



**UKOP THAMES MERSEY PIPELINE SYSTEM
PIPELINE SAFETY REGULATIONS
COST IMPACT ASSESSMENT FOR THE INCLUSION OF
GASOLINE AS A DANGEROUS SUBSTANCE
BPA REPORT NO: ENM-RPT-X-1283**

OCTOBER 1996



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1. **Background.**

- 1.1. The UKOP Thames Mersey Pipeline System was constructed in 1969 under the 1962 Pipelines Act. In accordance with the 1996 Pipeline Safety Regulations (SI 825), which have superseded the aspects of the 1962 Pipelines Act that cover safety management etc., the pipelines are not designated a Major Accident Hazard as they do not transport dangerous substances. HSE are currently undertaking a risk assessment to determine if gasoline should be defined as a dangerous substance, thus re-designating multiproduct pipelines as Major Accident Hazard Pipelines. If this re-designation proceeds the UKOP pipeline system would attract the additional duties under the Pipeline Safety Regulations and bring the pipelines within the scope of the proposed '*Major Accident Hazards : HSE's Approach to Land Use Planning Advice*'. This could attract serious financial implications to the pipeline owners.
- 1.2. For HSE to propose an amendment to existing regulations, they are duty bound to provide a Cost Benefit Analysis of the financial impact and benefit to society and the industry by the implementation of such regulations.
- 1.3. The pipeline industry have been in consultation with HSE via their Advisory Committee for Dangerous Substances (ACDS) during the development of the Pipeline Safety Regulations and have formed part of a steering committee for review of the gasoline pipeline risk assessment. HSE plan to present their findings to ACDS and HSC in November 1996, these will include the Cost Benefit Analysis. To assist the pipeline industry in discussions with HSE as to the applicability of the Cost Benefit Analysis, the UKOP Participants requested BPA to undertake an assessment of the potential cost impact on their pipelines. This cost impact assessment could then be compared with the HSE study and also could provide information to influence HSE.
- 1.4. The review was to deal with 3 aspects.
- 1.4.1. Define the direct financial consequences on the UKOP Thames Mersey pipeline system resulting from the additional duties for Major Accident Hazard Pipelines as defined within the Pipeline Safety Regulations i.e.
- Production of a Pipeline Safety Management System and Major Accident Prevention Document.
 - Funding of the development of Emergency Plans by each County Council Emergency Planning department.
 - Assistance to County Councils in the development of the Procedures
 - Any consequential costs associated with the increased public profile of the multiproduct pipelines.
- 1.4.2. Estimate the potential additional cost as a result of the Land Use Planning requirements and increased consultation zones for UKOP, i.e. additional planning applications to review etc.
- 1.4.3. Estimate the potential consequential cost of development loss or pipeline protection/diversion works as a result of the development restriction zones under the Land Use Planning Regulation.

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2. Major Accident Prevention Document, Emergency Plans etc.

2.1. Major Accident Prevention Document

2.1.1. BPA would need to develop a pipeline specific safety management system and Major Accident Prevention Document. Though the majority of the recommended procedures and practices are currently in place, an overall co-ordination document would be required. This document would need to meet the requirements of HSE and would be subject to audit. The approximate cost to develop such a document would be £5,000.

2.2. Emergency Plans

2.2.1. There are 11 County Councils, including the West Midlands, through which UKOP pipelines pass, although in two counties, Berkshire and Shropshire only small sections of pipeline are involved. The Thames-Buncefield section of pipeline passes a small rural part of the London Borough of Havering, therefore the London Emergency Planning Service will also be involved.

2.2.2. In addition, in April 1997, Milton Keynes becomes a Unitary Authority, and will probably set up their own Emergency Planning department, which will mean UKOP would be involved in a total of 13 local Emergency Plans.

2.2.3. Under the Pipeline Safety Regulations, the pipeline owner is liable for all reasonable costs associated with the development of such plans. A range of costs have been quoted from £1,500 to £18,000, thus for 13 plans an estimated cost of £150,000 would seem reasonable.

2.2.4. The regulations recommend that these plans are reviewed every 3 years, the cost of this review would also be recoverable from the pipeline owners. An estimated cost for this 3 yearly review would be say at the lower end of the cost of production, say £1,500. Thus for 13 plans the estimate would be approximately £20,000.

2.3. Operator Assistance

2.3.1. There is a duty for the owner to provide relevant information to both the owner/occupiers of the pipeline easement and all County Emergency Planning Officers. The provision of this information will provide additional burdens on the owner. In particular to discuss emergency plans with 13 authorities will be extremely time consuming. An estimate cost of £10,000 would be put on this duty.

2.3.2. These authorities may request all the information be provided in digital format for input into a geographical information system (GIS). UKOP pipeline routing is currently available on OS paper maps only, thus to digitise and confirm the correctness of this information would cost in the order of £100,000. It is not known if this request will be made but it is known that such systems are in use in many areas etc.

2.4. Public Relations

2.4.1. A major concern to the multiproduct pipeline industry over the proposed inclusion of gasoline as a dangerous substance is the impact on the public image of such pipelines by the change of description from "the safest form of transport" to a "major accident hazard operation". It is envisaged that this impact will result in a much increased activity in liaison with land owners/occupiers, County Emergency Planning Officers and local press. The financial cost of this activity is difficult to quantify, however, it could be substantial due to the length of the pipeline system (525km) and some 1000 owner/occupiers of the land where the pipelines

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pass. This is based on the existing easement which extends to 3m either side of each pipeline and not the potential planning zones.

3. Increased Planning Consultations.

3.1. The pipelines cross 29 Districts which are responsible for Planning Applications. BPA currently request to be consulted for all planning applications within 200m of the pipeline, however, under existing legislation the pipeline operators have no powers outside the 3 metre zone and cannot insist on being consulted with regard to applications further from the pipeline.

3.2. The Land Use Planning regulations will enforce the requirements for consultation with the pipeline owner within a greater zone, probably in the order of 100m either side of the pipeline. In the last 10 months BPA have only received details of 28 applications concerning developments which would need to be referred to HSE under the proposed new Land Use Planning Advice, and these consultations were only received from 11 of the 29 Councils (in fact 2 Councils account for 15 of the consultations)

3.3. It is difficult to believe there have been no applications for developments within 200 metre of the pipelines in the remaining Districts but at least, as the result of the regular pipeline surveillance we know that there have been no cases of building works within the 3 metre zone about which we were not aware.

3.4. In order to obtain an overall picture of the implications that the new Land Use Planning Advice would have with regard to the number of consultations BPA would be likely to receive, BPA contacted a number of District Councils. These were chosen for various reasons:-

- Milton Keynes / Commission for New Towns - Major developments taking place
- North Warwickshire Borough Council- A rural area very much aware to the pipelines as Kingsbury is in the District
- Chiltern District Council - A District which sends in the second highest number of enquiries
- Brentwood District Council - A District which never consults with BPA on planning matters.

3.5. It was apparent that none of the Councils contacted were aware of the Draft HSE document.

3.6. The following responses were obtained as a result of the meetings.

3.6.1. **Milton Keynes.** There have been no recent consultations. This is because, apart from some industrial development near where the pipelines were diverted, about which we were consulted a few years ago, there has been no development near the pipelines. The planners are aware of the existence of the pipelines.

3.6.2. **North Warwickshire District.** The planners were well aware of the pipelines and believed they had consulted us when necessary. Being a rural area they did not anticipate any changes if the pipelines were considered Hazardous, therefore for the foreseeable future changes in legislation are unlikely to increase the financial exposure to the pipeline owners, but would increase the number of consultations made.

3.6.3. **Chiltern District.** The planners confirmed the pipelines are within the green belt. The pipelines are relatively close to the District boundary and the likelihood of changes to the green belt and subsequent major developments is small. The number of consultations is

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unlikely to increase as they already consult BPA for all planning applications within 200 metres of the pipelines.

- 3.6.4. **Brentwood District.** It appears that the Council planners had confused the UKOP pipelines with gas pipelines. This explains why BPA have not received any consultations. However the UKOP pipeline is in the green belt area, and as this is separating Greater London from the District, it is rigorously maintained. In the last 6 years the only applications within 200 metres to the pipeline have been for single house extensions etc. The planners could see little risk of any major development within the vicinity of the pipeline, and therefore there is little chance of any loss of development claims. BPA should receive more consultations in the future.
- 3.7. On the basis of these visits it seems likely that only one District is at present regularly contacting BPA with details of relevant planning applications. If the pipelines are re-designated as Hazardous there will be more responsibility put upon the District Councils, and this should result in BPA being consulted on far more planning applications. If we assume Chiltern District sets the standard we have to assume there will be a 10-15 fold increase in the number of consultations, taking the total to approximately 300-400 per annum; this does not include applications for mineral extraction which should remain the same as at present.
- 3.8. The costs of reviewing the additional consultations would be probably be the order of £ 5-10,000 pa, plus any additional specialist legal and lands advice.

4. Consequential Cost of Loss of Development or Diversion

- 4.1. The standard Deed of Grant sets out a procedure that the land owner has to follow if they are to claim the existing pipeline has caused a planning application to be rejected or caused a reduction in the potential for development. The Deed also gives the pipeline owner the right to decide whether or not to pay compensation or divert the pipeline. Any diversion has to remain on the land owners property and the ingress and egress points have to be the same i.e. a land owner cannot alter the position of the pipeline onto land belonging to a neighbour.
- 4.2. The draft Land Use Planning Advice document prepared by the HSE defines the various consultation zones the size of which depends upon a number of variables including the diameter of the pipe, wall thickness, type of product, etc.

For the purpose of this review we have taken zone distances from the A.D.Little report, Risks from Gasoline Pipelines in the United Kingdom, August 1996 (extract given in Appendix A). They are :-

- Zone 1 - 0 to 3 metres
- Zone 2 - 3 to 61 metres
- Zone 3 - 61 to 95 metres

- 4.3. These zones are used by the Planning Authorities and the HSE to determine if the residual risk within the zone is acceptable for the particular development. The aim is to protect the sensitive population (young and old) and large scale developments. Applications for major housing, schools, hospitals, old peoples homes would be unlikely to be acceptable within any of the zones and thus present a high risk of loss of development claims. Whereas industrial developments would generally be acceptable in zones 2 and 3 and therefore most potential claims could be refuted by a re-design of the layout; by keeping the buildings as far as possible from the pipelines, and using the 'Hazardous' zone for car parking/landscaping etc.
- 4.4. A study of Tamworth shows that, since the pipeline was built, housing has now surrounded the route with an average density of 25 houses within the middle zone per 100 metres of pipe

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route and 36 houses within zone 3. There is a mixture of house types, so we have assumed an average price of £75,000.

- 4.5. A builder would expect to make 15 - 20% profit on the sale of a house, and it is this profit that they would claim if the development was restricted. Therefore in Tamworth we can estimate a claim of between £ 280,000 to £540,000 per 100 metre run of pipe if the pipelines become 'Hazardous'.
- 4.6. The size of the claims will obviously depend on the density of housing and the price of the housing. Studying other developments close to pipelines the highest density is in the region of 50 properties per hectare. These would obviously be small houses and therefore 'cheap'. However overall the figures obtained for Tamworth appear reasonably standard. On average a claim for a low density housing development, which automatically means more expensive housing, tends to result in a larger 'claim'
- 4.7. Based on the discussions with the selected Districts, there are three areas where major development is likely, and at two of these plans for development could result in claims for compensation in the event that the pipelines are designated as a Major Accident Hazard. These are:-

4.7.1. **Milton Keynes**

- (a) The current Local Plan allows for development of approximately 3 kilometres of the pipeline route. The UKOP pipelines (TK and MB) were diverted in 1991 to the edge of the defined development area and since that time the planners have followed a policy of not allowing any buildings within 15m of the pipelines. They have been quite prepared to follow this policy without making any claims for 'loss of development', however the zone distances being proposed would potentially cause them problems and financial loss.
- (b) The actual designation of land for housing, industry and leisure has already been made, and therefore their plans for the south west of Milton Keynes, would either need to be revised, or they would look for compensation.
- (c) The planners were able to emphasise the problems with respect to one particular site, which is right on the south west corner of the District boundary. The triangular site has been designated as a hotel site as it is on one of the major roads into the town. Both the Thames/Mersey and Kingsbury/Buncefield pipelines are laid along one side and across the middle of the site (see Appendix B).

If the Major Accident Hazard designation come into use the development would fall under Sensitivity Level 3 and virtually the whole site would be within the 1×10^{-6} range i.e. not be allowed within zones 1, 2 or 3. The only other possible use would be for industrial use, which is against the development plans and more importantly not feasible due to the infrastructure already built. The Commission for New Towns, who are the present owners would look for compensation. (Land values are in the region of £740,000 per hectare, and the site is approximately 4 hectares). Under the present situation the site could easily be developed with no claim against the pipeline owners.

- (d) With regard to the remainder of the south west sector we can assume approximately 25% is for industry, and the pipeline is unlikely to have too big an effect as it should be possible to position most of the buildings a distance from the pipelines (For the record in the last 6 years there has been only one case where BPA would have found it very difficult to redesign a development to accommodate the pipelines. This was at Uttoxeter where the section of pipeline was abandoned)

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- (e) The remaining 75% is for housing, and there is a strong possibility of a claim for loss of development. The pipeline is very close to the District boundary, and housing is therefore planned for one side only. As mentioned above the plan was to ensure houses at least 15m. from the pipelines, but under the new regulations this distance is likely to be approx. 75m. The density of housing has not been finalised so could vary from say 50 to 20 per hectare.
- (f) On the basis that an additional 60 metres of land would be effectively sterilised the area under consideration would be in the order of 6 hectares. Using the housing densities above, the loss of housing could vary from 300 to 120 units. Assuming the 300 units sold for £50,000 each the loss of profit would be in the region of £2.25 million, and assuming 120 units sold for £150,000 each the loss of profit claim would be in the region of £2.7 million. Although not definite we have to assume that this area will be developed in the next 5 years.
- (g) Although not included in the current plan, it is anticipated that land around an additional 6 kilometres of pipeline route, to the west of the existing town is very likely to be developed as at the end of the current local plan there will be only 2 areas left within the Borough boundary available for development.
- (h) Obviously if the planners are aware of the problem well in advance they have to use their 'best endeavours' in attempting to reduce any claim for loss of development. Bearing in mind that there has been talk in the press for a requirement of an additional 4 million houses we can safely assume this area will be developed, Bucks CC County plan anticipates 32,000 additional homes in Milton Keynes in the years 1991-2011. Assuming this housing is built, the area 'lost' could be in the region of $6000 \times 130m = 78$ hectares. As part of the area would be schools and open space we consider 75% would be housing, therefore 60 hectares. On current prices compensation would be in the region of £20 to £30 million. In this circumstance it would prove cheaper to divert the pipelines, if feasible, to the edge of the District so compensation could only be claimed for loss of development along one side of the pipeline. The cost of diversion would be in the region of £3 million, so there could be a saving in the region of £7 to £12 million.
- (i) What this situation emphasises is the importance of liaising with the planning departments in order to give them the best opportunity of planning major developments to cause the minimum of claims for compensation.

4.7.2. Tamworth

- (a) Approximately 7 km of pipeline are laid in Tamworth, of which 2.4 km was green field land at the time of pipeline construction This land has subsequently been developed partly for housing and partly for industry, with no claim being made to the pipeline owners for loss of development.
- (b) Under the current Local Plan housing developments are planned along 300m of pipeline route. Within the current legislation we would expect this development to proceed without any claims for compensation. However, if the pipeline is designated as Hazardous before development occurring there is the probability of claims in the region of £750,000 to £1,500,000. The area is close to the District boundary so it may be possible to reduce the claims by diverting to the boundary, as there is little risk of the adjacent District allowing development along their side of the boundary.
- (c) 1.9 km of pipeline route is in an area of restraint, where the Council have no plans at present other than to restrict development. 1.4 km is through green belt and for the remainder of the pipeline route the plans for the land are unspecified. Whilst it is difficult to redefine green belt land, the area of restraint could ultimately be released for development, particularly as the area is close to the District boundary.

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4.7.3. Northampton

- (a) The third area is along the Northampton Spur pipeline where virtually the whole length has been designated for industrial development
- 4.8. For the remainder of the pipeline routes, the visits made to the planners and Local Plans received to date, have not made BPA aware of any other plans for major developments apart from those about which the UKOP Participants have already been advised in the BIBs. However, from information gathered at the time of the Environmental Reviews there are a number of small developments which at present could be accommodated close to the pipelines but which in the future could result in claims for compensation for an area in the region of 17 hectares.
- 4.9. In addition we need to be aware that new housing is still required and, assuming the pipelines are in existence for the foreseeable future, additional developments will take place, some of which could easily result in claims for compensation. We estimate approximately 7.0 km of pipeline route is within 100 to 200m of locations where additional housing is a possibility, in particular these locations are where relatively new housing developments are already in existence and could therefore be expanded.
- 4.10. We also need to be aware that Local Plans are continually revised, and even the extent of the green belt can be altered, all be it with difficulty.

5. Cost Impact Summary

The summary of the costs given within the above is as follows:-

5.1. Set up costs

Para 2.1.1 - Development of MAPD	£ 5,000
Para 2.2.3 - Payment for Emergency Plans	£ 150,000
Para 2.3.1 - Operators assistance in development of the plans	£ 10,000
Total	£ 165,000

5.2. Increased Annual Operating costs

Para 2.2.4 - Update of emergency plans (20,000 every 3 years)	£ 6,667
Para 2.4.1 - Increased PR Department	£?
Para 3.8 - Increased consultations	£ 10,000
Total	£ 16,667

5.3. Consequential Costs of loss of Development or Diversions

Based on the known plans which would generally be undertaken within a 5 year period there is a potential cost exposure of :-

Milton Keynes	Para 4.7.1(c)	£ 3,000,000
	Para 4.7.1(f)	£ 2,700,000
Tamworth	Para 4.7.2(b)	£ 1,500,000
Total		£ 7,200,000

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- 5.4. This is for a 5 year period therefore the annual cost would be in the region of £1,440,000, say £1.5 million.
- 5.4.1. These costs are based on the two largest known development areas on the UKOP Thames Mersey Pipeline system. For the development on this cost impact assessment it has can be assumed that these will equate to at least 50% of the likely major claims for loss of development. Therefore the total estimated annual cost could be in the order of **£3,000,000**.
- 5.4.2. Finally, the probability of all these developments being undertaken in the next 5 years is not known, therefore, for completing any estimate of cost exposure, the annual estimate above should be weighted with a probability of the development being undertaken and that any settlement will be to the level estimated. For the purpose of this review we have considered that the overall probability of these two events is 25%. Therefore the revised annual cost impact is **£750,000**.
- 5.5. These costs are for the UKOP Thames Mersey Pipeline System only. This system represents only 585 km of the 3,600 km of multiproduct pipeline in the UK. therefore all estimates should be escalated by 600% to equate to the financial impact on the UK Multiproduct Pipeline Industry.

6. **Comparison with HSE's Cost Benefit Analysis**

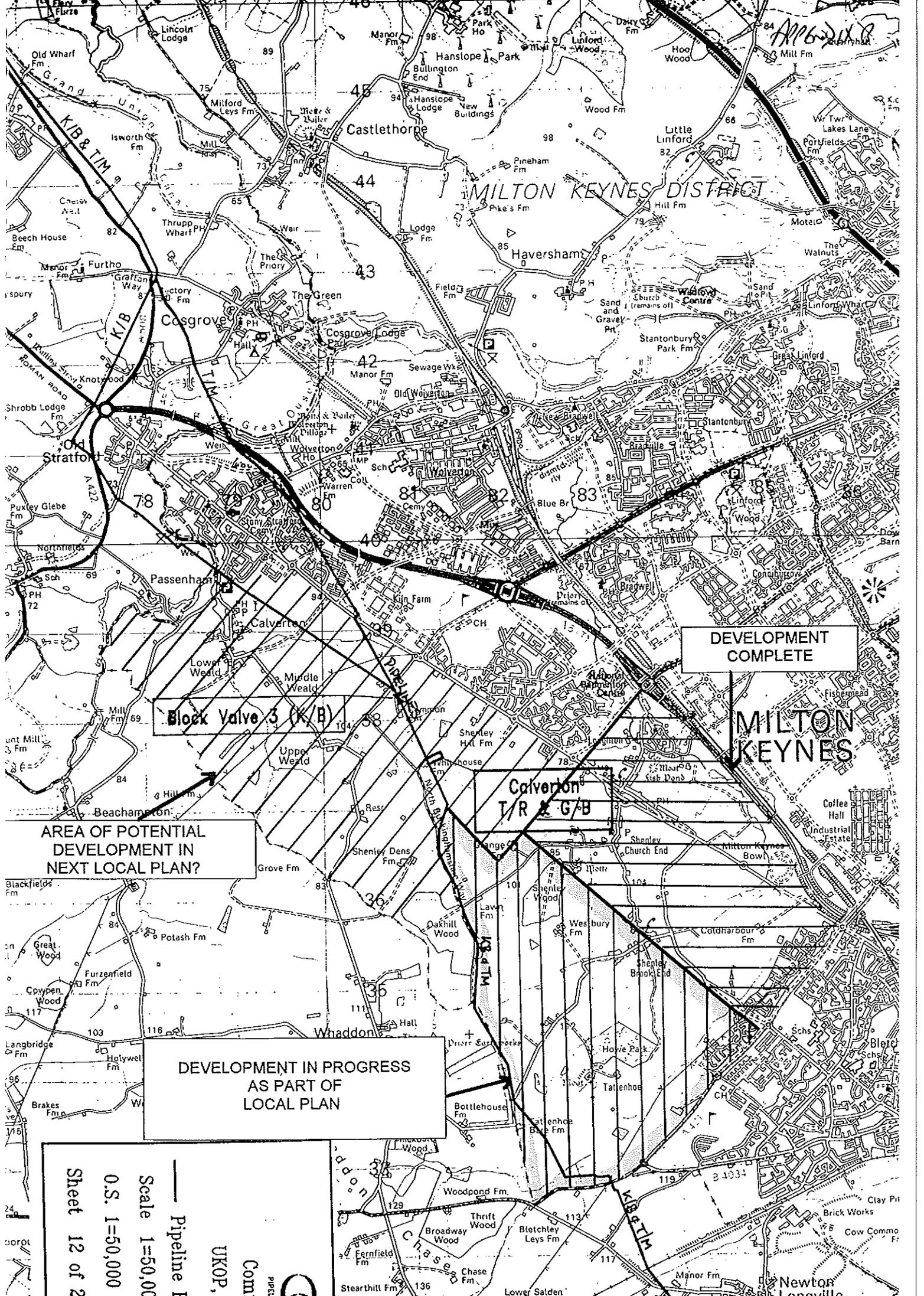
- 6.1. A comparison cannot be made as HSE's have yet to issue a draft to ACDS of the Gasoline Risk Assessment sub committee.
- 6.2. From discussions with HSE, they would undertake a Cost Benefit Analysis based on the overall cost to society of the regulation and not the potential compensation of a development. A specific example is that if a developer wished to build a Old Peoples home next to the pipeline and planning permission was rejected due to the presence of the pipeline, compensation could claimed from the owner. However, HSE would only consider the cost impact if there was not alternative land within the general area for the development, regardless of the wishes of that developer etc.

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Table (I) Summary of Individual Risk Results

Pipeline Outside Diameter	Location	Sensitivity Bound	Soil Type	Shut off time if Clay Soil	Burial Depth (m)	Distance to 10 ⁻⁶ /year	Distance to 3 x 10 ⁻⁷ /year
16"	Urban	High	Clay	Good/poor	0.9	78	104
	Urban	High	Average	-	0.9	74	100
	Urban	Middle	Average	-	0.9	65	95
	Rural	Middle	Average	-	0.9	-	80
12 ³ / ₄ "	Urban	Middle	Average	-	0.9	61	95
	Rural	Middle	Average	-	0.9	-	77
8 ⁵ / ₈ "	Urban	Middle	Clay	Poor	0.9	61	92
	Urban	Middle	Clay	Good	0.9	51	86
	Urban	Middle	Average	-	0.9	45	78
	Urban	Middle	Average	-	2	30	74
	Urban	Middle	Average	-	3	24	69
	Urban	High	Average	-	0.9	54	85
	Urban	Low	Average	-	0.9	27	71
	Rural	High	Average	-	0.9	23	69
	Rural	Middle	Average	-	0.9	-	61
	Rural	Low	Average	-	0.9	-	50
6 ⁵ / ₈ "	Urban	Middle	Average	-	0.9	5	36
	Rural	Middle	Average	-	0.9	-	26

APPENDIX 2



DEVELOPMENT COMPLETE

Block Valve 3 (K/B)

MILTON KEYNES

AREA OF POTENTIAL DEVELOPMENT IN NEXT LOCAL PLAN?

Calverton T/R & G/B

DEVELOPMENT IN PROGRESS AS PART OF LOCAL PLAN

Sheet 12 of 22

O.S. 1=50,000

Scale 1=50,001

— Pipeline R

UKOP, Comm