RMA92032968 - 318 Kennedys Bush Road. Risk Assessment

Item	Activity	Risks	Avoidance/Mitigation measures	Likelihood scale of the identified Risk(s)[1]	Comments
1	Loading at 36 Colwyn Street (comprising excavation of soils, placement onto truck and trailer, double bag containment)	The release of airborne asbestos fines during excavation, handling and loading onto the truck and trailer.	1. The property is private and there is no public access. The loading area is a limited access area for authorised personnel only. 2. All workers wear asbestos rated Personal Protective Equipment (PPE) and will have undergone specific training. 3. All soil to be wetted/sprayed with water before earthworks commence and prior to loading. 4. No earthworks will take place in windy conditions. 5. Earthworked soils to be double bagged (being a 200µm polythene liner, folded over four times; and tarpaulin cover over trailer) on the truck and trailer. 6. Machinery is hosed down at the end of each day and on completion of the earthworks.	Very unlikely (0-10% probability)	The release of airborne fines is very unlikely as they can easily be prevented by ensuring they are bonded with other larger particles. The majority of the asbestos is already bonded with other larger particles (such as concrete). The surface layer of asbestos containing soils are also bonded by a polymer seal. Water will be used to prevent the generation of dust during loading. A water supply is readily available from an on-site water cart. Placement of the removed soil containing asbestos within thick plastic liners will maintain the moisture content of the soil during transit.

[1] The 'likelihood scale' uses the calibrated language for describing quantified uncertainty set out in Environment Court decision RJ Davidson Family Trust v Marlborough District Council [Decision No. [2016] NZEnvC 81], Table 1, para' 42.

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2	Transportation to 318 Kennedys Bush Road	An accident occurs during transit that results in the load being dispersed off the truck and asbestos fines are released (either due to loss of soil moisture content sufficient to create dust and/or the creation of asbestos fibres where previously bonded with other substances).	1. All workers will have undergone specific health and safety training. 2. The placement of the soils within a double bag (being a 200µm polythene liner, folded over four times; and tarpaulin cover over trailer). 3. Wheel-wash before the truck and tailor leave 36 Colwyn Street. 4. The identification of a designated traffic route and a Traffic Management Plan enabling recording and monitoring of traffic movements. Drivers will be in radio contact. 5. Upgrade the farm track with metal to ensure access track fit for the vehicle loads. 6. Monitor and maintain the condition of the farm track.	Exceptionally unlikely (0-1% probability)	The release of asbestos fines is exceptionally unlikely. Transportation will take place in accordance with road traffic laws, including speed limits. The Land Transport Regulations require hazard signage to alert emergency services of the presence of a hazardous substance in event of an accident. Manifest carried specifying the load and precautions taken. The Traffic Management Plan will ensure any difficulties are speedily identified and assistance provided. The proposed track upgrades have been identified by the contractor to ensure safe passage on the internal access tracks at 318 Kennedys Bush Road. The Traffic Management Plan will assist co-ordinate vehicle passing in addition to driver radio contact. In the unlikely event of an accident the release of airborne fines can be prevented by maintaining soil moisture content. The double bagging of soil will prevent spills in most cases. A water spray will be carried on the vehicle in the further unlikely event of a spill occurs outside of the double bagging.

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3	Construction of the containment cell (comprising partial removal of capping layer of the existing containment cell to create trenches for the subsoil drains, placement of subsoil drains and filter fabric, placement of filter fabric over base and sides of containment cell)	Disturbance to the existing containment cell is caused during earthworks to create 2 x trenches (450mm D x 38m L (max)) over the existing containment cell and disturbance takes place to the crushed concrete sufficient to lead to the release of asbestos fines and heavy metals to air.	1. The property is private and there is no public access. The disposal area is a limited access area for authorised personnel only. 2. All workers wear asbestos rated Personal Protective Equipment (PPE) and will have undergone specific training. 3. The excavations that remove the capping layer above the existing containment cell are limited to 2 x trenches. The existing containment cell will continue to be contained by the existing filter fabric. Excavations will be undertaken by hand test pitting and then a flat headed digger bucket to enable careful excavation to be undertaken. The general depth of the filter fabric is all that is required. 4. The existing containment cell contains crushed concrete contaminated with asbestos and to a minor extent with heavy metals. In the unlikely event the existing containment cell is exposed through the existing filter fabric it will be instantly covered over with the same excavated soils, compacted and left in place. 5. A water supply is readily available from an on-site water cart. 6. Air quality monitoring stations will be in place to ensure any accidental release of asbestos fibres is detected and that further mitigating steps are undertaken.	Very unlikely (0-10% probability)	The release of asbestos fines is very unlikely as the crushed concrete is protected by filter fabric. Accidental disturbance of the filter cloth will be easily identified, very confined, and easily repaired. The area can only be accessed by authorised personnel, the location is remote and air monitoring will be in place.

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4	Unloading at 318 Kennedys Bush Rd (comprising removal of tarpaulin cover, placement of polythene lined soils within the excavated containment cell)	1. The polythene liner is ripped during unloading and asbestos fines are released to air. 2. Asbestos fines are released through the subsoil drain system.	1. The property is private and there is no public access. The disposal area is a limited access area for authorised personnel only. 2. All workers wear asbestos rated Personal Protective Equipment (PPE) and will have undergone specific training. 3. The unloaded soil will remain sealed within a 200µm polythene liner. Double bagging makes loss of soil moisture content unlikely. 4. If polythene liner rips during unloading, moisture content can be maintained with the application of water. Replace any displaced soil into the polythene liner and tape polythene patch over ruptured area. 5. No earthworks in windy conditions. 6. Machinery is hosed down at the end of each day and on completion of the earthworks. 7. Air quality monitoring stations will be in place to ensure any accidental release of asbestos fibres is detected and that further mitigating steps are undertaken. 8. The subsoil drains are designed to ensure any water that collects within the containment cell excavation can escape rather than accumulate over time. In addition to contaminated soils being contained within a polythene liner (item 4. above) the subsoils drains are separated by 3 x layers of filter fabric.	Very unlikely (0-10% probability)	1. The release of asbestos fines is very unlikely as asbestos containing materials will be sealed within polythene liners, the area can only be accessed by authorised personnel, the location is remote and unloading will take into the excavated hollow. A water supply is readily available from an on-site water cart. 2. The asbestos fines are contained within plastic liners. The filter fabric provides additional safeguards.

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5	Management of containment cell prior to capping (comprising storage of polythene lined asbestos containing materials prior to capping by soils).	1. The polythene liners are ripped insitu and asbestos fines are released to air. 2. Asbestos fines are released through the subsoil drain system.	1. The property is private and there is no public access. The disposal area is a limited access area for authorised personnel only. 2. All workers wear asbestos rated Personal Protective Equipment (PPE) and will have undergone specific training. 3. All soil containing asbestos is stored in their deposited state within the containment cell within 'parcels' of polythene liner on a layer of filter fabric awaiting capping by soils on completion. 4. If polythene liner becomes ripped, soil moisture content can be maintained with the application of water. Replace any displaced soil into the polythene liner and tape polythene patch over ruptured area. 5. Machinery is hosed down at the end of each day and on completion of the earthworks. 6. Air quality monitoring stations will be in place to ensure any accidental release of asbestos fibres is detected and that further mitigating steps are undertaken. 7. The subsoil drains are designed to ensure any water that collects within the containment cell excavation can escape rather than accumulate over time. In addition to contaminated soils being contained within a polythene liner (item 4. above) the subsoil drains are separated by 3 x layers of filter fabric.	Exceptionally unlikely (0-1% probability)	1. The release of asbestos fines is very unlikely as asbestos containing materials will be sealed within polythene liners, the area can only be accessed by authorised personnel, the location is remote and unloading will take into the excavated hollow. A water supply is readily available from an on-site water cart. 2. The asbestos fines are contained within plastic liners. The filter fabric provides additional safeguards.

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6	Completion of containment cell (comprising the placement of filter fabric over all polythene liners, capping soil layers, placement of orange plastic geogrid, and restoration planting)	1. The polythene liners are ripped insitu and asbestos fines are released to air. 2. Asbestos fines are released through the subsoil drain system.	1. The property is private and there is no public access. The disposal area is a limited access area for authorised personnel only. 2. All workers wear asbestos rated Personal Protective Equipment (PPE) and will have undergone specific training. 3. All soil containing asbestos is stored in within the containment cell in 'parcels' of polythene liner and interned by layers of soil (loess and topsoil) to a minimum depth of 1m. 4. Placement of orange plastic geogrid 200mm below new ground surface. 5. Restoration Planting.	Exceptionally unlikely (0-1% probability)	1. The release of asbestos fines is exceptionally unlikely as asbestos containing materials will be interned under soil, the area can only be accessed by authorised personnel, the location is remote and within the hollow of an excavation. A water supply is readily available from an on-site water cart. 2. The asbestos fines are contained within plastic liners. The filter fabric provides additional safeguards. The depth of loess soils will be generally impermeable.

Item	Activity	Risks	Avoidance/Mitigation measures	Likelihood scale of identified Risk	Comments
7	Long-term management at 318 Kennedys Bush Road (comprising monitoring and remediation where necessary).	1. Disturbance to the capping layers and exposure of asbestos fibres to air. 2. Asbestos fines are released through the subsoil drain system.	1. 'As built' drawings of the containment cell will be provided for Council records. 2. The containment cell will be identified by posts to demarcate the full extent of the containment cell. Signage will be fixed in place to identify the presence of the containment cell, that it contains buried hazardous material, and that no excavation is to take place and no heavy vehicles are to access the area. 3. A covenant be registered on the title to: a. memorialise the location of the containment cell. b. ensure continuous cover with grass, regenerating bush or native vegetation at all times. c. no trees shall be planted on the containment cell. d. no excavation is to take place or access by heavy vehicles. e. the containment cell will be inspected annually by the landowner. If the orange plastic marker mesh has become exposed or there are any other signs of disturbance to the soil cover, the containment cell is to be remediated to its former condition as certified by a suitably qualified person with engineering or land contamination experience and reported to the Council.	Exceptionally unlikely (0-1% probability)	1. The release of asbestos fines is exceptionally unlikely as asbestos containing materials will be interned under 1m of soil, any activity that may potentially cause the buried material to be exposed is prohibited and safeguards are put in place to ensure the need for any remediation is readily apparent and the integrity of the containment cell is not compromised. The property is private and there is no public access. 2. The asbestos fines are contained within plastic liners. The filter fabric provides additional safeguards. The depth of loess soils will be generally impermeable.

RMA92032968 - 318 Kennedys Bush Road. Risk Assessment Approval

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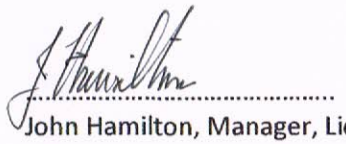
Dated 14 June 2016



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John Hamilton, Manager, Licensed Asbestos Assessor, Southern Insulation Group

Dated 14 June 2016