



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

RISK ASSESSMENT IN TERMS OF REGULATION 8 OF THE WASTE EXCLUSION REGULATIONS

APPLICANT	The South African Bitumen Association
WASTE STREAMS OR PORTION OF A WASTE STREAM TO BE EXCLUDED FROM THE DEFINITION OF WASTE	Reclaimed Asphalt (RA) or Reclaimed Asphalt Pavement (RAP)
BENEFICIAL USE/S	<p>Asphalt is primarily used in road construction. It used to bind mixed aggregate particles to create asphalt concrete.</p> <p>Reclaimed asphalt refers to the portion of asphalt which, once removed from an existing road surface, is reclaimed and re-used for the purposes of new road building, maintenance or repair. RA typically consists of 95% high quality aggregate and 5% of aged bitumen.</p> <p>The asphalt is removed by means of a milling process which removes the surface layers of the existing road by means of a milling machine. If this removed material is suitable for reclamation and recycling it is then re-used by mixing it with new (virgin) aggregate and new binder in a mixing plant to produce recycled asphalt material.</p>
WASTE GENERATING FACILITY OF FACILITIES	
PHYSICAL ADDRESS OF FACILITY OR FACILITIES	N/A
GPS COORDINATES OF WASTE GENERATING FACILITY OR FACILITIES	N/A
CONTACT PERSON	
NAME	Sabita (The Southern African Bitumen Association)
ADDRESS	Postnet Suite 56, Private Bag X21, Howard Place, 7450
EMAIL ADDRESS	info@sabita.co.za

<p style="text-align: center;">TELEPHONE</p>	<p>+27 (0)21 531 2718</p>
<p>*DETAILED DESCRIPTION OF WASTE GENERATING PROCESS</p>	<p>The proposed activity can be briefly described as the use of RA in asphalt plants and processes and includes the following steps and activities:</p> <ul style="list-style-type: none"> • Milling of RA (tested and found to be of sufficient standard and quality). • Transportation of RA to an asphalt plant. • Stockpiling of RA at an asphalt plant. • Grading, fractionating and/or crushing of RA for incorporation into asphalt mixes. • Application of RA within asphalt mixes. <p>Recycled or reclaimed asphalt refers to the portion of asphalt which, once removed from an existing road surface, is reclaimed and re-used for the purposes of new road building. The asphalt is removed by means of a milling process which removes the surface layers of the existing road by means of a milling machine. If this removed material is suitable for reclamation and recycling, it is then re-used by mixing it with new (virgin) aggregate and new binder in a mixing plant to produce recycled asphalt material.</p> <p>Note: the milling process takes place as part of the road repair and construction process regardless of whether the removed asphalt will be reclaimed or not.</p> <p>Recycling processes that utilise reclaimed asphalt include either <u>cold</u> or <u>hot</u> mix technologies which either take place <u>in-situ</u> or <u>in-place</u> or <u>in plant</u> i.e. at an asphalt plant, and not at the construction site.</p> <p>When stationary plant is used and RA is incorporated, it consists of removing the road material from the site where it is recovered to a plant located elsewhere which recycles the reclaimed asphalt in order to re-use it, either for the original project (i.e. where it was removed) or on other projects. These are typically well-established and fairly large facilities that provide asphalt for a variety of projects at any one time.</p> <p><i>In-situ</i> recycling takes place on the same site that the material has been reclaimed from and allows the material to be incorporated directly back into the new asphalt pavement under construction or maintenance.</p> <p>It is important for environmental reasons to utilise the growing stocks of RAP because an added advantage of recycling is that the use of virgin aggregate and bitumen can be reduced.</p>

The mixing of asphalt and aggregate is accomplished in one of several ways depending on the purpose and design of the road surface. The mixing and manufacturing of asphalt can be divided into two major process methods: hot or cold techniques.

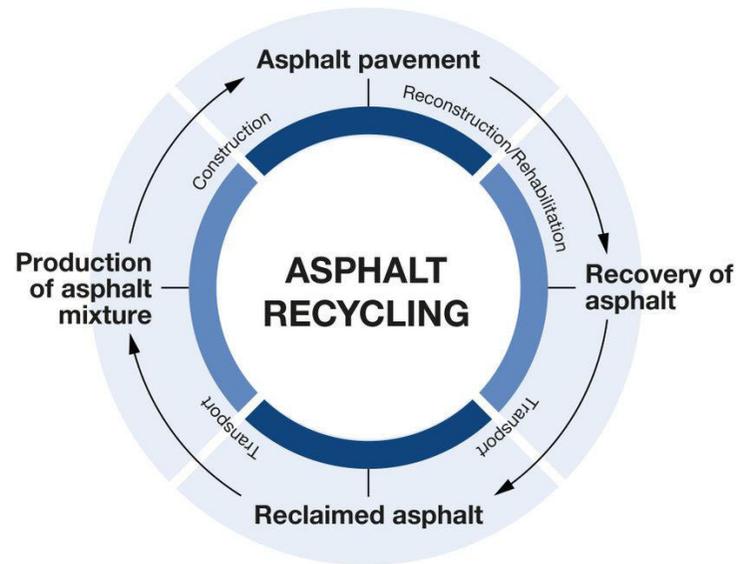


Figure 1: Asphalt Recycling process¹

In order to obtain RA, a milling process is usually used instead of breaking asphalt up using bulldozers or excavators. Milling has the advantages of:

- Fragmenting the asphalt to achieve a fairly uniform grading.
- The ability to remove the asphalt without disturbing the edges or underlying materials in the pavement.

¹ Source: https://www.researchgate.net/figure/Ideal-life-cycle-of-reclaimed-asphalt_fig8_317862596

- Removing the asphalt precisely to the prescribed thickness. This enables selective milling to be carried out where this is found desirable during the design stage, such as when more than one type of asphalt is found in the pavement, and
- Reducing the potential risk of contaminating the RA with material from the underlying layerworks.

The RA will then be processed by crushing and screening to further granulate and grade the RA into the specified size required to be added into the asphalt mix.

Any tailings (oversized material) not suitably processed are returned to the stockpile to be processed at a later stage, thus ensuring that 100% of the RA is utilised. Once the RA has been processed it is stockpiled separately before it is included into the asphalt mix.

The concept for asphalt mix plants is divided into two main types:

- Drum mix (continuous process) plants
- Batch mix plants

An asphalt plant can be divided into the following main parts:

- Hoppers of the cold feed unit
- Aggregate drying unit and connecting bag filter, wet or dry scrubber filter system
- Bitumen storage tanks and filler silos;
- Mixing tower: mixing unit,
- Silos for sorting and loading hot asphalt

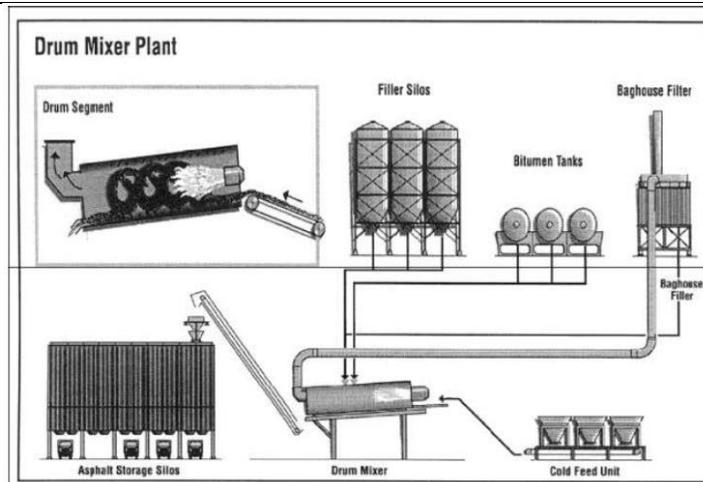


Figure 2: Schematic drawing of a typical drum mixer plant setup for temporary plants

Most asphalt plants are permanently sited installations (fixed plants). However, in some cases it is advantageous to move an asphalt plant from site to site to supply major works. This requires availability of temporary plants. A further variation is the limited use of driven asphalt plants where the mixing and laying of asphalt is unified in a continuous process on the job site.

Basic process

The asphalt mixing process consists of heating and drying aggregates which then are mixed with filler and bitumen. The mixed asphalt is then transferred directly to waiting delivery trucks or to silos for short-term (surge) storage or for longer-term storage before loading into trucks for transportation to the paving site.

The complete plant operation is monitored from the control room of the plant. The degree of automation and electronic control varies between plants, depending mainly on plant mobility and age. Small plants can be operated through simple control mechanisms. A fully computerised process control can monitor for example: burner combustion, fuel consumption, process air volumes, drum pressures, exhaust gases, bag-house pressure, flow rates for used materials and finished mix transfer, discharge and storage selection.

<p>PRODUCTION PROCESS FLOW CHART ATTACHED</p>	<p>YES X (Figure 2 shows production flow chart)</p>	<p>NO</p>
<p>WASTE CLASSIFICATION</p>	<p>HAZARDOUS X</p>	<p>GENERAL</p>

<p>IF WASTE IS HAZARDOUS LIST THE HAZARDS OF THE WASTE</p>	<p>RA typically consists of aggregate (\pm 95%) and bitumen (\pm 5%).</p> <p>Tar and Bituminous wastes are regarded as Hazardous.</p> <p>Aggregates are a broad category of coarse particulate material, including sand, gravel, crushed stone, slag, recycled concrete and geosynthetic aggregates. The aggregates used for road building are inert mineral materials. Aggregates are the most mined materials in the world.</p> <p>Bitumen is a non-renewable petroleum-based product. There are specifications for the different grades of bitumen, based on physical properties which can be achieved for specific applications either directly via refining or by blending. The bitumen used for road building is correctly known as “refined bitumen” and is a semi-solid hydrocarbon product produced by removing the lighter fractions (such as liquid petroleum gas, petrol and diesel) from heavy crude oil during the refining process.</p> <p>The following is an extract from the Sabita Information Sheet #1 – Bitumen:</p> <p><i>“Bitumen is a dark brown to black viscous liquid or solid, consisting essentially of hydrocarbon material. At ambient temperatures bitumen has a solid or semi-solid consistency and softens gradually when heated. Bitumen used in South Africa is obtained as an end product of the petroleum crude oil refining process. As a binder, bitumen is especially valuable to the engineer because it is a strong, readily adhesive, highly waterproof and durable material. It also provides some flexibility to mixtures of mineral aggregates (stones) with which it is usually combined in road or airfield pavement structures. It is highly resistant to the action of aggressive chemicals.</i></p> <p><i>Bitumen presents a low order of potential hazard, provided that sound and responsible practices are observed during the handling of the product. The most significant hazard associated with bitumen is the high temperature (120 - 210°C) at which the product is held during handling and processing. It is therefore critical that appropriate personal protective equipment is worn to avoid any skin contact with hot bitumen.”</i></p>
---	--

	<p>In addition, bitumen is often confused with tar. Although bitumen and coal tar are similarly black and sticky, they are distinctly different substances in origin, chemical composition and in their properties. Coal tar is produced by heating coal to extremely high temperatures and is a by-product of gas and coke production. It was widely used as the binding agent in road asphalt in the early part of the last century, but has since been replaced by refined bitumen.</p> <p>Prior to reclamation, asphalt is always investigated and tested to determine if it meets the required standard for reuse. The use of asphalt contaminated with tar (coal tar) is strictly prohibited for environmental and health reasons (carcinogen).</p> <p>In terms of SABS Code of Practice 0228-1990: tar is declared to be hazardous and should not be confused with bitumen which is an inert and non-hazardous material.</p>
<p>*A process flow chart must be attached to the process description</p>	

RISK ASSESSMENT WITHOUT MITIGATION

Risk Assessment for Asphalt Plants								
Activity	Risk Description	Environmental Receptors	Assessment of Risk					Significance
			Impact	Probability	Magnitude	Duration	Scale	
Plant start-up and shut down	Air Emissions: <ul style="list-style-type: none"> Stack dust Fugitive dust Gaseous emission 	Atmosphere	High	5	8	4	1	SP = 65
Drying/heating/mixing process Whole filler system/process	SO ₂ ; NO ₂ ; PM; TVOC; CO; PAH	Surrounding communities and workers on site	High	5	8	4	2	SP = 70
Site storage and handling	Hydrocarbons (cut-back Bitumen Burner fuels, Diesel)	Surrounding environment (unprotected areas)	Moderate	3	8	1	1	SP = 30

Manufacture/storage/handling	Offensive odours	Surrounding communities and workers on site	Low	5	2	1	2	SP = 25
Plant operation	Noise	Surrounding communities and workers on site	Low	5	2	1	1	SP = 20
Plant operation	Process waste (including laboratory waste)	Soil and groundwater resources	Low	5	4	2	1	SP = 35
Plant operation	Visual aspects	Surrounding communities	Moderate	3	2	5	2	SP = 45
Stormwater management	Stormwater	Surface and groundwater resources	Moderate	3	8	3	2	SP = 39
Risk Assessment for RA								
Activity	Risk Description	Environmental Receptors	Assessment of Risk					Significance
			Impact	Probability	Magnitude	Duration	Scale	
Suitability Testing against standards for reuse	Coal Tar content	Surrounding communities and workers on site	Moderate	2	8	5	2	SP = 30
Stockpiling of RA	Leachability	Surface and groundwater resources	Moderate	3	8	3	2	SP = 39
Stockpiling of RA	Visual Impact	Surrounding communities	Low	3	2	5	2	SP = 15
Stockpiling of RA	Dust	Surrounding communities and workers on site	Low	3	4	1	2	SP = 21

The following factors and criteria must be used to assess the impacts of the activities:

Criteria	
Magnitude (severity)	Duration
10 – Very high	5 – Permanent (longer than 10 years)
8 – High	4 – Long-term (5 to 10 years)
6 – Moderate	3 – Medium-term (12 months to 5 years)
4 – Low	2 – Short-term (0 to 12 months)
2 – Minor	1 - Immediate
Scale	Probability (likelihood)
5 – International	5 - Definite
4 – National	4 – Highly probable
3 – Regional	3 – Medium probability
2 – Local	2 – Low probability
1 – Site only	1 – Improbable
0 – None	0 – None

Magnitude

Magnitude measures the size of the impact

Duration

Duration refers to the lifetime of the impact i.e. how long it will last

Scale

The scale refers to the extent of the impact

Probability

The probability refers to the chance of impact to occur. The potential impact could be most likely to occur, unlikely etc.

Assessment of Significance of impact

Significance rating of the potential impacts illustrates the importance of the impact itself. The size of area affected by pollution may be extremely high but the significance of this effect is dependent on the concentration or level of pollution in that area. In order to determine the significance of impact, the following method was used:

Significance Points (SP) = (Magnitude + Duration + Scale) x Probability

The Values of SP are then ranged as follows:

Rating		Description
SP >60	Indicates high environmental significance	An impact which could influence the decision about whether or not to proceed with the activities regardless of any possible mitigation.
SP 30 – 60	Indicates moderate environmental significance	An impact or benefit which is sufficiently important to require management and which could have an influence on the decision unless it is mitigated.
SP <30	Indicates low environmental significance	Impacts with little real effect and which will not have an influence on or require modification of the activities.
+	Positive impact	An impact that is likely to result in positive consequences/effects

I, M Saied Solomons hereby declare that I have read the completed the Risk Assessment form and hereby confirm that the information is to the best of my knowledge true and correct.

Furthermore, I declare that I am fully aware of my responsibilities in terms of the Waste Exclusion Regulations, and that failure to comply with these Regulations may constitute an offence in terms of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008).

Applicant (Full names):

Designation: Chief Executive Officer

Signature:



Date: 1st April 2020

Place: Cape Town

FOR OFFICE USE ONLY			
Date Received			
Decision Taken	Authorised		Not authorised (provide reasons)
Reference Number			