Greater Manchester Waste Disposal Authority

Pink Bank Lane Methane Stripping Plant Facility

Supporting Statement

17 June 2008

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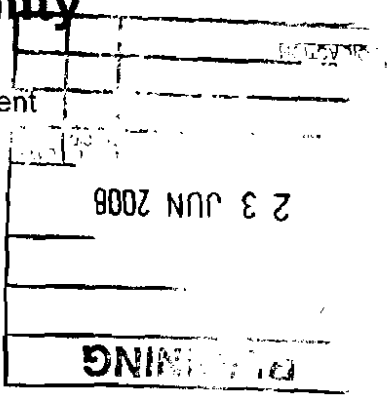

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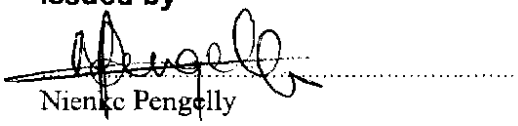

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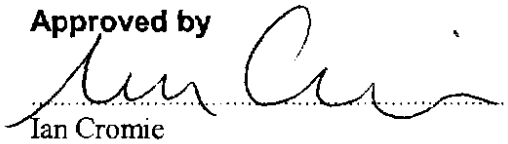

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Greater Manchester Waste Disposal Authority

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1. Introduction

1.1 Background to the Development

This supporting statement sets out the planning case in respect of a proposal by the Greater Manchester Waste Disposal Authority (GMWDA) to construct a methane stripping plant (MSP) facility on land which forms part of the closed Pink Bank Lane landfill site. The facility would be designed to prevent high levels of dissolved methane in the leachate from the landfill being discharged untreated to the sewer system.

The site is located in the Gorton area of Manchester, to the east of the A6 at grid reference SJ877952. The location of the landfill is shown in **Figure 1.1**.

The proposal has been prepared in the context of current waste management and environmental policy at the international, national, regional and local levels, in particular the Manchester City Unitary Development Plan. Furthermore, it will provide environmental enhancement through the treatment of leachate to prevent permitted discharge consents being exceeded.

1.2 The Site and its Environs

GMWDA is responsible for the maintenance of a number of closed landfill sites around the Greater Manchester area, including the former Pink Bank Lane site. The site is a former clay quarry (the clay extracted was used in the manufacture of bricks) that has been infilled with waste to the surrounding ground level. The site was inherited from Manchester City Council and was tipped in 1981 with 200 000 m^3 of waste and subsequently restored in 1982.

The application site comprises an area of approximately 0.03 ha immediately adjacent to the existing leachate pumping station compound. It is comprised of predominantly shrub vegetation with patches of woodland. The existing access to and from East Road to the leachate pumping station compound will be utilised. **Figure 1.2** defines the area covered by this planning application.

There are residential areas immediately to the east, north and west of the proposed development site, with the closest residential property located approximately 100 m to the west of the existing leachate collection manhole. The restored landfill site itself, which predominantly comprises open land, is used for recreational purposes with informal footpaths, in particularly by dog walkers. Cedar Mount High School and the Melland playing fields are located to the south and southeast of the site.

1.3 Statutory Requirements

The application has been prepared in accordance with the provisions of the Town and Country Planning Act 1990. The Planning Application Forms and certificates are enclosed as **Appendix A**.

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It is not considered that the proposal falls within the provisions of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999. This is because it is not included as a Schedule 1 development, where an Environmental Impact Assessment (EIA) is mandatory; nor does it fall under Schedule 2 development, where an EIA is required when development would cause significant environmental effects. Section 4 of this statement details the environmental issues raised by the application and the proposed measures and operational controls to minimise environmental effects. These measures would ensure that the effects of the proposed development would not be significant and would not therefore fall within Schedule 2.

A request for a Screening Opinion was submitted to Manchester City Council in August 2007 and in their response (dated 19 September 2007), the Council confirmed the proposal does not fall within either Schedule 1 or Schedule 2 development and that an EIA is **not** required.

In their Screening Opinion, the Council set out that any planning application would need to be accompanied by the following details:

- A planning statement, outlining the approach to the design of the development, with a visual assessment of the works involved;
- An acoustic survey relating to the works/structure proposed to enable any appropriate mitigation to be agreed;
- A methodology statement relating to works/measures which would be implemented should odours/vapours be released on the site;
- A landscape assessment and full details of any new landscaping proposals;
- Full details of how the MSP facility functions, including details of what happens to the methane after it has been stripped;
- Confirmation that no new pathway(s) would be created for leachate to travel along and potentially contaminate areas outside the site;
- Full details of any staffing and any vehicular movements to/from the site;
- Elevations details of all structures proposed.

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N

Existing Compound

395500

395250

Key

- Planning application boundary
- Land ownership boundary
- Existing site access road
- MSP location

0 m — 75 m

Scale 1:1500 @ A3

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Figure 1.2
Planning Application Area

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2. The Proposed Development

2.1 Reasons for the Development

Leachate from the site is currently untreated and is discharged directly to foul sewer. It drains towards a leachate collection manhole which is situated on the western side of the former landfill site and is accessed from East Road (Figure 1.2). Methane is known to be present in the leachate entering the sewer system and, as a responsible operator, GMWDA is seeking to development a MSP facility to address this problem.

2.2 Facility Details

2.2.1 Overview

The proposed MSP facility will consist of:

- Control kiosk;
- x3 Air blowers;
- x8-10 Methane stripping tanks;
- x1 Chamber with sewer discharge pump (below ground);
- Internal modifications to the existing inlet pumping chamber (below ground);
- Lighting columns.

The proposed site plan of the facility is shown on **Figure 2.1**. Note that some details of the project may need to change following the procurement of the facility, although the changes are likely to be relatively minor. GMWDA is therefore seeking a consent which facilitates some minor project amendments, with the written approval of the planning authority.

The proposed MSP facility will be located immediately adjacent to the existing leachate pumping station compound, which will effectively be extended to form one enclosed compound. The MSP facility will cover an area measuring approximately 21 m by 8 m (equivalent to approximately 0.02 ha), as shown in Figure 1.2.

2.3 Description of the Methane Stripping Process

2.3.1 Introduction

The following provides a summary of the methane stripping process. Further operational details would be provided as part of any amendments to the trade effluent discharge consent, including detailed site engineering and drainage.

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2.3.2 Proposed Development

The proposed MSP facility would consist of a series of methane stripping tanks connected to a number of air blowers which would be housed in acoustically insulated steel containers, together with associated infrastructure which will consist of a brick built building / kiosk to house stores, controls and electrical switchgear. The facility would be contained within a steel palisade fence approximately 2.75 m high and be located on a bunded, reinforced concrete slab.

The leachate is collected in a series of boreholes across the former landfill site and pumped or gravity fed into a collection chamber. From there the leachate is pumped into the series of MSP tanks. As the leachate flows through the tanks, the dissolved methane is stripped as a result of air being bubbled through the tank. The air / methane mix is then discharged to the atmosphere. The treated leachate, with the dissolved methane content below the 0.14 mg/l discharge consent level, is then discharge to sewer via an underground pipe.

The MSP facility would be fully automated on a Programmable Logic Controller (PLC) platform[1] with a Supervisory Control and Data Acquisition system and telemetry for remote monitoring and alarming. The motor control centre (MCC)[2], control and monitoring equipment will be located inside the purpose built brick building.

2.4 Volumes and Duration

The MSP facility design parameters for flow and final methane concentration are 1 000 m^3/day and <0.14 mg/l respectively. This is in line with the maximum permissible limit as set out in the discharge consent for the site. There is currently no pump in place at Pink Bank Lane. As such, the average flow rate is assumed to be the same as that at the former Bredbury and Cringle Road landfill sites.

It is expected that the facility will remain on site for some 25 years, after which time it would be removed from site, subject to the dissolved methane having been reduced to acceptable levels. It is possible that dissolved methane levels in the leachate could have reduced to levels that would not require treatment within a period of 10-15 years.

2.5 Hours of Operation

It is proposed that the MSP facility would be operational 24 hours with maintenance carried out as required and wherever possible during the day time.

[1] PLC platform is the hardware aspect of the control system for the MSP facility which contains the software programme that controls the operation of plant devices such as pumps, blowers, and automatic valves. The PLC also receives inputs to generate alarms.

[2] The MCC generally contains the motor starters and switchgear for the powered devices of the MSP facility.

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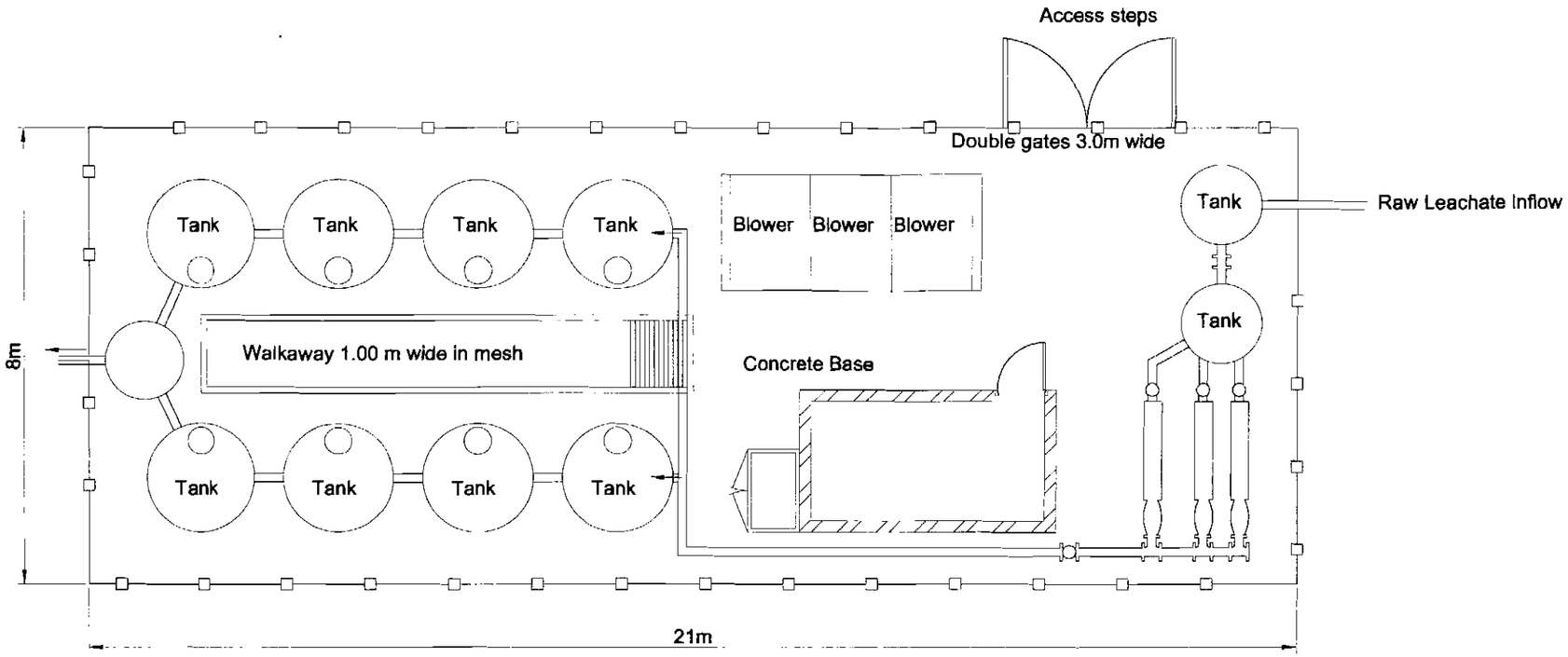
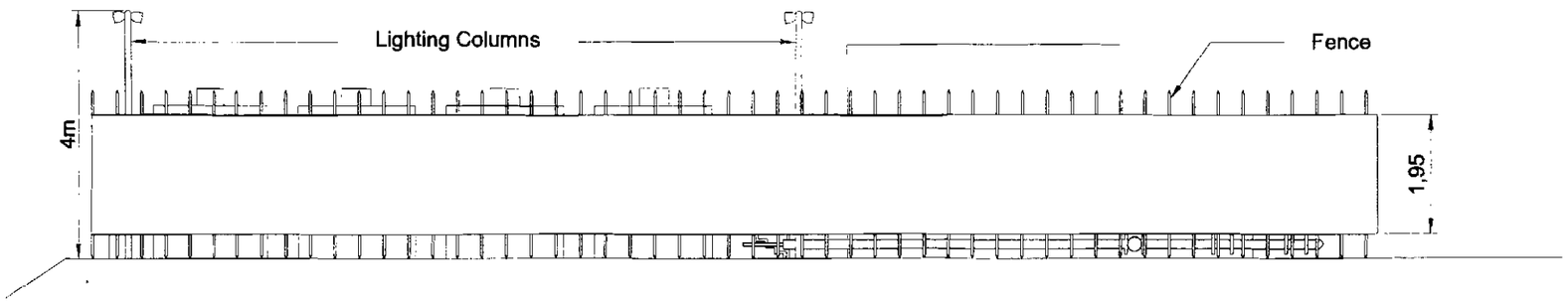


Methane Stripping Plant: Typical Plan



Methane Stripping Plant: Typical Elevation

0 m 5m

Scale 1:100 @ A3

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Figure 2.1
Indicative MSP Site Layout and Elevations

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3. Operational and Environmental Safeguards

3.1 Introduction

This section provides details on the operational and environmental safeguards that have been incorporated into the proposed development.

3.2 Odour

3.2.1 Introduction

The operation of the proposed MSP facility has the potential to cause an emission of odour which could have an effect in the vicinity of the proposed development, potentially affecting local receptors. An assessment of odours has been completed and is summarised below.

3.2.2 Scope of the Assessment

The potential for adverse effects at sensitive locations from increases in odour concentrations during the construction phase is very small and of only temporary duration. Therefore, no assessment is required relating to this scenario.

During the construction stage of the development there are likely to be minor emissions of dust associated with construction activities. It has been found that dust deposition on neighbouring receptors is unlikely to be significant at a distance of more than 100 m from the dust source, when there is no mitigation in place and when the receptor is in the path of the prevailing wind[3]. Given the limited scale of the proposed development and the uncertainties in modelling fugitive dust, particularly arising from a variable source such as construction activities, it is not considered that a quantitative assessment would be appropriate and a qualitative, risk based approach to dust assessment and control is usually adopted. This takes the form of examining the types of activities planned to take place, evaluating the potential for dust to be generated and assessing the locations of sensitive receptors in relation to the site activities and the prevailing wind directions. Appropriate dust mitigation can be highly effective at reducing dust generation and minimising dust dispersion off the site. Due to the small scale of development it is considered unlikely that any significant dust effects will occur during the construction phase and so dust has been scoped out of the assessment.

It has been acknowledged that neither combustion techniques nor additional vehicle movements will be required for MSP operation. For this reason, vehicle related air quality pollutants have been scoped out of the assessment.

[3] DETR (2005) *Minerals Policy Statement 2: Controlling and Mitigating the Environment Effects of Mineral Extraction in England Annex 1: Dust*, London: HMSO.

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The assessment uses measurement and modelling techniques to predict the odour concentrations arising from the proposed MSP facility at the Pink Bank Lane landfill. The potential odour effects of the proposals on local receptors have been considered by detailed dispersion modelling of the emissions from the MSP facility.

Potential receptors

The following section identifies potential receptors that could be significantly affected by odour during operation of the proposed MSP facility. The receptors locations chosen represent the residential properties where the odour effects of the MSP facility are likely to be at their greatest. Table 3.1 details the receptors selected for the assessment.

Table 3.1 Odour Receptor Locations

Reference	Location	Co-ordinates	
		x	y
1	East Road	387647	395404
2	Calbourne Crescent	387629	395444
3	Totland Close	387617	395494
4	Manby Road A	387701	395563
5	Manby Road B	387788	395526
6	Thornholm Close A	387822	395391
7	Thornholm Close B	387814	395287
8	Butter Close A	387676	395373
9	Butter Close B	387705	395293

Locations of the selected sensitive receptors are presented in **Figure 3.1**.

3.2.3 Assessment Methodology

Scope and Methodology

The assessment of odour effects was undertaken using the USEPA AERMOD dispersion model. This dispersion model has been extensively used to predict odour impacts both in the UK and overseas and, as such, was considered appropriate for the odour assessment. The proposed MSP facility buildings were included in the model to predict the impact of building downwash on odour concentrations at sensitive receptors. A terrain file is deemed necessary when the topography within the model has a gradient greater than 1 in 10. It has been concluded that the topography surrounding the site does not warrant the use of a terrain file in the dispersion model. The dispersion model was run using five years of meteorological data from Manchester Ringway Meteorological Station (2003-2007). It has been concluded that the Manchester Ringway dataset is most appropriate to represent the meteorological conditions at the former

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Pink Bank Lane landfill. The worst case wind rose for Manchester Ringway, assessed as being 2003, is presented in **Figure 3.2.**

Emission rates for the assessment have been calculated conservatively to best represent the worst case emission rate from the MSP facility. The facility design has indicated that landfill leachate before treatment contains 16 mg/l of methane. It has been assumed that all methane is stripped from the leachate by the MSP process and is emitted to the atmosphere. Landfill gas (LFG) concentrations have been calculated using the assumption that LFG is composed of 55% methane by volume. This is considered to be a conservative assumption compared to the LFTGN 03[4] guidance which states a bulk methane composition of 63.8% by volume is considered typical for LFG. From Entec's experience of landfill odour emissions, an odour concentration of 250 000 $ou_E\ m^{-3}$ has been applied to LFG. The odour emission rate was doubled to represent the stripping of volatile compounds from the leachate itself Details of the gas calculations made are presented in Table 3.2.

Table 3.2 Gas Calculations

Gas Calculation	Value
Total Methane Removed *	16 mg/l
Leachate Flow *	42 m^3hr^{-1}
Methane Removal Rate	0.187 g s^{-1}
Volume of methane	$2.81*10^{-4}\ m^3\ s^{-1}$
Composition of LFG	55% by volume methane
Total LFG Volume	$5.10*10^{-4}\ m^3\ s^{-1}$
Odour concentration of Landfill Gas (including additional stripped odours from the leachate itself)	500,000 $ou_E\ m^{-3}$
Odour Emission Rate	255 $ou_E\ s^{-1}$

*As stated in the MSP facility design

Significance Evaluation Methodology

The issue of malodours from odour emitting activities has gained increased public recognition over the last 20 years, along with growing expectations of quality of life and a reduced tolerance towards adverse environmental effects of business and utilities upon public amenity.

Odours are not generally additive in the same way as other nuisance parameters such as decibels for noise[5]. This reflects the way in which the brain responds to odour. The human brain has a tendency to "screen out" those odours which are always present or those that are in context to their surroundings. For example, an individual is more likely to be tolerant of an odour from a factory in an industrial area than in the countryside. The human brain will also develop a form of acceptance to a constant background of local odours.

[4] Environment Agency (2004) LFTGN03, Guidance on the Management of Landfill Gas.

[5] Environment Agency (2002). DRAFT Horizontal Guidance for Odour Part 1- Regulation and Permitting

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Limited research is available into what constitutes an appropriate and workable odour standard. The Concise Guide[6] considers that odours at 5 times their detection threshold (effectively 5 $ou_E\ m^{-3}$) can be considered as having the potential to cause annoyance. Entec commonly uses the 5 $ou_r\ m^{-3}$ as the 98th percentile of hourly averages as the odour annoyance criterion for food preparation sites.

The assessment of significance of changes to odour levels with the proposed development has been evaluated in the context of the 5 $ou_E\ m^{-3}$ as the 98th percentile of hourly averages threshold. Odour levels above this threshold are considered to be significant, while those below are considered to be not significant.

3.2.4 Assessment of Odour Effects

The following section presents the results of the detailed odour dispersion modelling assessment of the Pink Bank Lane landfill site.

The MSP facility was modelled in accordance with the proposed plan. The facility was modelled as having 8 release points each with a 0.5 m stack extension and a diameter 0.1 m. The release points were modelled as being capped stacks, 3 m above the ground, with an air flow rate of 65 $m^3\ hr^{-1}$ per tank as stated in the MSP design. The total odour emission rate from the MSP facility was calculated as 255 $ou_E\ s^{-1}$.

Table 3.3 details the predicted odour concentrations at sensitive receptors for the year of meteorological data giving the highest concentrations (2003).

Table 3.3 Predicted Odour Concentration

Receptor	Location	Odour Concentration - $ou_E\ m^{-3}$ as the 98th Percentile of Hourly Averages (2003)
1	East Road	0.43
2	Calbourne Crescent	0.22
3	Totland Close	0.12
4	Manby Road A	0.08
5	Manby Road B	0.09
6	Thornholm Close A	0.13
7	Thornholm Close B	0.08
8	Butter Close A	0.72
9	Butter Close B	0.14

The maximum odour concentration at a receptor location was predicted to be at the Butter Close A receptor with a concentration of 0.72 $ou_E\ m^{-3}$ as the 98th percentile of hourly averages. It was

[6] Valentin, F.H.H and North, A.A. (1980). Odour Control – a concise guide. Department of the Environment.

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predicted that no receptor would be exposed to concentrations above the adopted 5 $ou_E\ m^{-3}$ as the 98th percentile of hourly averages odour annoyance criterion. **Figure 3.3** shows the predicted odour extent of emissions from the MSP facility. It was predicted that the 1 $ou_E\ m^{-3}$ as the 98th percentile of hourly averages odour contour is contained within the former landfill site boundary.

3.2.5 Significance Assessment of Odour Effects

Table 3.4 summarises the significance of the odour effects of the proposed MSP facility. The detailed modelling assessment for the worst case year, 2003, predicted that odour concentrations at receptor locations would not exceed the 5 $ou_E\ m^{-3}$ as the 98th percentile of hourly averages odour annoyance criterion. It was predicted that odour emission from the proposed MSP facility is considered to be not significant.

Table 3.4 Significance of Odour Effects

Receptor	Location	Significance of Effects
1	East Road	Below 5 $ou_E\ m^{-3}$ criterion – Not Significant
2	Calbourne Crescent	Below 5 $ou_E\ m^{-3}$ criterion – Not Significant
3	Totland Close	Below 5 $ou_E\ m^{-3}$ criterion – Not Significant
4	Manby Road A	Below 5 $ou_E\ m^{-3}$ criterion – Not Significant
5	Manby Road B	Below 5 $ou_E\ m^{-3}$ criterion – Not Significant
6	Thornholm Close A	Below 5 $ou_E\ m^{-3}$ criterion – Not Significant
7	Thornholm Close B	Below 5 $ou_E\ m^{-3}$ criterion – Not Significant
8	Butter Close A	Below 5 $ou_E\ m^{-3}$ criterion – Not Significant
9	Butter Close B	Below 5 $ou_E\ m^{-3}$ criterion – Not Significant

3.2.6 Conclusions

In summary, it has been predicted that no residential receptor is to be exposed to odour concentrations above the 5 $ou_E\ m^{-3}$ as the 98th percentile of hourly averages adopted annoyance criterion. A maximum odour concentration of 0.72 $ou_E\ m^{-3}$ as the 98th percentile of hourly averages was predicted at receptor locations with no location outside the site boundary being exposed to odour concentrations above the 5 $ou_E\ m^{-3}$ annoyance criterion. In accordance with the significance criteria detailed in Section 3.2.3, the odour impact of the proposed MSP facility at former Pink Bank Lane landfill has been assessed as not being significant. It is concluded that an odour annoyance caused by the MSP facility is unlikely to be experienced at receptors close to the former Pink Bank Lane landfill site.

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3.3 Noise

3.3.1 Introduction

A background noise survey and noise assessment for the proposed MSP development has been completed. The purpose of the assessment is to predict the noise levels likely to be experienced at local sensitive receptors from the operation of the proposed MSP facility and to evaluate these noise effects against appropriate Standards and Government advice.

The main noise sources associated with the MSP facility are three air blowers located on concrete plinths located within a compound bounded by a palisade fence. The plant is located to the northeast of East Road and to the west of Thorneholme, as shown by **Figure 3.4**.

Noise Assessment Guidance

BS4142 '*Method for rating industrial noise affecting mixed residential and industrial areas*' (1997) contains guidance on the monitoring and assessment of industrial noise sources, and is particularly designed to assess noise from fixed plant which affects residential areas. The Standard provides a methodology for determining whether a new or existing noise source is likely to cause noise complaints by comparing the operational noise level with the background level (i.e. the level that would occur in the absence of the noise from the industrial development, in this case, the proposed MSP facility). If the industrial noise contains any annoying characteristics, such as hums, clanks or bangs, it is also subject to a 5dB rating penalty. A difference of +10dB or more means complaints are likely, whereas +5dB is of marginal significance. For differences of less than +5dB the likelihood of complaints reduces further.

Additional relevant guidance is presented in BS8233 *Sound Insulation and Noise Reduction for Dwellings* (1999), which presents design criteria for internal noise levels for different rooms within a dwelling. Compliance with these criteria should ensure that residents do not experience any significant disturbance by noise.

3.3.2 Noise Terminology

The ratio between the quietest audible sound and the loudest tolerable sound is a million to one in terms of the change in sound pressure. Because of the wide range a scale based on a logarithmic basis is used in noise level measurement. The scale used is the decibel (dB) scale which extends from 0 to 140 decibels (dB) corresponding to the intensity of the sound pressure level. The ear has the ability to recognise a particular sound depending on the pitch or frequencies found at the source. Microphones cannot differentiate noise in the same way as the ear; and to counter this weakness the noise-measuring instrument applies a correction to correspond more closely to the frequency response of the ear. The correction factor is called "A Weighting" and the resulting measurements are written as dB(A). "A Weighting" refers to the noise level that represents the human ear's response to sound. The dB(A) is internationally accepted and has been found to correspond well with people's subjective reaction to noise.

Typical dB(A) noise levels for familiar noises are given in Table 3.5.

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Table 3.5 Typical Noise Levels

Approximate Noise Level dB(A)	Example
0	Limit of hearing
30	Rural area at night, no wind or adverse weather conditions
40	Library
50	Quiet office without noisy machinery, such as typewriters
60	Normal conversation
70	In car noise without radio
80	Household vacuum cleaner
100	Pneumatic drill
140	Threshold of pain

Source : Entec

Noise levels vary over time depending on noise generating activities. The following indices are used to take account of these variations:

- SPL is the instantaneous sound pressure level; it is a measure of the noise level at a particular point in space. The SPL of a noise source will vary with distance from the noise source;
- SWL is the instantaneous sound power level, it is a measure of the sound energy produced by a noise source;
- $L_{Aeq\ T}$ is the equivalent continuous sound level and is the sound level of a steady sound having the same energy as a fluctuating sound over the same period. It is possible to consider this level as the ambient noise encompassing all noise at a given time. $L_{Aeq\ T}$ is considered the best general purpose index for environmental noise;
- $L_{A90\ T}$ index represents the noise level exceeded for 90 percent of the measurement period and is used to indicate quieter times during the measurement period. It is usually referred to as the background noise level;
- L_{Amax} is the maximum recorded noise level during the measurement period.

3.3.3 Noise Monitoring

Identification of Noise Sensitive Receptors

Background noise measurements have been undertaken at two of the nearest noise sensitive receptors to the proposed plant site, which generally comprise of residential properties.

The receptors selected for this assessment, as shown in **Figure 3.4**, are:

1 Housing to the East of the landfill boundary represented by Thorneholme Close;
2 Housing to the West of the landfill boundary represented by East Road.

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Baseline Noise Levels

Noise monitoring was undertaken on 7 and 8 February 2008, using Rion NL-31 sound level meters (SLM) which conform to Class 1 as defined by BS EN 61672: Part1:2003 (*Electro acoustics, Sound Level Meters, Specifications*). Further details regarding the instrumentation used are provided in **Appendix B**.

The proposed MSP facility will operate throughout the day and night. Due to the sensitivity of the night-time period, baseline noise levels were measured only during the night-time hours to ensure a 'worst case' assessment. It is assumed that background noise levels during the daytime period are likely to be higher. Noise levels were recorded over consecutive 5 minute periods, and a total of approximately 1 hour's worth of data was obtained at each measurement position.

The measurement methodology was based on that contained within BS 7445:2003 *'Description and measurement of environmental noise – Part 1: Guide to quantities and procedures*". The calibration levels of the SLM were checked before and after each set of measurements, with no significant drift in calibration recorded. Battery levels remained within acceptable limits throughout the measurements.

Weather conditions during the monitoring period were calm and dry. There were no significant precipitation or wind effects that impacted upon the noise levels measured.

The results of the baseline noise monitoring are summarised in Table 3.6 below. Full results are also presented in Appendix B.

Table 3.6 Baseline Noise Monitoring Results

Receptor	Sampling Period	$L_{Aeq,\ 1h}$ (dB)*	$L_{A90,\ 1h}$ (dB)*
Thorneholme Close to the east of the landfill boundary	00.28 – 01.28	39.8	37.0
East Road to the west of the landfill boundary	00.41 – 01.41	39.5	35.4

*Average of the 5 minute periods

At the two monitoring positions, the predominant noise source throughout the monitoring period was intermittent aircraft noise and sporadic vehicle movements on the nearby roads.

3.3.4 Plant Noise Predictions

Sound Power Levels

Measurements to characterise the noise emissions of an operating MSP facility were provided to Entec staff by GMWDA. Sound pressure levels for the Roots blowers within the plant were measured at a distance of 7 m. The data obtained is presented in Table 3.7.

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Table 3.7 Sound Power Levels

Plant	Sound Pressure Level (dB(A))	Distance (m)	Sound Power Level (dB(A))	Data Source
MPS (Roots Blowers)	45	7	70	Greater Manchester Waste Disposal Authority

Plant Noise Predications

The prediction methods used in this assessment are based on those outlined in BS 5228: 1997, which incorporates guidance on the attenuation of noise due to the effect of natural barriers, and the absorbing effect of soft ground lying between the noise source and the receptor. An allowance for ground absorption (assuming 100% soft ground intervening between site and receptors) has been included. In order to assess the likely noise effects of the simultaneous operation of several Roots blowers at the noise sensitive receptors, a series of predictions have been undertaken the results of which are tabulated below:

Table 3.8 Predicted Plant Noise Levels (Pink Bank Lane)

Receptor	Operation of 1 No. Roots Blower only	Operation of 2 No. Roots Blowers	Operation of 3 No. Roots Blowers
Thorneholme Close to the east of the landfill boundary	16.0	19.0	21.0
East Road to the west of the landfill boundary	29.0	32.0	34.0

The worst case predicted noise levels, with all three root blowers operating, at the receptors are presented in Table 3.9.

Table 3.9 Predicted Worst Case Plant Noise Levels (3 No. Roots Blowers)

Receptor	Predicted Plant Noise Level $L_{Aeq,\ 1h}$ (dB)	Rating Level $L_{Ar,T}$ (dB)
Thorneholme Close to the east of the landfill boundary	21.0	26.0
East Road to the west of the landfill boundary	34.0	39.0

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3.3.5 Assessment

BS4142 Assessment

The BS4142 methodology predicts the likelihood of complaints from local residents by comparing the predicted plant noise level with the existing measured background noise levels. The methodology allows for a rating penalty to be applied to any noise sources which exhibit tonal or intermittent characteristics. In order to provide the most robust assessment, the rating penalty of +5dB has been added to the predicted plant noise levels.

The resulting rating levels for the Methane Stripping Plant have been compared with the minimum measured background noise levels at the nearest properties to reinforce the worst case assessment and are shown in Table 3.10 below.

Table 3.10 BS4142 Assessment (Jenbacher 320)

Receptor	Rating Level $L_{Aeq,1h}$ (dB))	Minimum Measured Background Level LA90 (dB)	Plant Noise Exceeds Minimum Background by (dB)	Likelihood of Complaint
Thorneholme Close to the east of the landfill boundary	26.0	36.0	-10.0	Unlikely
East Road to the west of the landfill boundary	39.0	34.0	+5.0	Marginal

All noise levels rounded to nearest whole dB(A) in accordance with the standard

Table 3.10 shows that the predicted plant noise levels at the housing to the east are below the background levels by a considerable margin, therefore, it is considered that local residents are unlikely to complain. However at the receptor on East Road to the west of the proposed development the BS4142:1997 assessment appears to indicate that the likelihood of complaint from residents of these properties would be marginal at most. In addition, it is acknowledged that the rating level at Thorneholme Close is considered by BS4142:1997 to be 'very low' and could sometimes be considered outside the scope of the methodology. In the light of the above, an assessment of the internal noise levels within the closest receptors has also been undertaken the results of which appear below.

BS8233 Assessment

The BS4142 methodology evaluates outdoor free-field noise levels; however at night-time in particular, internal noise levels are also of relevance. BS 8233:1999 *Sound Insulation and Noise Reduction for Buildings – Code of Practice,* gives recommended design criteria for internal noise levels for different types of rooms. The criteria for bedrooms and living rooms which have been set to avoid sleep disturbance and ensure suitable resting conditions are:

- Bedrooms
  - Good $L_{Aeq,T}$ 30dB;
  - Reasonable $L_{Aeq,T}$ 35dB.

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- Living Rooms
  - Good $L_{Aeq,T}$ 30dB;
  - Reasonable $L_{Aeq,T}$ 40dB.

Additionally, maximum noise levels should not exceed L_{Amax} 45dB in bedrooms at night. This information is based on World Health Organisation (WHO) Guidelines for Community Noise (1999). BS8233 states that the noise limits relate to steady intrusive noise such as that from fixed plant.

The residential buildings will provide some degree of attenuation of outdoor noise levels, which will affect the internal noise levels experienced by occupants. This attenuation will be at a minimum when windows are open in a façade of the occupied room. It is generally accepted that a façade with an open window will provide approximately 12-15 dB(A) attenuation. The internal noise levels due to noise from the proposed plant are presented in Table 3.11 below. It should be noted that the predicted plant noise levels are free-field levels and have therefore been corrected for the façade effect (+3dB) to facilitate the internal noise level prediction.

Table 3.11 BS8233 Assessment

Receptor	Predicted Facade Noise Level, $L_{Aeq,\ 1h}$ (dB)	Façade Reduction, Open Windows (dB)	Internal Noise Level, $L_{Aeq,\ 1h}$ (dB)	BS8233 Internal Noise Level Standard (Living Rooms & Bedrooms)
Thorneholme Close to the east of the landfill boundary	24.0	-12	12.0	Good
East Road to the west of the landfill boundary	37.0	-12	25.0	Good

*includes a +3dB correction to convert freefield to façade noise levels

Table 3.11 indicates compliance with the "good" internal noise level criterion of $L_{Aeq,\ T}$ 30dB for bedrooms at night at all noise sensitive properties, even with the windows open. Based upon these levels, it is considered that even the simultaneous operation of all 3 of the Roots blowers would be almost inaudible indoors.

Note that predicted plant noise levels are considered to be continuous, and it is not anticipated that maximum levels, in terms of L_{Amax}, will exceed the predicted continuous average levels by a significant amount, at any of the noise sensitive receivers. Therefore, the plant will also easily comply with the internal maximum noise level limit of L_{Amax} 45dB.

Mitigation Measures

No mitigation measures would be required as the noise levels at the internal and external residential properties are within the acceptable noise limits.

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3.3.6 Conclusions

The noise assessment has concluded that the predicted plant noise levels at the two locations are equal to or below the background levels, therefore, it is considered that the likelihood of complaint from local residents would be marginal at most. However, to further assess the situation the internal noise levels resulting from the installation were assessed with respect to BS8233:1999 and it was found that, even with bedroom windows opened at night, the internal noise levels would still meet the 'good' design criterion, at the noise sensitive receptors in the area. As such, the installation of the MSP facility at the former Pink Bank Lane landfill site will not result in any significant noise effects at local sensitive receptors and, therefore, no additional mitigation measures would be required.

3.4 Landscape and Visual Amenity

3.4.1 Methodology

The methodology for the landscape and visual assessment is based on "*The Guidelines for Landscape and Visual Impact Assessment: Second Edition*"[7], (GLVIA) which is widely regarded by the landscape and planning professions as the 'industry standard'. Landscape effects and visual effects are defined as follows:

- Landscape effects: These consist of the changes in the fabric, character and quality of the landscape which it is predicted would result from the construction and operation of the proposed MSP facility;
- Visual effects: These are the predicted effects on views available to the public from publicly accessible areas and residential dwellings, i.e. visual receptors. Specific effects result from changing the constituent elements within an existing view. This may be caused by the construction of a feature, or the obstruction, or modification of an existing view. The overall effect upon visual amenity can range from degradation to enhancement.

3.4.2 Desktop Study and Site Survey

For the purpose of this appraisal the wider study area extends approximately 2 km beyond the boundaries of the site in order to place the development within a local context. The landscape and visual baseline has been established through both a desktop study and site survey. The desktop study involved a review of existing information whilst the site survey entailed a more detailed information gathering exercise. Preliminary data collection was carried out in April 2008 and began with some initial desk research, followed by a site visit, walkover and driving tour of the study area. This work had the objective of provisionally identifying the extent to which the site would be visible from adjacent land within the visual study area.

Information on the existing baseline has been collected by reference to the following documents and sources of information:

[7] The Guidelines for Landscape and Visual Impact Assessment Second Edition The Landscape Institute and the Institute of Environmental Management and Assessment 2002

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- The Manchester Plan UDP, Manchester City Council (Adopted 1995);
- The Multi-Agency Geographic Information for the Countryside website www.magic.gov.uk;
- OS Mapping (OS Explorer 277, 1:25,000).

3.4.3 Site Context

Site Description

The proposed site for the MSP facility is located in the Pink Bank Lane area of Manchester, between Belle Vue and Levenshulme. The former landfill site within which the MSP facility would be sited is located within an area to the northwest of Cedar Mount High School and Gorton Mount Primary School. There is currently an existing smaller compound on the landfill site which is adjacent to the proposed location of the MSP facility (see **Figure 3.5**). The existing facility comprises an area of hardstanding, fenced with dark green steel palisade fencing, accessed by a hard surfaced route from East Road to the west. Scrubby vegetation and woodland occur in patches across the former landfill site and there is evidence of litter and graffiti within the immediate environs.

Site Context

The proposed site for the MSP facility is located at an elevation of approximately 55 m AOD. The site undulates slightly, with the existing facility set into an artificial bund. To the north the landform gradually slopes down to a small watercourse. To the south the landform gently rises to around 60 m AOD. The predominant land use surrounding the landfill site is residential interspersed with green spaces, including golf courses, parks, recreation grounds and playing fields. With regard to settlement pattern, the area forms part of the Manchester conurbation, with the urban area of Levenshulme to the south and Belle Vue to the north. Housing is traditionally terraced in a grid layout, with more recent developments including 1960's council owned houses or high-rise flats in a less linear network of avenues and closes.

A local Public Right of Way (PRoW) crosses to the south of the former landfill site whilst other PRoWs pass through the green spaces in the study area. A number of desire lines cross the restored landfill site, namely the route linking East Road (west) to East Road (east) which also shows signs of unofficial vehicle access. Furthermore, Sustrans Cycle Route 6/60 follows the disused railway ~1.5 km to the south of the site.

Visual Context

The site is well screened to the north by an area of mature trees comprising both deciduous and coniferous species which form clumps across the site. Views of the site are available from locations along East Road to the northeast and southwest (see **Figure 3.6**).

Landscape Character

At a strategic level, the site is located within the Manchester Conurbation Joint Character Area (JCA 55) as classified in the Countryside Character Assessment published by the (then) Countryside Agency in 1999. The assessment cites the following as key characteristics of the Manchester Conurbation JCA:

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- Countryside extends throughout the Manchester Conurbation following the network of corridors formed by the numerous rivers, and to a lesser extent canals, railways and roads which thread through the urban fabric;
- Typical land uses include playing fields, numerous golf courses and water treatment works set within an overall managed countryside. These, together with heavy recreational demands and frequent major road crossings, produce a suburban character to the countryside areas;
- There is an ongoing pressure for development, including landfill, housing expansion from adjoining urban areas, business park developments particularly associated with key road intersections, expansion of water treatment facilities, related to major development sites and infrastructure projects;
- Woodland expansion in the Red Rose Community Forest is likely to bring about changes to the character of the valley landscapes though is likely to be directed toward the poor quality amenity grassland and not at the expense of semi natural habitats.

There is no local level Landscape Character Assessment covering the City of Manchester.

Landscape Designations

Landscape planning designations and policies are used to provide an indication of the value attributed to the landscape/townscape resource by national and local government and can, therefore, be considered in the determination of the sensitivity of the landscape.

There are no statutory national landscape designations within 2 km of the proposed MSP facility but the site is located within the non-statutory Red Rose Community Forest designation. The Forest is a partnership between local authorities, the Forestry Commission, the Countryside Agency and other local and national organisations who together define a 30-year vision of landscape-scale improvement across the area[8].

There are no Registered Parks and Gardens or Conservation Areas within 2 km of the proposed MSP facility.

3.4.4 Assessment of Impacts

Landscape

The introduction and subsequent operation of the new MSP facility including hardstanding, 3.5 m high kiosk, 4 m tall lighting columns and fencing would represent the expansion of an existing landscape element. Whilst this would not be in keeping with the other established landscape elements in the local area, namely the regenerated vegetation and that implemented during the restoration of the landfill, the consequent magnitude of landscape change would be insufficient to generate any discernible changes to the existing largely urban landscape character.

[8] http://www.communityforest.org.uk/aboutenglandsforests.htm

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In this respect the perception or experience of the landscape in the immediate vicinity of the site would be retained. This retention would primarily be facilitated by the fact that most of the tree cover and scrub located around the site's periphery would not be affected by the proposal. As such, the aims of the Red Rose Community Forest designation would not be weakened as a result of the proposal.

Visual

Due to the scale of the proposed MSP facility it would not be visible above the adjoining tree cover to the north or south of the proposed facility. Users on PRoWs or Sustrans Cycle Route 6 within the study area would not have any views of the MSP facility due to the woodland on site. Any changes to views would, therefore, be restricted to those that could be available from housing on East Road either side of the landfill site. These properties would gain views from the gable ends, although the block of flats would gain views from windows on the north and eastern elevations. The MSP facility would primarily be noticeable due to the effect of the lighting columns, and the increased height of the existing facility which would almost double. This would generally have a negligible to moderate effect on residential receptors which would be 'not significant'.

Other receptors that would have views of the site and the proposed MSP facility are recreational receptors that cross the site on a number of desire lines. The lighting columns may be a positive addition to their experience of the area adding to a sense of safety. The increased scale of the facility when compared to the existing compound may physically obstruct their journey along the existing desire lines and would be a notable new feature in existing views, although these receptors would be habituated to the use of this part of the Site as a fenced compound.

Beyond the immediate environs of the site any visual effects would be negligible whilst the magnitude of visual change in the views available to the limited number of visual receptors, including residents of East Road and recreational receptors would be restricted to moderate.

3.4.5 Mitigation Recommendations

There is a recommendation for the proposed design / construction of development to retain the existing wooded areas and bunding around the proposed MSP facility site in order to continue to screen the development and help preserve the landscape characteristics which are contributing to the Red Rose Community Forest.

Any proposed sources of light required for the MSP facility should be carefully designed to reduce potential light spill, glare and sky glow following the *Guidance Notes for the Reduction of Obtrusive Light* published by The Institution of Lighting Engineers (2005).

3.4.6 Summary and Conclusions

The proposed works are consistent with the existing land use of the site and immediate local landscape context which is defined by the site's history as a landfill. The proposal is considered to be largely consistent with the type and scale of development currently evident on site; therefore, it is unlikely that there would be any incremental weakening of the urban character of the area. Furthermore, the presence of the perimeter tree belts ensure that there is limited intervisibility with the wider residential area, other than East Road, or the recreational routes which pass through the study area.

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3.5 Biodiversity

3.5.1 Introduction

This section summarises the findings of an Extended Phase 1 Habitat Survey and desk study of the terrestrial habitats and species that may be affected by construction and operation of the proposed methane stripping plant at the former Pink Bank Lane landfill, and provides a brief appraisal of the nature conservation features of the site. The likely effects of the proposed development on the nature conservation value of the site are also considered.

3.5.2 Methods

Desk Study

The desk study followed the guidelines for assessing the nature conservation value of sites set out by the *Institute of Environmental Assessment*[9] and the *Institute of Ecology and Environmental Management*[10]. Ecological data held by Natural England (NE), the Environment Agency (EA), MAGIC (the government environmental information partnership project), and the Greater Manchester Ecology Unit (GMEU) were consulted to identify possible ecological receptors for the proposed development, including:

- Statutory[11] and non-statutory[12] nature conservation sites within 2 km / 1 km respectively (or statutory sites beyond this distance linked by a clear impact pathway - e.g. rivers);
- Protected[13], Biodiversity Action Plan (BAP) or conservation notable species recorded within 500 m.

The geographical context of the proposed development was examined using the relevant Ordnance Survey 1:25 000 and 1:10 000 scale maps, and web-based aerial photographs, to identify key landscape features that may be important for protected, BAP or conservation notable species (such as potential migration or dispersal routes) or any potential receptors of site-derived pollutants in the wider landscape.

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[9] Institute of Environmental Assessment (1995) *Institute of Environmental Assessment: Guidelines for Baseline Ecological Assessment*, E & FN Spon, London.

[10] Institute of Ecology and Environmental Management (2006) *Guidelines for Ecological Impact Assessment in the United Kingdom* (version 7 July 2006). http://www.ieem.org.uk/ecia/index.html.

[11] Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar wetland sites (designated by Natural England), National and Local Nature Reserves etc (NNR & LNR).

[12] County-level wildlife sites (Sites of Biological Interest (SBIs) in Greater Manchester).

[13] For the purposes of this study, legal protection refers to: species included on Schedules 2 and 4 of *The Conservation (Natural Habitats, &c.) Regulations 1994* (SI 1994 No. 2716) and Schedules 1, 5 and 8 of the *Wildlife and Countryside Act 1981* (as amended), excluding species that are only protected in relation to their sale (Section 9[5] and 13[2]); and badgers, which are protected under the *Protection of Badgers Act 1992*.

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