dust generated during stripping soils in area of proposed extension