

Delivery Report Poland

EEA-FTSP-Sealing_CountryDeliveryReport-PL

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1 INTRODUCTION

1.1 PURPOSE AND SCOPE

This document presents the country delivery report of EEA's Fast Track Service Precursor Sealing Product of Poland.

According to the Tender Specifications, this report corresponds to deliverable 5 (38 Country delivery reports).

1.2 APPLICABLE DOCUMENTS

ITD-0490-PRO-0006	Proposal responding to EEA's Invitation for Tender, Technical Offer including Management Part –Issue 1

1.3 REFERENCE DOCUMENTS

EEA/IDS/07/001	Tender Specifications "GMES Fast Track Service on Land Monitoring", EEA, 2006
ISO9001	ISO 9001: 2000 Standard
ITD-QMS-POL-0001_Infoterra_Quality_Policy	Quality Policy Statement
QMS-ITD-MA-0011_QMSManual_I3.1	Quality Management System (QMS) Manual
ITD-UMS-POL-0001_Infoterra_Environmental_Policy	Declaration of Enterprise Environmental Policy
ITD-QMS-STD-0001-ControlOfDocumentation	Control of Documentation and Data
QMS-ITD-ST-0001_CSM	Customer Satisfaction Measurement
QMS-ITD-PR-0003_PM_ProductDevelopment_I4	Project Management, Product (Prototype) Development and Production

2 DATA SPECIFICATIONS

2.1 TECHNICAL PRODUCT SPECIFICATION

Content
<i>Raster dataset of built-up and non built-up areas including continuous degree of soil sealing ranging from 0 - 100% in full spatial resolution (20 x 20 m) with the associated metadata.</i>
Geographic coverage
<i>Poland (PL)</i>
<i>Coverage [km²]: 312.685 (plus additional buffer of 200 meters outside of country border)</i>
Input data sources
<p><u>Input data provided by ESA:</u></p> <ul style="list-style-type: none"> ▪ <i>Orthorectified satellite data coverage for Europe (Image2006), acquired primarily in the reference year 2006 (+/- 1 year), covering two dates, used sensors SPOT 4 and 5 (HRVIR) and IRS-P6 LISS-III:</i> <ul style="list-style-type: none"> • <i>20 m resampled (with cubic convolution interpolation)</i> • <i>4 spectral bands</i> • <i>Max. 5% cloud coverage</i> • <i>Covering 2 dates, at least 6 weeks apart from the respect. scene selected for the first coverage</i> • <i>Orthorectified towards national projection systems (used DTM unknown)</i> • <i>Delivery on a country by country basis foreseen</i> • <i>Metadata to each scene</i> <p><u>Input data provided by EEA</u></p> <ul style="list-style-type: none"> ▪ <i>Dataset with national country borders (to be used for clipping the data at a national level) as defined and provided by the EEA</i> <p><u>Ancillary input data</u></p> <ul style="list-style-type: none"> ▪ <i>National Corine Land Cover 2000 data in vector format to be used for the stratification of the QA sample plots</i>
Methodology
<i>Supervised classification of built-up areas with following visual improvement of classification result and derivation of degree of soil sealing based on calibrated NDVI</i>
Geometric resolution
<i>Pixel resolution 20 x 20 m</i>

Coordinate Reference System
<i>Projection: Transverse Mercator</i> <i>False Easting: 500000,00</i> <i>False Northing: 5300000,00</i> <i>Scale Factor: 0,9993</i> <i>Central Meridian: 19°00'00"</i> <i>Latitude of Origin: 0°00'00"</i> <i>Datum: GRS 80</i>
Geometric accuracy (positioning scale)
<i>According to orthorectified satellite image base delivered by ESA</i>
Thematic accuracy (in %)
<i>Classification accuracy per hectare (based on 100 x 100 m grid) of built-up non built-up areas is > 85% (assessed according approach as described in chapter 4.1)</i>
Accuracy assessment approach
<i>Accuracy assessment based on random sample plots</i>
Delivery format
<i>IMAGINE Image (IMG)</i>
Data type
<i>Raster</i>
Raster coding
<i>Thematic pixel values</i> <i>0 – Non-built up areas, water bodies inland</i> <i>1-100 - sealing values for built-up areas</i> <i>254 – Unclassifiable areas (clouds, shadows, etc.)</i> <i>255 – No Data (No thematic information)</i>
Metadata
<i>According to EEA metadata standards (EEA MSGI specification)</i>
Ancillary Data – Mitigation shape file
<i>Metadata set per delivered country in vector format defining all areas which deviate from the ITT's EO data specifications (i.e. clouds, acquisition date). The vector layer is derived from image footprints and cloud cover information of Image2006 within the country border.</i> <i>The attribute table contains information about WU identification and possible deviations from the standard specifications of Image2006:</i> <ul style="list-style-type: none"> <i>[Cntr] Country Code;</i>

- *[SCU] Number of Sub-Country unit containing the Working Unit;*
- *[WU_ID] Full name of the Working Unit;*
- *[No_acqu] Number of acquisitions within the WU; 0 = gap / no image available;*
- *[Out_Veg] No of acquisition dates outside of country-specific vegetation period;*
- *[Below_6w] Acquisition dates less than 6 weeks apart;*
- *[Cloud_cov] Thematic value indicating the cloud coverage: No clouds = 1; Clouds present in coverage 1 = 2; Clouds present in Coverage 2 = 3; Clouds present in both coverages = 4*

2.2 ALGORITHMS USED

The aim of the image processing is to derive in a robust, reliable and reproducible way based on satellite images (Spot 4/5, IRS LISS) a raster dataset of built-up and non built-up areas including continuous degree of soil sealing ranging from 0 - 100% in full spatial resolution (20 x 20 m).

As the main challenge, the derivation of a continuous degree of soil sealing has to be solved. The proposed image processing approach is based on the fact that a reliable derivation of soil sealing degrees is not possible directly from the vegetation index. Low vegetation index values, which are characteristic for densely built-up areas are e.g. also found in bare soil areas of agricultural fields. Even when using multi-temporal satellite images with different acquisition dates in combination with bi-temporal, multi-spectral classification techniques the result may be improved, but the vegetation indices of two acquisitions are still too ambiguous.

Therefore, the proposed image processing approach will start with deriving a binary map of built-up areas and then further subdivide this area into 100 degrees of soil sealing, ranging from totally sealed surfaces (100% degree of soil sealing) up to built-up areas with extensive vegetation cover (1% degree of soil sealing). This allows the final user to aggregate the continuous values as required.

To be viable for this objective the classification methodology has to fulfil the following general criteria:

- Allow for local calibration of parameters used per working sub-area (as defined by satellite images) to overcome diversity of different regions in Europe and image immanent characteristics (such compensating for different settlement structures, ecozones, phonological and weather conditions).
- Deliver the required accuracy
- Maximise consistency and objectivity of the results all over Europe
- Maximise cost-efficiency under given constraints
- Maximise standardisation of production and working motivation of the analysts
- Secure realisation in due time.

Based on these criteria, the proposed methodological approach consists of the following main steps:

- a) Data preparation & management: Provision of spatial database of bi-temporal satellite images and derived working sub-areas ("Working Units" = WU) to be processed in the following steps
- b) Core processing, containing the 3 main processing steps:
 - (1) Hybrid automated classification with supervised and unsupervised elements, leading to binary maps of built-up area
 - (2) Manual correction of the binary built-up map to obtain the required quantitative thematic accuracy (85%) as well as good qualitative results
 - (3) Derivation of degree of soil sealing based on the NDVI (Normalised Difference Vegetation Index)
- c) Generation of sub-country / country data sets
- d) Accuracy assessment
- e) Re-projection & mosaicing, generation of seamless European dataset.

2.3 FORMAT DESCRIPTION

Delivery format
<i>ERDAS IMAGINE Image (IMG)</i>
<i>Data Type: unsigned 8-bit</i>
<i>Compression: Run-length encoding (ESRI)</i>
<i>Number of bands: 1</i>
<i>Pixel size: 20 m</i>
Data type
<i>Thematic Raster</i>
Metadata
<i>According to EEA metadata standards (EEA MSGI specification)</i>

2.4 METADATA

See European Environment Agency – Metadata Standard for Geographic Information (EEA-MSGI), Version 1.1a (18 August 2004).

The metadata is provided as XML-file and as PDF-document according to EEA Metadata Standard for Geographic Information (EEA-MSGI).

3 SUMMARY OF PRODUCTION

3.1 TIMETABLE, PRODUCTION MILESTONES

Delivery by ESA	Data Reception	Data Preparation		Received by SP	Production	
		Start	End		Start	End
02.10.2007	10.10.2007	11.10.2007	30.11.2007	30.11.2007	5.12.2007	25.06.2008

3.2 TECHNICAL PROBLEMS ENCOUNTERED, MITIGATION MEASURES

Clouds handled according to the agreed mitigation procedure.

High effort in data management and processing due to high number of small Working Units.

4 ACCURACY ASSESSMENT REPORT

4.1 DESCRIPTION OF APPROACH

The derivation of accuracy measures as agreed with EEA includes the following steps:

1. Definition of 100 x 100 m reference grid in national projection of the respective country as-
sessed
2. Stratification of the area based on Corine Land Cover level I. To emphasize the accuracy as-
sessment in the urban areas, 50 % of the sample plots are placed within CLC class Artificial
Surfaces, the other 50 % are placed in the remaining classes.
3. Cluster based random sampling based on 100 x 100 m reference grid, defined per single na-
tion, number of samples adapted to nation size in km²
4. Re-projection of reference samples to allow overlay with Google Earth
5. Estimation , if reference cell will be labelled as “built-up” according to EEA definition or not
(80% threshold degree of soil sealing) taking into account the visibility of objects in the satel-
lite images used for the production of the raster product (technically possible also when using
Google Earth¹)
6. Estimation of overall accuracy to generate accuracy measure (overall accuracy, user accu-
racy, (commission error), producer accuracy (omission error), per single nation (for internal
use & validation only) and for European dataset for publication by EEA.
7. Adaptation of statistics with regard to the mitigation shape file. All sample plots falling within
areas of the raster product, where the underlying IMAGE2006 data has been identified to fail
the ITT’s specifications, are not included in the final statistics. This includes areas where
 - Less than two coverages of EO data are available
 - One or more acquisition dates are outside the defined acquisition window
 - The acquisition dates of the two coverages used are less than six weeks apart
 - Cloud cover is present in one or more coverage

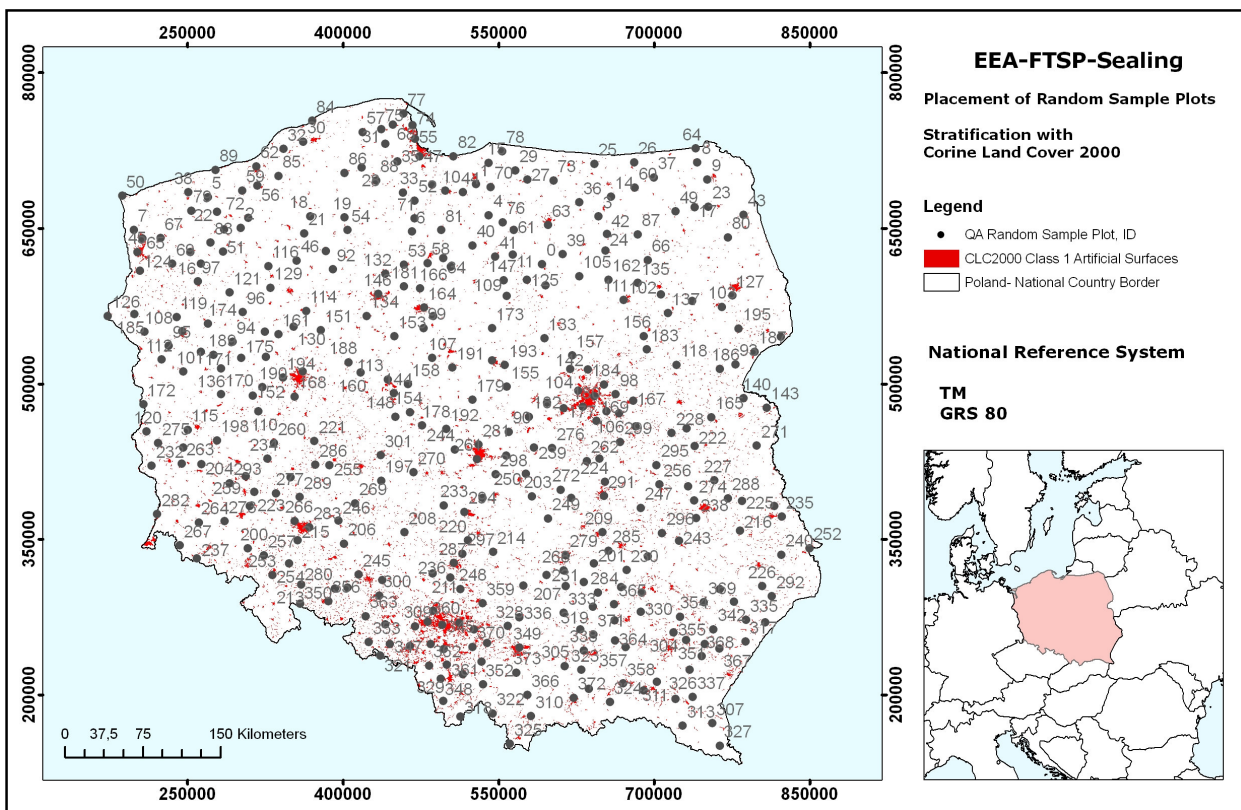
The built-up raster product which is subject to the accuracy assessment is accepted as according to the specifications if the final statistics indicate an overall accuracy of more than 85 %.

Accuracy assessment is performed per country product for internal quality control. For final accep-
tance by EEA, the overall accuracy of the European product is arbitratative.

¹ using web-based information input to a local server

4.2 SAMPLE PLACEMENT (STRATIFICATION, NUMBER & LOCATIONS OF SAMPLE SITES)

Overall number of sample plots: 373 (186 within CLC2000 Artificial Surfaces). The figure below shows the placement of sample plots (black dots) within CLC urban areas (red areas) and outside.



4.3 FINAL RESULT

The final accuracy assessment for the country product surpassed the threshold of an overall accuracy of 85 %.

Classification				Producer's Accuracy	Omission Error
Validation		>80%	<80%	Σ	
	>80%	26	29	55	47,3%
	<80%	0	194	194	100,0%
	Σ	26	223	249	0,0%
	User's Accuracy	100,0%	87,0%		
	Commission Error	0,0%	13,0%		
	Overall Accuracy	88,4%			

5 DETAILED LIST OF PROVIDED DATA

- Raster dataset of built-up and non built-up areas including degree of soil sealing, 2006, in full spatial resolution (20 m x 20 m).
- ArcMap Legend File for raster data set for plotting a degree of soil sealing, aggregated to thematic classes
- ArcMap Legend File for raster data set for plotting a degree of soil sealing in a range from 1-100 %
- Mitigation shape file; metadata set per delivered country defining all areas which deviate from the ITT's EO data specifications.
- XML-Metadata of raster and vector data after EEA specifications
- EEA Metadata Stylesheet
- Report per Country with description of raster and vector data, country specific production & mitigation issues (the document at hand)
- Product inspection sheet for outgoing deliveries, ensuring product conformity of raster dataset
- National country borders in national projection

ANNEX 1: INTERPRETATION GUIDELINE FOR VISUAL CORRECTION

Objective

To produce a pixel-based high-resolution layer of built-up areas including degree of soil sealing for the EEA member states of homogeneous look & feel with an overall thematic accuracy of 85%.

Definition of Built-up Areas

Built-up areas according to the consortium definition are represented by a degree of soil sealing between 1 and 100%.

Built-up area therefore comprises pixels that are fully or partly covered by houses, roads, mines and quarries and any other facilities, including their auxiliary spaces, deliberately installed for the pursuit of human activities. Built-up area does not include any fully vegetated pixels, even if they are closely related to these activities (such as city parks and gardens), or any other unvegetated non-built-up open spaces covered with bare soil, sand, glacier, bare rocks or water.

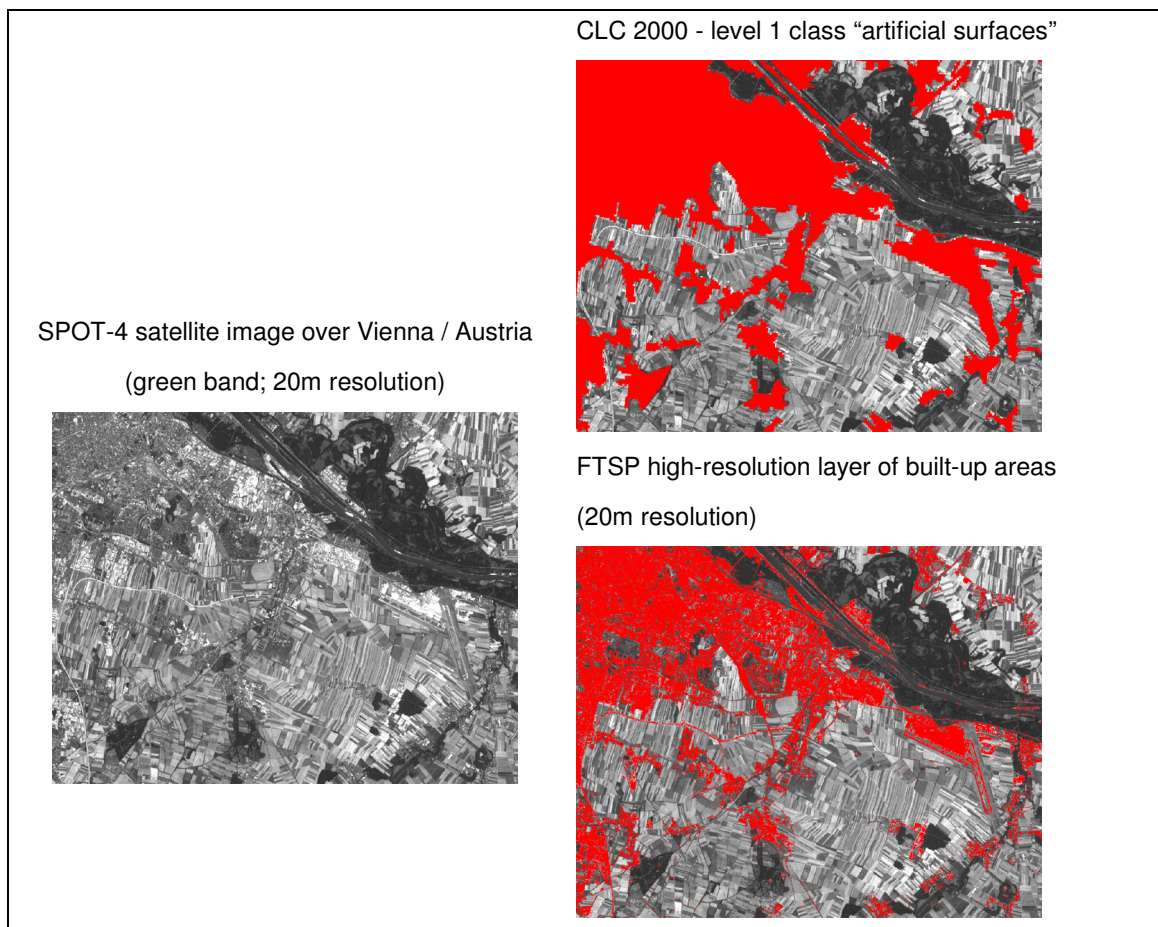
(modified according to http://glossary.eea.europa.eu/EEAGlossary/B/built_up_land)

The FTSP in Relation to Corine Land Cover

The FTSP high resolution core land cover data is a complementary element of the GMES Fast Track Services. The data set will be a land cover product, reflecting actual ground cover on a pixel by pixel level rather than functional properties.

CLC level 1 class 'artificial surfaces' contains artificial surfaces and functionally related vegetated areas, reflecting the land use aspect. Therefore a significant part of this CLC level 1 class contains vegetated areas composed of fully vegetated pixels. However, in the FTSP product only pixels that contain some built-up/sealed area will be included.

In addition, built-up pixels within all other CLC level 1 classes (which are not mapped in CLC according to the 25ha MMU) will be included according to the above definition. Fully vegetated or unvegetated non-built-up pixels will be excluded.



Special Considerations

- The same definition of built-up areas shall apply for production and quality control.
- To ensure homogeneity across the whole of Europe, partially captured linear features outside of urban agglomerations (e.g. fragments of roads or railway lines) will not be completed by the manual post editing.
- Mines and quarries will be considered built-up areas according to the above definition.
- It is proposed to include a no-data class for unclassifiable areas (e.g., clouds) which is to be marked and identified during the process of manual interpretation.

ANNEX 2: LIST OF WORKING UNITS AND EO DATA USED

The following list provides information about the two coverages of EO data which were used to create the working units. The file name is identical to the WU identification within the mitigation shapefile's attribute table and contains the specifications of sensors, paths/rows and capture dates.

The full file name is explained in the following:

[Sensor Coverage 1]_[TrackFrame Coverage 1]_[Capture Date YY/MM/DD Coverage 1]_[Instrument Coverage 1]_[Sensor Coverage 2]_[TrackFrame Coverage 2]_[Capture Date YY/MM/DD Coverage 2]_[Instrument Coverage 2]

Table 1: List of Working Units used for the production of Poland

SCU	Working Unit
1	lrsp6_028030_050402_l30_lrsp6_028030_060726_l30
1	lrsp6_028030_060726_l30_lrsp6_029030_050829_l30
1	lrsp6_029029_060707_l30_lrsp6_029029_070328_l30
1	lrsp6_029030_050829_l30_lrsp6_029030_060426_l30
1	lrsp6_029030_050829_l30_spot4_061241_070312_2i0
1	lrsp6_031029_060506_l30_lrsp6_032030_070412_l30
1	lrsp6_031029_060506_l30_spot4_065238_060717_2i4
1	lrsp6_031029_060506_l30_spot4_065239_060717_2i2
1	lrsp6_031029_060506_l30_spot4_066240_070329_1i0
1	lrsp6_031029_060506_l30_spot4_069240_060912_1i0
1	lrsp6_031030_060506_l30_lrsp6_031030_060717_l30
1	lrsp6_031030_060506_l30_lrsp6_032030_070412_l30
1	lrsp6_032029_060511_l30
1	lrsp6_032029_060511_l30_spot4_069240_060912_1i0
1	lrsp6_032030_070412_l30_lrsp6_033030_060703_l30
1	lrsp6_032030_070412_l30_spot4_069241_060912_1i0
1	Spot4_058240_060727_2i0_spot5_058240_060915_1j1
1	Spot4_065240_060922_1i0_spot4_065240_070504_1i0
2	lrsp6_032029_060511_l30_lrsp6_033029_060913_l30
2	lrsp6_033029_060913_l30_lrsp6_034029_070422_l30
2	lrsp6_033030_060703_l30_lrsp6_033030_060913_l30
2	lrsp6_033030_060913_l30_lrsp6_034030_070422_l30
2	lrsp6_034029_060918_l30_lrsp6_034029_070422_l30
2	lrsp6_034030_060918_l30_lrsp6_034030_070422_l30
2	lrsp6_034031_050923_l30_lrsp6_034031_060427_l30
3	lrsp6_034030_060918_l30_lrsp6_035030_050413_l30
3	lrsp6_034030_070422_l30_lrsp6_035030_050413_l30
3	lrsp6_035030_050413_l30_lrsp6_036030_060507_l30
3	lrsp6_035030_050413_l30_lrsp6_036031_060507_l30
3	lrsp6_035030_050413_l30_spot4_077243_051031_2i0

SCU	Working Unit
3	irsp6_035031_060408_L30
3	Irsp6_035031_060408_I30_spot4_074243_060923_1i0
3	Irsp6_035031_060408_I30_spot4_074244_060923_1i0
3	Irsp6_035031_060408_I30_spot4_077244_060617_2i1
3	Irsp6_036030_060507_I30_irsp6_037030_070413_I30
3	Irsp6_036030_060507_I30_spot4_078241_060914_1i0
3	Irsp6_036030_060507_I30_spot5_077241_060707_1j1
3	Irsp6_036030_060507_I30_spot5_077241_070504_1j0
3	Irsp6_036031_060507_I30_irsp6_037031_050821_I30
3	Irsp6_036031_060507_I30_spot4_077243_051031_2i0
3	Irsp6_036031_060507_I30_spot4_077244_051031_2i0
3	Irsp6_036031_060507_I30_spot4_078244_060913_2i0
3	Irsp6_036031_060507_I30_spot4_078245_060914_1i0
3	Irsp6_036032_060928_I30_irsp6_037032_050821_I30
3	Irsp6_037030_070413_I30_irsp6_037031_050821_I30
3	Irsp6_037030_070413_I30_spot4_078241_060914_1i0
3	Irsp6_037030_070413_I30_spot4_078242_060914_2i0
3	Irsp6_037030_070413_I30_spot4_078243_060914_2i0
3	Irsp6_037031_050821_I30_irsp6_037031_070413_I30
3	Spot4_077239_060924_2i0_spot5_077239_060717_1j1
3	Spot4_078240_070521_2i3_spot5_078240_060701_1j0
3	Spot5_077240_060611_1j0_spot5_077240_070504_1j0
4	Irsp6_029031_050829_I30_irsp6_029031_060426_I30
4	Irsp6_029031_050829_I30_irsp6_029031_070328_I30
4	Irsp6_029031_060426_I30_irsp6_029031_070328_I30
4	Irsp6_029031_060426_I30_spot4_063246_060922_1i0
4	Irsp6_029031_060426_I30_spot4_063247_060922_1i0
4	Irsp6_029031_060426_I30_spot4_064246_060706_1i8
4	Irsp6_029031_060426_I30_spot4_065246_060923_1i0
4	Irsp6_029031_070328_I30_irsp6_031031_060717_I30
4	Irsp6_031031_060506_I30_irsp6_031031_060717_I30
4	Irsp6_031031_060717_I30_spot4_065245_060918_1i0
4	Irsp6_031032_060506_I30_irsp6_031032_060717_I30
4	Irsp6_031032_060506_I30_spot4_068246_060923_2i0
4	Irsp6_031032_060506_I30_spot4_068247_060923_2i0
4	Irsp6_031032_060506_I30_spot4_068248_060907_2i0
4	Irsp6_031032_060717_I30_spot4_065246_060923_1i0
4	Irsp6_031032_060717_I30_spot4_068248_060907_2i0
4	Irsp6_031033_060506_I30_spot4_068248_060907_2i0
4	Irsp6_031033_060506_I30_spot4_068249_060907_2i0
4	Irsp6_033032_050521_I30_irsp6_033032_060703_I30
4	Irsp6_033032_050521_I30_spot4_068247_060923_2i0
4	Irsp6_033032_050521_I30_spot4_068248_060907_2i0
5	Irsp6_033031_060703_I30_irsp6_033031_060913_I30

SCU	Working Unit
5	lrs6_033032_050521_l30 lrs6_033033_060913_l30
5	lrs6_033032_060703_l30 lrs6_033032_060913_l30
5	lrs6_034032_050830_l30 lrs6_034032_060427_l30
5	lrs6_034033_050830_l30 lrs6_034033_060427_l30
6	lrs6_034031_060427_l30 spot4_074245_060923_1i0
6	lrs6_034032_060427_l30 spot4_074248_060913_1i0
6	lrs6_034033_060427_l30 lrs6_035033_061017_l30
6	lrs6_034033_060427_l30 spot5_075250_060922_2j0
6	lrs6_035031_060408_l30 lrs6_036032_060928_l30
6	lrs6_035031_060408_l30 spot4_074245_060923_1i0
6	lrs6_035032_060408_l30 lrs6_036032_060624_l30
6	lrs6_035032_060408_l30 lrs6_036033_060718_l30
6	lrs6_035032_060408_l30 spot4_074247_060913_1i0
6	lrs6_035032_060408_l30 spot4_075246_060913_1i0
6	lrs6_035033_061017_l30
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6	lrs6_035033_061017_l30 spot4_075249_060512_2i0
6	lrs6_035033_061017_l30 spot4_076250_060718_2i0
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6	lrs6_037032_070413_l30 lrs6_038032_050404_l30
6	lrs6_037032_070413_l30 spot4_080248_060703_2i0
6	lrs6_037033_061027_l30 lrs6_038033_060728_l30
6	lrs6_037033_061027_l30 lrs6_038034_060728_l30
6	lrs6_037033_061027_l30 spot4_080248_060703_2i0
6	lrs6_037033_061027_l30 spot4_080249_060703_2i0
6	lrs6_037033_061027_l30 spot4_080250_060703_2i0
6	lrs6_038032_050404_l30 lrs6_038032_060914_l30
6	lrs6_038033_060728_l30 lrs6_038033_060914_l30
6	lspot5_075250_060922_2j0 spot5_075250_061215_2j5
6	spot4_074248_060913_1i0

ANNEX 3: SAMPLE PLOT VALIDATION SHEET

Sample Plot 100 x100 m [ID]	FTSP Degrees of Soil Sealing [Mean Value]	FTSP Built up [TRUE / FALSE]	Reference Built up [TRUE / FALSE]	Compliance	Excluded by Mitigation Shape [TRUE / FALSE]
0	0,0	FALSE	FALSE	TRUE	FALSE
1	0,0	FALSE	FALSE	TRUE	FALSE
2	0,0	FALSE	FALSE	TRUE	FALSE
3	0,0	FALSE	FALSE	TRUE	FALSE
4	0,0	FALSE	FALSE	TRUE	FALSE
5	0,0	FALSE	FALSE	TRUE	TRUE
6	0,0	FALSE	FALSE	TRUE	FALSE
7	0,0	FALSE	FALSE	TRUE	FALSE
8	0,0	FALSE	FALSE	TRUE	TRUE
9	0,0	FALSE	FALSE	TRUE	TRUE
10	0,0	FALSE	FALSE	TRUE	FALSE
11	0,0	FALSE	FALSE	TRUE	FALSE
12	0,0	FALSE	FALSE	TRUE	FALSE
13	0,0	FALSE	FALSE	TRUE	FALSE
14	0,0	FALSE	FALSE	TRUE	FALSE
15	0,0	FALSE	FALSE	TRUE	FALSE
16	0,0	FALSE	FALSE	TRUE	FALSE
17	0,0	FALSE	FALSE	TRUE	FALSE
18	0,0	FALSE	FALSE	TRUE	FALSE
19	0,0	FALSE	FALSE	TRUE	FALSE
20	0,0	FALSE	FALSE	TRUE	FALSE
21	0,0	FALSE	FALSE	TRUE	FALSE
22	0,0	FALSE	FALSE	TRUE	FALSE
23	0,0	FALSE	FALSE	TRUE	FALSE
24	0,0	FALSE	FALSE	TRUE	FALSE
25	0,0	FALSE	FALSE	TRUE	FALSE
26	0,0	FALSE	FALSE	TRUE	FALSE
27	0,0	FALSE	FALSE	TRUE	FALSE
28	0,0	FALSE	FALSE	TRUE	FALSE
29	0,0	FALSE	FALSE	TRUE	FALSE
30	0,0	FALSE	FALSE	TRUE	TRUE
31	0,0	FALSE	FALSE	TRUE	TRUE
32	0,0	FALSE	FALSE	TRUE	TRUE
33	0,0	FALSE	FALSE	TRUE	FALSE
34	0,0	FALSE	FALSE	TRUE	FALSE
35	0,0	FALSE	FALSE	TRUE	TRUE
36	0,0	FALSE	FALSE	TRUE	FALSE

Sample Plot 100 x100 m [ID]	FTSP Degrees of Soil Sealing [Mean Value]	FTSP Built up [TRUE / FALSE]	Reference Built up [TRUE / FALSE]	Compliance	Excluded by Mitigation Shape [TRUE / FALSE]
37	0,0	FALSE	FALSE	TRUE	FALSE
38	0,0	FALSE	FALSE	TRUE	TRUE
39	0,0	FALSE	FALSE	TRUE	FALSE
40	0,0	FALSE	FALSE	TRUE	FALSE
41	0,0	FALSE	FALSE	TRUE	FALSE
42	0,0	FALSE	FALSE	TRUE	FALSE
43	0,0	FALSE	FALSE	TRUE	TRUE
44	0,0	FALSE	FALSE	TRUE	FALSE
45	98,5	TRUE	TRUE	TRUE	FALSE
46	44,8	FALSE	FALSE	TRUE	FALSE
47	96,8	TRUE	TRUE	TRUE	FALSE
48	98,1	TRUE	TRUE	TRUE	FALSE
49	56,6	FALSE	FALSE	TRUE	TRUE
50	88,4	TRUE	FALSE	FALSE	FALSE
51	0,0	FALSE	FALSE	TRUE	FALSE
52	43,2	FALSE	FALSE	TRUE	FALSE
53	100,0	TRUE	TRUE	TRUE	FALSE
54	75,4	FALSE	FALSE	TRUE	TRUE
55	83,7	TRUE	TRUE	TRUE	TRUE
56	33,2	FALSE	FALSE	TRUE	TRUE
57	99,7	TRUE	TRUE	TRUE	FALSE
58	73,0	FALSE	FALSE	TRUE	FALSE
59	73,9	FALSE	FALSE	TRUE	TRUE
60	77,8	FALSE	FALSE	TRUE	FALSE
61	67,7	FALSE	FALSE	TRUE	FALSE
62	42,0	FALSE	FALSE	TRUE	TRUE
63	0,0	FALSE	FALSE	TRUE	FALSE
64	1,5	FALSE	FALSE	TRUE	TRUE
65	31,7	FALSE	FALSE	TRUE	FALSE
66	48,1	FALSE	FALSE	TRUE	TRUE
67	44,4	FALSE	FALSE	TRUE	FALSE
68	31,6	FALSE	FALSE	TRUE	TRUE
69	91,5	TRUE	FALSE	FALSE	FALSE
70	55,0	FALSE	FALSE	TRUE	FALSE
71	46,5	FALSE	FALSE	TRUE	FALSE
72	68,3	FALSE	FALSE	TRUE	TRUE
73	21,9	FALSE	FALSE	TRUE	FALSE
74	93,9	TRUE	TRUE	TRUE	TRUE
75	32,8	FALSE	FALSE	TRUE	FALSE

Sample Plot 100 x100 m [ID]	FTSP Degrees of Soil Sealing [Mean Value]	FTSP Built up [TRUE / FALSE]	Reference Built up [TRUE / FALSE]	Compliance	Excluded by Mitigation Shape [TRUE / FALSE]
76	0,0	FALSE	FALSE	TRUE	FALSE
77	27,8	FALSE	FALSE	TRUE	TRUE
78	31,5	FALSE	FALSE	TRUE	FALSE
79	77,8	FALSE	FALSE	TRUE	TRUE
80	55,8	FALSE	FALSE	TRUE	TRUE
81	97,6	TRUE	TRUE	TRUE	FALSE
82	0,0	FALSE	FALSE	TRUE	FALSE
83	28,4	FALSE	FALSE	TRUE	FALSE
84	0,0	FALSE	FALSE	TRUE	TRUE
85	0,0	FALSE	FALSE	TRUE	TRUE
86	79,1	FALSE	FALSE	TRUE	TRUE
87	95,1	TRUE	TRUE	TRUE	FALSE
88	84,5	TRUE	TRUE	TRUE	TRUE
89	96,1	TRUE	FALSE	FALSE	TRUE
90	0,0	FALSE	FALSE	TRUE	FALSE
91	0,0	FALSE	FALSE	TRUE	FALSE
92	0,0	FALSE	FALSE	TRUE	FALSE
93	0,0	FALSE	FALSE	TRUE	FALSE
94	0,0	FALSE	FALSE	TRUE	FALSE
95	0,0	FALSE	FALSE	TRUE	TRUE
96	0,0	FALSE	FALSE	TRUE	FALSE
97	0,0	FALSE	FALSE	TRUE	FALSE
98	0,0	FALSE	FALSE	TRUE	TRUE
99	0,0	FALSE	FALSE	TRUE	FALSE
100	0,0	FALSE	FALSE	TRUE	FALSE
101	0,0	FALSE	FALSE	TRUE	TRUE
102	0,0	FALSE	FALSE	TRUE	TRUE
103	0,0	FALSE	FALSE	TRUE	TRUE
104	0,0	FALSE	FALSE	TRUE	FALSE
105	0,0	FALSE	FALSE	TRUE	FALSE
106	0,0	FALSE	FALSE	TRUE	FALSE
107	0,0	FALSE	FALSE	TRUE	FALSE
108	0,0	FALSE	FALSE	TRUE	TRUE
109	0,0	FALSE	FALSE	TRUE	FALSE
110	0,0	FALSE	FALSE	TRUE	FALSE
111	0,0	FALSE	FALSE	TRUE	FALSE
112	0,0	FALSE	FALSE	TRUE	TRUE
113	0,0	FALSE	FALSE	TRUE	FALSE
114	0,0	FALSE	FALSE	TRUE	FALSE

Sample Plot 100 x100 m [ID]	FTSP Degrees of Soil Sealing [Mean Value]	FTSP Built up [TRUE / FALSE]	Reference Built up [TRUE / FALSE]	Compliance	Excluded by Mitigation Shape [TRUE / FALSE]
115	0,0	FALSE	FALSE	TRUE	TRUE
116	0,0	FALSE	FALSE	TRUE	FALSE
117	0,0	FALSE	FALSE	TRUE	FALSE
118	0,0	FALSE	FALSE	TRUE	FALSE
119	0,0	FALSE	FALSE	TRUE	FALSE
120	0,0	FALSE	FALSE	TRUE	TRUE
121	0,0	FALSE	FALSE	TRUE	FALSE
122	1,6	FALSE	FALSE	TRUE	TRUE
123	0,0	FALSE	FALSE	TRUE	FALSE
124	0,0	FALSE	FALSE	TRUE	FALSE
125	0,0	FALSE	FALSE	TRUE	FALSE
126	0,0	FALSE	FALSE	TRUE	TRUE
127	0,0	FALSE	FALSE	TRUE	TRUE
128	0,0	FALSE	FALSE	TRUE	TRUE
129	0,0	FALSE	FALSE	TRUE	FALSE
130	238,8	NO DATA	FALSE	FALSE	FALSE
131	0,0	FALSE	FALSE	TRUE	FALSE
132	3,6	FALSE	FALSE	TRUE	FALSE
133	0,0	FALSE	FALSE	TRUE	FALSE
134	0,0	FALSE	FALSE	TRUE	FALSE
135	0,0	FALSE	FALSE	TRUE	TRUE
136	0,0	FALSE	FALSE	TRUE	TRUE
137	0,0	FALSE	FALSE	TRUE	TRUE
138	0,0	FALSE	FALSE	TRUE	FALSE
139	0,0	FALSE	FALSE	TRUE	FALSE
140	0,0	FALSE	FALSE	TRUE	FALSE
141	0,0	FALSE	FALSE	TRUE	FALSE
142	0,0	FALSE	FALSE	TRUE	FALSE
143	82,3	TRUE	FALSE	FALSE	FALSE
144	100,0	TRUE	TRUE	TRUE	FALSE
145	87,2	TRUE	FALSE	FALSE	FALSE
146	89,0	TRUE	FALSE	FALSE	FALSE
147	87,0	TRUE	TRUE	TRUE	FALSE
148	98,7	TRUE	TRUE	TRUE	FALSE
149	66,0	FALSE	FALSE	TRUE	FALSE
150	95,7	TRUE	FALSE	FALSE	FALSE
151	90,0	TRUE	FALSE	FALSE	FALSE
152	0,0	FALSE	FALSE	TRUE	FALSE
153	92,5	TRUE	FALSE	FALSE	FALSE

Sample Plot 100 x100 m [ID]	FTSP Degrees of Soil Sealing [Mean Value]	FTSP Built up [TRUE / FALSE]	Reference Built up [TRUE / FALSE]	Compliance	Excluded by Mitigation Shape [TRUE / FALSE]
154	100,0	TRUE	TRUE	TRUE	FALSE
155	10,2	FALSE	FALSE	TRUE	FALSE
156	22,9	FALSE	FALSE	TRUE	FALSE
157	78,7	FALSE	FALSE	TRUE	FALSE
158	28,3	FALSE	TRUE	FALSE	FALSE
159	43,5	FALSE	FALSE	TRUE	TRUE
160	73,2	FALSE	FALSE	TRUE	FALSE
161	22,4	FALSE	FALSE	TRUE	FALSE
162	0,0	FALSE	FALSE	TRUE	FALSE
163	3,4	FALSE	FALSE	TRUE	FALSE
164	85,5	TRUE	FALSE	FALSE	FALSE
165	4,7	FALSE	FALSE	TRUE	FALSE
166	88,4	TRUE	FALSE	FALSE	FALSE
167	0,6	FALSE	FALSE	TRUE	FALSE
168	100,0	TRUE	TRUE	TRUE	FALSE
169	1,9	FALSE	FALSE	TRUE	FALSE
170	82,3	TRUE	FALSE	FALSE	TRUE
171	79,9	FALSE	FALSE	TRUE	TRUE
172	63,9	FALSE	FALSE	TRUE	TRUE
173	66,5	FALSE	FALSE	TRUE	FALSE
174	59,3	FALSE	FALSE	TRUE	FALSE
175	99,6	TRUE	TRUE	TRUE	TRUE
176	4,3	FALSE	FALSE	TRUE	FALSE
177	59,2	FALSE	FALSE	TRUE	FALSE
178	0,0	FALSE	FALSE	TRUE	FALSE
179	98,3	TRUE	TRUE	TRUE	FALSE
180	92,1	TRUE	TRUE	TRUE	FALSE
181	28,2	FALSE	FALSE	TRUE	FALSE
182	96,3	TRUE	TRUE	TRUE	FALSE
183	0,0	FALSE	FALSE	TRUE	FALSE
184	83,0	TRUE	FALSE	FALSE	FALSE
185	51,0	FALSE	FALSE	TRUE	FALSE
186	97,0	TRUE	TRUE	TRUE	TRUE
187	15,8	FALSE	FALSE	TRUE	FALSE
188	3,6	FALSE	FALSE	TRUE	FALSE
189	75,6	FALSE	FALSE	TRUE	TRUE
190	89,6	TRUE	TRUE	TRUE	FALSE
191	67,9	FALSE	FALSE	TRUE	FALSE
192	56,4	FALSE	FALSE	TRUE	FALSE

Sample Plot 100 x100 m [ID]	FTSP Degrees of Soil Sealing [Mean Value]	FTSP Built up [TRUE / FALSE]	Reference Built up [TRUE / FALSE]	Compliance	Excluded by Mitigation Shape [TRUE / FALSE]
193	46,8	FALSE	FALSE	TRUE	FALSE
194	52,6	FALSE	FALSE	TRUE	FALSE
195	92,4	TRUE	FALSE	FALSE	TRUE
196	0,0	FALSE	FALSE	TRUE	FALSE
197	0,0	FALSE	FALSE	TRUE	FALSE
198	0,0	FALSE	FALSE	TRUE	FALSE
199	0,0	FALSE	FALSE	TRUE	FALSE
200	7,9	FALSE	FALSE	TRUE	FALSE
201	0,0	FALSE	FALSE	TRUE	FALSE
202	0,0	FALSE	FALSE	TRUE	TRUE
203	0,0	FALSE	FALSE	TRUE	FALSE
204	0,0	FALSE	FALSE	TRUE	TRUE
205	0,0	FALSE	FALSE	TRUE	FALSE
206	0,0	FALSE	FALSE	TRUE	FALSE
207	0,0	FALSE	FALSE	TRUE	TRUE
208	0,0	FALSE	FALSE	TRUE	FALSE
209	0,0	FALSE	FALSE	TRUE	FALSE
210	0,0	FALSE	FALSE	TRUE	FALSE
211	0,0	FALSE	FALSE	TRUE	FALSE
212	0,0	FALSE	FALSE	TRUE	FALSE
213	0,0	FALSE	FALSE	TRUE	FALSE
214	0,0	FALSE	FALSE	TRUE	FALSE
215	0,0	FALSE	FALSE	TRUE	FALSE
216	0,0	FALSE	FALSE	TRUE	FALSE
217	0,0	FALSE	FALSE	TRUE	FALSE
218	0,0	FALSE	FALSE	TRUE	FALSE
219	43,3	FALSE	FALSE	TRUE	FALSE
220	0,0	FALSE	FALSE	TRUE	FALSE
221	0,0	FALSE	FALSE	TRUE	FALSE
222	0,0	FALSE	FALSE	TRUE	FALSE
223	0,0	FALSE	FALSE	TRUE	FALSE
224	0,0	FALSE	FALSE	TRUE	TRUE
225	0,0	FALSE	FALSE	TRUE	TRUE
226	0,0	FALSE	FALSE	TRUE	FALSE
227	0,0	FALSE	FALSE	TRUE	FALSE
228	0,0	FALSE	FALSE	TRUE	FALSE
229	0,0	FALSE	FALSE	TRUE	FALSE
230	0,0	FALSE	FALSE	TRUE	FALSE
231	0,0	FALSE	FALSE	TRUE	TRUE

Sample Plot 100 x100 m [ID]	FTSP Degrees of Soil Sealing [Mean Value]	FTSP Built up [TRUE / FALSE]	Reference Built up [TRUE / FALSE]	Compliance	Excluded by Mitigation Shape [TRUE / FALSE]
232	0,0	FALSE	FALSE	TRUE	TRUE
233	0,0	FALSE	FALSE	TRUE	FALSE
234	0,0	FALSE	FALSE	TRUE	FALSE
235	0,0	FALSE	FALSE	TRUE	FALSE
236	0,0	FALSE	FALSE	TRUE	FALSE
237	0,0	FALSE	FALSE	TRUE	FALSE
238	0,0	FALSE	FALSE	TRUE	FALSE
239	0,0	FALSE	FALSE	TRUE	FALSE
240	0,0	FALSE	FALSE	TRUE	FALSE
241	0,0	FALSE	FALSE	TRUE	FALSE
242	0,0	FALSE	FALSE	TRUE	FALSE
243	0,0	FALSE	FALSE	TRUE	FALSE
244	0,0	FALSE	FALSE	TRUE	FALSE
245	0,0	FALSE	FALSE	TRUE	FALSE
246	0,0	FALSE	FALSE	TRUE	TRUE
247	0,0	FALSE	FALSE	TRUE	FALSE
248	0,0	FALSE	FALSE	TRUE	FALSE
249	72,6	FALSE	FALSE	TRUE	FALSE
250	0,0	FALSE	FALSE	TRUE	FALSE
251	96,4	TRUE	TRUE	TRUE	FALSE
252	8,2	FALSE	FALSE	TRUE	FALSE
253	100,0	TRUE	FALSE	FALSE	TRUE
254	49,0	FALSE	FALSE	TRUE	FALSE
255	26,4	FALSE	FALSE	TRUE	FALSE
256	0,0	FALSE	TRUE	FALSE	FALSE
257	33,2	FALSE	FALSE	TRUE	FALSE
258	27,7	FALSE	FALSE	TRUE	FALSE
259	0,0	FALSE	FALSE	TRUE	FALSE
260	98,7	TRUE	TRUE	TRUE	FALSE
261	74,2	FALSE	TRUE	FALSE	FALSE
262	65,3	FALSE	FALSE	TRUE	FALSE
263	89,8	TRUE	FALSE	FALSE	TRUE
264	20,0	FALSE	FALSE	TRUE	FALSE
265	64,4	FALSE	FALSE	TRUE	FALSE
266	69,1	FALSE	FALSE	TRUE	FALSE
267	54,4	FALSE	FALSE	TRUE	FALSE
268	77,1	FALSE	FALSE	TRUE	FALSE
269	33,7	FALSE	FALSE	TRUE	FALSE
270	62,8	FALSE	FALSE	TRUE	FALSE

Sample Plot 100 x100 m [ID]	FTSP Degrees of Soil Sealing [Mean Value]	FTSP Built up [TRUE / FALSE]	Reference Built up [TRUE / FALSE]	Compliance	Excluded by Mitigation Shape [TRUE / FALSE]
271	52,3	FALSE	FALSE	TRUE	FALSE
272	37,2	FALSE	FALSE	TRUE	FALSE
273	66,0	FALSE	FALSE	TRUE	FALSE
274	63,5	FALSE	FALSE	TRUE	FALSE
275	24,9	FALSE	FALSE	TRUE	TRUE
276	85,0	TRUE	FALSE	FALSE	FALSE
277	31,1	FALSE	FALSE	TRUE	FALSE
278	81,4	TRUE	FALSE	FALSE	FALSE
279	100,0	TRUE	TRUE	TRUE	FALSE
280	0,0	FALSE	FALSE	TRUE	FALSE
281	0,0	FALSE	FALSE	TRUE	FALSE
282	0,0	FALSE	FALSE	TRUE	FALSE
283	72,9	FALSE	FALSE	TRUE	FALSE
284	0,0	FALSE	FALSE	TRUE	TRUE
285	54,5	FALSE	FALSE	TRUE	FALSE
286	79,7	FALSE	FALSE	TRUE	FALSE
287	0,7	FALSE	FALSE	TRUE	FALSE
288	33,7	FALSE	FALSE	TRUE	FALSE
289	63,5	FALSE	FALSE	TRUE	FALSE
290	39,2	FALSE	FALSE	TRUE	FALSE
291	98,5	TRUE	FALSE	FALSE	TRUE
292	92,3	TRUE	TRUE	TRUE	FALSE
293	0,0	FALSE	FALSE	TRUE	FALSE
294	100,0	TRUE	TRUE	TRUE	FALSE
295	95,6	TRUE	TRUE	TRUE	TRUE
296	5,4	FALSE	FALSE	TRUE	FALSE
297	58,2	FALSE	FALSE	TRUE	FALSE
298	28,9	FALSE	FALSE	TRUE	FALSE
299	0,0	FALSE	FALSE	TRUE	TRUE
300	0,0	FALSE	FALSE	TRUE	FALSE
301	81,8	TRUE	TRUE	TRUE	FALSE
302	0,0	FALSE	FALSE	TRUE	FALSE
303	0,0	FALSE	FALSE	TRUE	FALSE
304	0,0	FALSE	FALSE	TRUE	FALSE
305	0,0	FALSE	FALSE	TRUE	TRUE
306	0,0	FALSE	FALSE	TRUE	FALSE
307	0,0	FALSE	FALSE	TRUE	FALSE
308	0,0	FALSE	FALSE	TRUE	FALSE
309	0,0	FALSE	FALSE	TRUE	FALSE

Sample Plot 100 x100 m [ID]	FTSP Degrees of Soil Sealing [Mean Value]	FTSP Built up [TRUE / FALSE]	Reference Built up [TRUE / FALSE]	Compliance	Excluded by Mitigation Shape [TRUE / FALSE]
310	0,0	FALSE	FALSE	TRUE	FALSE
311	0,0	FALSE	FALSE	TRUE	FALSE
312	0,0	FALSE	FALSE	TRUE	FALSE
313	0,0	FALSE	FALSE	TRUE	FALSE
314	0,0	FALSE	FALSE	TRUE	FALSE
315	0,0	FALSE	FALSE	TRUE	FALSE
316	0,0	FALSE	FALSE	TRUE	FALSE
317	0,0	FALSE	FALSE	TRUE	FALSE
318	0,0	FALSE	FALSE	TRUE	TRUE
319	17,0	FALSE	FALSE	TRUE	FALSE
320	0,0	FALSE	FALSE	TRUE	FALSE
321	0,0	FALSE	FALSE	TRUE	FALSE
322	0,0	FALSE	FALSE	TRUE	FALSE
323	0,0	FALSE	FALSE	TRUE	FALSE
324	0,0	FALSE	FALSE	TRUE	FALSE
325	0,0	FALSE	FALSE	TRUE	TRUE
326	0,0	FALSE	FALSE	TRUE	FALSE
327	0,0	FALSE	FALSE	TRUE	FALSE
328	0,0	FALSE	FALSE	TRUE	FALSE
329	0,0	FALSE	FALSE	TRUE	TRUE
330	0,0	FALSE	FALSE	TRUE	TRUE
331	0,0	FALSE	FALSE	TRUE	FALSE
332	0,0	FALSE	FALSE	TRUE	FALSE
333	0,0	FALSE	FALSE	TRUE	FALSE
334	0,0	FALSE	FALSE	TRUE	FALSE
335	0,0	FALSE	FALSE	TRUE	FALSE
336	0,0	FALSE	FALSE	TRUE	FALSE
337	0,0	FALSE	FALSE	TRUE	FALSE
338	0,0	FALSE	FALSE	TRUE	FALSE
339	27,8	FALSE	FALSE	TRUE	FALSE
341	0,0	FALSE	FALSE	TRUE	TRUE
342	50,0	FALSE	FALSE	TRUE	FALSE
343	32,7	FALSE	FALSE	TRUE	FALSE
344	25,7	FALSE	FALSE	TRUE	FALSE
345	97,5	TRUE	TRUE	TRUE	FALSE
346	37,6	FALSE	FALSE	TRUE	FALSE
347	0,0	FALSE	FALSE	TRUE	FALSE
348	3,8	FALSE	FALSE	TRUE	FALSE
349	61,8	FALSE	FALSE	TRUE	FALSE

Sample Plot 100 x100 m [ID]	FTSP Degrees of Soil Sealing [Mean Value]	FTSP Built up [TRUE / FALSE]	Reference Built up [TRUE / FALSE]	Compliance	Excluded by Mitigation Shape [TRUE / FALSE]
350	70,2	FALSE	FALSE	TRUE	TRUE
351	94,9	TRUE	TRUE	TRUE	FALSE
352	0,0	FALSE	FALSE	TRUE	FALSE
353	12,2	FALSE	FALSE	TRUE	FALSE
354	0,0	FALSE	FALSE	TRUE	FALSE
355	94,9	TRUE	TRUE	TRUE	FALSE
356	11,6	FALSE	FALSE	TRUE	FALSE
357	65,2	FALSE	FALSE	TRUE	FALSE
358	0,0	FALSE	FALSE	TRUE	FALSE
359	99,0	TRUE	FALSE	FALSE	FALSE
360	45,4	FALSE	FALSE	TRUE	FALSE
361	39,0	FALSE	FALSE	TRUE	FALSE
362	90,7	TRUE	FALSE	FALSE	FALSE
363	28,1	FALSE	FALSE	TRUE	FALSE
364	92,5	TRUE	TRUE	TRUE	FALSE
365	69,4	FALSE	FALSE	TRUE	FALSE
366	0,0	FALSE	FALSE	TRUE	FALSE
367	86,3	TRUE	FALSE	FALSE	FALSE
368	21,7	FALSE	FALSE	TRUE	FALSE
369	20,5	FALSE	FALSE	TRUE	FALSE
370	27,2	FALSE	FALSE	TRUE	FALSE
371	94,9	TRUE	TRUE	TRUE	FALSE
372	94,0	TRUE	TRUE	TRUE	FALSE
373	0,0	FALSE	FALSE	TRUE	FALSE