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# Coastal California Data Merge Project

Report Produced for the National Oceanic and Atmospheric Administration (NOAA)

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## **Executive Summary**

The primary purpose of this project is to merge recently collected topographic, bathymetric, and acoustic data along the California coastline from approximately the 10 meter elevation contour out to California's 3 mile state waters boundary. The inland boundary will include the NOAA/Ocean Protection Council (OPC) "all valid data" dataset based on a shapefile provided by NOAA Coastal Services Center (CSC).

Following an extensive data inventory, topographic, bathymetric, and acoustic data sources were obtained for use in the merge. Topographic LiDAR data was provided by NOAA, collected for the California Coastal Mapping Project (CCMP). Bathymetric LiDAR data was provided by the Joint Airborne LiDAR Bathymetry Technical Center of Expertise (JALBTCX), also collected for the CCMP. Multibeam Acoustic data was provided by the California Seafloor Mapping Program (CSMP): Ocean Protection Council, NOAA, and USGS where available.

Data delivery for California is divided into 4 production blocks. This delivery includes all production blocks.

### THE PROJECT TEAM

Dewberry served as the prime contractor for the project and subcontracted with Fugro EarthData for a portion of this task order. Dewberry was responsible for acquiring and preparing all sources of the topographic, bathymetric, and acoustic data, developing best-fit seamlines between data types, reclassifying the LAS data, generating and smoothing the final DEM, creating the final vertical accuracy and data void layers, and performing final quality assurance.

Fugro Earthdata was tasked with processing and tiling of the acoustic data in production blocks 3 and 4, as well as a portion of the bathymetric data. LAS data was reclassified accordingly into final and overlap classes. Fugro Earthdata generated best-fit seamlines between unique acoustic survey data and in areas where overlapping bathymetric was present. Within the same survey group, best resolution data was used and no best-fit seamlines were produced.

### **SURVEY AREA**

The full project area includes 4 production blocks, spanning 6,145 miles, and includes 17 counties along the coastline.

### **DATE OF SURVEY**

The LiDAR aerial acquisition dates vary with each data source. Information, including acquisition dates, is available for each data source used for this delivery and can be found in the data inventory, named Full\_DataInventory.xlsx, delivered to NOAA CSC. A file geodatabase (FGDB) has also been included to show the spatial extents of all acoustic data used.

### **DATUM REFERENCE**

Data produced for the Coastal California Data Merge Project were delivered in the following reference system.

**Horizontal Datum:** The horizontal datum for the project is North American Datum of 1983 (NAD 83) NSRS2007

**Vertical Datum:** The Vertical datum for the project is North American Vertical Datum of 1988 (NAVD88)



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Coordinate Systems: Universal Transverse Mercator (UTM) Zone 10 North and

Universal Transverse Mercator (UTM) Zone 11 North, where appropriate

**Units:** Horizontal units are in meters, vertical units are in meters

Geoid Model: Geoid 09

### LIDAR VERTICAL ACCURACY

LiDAR vertical accuracy varies with each data source. Additional vertical accuracy testing was not performed on the data and was not required by this task order. Using the information from the metadata, a vertical accuracy layer was generated in both raster and vector format. Accuracy values are represented as  $RMSE_z$  where available.

Data Source	Reported Vertical Accuracy
NOAA Topographic LiDAR	4.8 cm RMSE <sub>z</sub>
JALBTCX Bathymetric LiDAR	15 cm RMSE <sub>z</sub>
Multibeam Acoustic Data	Varies by source or not available

Table 1: Accuracy values of source data as found in the respective metadata.

Where vertical accuracy is unavailable, it was identified as "undefined" in the vector layer and as -9999 in the raster layer. Uncertainty values provided in the acoustic Bathymetry Attributed Grid (BAG) data were generalized in the vector layer.

### PROJECT DELIVERABLES

The deliverables for the project are listed below.

- 1. Merged Point Data in LAS v1.2 format
- 2. Smoothed with Interpolated Voids Merged DEM in ERDAS IMG format (Tiled)
- 3. Smoothed with Voids Merged DEM in ERDAS IMG format (Tiled)
- 4. Vertical Accuracy Layer in raster (Tiled) and vector (shapefile) formats
- 5. Void Mask in raster (Tiled) and vector (shapefile) formats
- 6. Ancillary Data (File GDB)
  - Seamlines (topo/bathy and bathy/acoustic)
  - o Smoothed Areas (topo/bathy and bathy/acoustic)
  - Tile grid of delivered tiles
  - Acoustic boundaries
- 7. FGDC Compliant Metadata for DEM, Vertical Accuracy layer, and Void Mask
- 8. Source Data Used (Microsoft Excel spreadsheet)
- 9. Acoustic Source extent boundaries (File GDB)
- 10. Project Boundary
- 11. Project Report

### PROJECT TILING FOOTPRINT

Eight thousand and eighteen (8018) LAS tiles are included in all of the Coastal California Data Merge Project area. Eight thousand and forty (8040) tiles are included per DEM, vertical accuracy, and void mask rasters. This discrepancy is attributed to the fact that in areas of large voids, no LAS data points are available. However, in the DEMs, these void areas are interpolated and available for tiling. In the DEMs with voids, these tiles are comprised of full NoData values. Each tile's extent is 1500m x 1500m. A complete list of delivered tiles can be found in Appendix A.



Ten (10) tiles that intersect the project boundary were completely removed from final delivery. These tiles do not have any valid LAS points and also do not have any interpolated DEM values. They are found on the very edges of the project boundary. These 10 tiles are listed below:

Tile Name				
11SMS275975	10SFE840000			
11SMS275990	10SFE825285			
11SMS500795	10SEG235865			
11SMT260005	10TCL885150			
11SLT690575	10TCM975125			

Table 2: List of tiles removed from delivery



Figure 1: Coastal California Project Boundary





Figure 2: Coastal California production blocks

# **LiDAR Processing & Qualitative Assessment**

### DATA CLASSIFICATION AND EDITING

All data was initially processed using GeoCue and TerraScan software by Dewberry. The initial step is the setup of the GeoCue project, which is done by importing a project defined tile boundary index encompassing the entire project area. LAS points from the topographic data and ASCII files from the bathymetric and acoustic data sources were imported into the GeoCue project, converted to LAS 1.2, and tiled to the production tile grid.

Topographic data was reviewed along the coastline for misclassified ground. Offshore islands were added back to the ground (class 2) where necessary. The shoreline ground was also extended in some areas to meet with the bathymetric data.

Bathymetric data was modified to remove miscellaneous artifacts located above the water line – docks, piers, boats, etc. This is done through TerraScan using absolute elevation reclassification to class 21 (Non-submerged Bathymetry). Tiles are then reviewed for additional artifacts and/or aggressive classification. Bathymetric-acoustic overlap data was moved to class 23 (Ignored Submerged Bathymetry/Overlap).



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ASCII files from the acoustic BAG data were transformed from mean lower low water (MLLW) to NAVD88 using NOAA's VDatum software (version 2.3.5) prior to import. Acoustic heights (z) were also converted to soundings (-z) for project consistency. Other sources of acoustic data were modified as necessary to remain consistent with the rest of the project data. Acoustic-acoustic overlap data was reclassified to class 26 (Ignored Multibean Acoustic/Overlap).

For the final merged LAS product, the following classification codes were used:

- Class 1 = Unclassified (Topography)
- Class 2 = Ground (Topography)
- Class 7 = Noise (Topography)
- Class 9 = Water (Topography)
- Class 10 = Mud Flats (Topography)
- Class 12 = Overlap (Topography)
- Class 21 = Non-submerged Bathymetry
- Class 22 = Submerged Bathymetry
- Class 23 = Ignored Submerged Bathymetry / Overlap
- Class 25 = Multibeam Acoustic
- Class 26 = Ignored Multibeam Acoustic / Overlap

Final LAS data points were not clipped to the project boundary. Fully classified LAS tiles have been provided.

### CREATING SEAMLINES BETWEEN DIFFERENT DATASETS

The creation of seamlines between the different datasets is necessary in order to properly reclassify areas of overlap. The seamline is also the starting point for the creation of the buffers used for smoothing the final DEM. Best fit seamlines were generated for the following areas:

- Topographic/Bathymetric boundary
- Acoustic/Acoustic survey boundary
- Bathymetric/Acoustic boundary

Within an acoustic survey, if multiple resolution data was available, the best resolution was prioritized. The extent of each resolution was generated in Global Mapper. In areas of overlap, the extent of the best resolution data was used to classify acoustic data to class 25 (Multibeam Acoustic). Remaining LAS points were moved to class 26 (Ignored Multibeam Acoustic/Overlap).

### **Topographic-Bathymetric Best Fit Seamline**

All breaklines provided by NOAA were merged into a single polygon feature class. This became the foundation of the initial seamline. Areas containing both topographic and bathymetric data along the coastline were reviewed on a tile-by-tile basis using difference rasters. Because the topographic data has better horizontal resolution and vertical accuracy than the bathymetric data, it generally took priority over bathymetric data in overlap areas. However, in some areas a smoother transition between the topographic and bathymetric LiDAR datasets could be achieved by modifying the extent of the topographic data in favor of the bathymetric data. In these cases, the breakline was adjusted accordingly.



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The final polygon feature class was used for reclassification of LAS points in TerraScan. The polygon was converted to a polyline in Arc and clipped to the extent of the coastal shoreline. This final polyline was also used as basis for the creation of the DEM smoothing buffers.

### **Acoustic-Acoustic Best Fit Seamline**

Extent boundaries for each acoustic survey were generated in Global Mapper and used as a foundation for a best fit line. Difference rasters were produced along survey boundaries. Using the difference rasters as a guide, the extents were modified in areas of overlap to create the smoothest transition from one survey to the next. The final polygon boundaries were used for reclassification of acoustic data points.

### **Bathymetric-Acoustic Best Fit Seamline**

The bathymetric-acoustic seamline was generated using the same methodology as the acoustic overlap seamline above. Difference rasters were produced along the acoustic and bathymetric boundary. The polygon extent from the acoustic data was modified along this boundary to create a best fit seamline. The final polygon was used for reclassification of bathymetric and acoustic data points. The polygon was converted to a polyline in Arc and used as basis for the creation of the DEM smoothing buffers.

### RECLASSIFICATION OF TOPOGRAPHIC DATA

Reclassification of offshore islands and pinnacles is a critical component to the success of the final merged product. Tiles within 100 meters of the coastal shoreline were identified for manual reclassification. Each tile was brought into TerraScan and a temporary surface model was created from the topographic ground points (class 2). Using aerial imagery as a guide, the coastline was examined for any exposed islands that could be reclassified to ground (class 2). Once located, LAS points were reclassified from water (class 9), unclassified (class 1), or, in rare cases, bathymetry (class 22) to ground.

In topographic-bathymetric overlap areas where the seamline was modified, any affected topographic points were moved from ground (class 2) to unclassified (class 1) in TerraScan using the topographic-bathymetric seamline polygon feature class. After manual classification was complete, LAS tiles were loaded into Global Mapper for initial QC.

### RECLASSIFICATION OF BATHYMETRIC DATA

In areas of overlap where topographic data was given priority over bathymetric data, overlapping bathymetric points were moved to class 21 (non-submerged bathymetry). This was performed in TerraScan using the final seamline polygon.

A minimum of three (3) data points within a 15 meter radius is required for inclusion in the DEM. An extent polygon is needed to accomplish this task. Topographic ground points (class 2) and bathymetric points (class 22) were converted to a masspoint feature class in Arc. Ground points from the topographic data were purposefully included here. The assumption is that if there is a bathymetric point within 15 meters of two topographic ground points, it should be used in the DEM. If ground points were excluded from consideration, nearshore bathymetric points may be incorrectly excluded as well. The masspoints were used as the input in the Aggregate Points tool in Arc with a set distance of 15m.

After the final extent polygons were generated, class 22 bathymetric points not within these polygons were moved to class 23 (ignored submerged bathymetry/overlap) in TerraScan. Points outside the extent polygon remained in class 21/22. Finally, to remove above-ground artifacts from the bathymetric data, all class 22 points with elevations above +1m were reassigned to



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class 21 using an automated process in TerraScan. This removed docks, piers, bridges, and other miscellaneous artifacts from the point cloud. Bathymetric data between o-1m elevation were left in class 22 to avoid classifying out too many data points in the nearshore areas. Bathymetric elevations between o-1m were evaluated on a tile-by-tile basis and moved to class 21 if necessary.

In areas where bathymetric data overlapped acoustic data, the bathymetric-acoustic seamline boundary was used to reclassify overlapping bathymetric points to class 23.

### RECLASSIFICATION OF ACOUSTIC DATA

Each survey of the acoustic data was reclassified from temporary class codes to the final class 25 (multibeam acoustic) and class 26 (acoustic overlap). This process was automated in TerraScan. For the BAG data, the best resolution data was used and no best fit line was produced between resolutions. In Terrascan, voids in higher resolution acoustic BAG data were filled with available lower resolution BAG data. This process results in a merged LAS point cloud for each survey location utilizing the best resolution BAG data. Ignored and overlap points were classified into class 26. QC of the filled datasets was performed to check for excessize stepping, surface quality (artificial cliffs and ridges), and conpleteness.

Between surveys, the best fit seamline was used for reclassification. Final acoustic data was reviewed to ensure aggressive classification of data did not occur.

### LIDAR ANALYSIS

After the reclassification of the data was finalized, all LAS data was merged in GeoCue to produce the final tiled LAS. Files were QCed for correct header, projection, and naming conventions.

The following observations were made during LiDAR processing:

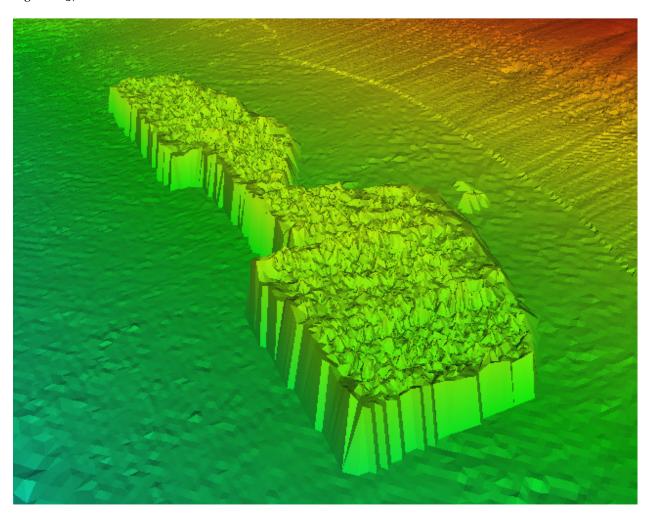
- 1. <u>File Format</u>: The LAS files are verified to meet project specifications. The LAS files for the NOAA Coastal California Data Merge project conform to the specifications outlined below.
  - Format
    - LAS format 1.2
    - o Point data record format 1
    - o GPS Standard Time (where available)
  - Classification scheme
    - Class 1 = Unclassified
    - Class 2 = Ground
    - Class 7 = Noise
    - Class 9 = Water
    - Class 10 = Mud Flats
    - Class 12 = Overlap
    - o Class 21 = Non-submerged Bathymetry
    - Class 22 = Submerged Bathymetry
    - Class 23 = Ignored Submerged Bathymetry / Overlap
    - o Class 25 = Multibeam Acoustic
    - Class 26 = Ignored Multibeam Acoustic / Overlap



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- Projection
  - o Datum: North American Datum 1983, NSRS 2007
  - o Projected Coordinate System: UTM Zone 10 North, UTM Zone 11 North
  - Horizontal Units: Meters
  - o Vertical Datum: North American Vertical Datum 1988, Geoid 09
  - o Vertical Units: Meters
- 2. <u>Submerged Artifacts:</u> Most submerged artifacts were not removed from the LAS. In order to treat features consistently across the project area, when in doubt regarding the accuracy of the data points, the points would be considered a valid underwater feature. In cases where features seem inaccurately portrayed, these points were moved to the overlap class. An example is shown below.





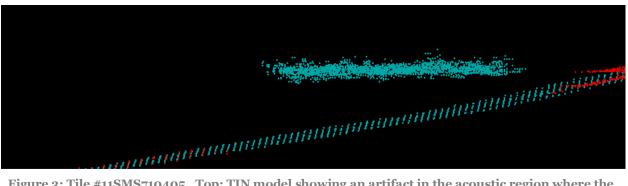
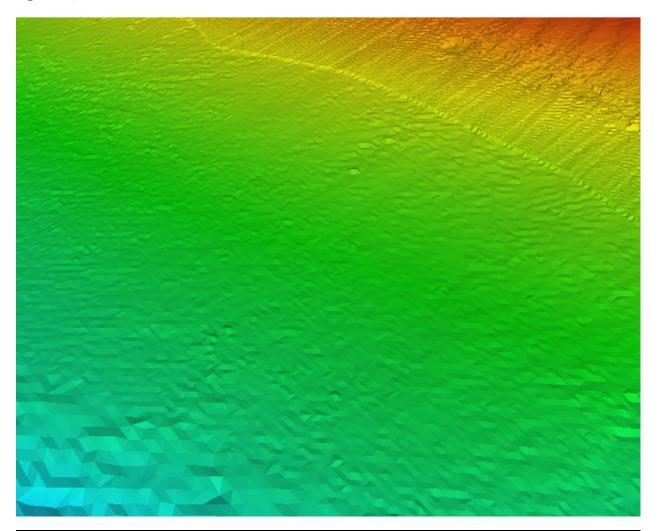


Figure 3: Tile #11SMS710405. Top: TIN model showing an artifact in the acoustic region where the points range from 20-50 meters above the surrounding area. Bottom: Profile view of acoustic points (cyan - class 25) in this location.





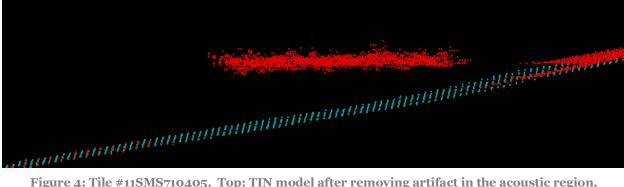


Figure 4: Tile #11SMS710405. Top: TIN model after removing artifact in the acoustic region. Bottom: Profile view of newly classified acoustic points in this location (cyan – class 25 final, red – class 26 overlap).



3. <u>Islands / Offshore outcrops</u>: Some islands were classified to water in the original topographic LiDAR data. Dewberry manually reclassified topographic LiDAR data to accurately reflect the presence of these offshore landmasses. Bathymetric data in these areas were reclassified to class 21 (non-submerged topography). If no topographic data was available, bathymetric data was moved from class 22 to class 2 to supplement the ground. An example from block 4 is shown below.

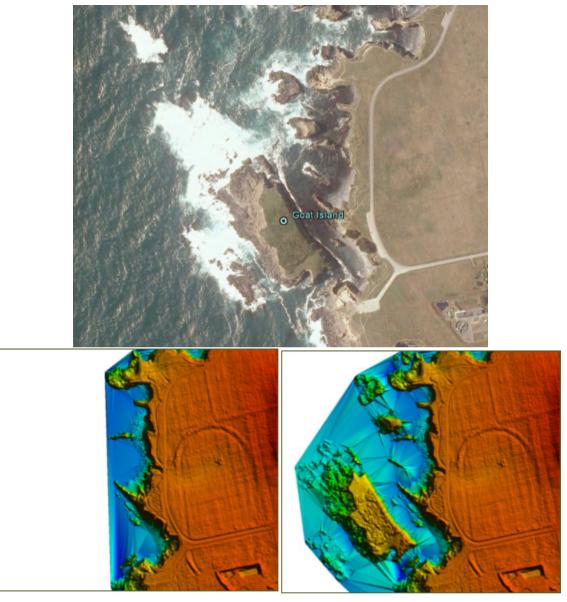
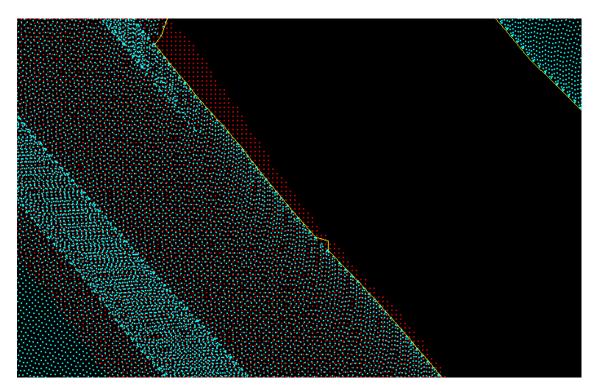


Figure 5: Tile# 10SDJ290500. Top: Aerial imagery showing a large island off the coastline. Bottom left: TIN before reclassification. Bottom right: TIN after manual reclassification.



4. Artificial Features: In several locations, filling voids with available acoustic data would result in elevated "islands" or artificial depressions due to the vertical offsets between the data sources. Therefore, to provide a more consistent ground, the points were allowed to interpolate across and acoustic data was kept in class 26 (ignored). Similarly, in areas where there are voids in the acoustic data, some bathymetric data was left as class 23 (ignored/overlap) to prevent additional artificial features. An example is shown below.



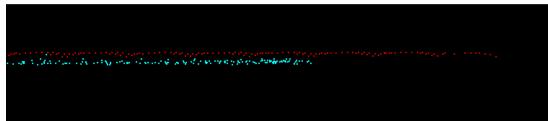


Figure 6: Tile #11SMS530855. Top: Bathymetric data (cyan – class 22) and acoustic overlap data (red – class 26). This void is not filled with available acoustic data because it would create a 0.5 meter high ledge at the boundary.

# **DEM Production & Qualitative Assessment**

The final products for production block 1a include two types of Digital Elevation Models (DEMs): Smoothed with Interpolated Voids and Smoothed with Voids. Smoothing was performed on the topographic-bathymetric seamline and the bathymetric-acoustic data seamline where necessary. Smoothing was not performed between adjacent acoustic surveys. DEMs were created by Dewberry after finalizing all data point classifications and reviewing LAS for quality assurance.



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### **DEM PRODUCTION METHODOLOGY**

Dewberry utilized ESRI software and Global Mapper for the DEM production and QC process. ArcGIS software was used to generate the products and the QC was performed in both ArcGIS and Global Mapper.

- 1. <u>LAS Classification</u>: Final classifications for topographic, bathymetric, and multibeam acoustic LAS were merged in GeoCue.
- 2. <u>Terrain Processing</u>: LAS data was converted to masspoints in Arc using classes 2, 22, and 25. This masspoint feature class was used as the input for terrain processing in Arc with a 0.7m average point spacing.
- 3. <u>DEM Zones for Processing</u>: Individual DEM zones consisting of a one tile buffer were generated for the production block. This ensures artifacts are not created along boundaries during processing.
- 4. <u>Convert Terrain to Raster</u>: The output terrain was converted to an ERDAS Imagine raster (IMG) with 1 m cell size using the Natural Neighbors method. Extents were set to the DEM zone boundaries generated in step 3.
- 5. <u>Smoothing:</u> The resulting raster was smoothed using the approved smoothing methodology described below.
- 6. <u>Removal of Voids:</u> Void areas were removed from the raster produced from step 5 above using a void mask produced in the methodology described below. Voids along the topographic project boundary were removed for both DEM products. Additional voids within the bathymetric and acoustic areas were removed for the DEM with voids.
- 7. Final DEM: Rasters were clipped to the project boundary in Arc.
- 8. Extract Individual Tiles: Using a Dewberry proprietary tool, final DEMs were clipped to the tile grid and QC'd to ensure tile boundaries are seamless.

### SMOOTHING METHODOLOGY

Dewberry utilized ESRI ArcGIS software and Global Mapper for the creation and analysis of the smoothing technique.

- 1. <u>Best Fit Line</u>: The best fit seamline was used as the starting point for the smoothing process of the DEM. Using the initial raster from step 4 of the DEM methodology above as a visual guide, the seamline was reviewed manually on a tile by tile basis in Global Mapper. The line was clipped and/or removed in areas where vertical offsets were not visible in the DEM or where cliffs, berms, voids, or other features would be not be smoothed. This prevents any unnecessary alteration of the original elevation data. A 10m radius buffer polygon was generated in Arc around the remaining portions of the best fit line.
- 2. Extract the Smooth Mask Area: In Arc, the polygon buffer was used to extract a raster "strip" that would be used in the smoothing process. After extraction, the cell values in this raster strip were resampled to 3m cell size using mean aggregation. The resulting raster was resampled back to a 1m cell size using bilinear interpolation. This process produced a raster strip that would be used to smooth between data sources.
- 3. Smooth Mask Overlay: The initial raster, the raster strip, and the seamline polygon buffer were opened in Global Mapper software. To ensure that raster values are not automatically resampled in Global Mapper when performing the final export, the default raster interpolation option was changed to Nearest Neighbor (none) before any further processing was performed. The seamline polygon buffer was selected in Global Mapper and the raster strip was feathered by 8 pixels. This eliminated any hard edges that would



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normally be produced by merging the two raster datasets. The two rasters were exported as one merged raster from Global Mapper using the following parameters:

File Type: ERDAS Imagine Image (IMG) Cell Size: 1m x 1m Data: 32-bit floating elevation Create Compressed File (UNCHECKED) Interpolate Gaps (CHECKED)

4. <u>Initial QC of Exported DEM</u>: The DEM was reopened in ESRI ArcGIS software and QC'd. Any alignment shifts, projection issues, or other problems were corrected as necessary.

### CREATION OF VOID MASK

Areas would be considered voids if they are greater than 3 times the nominal post spacing (or resolution) of the source data. It was determined the value of 225 sq meters would be used for the project.

- 1. <u>Generation of Data Extent:</u> Masspoints containing LAS class codes 2, 22, and 25 were used to generate extent polygons in Arc with the aggregate point tool. Aggregation distance was set to 15m. Extents were generated to the DEM zone boundary to prevent excessive voids along the project boundary.
- 2. <u>Buffer:</u> The resulting data extent was buffered by 1m. This prevents points on the edge of the extents from being included in the final void mask.
- 3. <u>Symmetrical Difference:</u> The buffered extent was inverted using the symmetrical difference tool in Arc. These areas represent the new initial data voids layer. Multipart features were exploded and area calculations were made on the resulting void polygons.
- 4. <u>Void Mask:</u> Void polygons smaller than 225 sq meters in area were removed. Voids resulting from poor LiDAR penetration, building footprints, or other topographic features were removed. An exception to this includes areas along the project boundary where a legitimate data void is present. Inland breaklines (lakes, ponds, streams) were converted to polygons and added to the void mask as necessary. The void mask was converted to raster format.
- 5. <u>Extract Individual Tiles:</u> Using a Dewberry proprietary tool, the final raster was clipped to the tile grid and OC'd to ensure tile boundaries are seamless.

### **DEM ANALYSIS**

Dewberry utilized Global Mapper and ArcGIS software to review the cleanliness of the DEM products. The following observations were made regarding the final merged DEMs.

1. <u>Seamlines and Smoothing</u>: Smoothing was performed between the topographic-bathymetric data and the bathymetric-acoustic data in areas where an offset was visible. Smoothing was not performed between acoustic surveys.



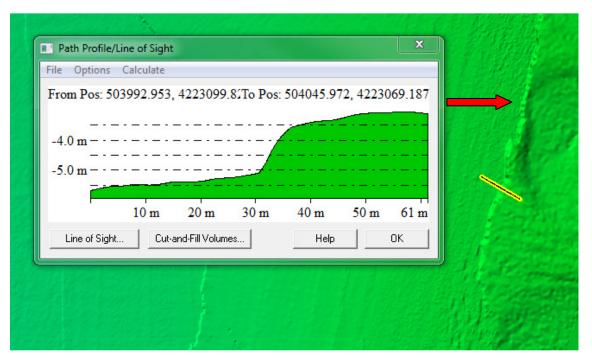


Figure 7: The best fit seamline between bathymetric and acoustic datasets results in approximately a 1.5 m vertical offset. This seamline is smoothed in the final DEM.

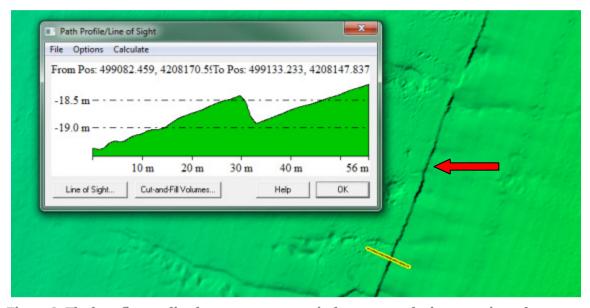


Figure 8: The best fit seamline between two acoustic datasets results in approximately a 0.5 m vertical offset. This seamline is not smoothed in the final DEM.

2. <u>Void Boundaries</u>: Final LAS class values of 2, 22, and 25 were used to create the void polygons. The final extents were buffered and inverted to create the new void mask. Review of the void mask showed that many of the narrower streams were not being correctly identified as voids. This resulted in some abrupt transitions between void and non-void areas. Breaklines were used to supplement the void layer in these areas.



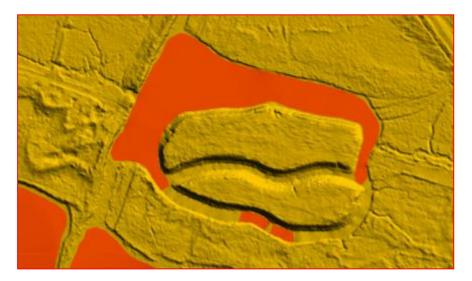




Figure 9: Top: Void Mask (red) after initial creation. Bottom: Void mask revised after reviewing for bathymetric data and incorporating the breaklines provided.

3. <u>Processing Artifacts</u>: In areas with large voids, Arc has a difficult time interpolating between available data points. Therefore, the resulting raster is produced with an assortment of processing artifacts in the void areas. These artifacts are not of concern in the DEM with voids since they are removed with the void mask. In the interpolated DEM, attempts were made to reduce the appearance of these artifacts. Smaller areas of processing artifacts still exist, but should not affect the overall usability of the DEM.



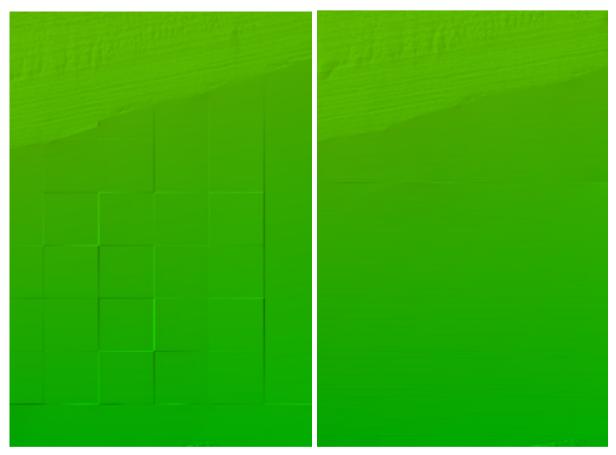


Figure 10: Left: Square processing artifacts emerge in areas of large voids when using ArcGIS Terrain to Raster tool. Right: Artifacts have been minimized by reprocessing the DEM in subsections in the affected area. Some processing artifacts still remain in the interpolated DEM, but have been minimalized as much as possible.

4. Artifacts Along Project Boundary: Along the topographic side of the project boundary, there are several areas where LAS points are not available. To prevent the inclusion of processing artifacts in the DEMs at the project boundary, the project boundary was buffered inside by 15m and the DEMs were clipped to the new boundary extent. Large voids along the boundary edge were also removed from the DEMs.



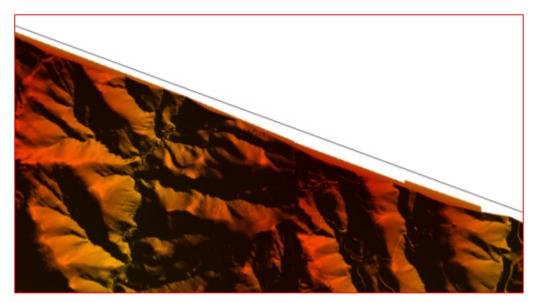


Figure 11: There is a visible gap between the project boundary (black line) and the topographic extent of the interpolated DEM. Because there are no data points in this area, interpolation does not extend to the project boundary and creates processing artifacts in the DEM. This area is clipped out for both DEM products.

### **DEM QUALITATIVE ASSESSMENT**

Dewberry performed a comprehensive qualitative assessment of the DEM deliverables to ensure that all tiled DEM products were delivered with the proper extents, were free of processing artifacts, and contained the proper referencing information. Upon completion of this review the DEM data was loaded into Global Mapper to ensure that all files are readable and that no artifacts exist between tiles.

### **DEM QA/QC CHECKLIST**

# Project Number/Description: TO 11; NOAA Coastal California Data Merge Project Date: 10/31/2013

OC

Correct number of files

ERDAS Imagine IMG format

Verify projection/coordinate system (NAD83 NSRS2007 UTM Zone 10N/11N meters and NAVD88 Geoido9 meters)

Verify correct cell size, type, number of rows and columns of pixels

Verify raster spatial extent covers project tile grid

Perform final overview in Arc and Global Mapper to ensure seamless product

### Metadata

☑ Project level DEM metadata XML file is error free as determined by the USGS MP tool
 ☑ Metadata content contains sufficient detail and all pertinent information regarding source materials, projections, datums, processing steps, etc.

**Completion Comments: Complete** 



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## **Generation of the Vertical Accuracy Layer**

The final confidence layer is comprised of two (2) products: a Vertical Accuracy Layer and a Void Mask. The process for creating the void mask has been described in the previous section of this project report. The following describes the process of creating the vertical accuracy layer.

Where accuracy is unavailable for the vertical accuracy layer, the resulting products contain "undefined" in the vector layer and -9999 is the raster layer. Voids within the vertical accuracy layer are removed in the vector layer and is symbolized as NoData in the raster layer. For the separate void mask, void areas have a value of 1 in the raster layer. All other areas were assigned a value of 0 if within the project boundary and NoData if outside the project boundary.

### VECTOR LAYER

The seamlines generated between the topographic, bathymetric, and acoustic datasets were used to cut polygons from the DEM production boundaries. Each polygon was assigned a "Type" and "Accuracy" attribute using the information provided in the metadata.

The acoustic BAG data provided by NOAA's National Geophysical Data Center (NGDC) contains a separate collection of ASCII point files where the elevations (z) are replaced with uncertainty (u) values per point (resulting in xyu files). These values represent uncertainties at MLLW. Using NOAA's guide, *Estimation of Vertical Uncertainties in VDatum*, uncertainties were updated to reflect the transformation of the BAG data from MLLW to NAVD88 using the square root of the sum of the squares of the individual uncertainties. Accuracy values are generalized in the vector data for ease of display and the min-max uncertainty values per BAG survey are attributed accordingly.

### RASTER LAYER

Acoustic BAG uncertainty data was reclassified using the same extents used to classify the BAG elevation data. Cell sizes and values for each resolution were designated based on initial acoustic resolutions, i.e an LAS point with an uncertainty of 25cm in the 4m resolution extent would result in a 4m x 4m cell with a value of 0.25m. Cell sizes less than 1m were resampled to 1m resolution using mean cell assignment. Acoustic rasters were mosaicked together to 1m cell size.

Topographic and bathymetric polygons generated from the vertical accuracy vector layer were converted to 1m cell size rasters using the polygon to raster tool in Arc. These rasters were mosaicked with the final vertical accuracy raster.

Any NoData cells that existed between or within resolutions were filled in using focal statistics, neighborhood mean method using a 15m radius. Values of -9999 were treated as NoData to avoid being incorporated into mean calculations.



# **Appendix A**

### PRODUCTION BLOCK 1A

The 712 tiles delivered with production block 1a are listed below. Sixteen (16) tiles highlighted in yellow have DEMs, but do not have a corresponding LAS tile due to data voids:

m yenow nave i	ones, but do no	t nave a correspo	manig Lab the a	de to data voids.	
11SMR815985	11SMS395930	11SMS455960	11SMS530795	11SMS575825	11SMS635600
11SMR830985	11SMS395945	11SMS470840	11SMS530810	11SMS575840	11SMS635615
11SMR845985	11SMS395960	11SMS470855	11SMS530825	11SMS590675	11SMS635630
11SMR860985	11SMS395975	11SMS470870	11SMS530840	11SMS590690	11SMS635645
11SMR875985	11SMS395990	11SMS470885	11SMS530855	11SMS590705	11SMS635660
11SMR890985	11SMS410885	11SMS470900	11SMS530870	11SMS590720	11SMS635675
11SMR905985	11SMS410900	11SMS470915	11SMS530885	11SMS590735	11SMS635690
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11SMS290975	11SMS410930	11SMS470945	11SMS545750	11SMS590765	11SMS635720
11SMS290990	11SMS410945	11SMS485825	11SMS545765	11SMS590780	11SMS635735
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11SMS320960	11SMS425870	11SMS485885	11SMS545825	11SMS605660	11SMS635795
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11SMS320990	11SMS425900	11SMS485915	11SMS545855	11SMS605690	11SMS635825
11SMS335960	11SMS425915	11SMS485930	11SMS545870	11SMS605705	11SMS650555
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11SMS350945	11SMS425960	11SMS500840	11SMS560735	11SMS605750	11SMS650600
11SMS350960	11SMS425975	11SMS500855	11SMS560750	11SMS605765	11SMS650615
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11SMS350990	11SMS440870	11SMS500885	11SMS560780	11SMS605795	11SMS650645
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11SMS665510	11SMS680645	11SMS695645	11SMS710630	11SMS725645	11SMS755135
11SMS665525	11SMS680660	11SMS695660	11SMS710645	11SMS725660	11SMS755150
11SMS665540	11SMS680675	11SMS695675	11SMS710660	11SMS725675	11SMS755165
11SMS665555	11SMS680690	11SMS695690	11SMS710675	11SMS725690	11SMS755180
11SMS665570	11SMS680705	11SMS695705	11SMS710690	11SMS740075	11SMS755195
11SMS665585	11SMS680720	11SMS695720	11SMS710705	11SMS740090	11SMS755210
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11SMS665645	11SMS695150	11SMS710135	11SMS725135	11SMS740150	11SMS755270
11SMS665660	11SMS695165	11SMS710150	11SMS725150	11SMS740165	11SMS755285
11SMS665675	11SMS695180	11SMS710165	11SMS725165	11SMS740180	11SMS755300
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11SMS665735	11SMS695240	11SMS710225	11SMS725225	11SMS740240	11SMS755360
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11SMS665765	11SMS695270	11SMS710255	11SMS725255	11SMS740270	11SMS755390
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11SMS770285	11SMS785465	11SMS815180	11SMS845150	11SMS890060	11SMS935120
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11SMS770345	11SMS785495	11SMS815210	11SMS845180	11SMS890090	11SMS950000
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11SMS770375	11SMS785525	11SMS815240	11SMS845240	11SMS890120	11SMS950045
11SMS770390	11SMS785540	11SMS815255	11SMS845255	11SMS890135	11SMS950120
11SMS770405	11SMS785555	11SMS815270	11SMS860000	11SMS890150	11SMS950135
11SMS770420	11SMS800075	11SMS815465	11SMS860015	11SMS890165	11SMT275005
11SMS770435	11SMS800090	11SMS815480	11SMS860030	11SMS890180	11SMT290005
11SMS770450	11SMS800105	11SMS815495	11SMS860045	11SMS905000	11SMT290020
11SMS770465	11SMS800120	11SMS815510	11SMS860060	11SMS905015	11SMT305005
11SMS770480	11SMS800135	11SMS830000	11SMS860075	11SMS905030	11SMT305020
11SMS770495	11SMS800150	11SMS830015	11SMS860090	11SMS905045	11SMT305035
11SMS770510	11SMS800165	11SMS830030	11SMS860105	11SMS905060	11SMT320005
11SMS770525	11SMS800180	11SMS830045	11SMS860120	11SMS905075	11SMT320020
11SMS770540	11SMS800195	11SMS830060	11SMS860135	11SMS905090	11SMT320035
11SMS770555	11SMS800210	11SMS830075	11SMS860150	11SMS905105	11SMT320050
11SMS770600	11SMS800225	11SMS830090	11SMS860165	11SMS905120	11SMT335005
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11SMS785075	11SMS800255	11SMS830120	11SMS860195	11SMS905150	11SMT335035
11SMS785090	11SMS800270	11SMS830135	11SMS860240	11SMS905165	11SMT335050
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11SMS785120	11SMS800300	11SMS830165	11SMS860270	11SMS920000	11SMT350020
11SMS785135	11SMS800315	11SMS830180	11SMS875000	11SMS920015	11SMT350035
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11SMS785180	11SMS800495	11SMS830225	11SMS875045	11SMS920060	11SMT365020
11SMS785195	11SMS800510	11SMS830240	11SMS875060	11SMS920075	11SMT365035
11SMS785210	11SMS815000	11SMS830255	11SMS875075	11SMS920090	11SMT365050
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11SMS785240	11SMS815030	11SMS845000	11SMS875105	11SMS920120	11SMT380020
11SMS785255	11SMS815045	11SMS845015	11SMS875120	11SMS920135	11SMT395005
11SMS785270	11SMS815060	11SMS845030	11SMS875135	11SMS935000	11SMT395020
11SMS785285	11SMS815075	11SMS845045	11SMS875150	11SMS935015	11SMT410005
11SMS785300	11SMS815090	11SMS845060	11SMS875165	11SMS935030	
11SMS785315	11SMS815105	11SMS845075	11SMS875180	11SMS935045	



### PRODUCTION BLOCK 1B

The 1236 tiles delivered with production block 1b are listed below. Two (2) tiles highlighted in yellow do not have a corresponding LAS tile due to data voids:

<i>y</i> e220 420 220 2 220	ave a correspond	ing mis the due	to data voids.		
11SKT730965	11SKT835920	11SKT880965	11SKT925890	11SKT970830	11SLT000740
11SKT730980	11SKT835935	11SKT895770	11SKT925905	11SKT970845	11SLT000755
11SKT730995	11SKT835950	11SKT895785	11SKT925920	11SKT970860	11SLT000770
11SKT745950	11SKT835965	11SKT895800	11SKT925935	11SKT985695	11SLT000785
11SKT745965	11SKT835980	11SKT895815	11SKT940740	11SKT985710	11SLT000800
11SKT745980	11SKT835995	11SKT895830	11SKT940755	11SKT985725	11SLT000815
11SKT745995	11SKT850860	11SKT895845	11SKT940770	11SKT985740	11SLT000830
11SKT760950	11SKT850875	11SKT895860	11SKT940785	11SKT985755	11SLT015680
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11SKT775935	11SKT850935	11SKT895920	11SKT940845	11SKT985815	11SLT015740
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11SKT835890	11SKT880935	11SKT925860	11SKT970800	11SLT000710	11SLT045770
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11SLT060695	11SLT105710	11SLT180650	11SLT270650	11SLT360590	11SLT450650
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11SLT060755	11SLT105785	11SLT180710	11SLT285590	11SLT360650	11SLT465620
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11SLT060785	11SLT105815	11SLT195635	11SLT285620	11SLT360680	11SLT465650
11SLT060800	11SLT105830	11SLT195650	11SLT285635	11SLT375590	11SLT465665
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11SLT060830	11SLT120665	11SLT195680	11SLT285665	11SLT375620	11SLT480605
11SLT060845	11SLT120680	11SLT195695	11SLT285680	11SLT375635	11SLT480620
11SLT075665	11SLT120695	11SLT195710	11SLT300575	11SLT375650	11SLT480635
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11SLT075710	11SLT120740	11SLT210650	11SLT300620	11SLT390605	11SLT480680
11SLT075725	11SLT120785	11SLT210665	11SLT300635	11SLT390620	11SLT495605
11SLT075740	11SLT120800	11SLT210680	11SLT300650	11SLT390635	11SLT495620
11SLT075755	11SLT120815	11SLT210695	11SLT300665	11SLT390650	11SLT495635
11SLT075770	11SLT135650	11SLT210710	11SLT300680	11SLT390665	11SLT495650
11SLT075785	11SLT135665	11SLT225620	11SLT315575	11SLT390680	11SLT495665
11SLT075800	11SLT135680	11SLT225635	11SLT315590	11SLT405605	11SLT495680
11SLT075815	11SLT135695	11SLT225650	11SLT315605	11SLT405620	11SLT510605
11SLT075830	11SLT135710	11SLT225665	11SLT315620	11SLT405635	11SLT510620
11SLT075845	11SLT135725	11SLT225680	11SLT315635	11SLT405650	11SLT510635
11SLT090665	11SLT135740	11SLT225695	11SLT315650	11SLT405665	11SLT510650
11SLT090680	11SLT150635	11SLT240620	11SLT315665	11SLT405680	11SLT510665
11SLT090695	11SLT150650	11SLT240635	11SLT330575	11SLT420605	11SLT510680
11SLT090710	11SLT150665	11SLT240650	11SLT330590	11SLT420620	11SLT525605
11SLT090725	11SLT150680	11SLT240665	11SLT330605	11SLT420635	11SLT525620
11SLT090740	11SLT150695	11SLT240680	11SLT330620	11SLT420650	11SLT525635
11SLT090755	11SLT150710	11SLT240695	11SLT330635	11SLT420665	11SLT525650
11SLT090770	11SLT150725	11SLT255620	11SLT330650	11SLT420680	11SLT525665
11SLT090785	11SLT165635	11SLT255635	11SLT330665	11SLT435605	11SLT525680
11SLT090800	11SLT165650	11SLT255650	11SLT345575	11SLT435620	11SLT540605
11SLT090815	11SLT165665	11SLT255665	11SLT345590	11SLT435635	11SLT540620
11SLT090830	11SLT165680	11SLT255680	11SLT345605	11SLT435650	11SLT540635



11SLT540650	11SLT615410	11SLT645410	11SLT660650	11SLT690500	11SLT720635
11SLT540665	11SLT615500	11SLT645425	11SLT675275	11SLT690515	11SLT720650
11SLT540680	11SLT615515	11SLT645440	11SLT675290	11SLT690530	11SLT735260
11SLT555590	11SLT615530	11SLT645455	11SLT675305	11SLT690590	11SLT735275
11SLT555605	11SLT615545	11SLT645470	11SLT675320	11SLT690605	11SLT735290
11SLT555620	11SLT615560	11SLT645485	11SLT675335	11SLT690620	11SLT735305
11SLT555635	11SLT615575	11SLT645500	11SLT675350	11SLT690635	11SLT735320
11SLT555650	11SLT615590	11SLT645515	11SLT675365	11SLT705275	11SLT735335
11SLT555665	11SLT615605	11SLT645530	11SLT675380	11SLT705290	11SLT735350
11SLT555680	11SLT615620	11SLT645545	11SLT675395	11SLT705305	11SLT735440
11SLT570590	11SLT615635	11SLT645560	11SLT675410	11SLT705320	11SLT735455
11SLT570605	11SLT615650	11SLT645575	11SLT675425	11SLT705335	11SLT750245
11SLT570620	11SLT630305	11SLT645590	11SLT675440	11SLT705350	11SLT750260
11SLT570635	11SLT630320	11SLT645605	11SLT675455	11SLT705380	11SLT750275
11SLT570650	11SLT630335	11SLT645620	11SLT675470	11SLT705395	11SLT750290
11SLT570665	11SLT630350	11SLT645635	11SLT675485	11SLT705410	11SLT750305
11SLT570680	11SLT630365	11SLT660275	11SLT675500	11SLT705425	11SLT750320
11SLT585560	11SLT630380	11SLT660290	11SLT675515	11SLT705440	11SLT750335
11SLT585575	11SLT630395	11SLT660305	11SLT675530	11SLT705455	11SLT750485
11SLT585590	11SLT630410	11SLT660320	11SLT675545	11SLT705470	11SLT750500
11SLT585605	11SLT630425	11SLT660335	11SLT675560	11SLT705485	11SLT750515
11SLT585620	11SLT630470	11SLT660350	11SLT675575	11SLT705500	11SLT765245
11SLT585635	11SLT630485	11SLT660365	11SLT675590	11SLT705590	11SLT765260
11SLT585650	11SLT630500	11SLT660380	11SLT675605	11SLT705605	11SLT765275
11SLT585665	11SLT630515	11SLT660395	11SLT675620	11SLT705620	11SLT765290
11SLT585680	11SLT630530	11SLT660410	11SLT675635	11SLT705635	11SLT765305
11SLT600530	11SLT630545	11SLT660425	11SLT690275	11SLT705650	11SLT765320
11SLT600545	11SLT630560	11SLT660440	11SLT690290	11SLT720260	11SLT765335
11SLT600560	11SLT630575	11SLT660455	11SLT690305	11SLT720275	11SLT765470
11SLT600575	11SLT630590	11SLT660470	11SLT690320	11SLT720290	11SLT765485
11SLT600590	11SLT630605	11SLT660485	11SLT690335	11SLT720305	11SLT765500
11SLT600605	11SLT630620	11SLT660500	11SLT690350	11SLT720320	11SLT765515
11SLT600620	11SLT630635	11SLT660515	11SLT690365	11SLT720335	11SLT780245
11SLT600635	11SLT645290	11SLT660530	11SLT690380	11SLT720350	11SLT780260
11SLT600650	11SLT645305	11SLT660545	11SLT690395	11SLT720410	11SLT780275
11SLT600665	11SLT645320	11SLT660560	11SLT690410	11SLT720425	11SLT780290
11SLT615335	11SLT645335	11SLT660575	11SLT690425	11SLT720440	11SLT780305
11SLT615350	11SLT645350	11SLT660590	11SLT690440	11SLT720455	11SLT780320
11SLT615365	11SLT645365	11SLT660605	11SLT690455	11SLT720590	11SLT780335
11SLT615380	11SLT645380	11SLT660620	11SLT690470	11SLT720605	11SLT780350
11SLT615395	11SLT645395	11SLT660635	11SLT690485	11SLT720620	11SLT780365



11SĽ	Т780380	11SLT810440	11SLT855260	11SLT885410	11SLT930440	11SLT975425
11SL	Т780395	11SLT810455	11SLT855275	11SLT885425	11SLT945260	11SLT975440
11SL	Т780410	11SLT810470	11SLT855290	11SLT885440	11SLT945275	11SLT975455
11SĽ	Г780425	11SLT810485	11SLT855305	11SLT885455	11SLT945290	11SLT990215
11SL	Т780440	11SLT810500	11SLT855320	11SLT885470	11SLT945305	11SLT990230
11SL	T780455	11SLT825230	11SLT855335	11SLT900260	11SLT945320	11SLT990245
11SL	Т780470	11SLT825245	11SLT855350	11SLT900275	11SLT945335	11SLT990260
11SL	Т780485	11SLT825260	11SLT855365	11SLT900290	11SLT945350	11SLT990275
11SL	Т780500	11SLT825275	11SLT855380	11SLT900305	11SLT945365	11SLT990290
11SL	Т795245	11SLT825290	11SLT855395	11SLT900320	11SLT945380	11SLT990305
11SL	Т795260	11SLT825305	11SLT855410	11SLT900335	11SLT945395	11SLT990320
11SL	Т795275	11SLT825320	11SLT855425	11SLT900350	11SLT945410	11SLT990335
11SĽ	Т795290	11SLT825335	11SLT855440	11SLT900365	11SLT945425	11SLT990350
11SL	Т795305	11SLT825350	11SLT855455	11SLT900380	11SLT945440	11SLT990365
11SĽ	Г795320	11SLT825365	11SLT855470	11SLT900395	11SLT945455	11SLT990380
11SĽ	Т795335	11SLT825380	11SLT870245	11SLT900410	11SLT960260	11SLT990395
11SL	Т795350	11SLT825395	11SLT870260	11SLT900425	11SLT960275	11SLT990410
11SL'	Г795365	11SLT825410	11SLT870275	11SLT915260	11SLT960290	11SLT990425
11SL	Т795380	11SLT825425	11SLT870290	11SLT915275	11SLT960305	11SLT990440
11SL	Т795395	11SLT825440	11SLT870305	11SLT915290	11SLT960320	11SLT990455
11SL	Т795410	11SLT825455	11SLT870320	11SLT915305	11SLT960335	11SMT005215
11SL	Т795425	11SLT825470	11SLT870335	11SLT915320	11SLT960350	11SMT005230
11SL'	Т795440	11SLT825485	11SLT870350	11SLT915335	11SLT960365	11SMT005245
11SL	Т795455	11SLT840245	11SLT870365	11SLT915350	11SLT960380	11SMT005260
11SĽ	Т795470	11SLT840260	11SLT870380	11SLT915365	11SLT960395	11SMT005275
11SL'	Т795485	11SLT840275	11SLT870395	11SLT915380	11SLT960410	11SMT005290
11SĽ	Т795500	11SLT840290	11SLT870410	11SLT915395	11SLT960425	11SMT005305
11SL'	T810230	11SLT840305	11SLT870425	11SLT915410	11SLT960440	11SMT005320
11SL'	T810245	11SLT840320	11SLT870440	11SLT915425	11SLT960455	11SMT005335
11SL'	T810260	11SLT840335	11SLT870455	11SLT930260	11SLT975245	11SMT005350
11SL'	Т810275	11SLT840350	11SLT870470	11SLT930275	11SLT975260	11SMT005365
	T810290	11SLT840365	11SLT885260	11SLT930290	11SLT975275	11SMT005380
	T810305	11SLT840380	11SLT885275	11SLT930305	11SLT975290	11SMT005395
	Т810320	11SLT840395	11SLT885290	11SLT930320	11SLT975305	11SMT005410
	T810335	11SLT840410	11SLT885305	11SLT930335	11SLT975320	11SMT005425
	Т810350	11SLT840425	11SLT885320	11SLT930350	11SLT975335	11SMT005440
	T810365	11SLT840440	11SLT885335	11SLT930365	11SLT975350	11SMT005455
	T810380	11SLT840455	11SLT885350	11SLT930380	11SLT975365	11SMT020185
	T810395	11SLT840470	11SLT885365	11SLT930395	11SLT975380	11SMT020200
	T810410	11SLT840485	11SLT885380	11SLT930410	11SLT975395	11SMT020215
11SL'	T810425	11SLT855245	11SLT885395	11SLT930425	11SLT975410	11SMT020230



11SMT020245	11SMT050200	11SMT080230	11SMT125125	11SMT155275	11SMT200215
11SMT020260	11SMT050215	11SMT080245	11SMT125140	11SMT155290	11SMT200230
11SMT020275	11SMT050230	11SMT080260	11SMT125155	11SMT155305	11SMT200245
11SMT020290	11SMT050245	11SMT080275	11SMT125170	11SMT170095	11SMT200260
11SMT020305	11SMT050260	11SMT080290	11SMT125185	11SMT170110	11SMT200275
11SMT020320	11SMT050275	11SMT080305	11SMT125200	11SMT170125	11SMT200290
11SMT020335	11SMT050290	11SMT080320	11SMT125215	11SMT170140	11SMT215065
11SMT020350	11SMT050305	11SMT080335	11SMT125230	11SMT170155	11SMT215080
11SMT020365	11SMT050320	11SMT080350	11SMT125245	11SMT170170	11SMT215095
11SMT020380	11SMT050335	11SMT080365	11SMT125260	11SMT170185	11SMT215110
11SMT020395	11SMT050350	11SMT095140	11SMT125275	11SMT170200	11SMT215125
11SMT020410	11SMT050365	11SMT095155	11SMT125290	11SMT170215	11SMT215140
11SMT020425	11SMT050380	11SMT095170	11SMT125305	11SMT170230	11SMT215155
11SMT020440	11SMT050395	11SMT095185	11SMT125320	11SMT170245	11SMT215215
11SMT020455	11SMT050410	11SMT095200	11SMT125335	11SMT170260	11SMT215230
11SMT020470	11SMT050425	11SMT095215	11SMT140110	11SMT170275	11SMT215245
11SMT020485	11SMT050470	11SMT095230	11SMT140125	11SMT170290	11SMT215260
11SMT035185	11SMT050485	11SMT095245	11SMT140140	11SMT170305	11SMT215275
11SMT035200	11SMT065155	11SMT095260	11SMT140155	11SMT185080	11SMT230050
11SMT035215	11SMT065170	11SMT095275	11SMT140170	11SMT185095	11SMT230065
11SMT035230	11SMT065185	11SMT095290	11SMT140185	11SMT185110	11SMT230080
11SMT035245	11SMT065200	11SMT095305	11SMT140200	11SMT185125	11SMT230095
11SMT035260	11SMT065215	11SMT095320	11SMT140215	11SMT185140	11SMT230110
11SMT035275	11SMT065230	11SMT095335	11SMT140230	11SMT185155	11SMT230125
11SMT035290	11SMT065245	11SMT095350	11SMT140245	11SMT185170	11SMT230140
11SMT035305	11SMT065260	11SMT110125	11SMT140260	11SMT185185	11SMT230155
11SMT035320	11SMT065275	11SMT110140	11SMT140275	11SMT185200	11SMT230230
11SMT035335	11SMT065290	11SMT110155	11SMT140290	11SMT185215	11SMT230245
11SMT035350	11SMT065305	11SMT110170	11SMT140305	11SMT185230	11SMT230260
11SMT035365	11SMT065320	11SMT110185	11SMT140320	11SMT185245	11SMT230275
11SMT035380	11SMT065335	11SMT110200	11SMT155110	11SMT185260	11SMT245035
11SMT035395	11SMT065350	11SMT110215	11SMT155125	11SMT185275	11SMT245050
11SMT035410	11SMT065365	11SMT110230	11SMT155140	11SMT185290	11SMT245065
11SMT035425	11SMT065380	11SMT110245	11SMT155155	11SMT200065	11SMT245080
11SMT035440	11SMT065395	11SMT110260	11SMT155170	11SMT200080	11SMT245095
11SMT035455	11SMT080140	11SMT110275	11SMT155185	11SMT200095	11SMT245110
11SMT035470	11SMT080155	11SMT110290	11SMT155200	11SMT200110	11SMT245125
11SMT035485	11SMT080170	11SMT110305	11SMT155215	11SMT200125	11SMT245140
11SMT035500	11SMT080185	11SMT110320	11SMT155230	11SMT200140	11SMT260020
11SMT050170	11SMT080200	11SMT110335	11SMT155245	11SMT200155	11SMT260035
11SMT050185	11SMT080215	11SMT110350	11SMT155260	11SMT200170	11SMT260050



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11SMT260065	11SMT260125	11SMT275065	11SMT275125	11SMT290080	11SMT305065
11SMT260080	11SMT275020	11SMT275080	11SMT290035	11SMT290095	11SMT305080
11SMT260095	11SMT275035	11SMT275095	11SMT290050	11SMT290110	11SMT305095
11SMT260110	11SMT275050	11SMT275110	11SMT200065	11SMT305050	11SMT320065



### PRODUCTION BLOCK 2A

The 226 tiles delivered with production block 2a are listed below.

The 220 thes derivered with production block 2d dre listed below.						
11SKT700995	11SKU325100	11SKU400040	11SKU475055	11SKU550100	11SKU640070	
11SKT715980	11SKU325115	11SKU400055	11SKU475070	11SKU550115	11SKU640085	
11SKT715995	11SKU325130	11SKU400070	11SKU475085	11SKU550130	11SKU640100	
11SKU250085	11SKU325145	11SKU400085	11SKU475100	11SKU565055	11SKU640115	
11SKU250100	11SKU340040	11SKU400100	11SKU475115	11SKU565070	11SKU655025	
11SKU250115	11SKU340055	11SKU400115	11SKU490025	11SKU565085	11SKU655040	
11SKU250130	11SKU340070	11SKU400130	11SKU490040	11SKU565100	11SKU655055	
11SKU250145	11SKU340085	11SKU400145	11SKU490055	11SKU565115	11SKU655070	
11SKU250160	11SKU340100	11SKU415055	11SKU490070	11SKU565130	11SKU655085	
11SKU250175	11SKU340115	11SKU415070	11SKU490085	11SKU580055	11SKU655100	
11SKU265085	11SKU340130	11SKU415085	11SKU490100	11SKU580070	11SKU655115	
11SKU265100	11SKU340145	11SKU415100	11SKU490115	11SKU580085	11SKU670010	
11SKU265115	11SKU355040	11SKU415115	11SKU505025	11SKU580100	11SKU670025	
11SKU265130	11SKU355055	11SKU415130	11SKU505040	11SKU580115	11SKU670040	
11SKU265145	11SKU355070	11SKU415145	11SKU505055	11SKU580130	11SKU670055	
11SKU265160	11SKU355085	11SKU430040	11SKU505070	11SKU595055	11SKU670070	
11SKU280085	11SKU355100	11SKU430055	11SKU505085	11SKU595070	11SKU670085	
11SKU280100	11SKU355115	11SKU430070	11SKU505100	11SKU595085	11SKU670100	
11SKU280115	11SKU355130	11SKU430085	11SKU505115	11SKU595100	11SKU685010	
11SKU280130	11SKU355145	11SKU430100	11SKU520025	11SKU595115	11SKU685025	
11SKU280145	11SKU370040	11SKU430115	11SKU520040	11SKU595130	11SKU685040	
11SKU280160	11SKU370055	11SKU430130	11SKU520055	11SKU610040	11SKU685055	
11SKU295070	11SKU370070	11SKU445040	11SKU520070	11SKU610055	11SKU685070	
11SKU295085	11SKU370085	11SKU445055	11SKU520085	11SKU610070	11SKU685085	
11SKU295100	11SKU370100	11SKU445070	11SKU520100	11SKU610085	11SKU700010	
11SKU295115	11SKU370115	11SKU445085	11SKU520115	11SKU610100	11SKU700025	
11SKU295130	11SKU370130	11SKU445100	11SKU520130	11SKU610115	11SKU700040	
11SKU295145	11SKU370145	11SKU445115	11SKU535040	11SKU610130	11SKU700055	
11SKU310055	11SKU370160	11SKU445130	11SKU535055	11SKU625025	11SKU700070	
11SKU310070	11SKU385040	11SKU460025	11SKU535070	11SKU625040	11SKU700085	
11SKU310085	11SKU385055	11SKU460040	11SKU535085	11SKU625055	11SKU715010	
11SKU310100	11SKU385070	11SKU460055	11SKU535100	11SKU625070	11SKU715025	
11SKU310115	11SKU385085	11SKU460070	11SKU535115	11SKU625085	11SKU715040	
11SKU310130	11SKU385100	11SKU460085	11SKU535130	11SKU625100	11SKU715055	
11SKU310145	11SKU385115	11SKU460100	11SKU550040	11SKU625115	11SKU715070	
11SKU325055	11SKU385130	11SKU460115	11SKU550055	11SKU640025	11SKU715085	
11SKU325070	11SKU385145	11SKU475025	11SKU550070	11SKU640040		
11SKU325085	11SKU385160	11SKU475040	11SKU550085	11SKU640055		



### PRODUCTION BLOCK 2B

The 2,310 tiles delivered with production block 2b are listed below.

,0	· · · · · ·				
10SEF595995	10SEF700950	10SEF775920	10SEF850485	10SEF865665	10SEF880635
10SEF610965	10SEF700965	10SEF790830	10SEF850500	10SEF865680	10SEF880650
10SEF610980	10SEF700980	10SEF790845	10SEF850515	10SEF865695	10SEF880665
10SEF610995	10SEF715860	10SEF790860	10SEF850665	10SEF865710	10SEF880680
10SEF625950	10SEF715875	10SEF790875	10SEF850680	10SEF865725	10SEF880695
10SEF625965	10SEF715890	10SEF790890	10SEF850695	10SEF865740	10SEF880710
10SEF625980	10SEF715905	10SEF790905	10SEF850710	10SEF865755	10SEF880725
10SEF625995	10SEF715920	10SEF790920	10SEF850725	10SEF865770	10SEF880740
10SEF640935	10SEF715935	10SEF805830	10SEF850740	10SEF865785	10SEF880755
10SEF640950	10SEF715950	10SEF805845	10SEF850755	10SEF865800	10SEF880770
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10SFE930225	10SFF000470	10SFF015515	10SFF030575	10SFF045710	10SFF075020
10SFE945000	10SFF000485	10SFF015530	10SFF030590	10SFF045725	10SFF075035
10SFE945090	10SFF000500	10SFF015545	10SFF030605	10SFF045740	10SFF075050
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10SFE945120	10SFF000530	10SFF015575	10SFF030635	10SFF045770	10SFF075080
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10SFE945165	10SFF000575	10SFF015620	10SFF030680	10SFF045815	10SFF075590
10SFE945180	10SFF000590	10SFF015635	10SFF030695	10SFF045830	10SFF075605
10SFE945195	10SFF000605	10SFF015650	10SFF030710	10SFF045845	10SFF075620
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10SFE960000	10SFF000635	10SFF015680	10SFF030740	10SFF045875	10SFF075650
10SFE960090	10SFF000650	10SFF015695	10SFF030755	10SFF060035	10SFF075665
10SFE960105	10SFF000665	10SFF015710	10SFF030770	10SFF060050	10SFF075680
10SFE960120	10SFF000680	10SFF015725	10SFF030785	10SFF060065	10SFF075695
10SFE960135	10SFF000695	10SFF015740	10SFF030800	10SFF060080	10SFF075710
10SFE960150	10SFF000710	10SFF015755	10SFF030815	10SFF060095	10SFF075725
10SFE960165	10SFF000725	10SFF015770	10SFF030830	10SFF060110	10SFF075740
10SFE975090	10SFF000740	10SFF015785	10SFF030845	10SFF060125	10SFF075755
10SFE975105	10SFF000755	10SFF015800	10SFF030860	10SFF060560	10SFF075770
10SFE975120	10SFF000770	10SFF015815	10SFF045035	10SFF060575	10SFF075785
10SFE975135	10SFF000785	10SFF015830	10SFF045050	10SFF060590	10SFF075800
10SFE975150	10SFF000800	10SFF015845	10SFF045065	10SFF060605	10SFF075815
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10SFE990120	10SFF000860	10SFF030050	10SFF045125	10SFF060665	10SFF075875
10SFE990135	10SFF000875	10SFF030065	10SFF045140	10SFF060680	10SFF090020
10SFE990150	10SFF000890	10SFF030080	10SFF045155	10SFF060695	10SFF090035
10SFF000065	10SFF000905	10SFF030095	10SFF045530	10SFF060710	10SFF090050
10SFF000080	10SFF015050	10SFF030110	10SFF045545	10SFF060725	10SFF090065
10SFF000095	10SFF015065	10SFF030125	10SFF045560	10SFF060740	10SFF090080
10SFF000110	10SFF015080	10SFF030140	10SFF045575	10SFF060755	10SFF090095



10SFF090110	10SFF105770	10SFF135530	10SFF150740	10SFF180680	10SGD035895
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10SFF090605	10SFF105800	10SFF135560	10SFF150770	10SFF180710	10SGD035925
10SFF090620	10SFF105815	10SFF135575	10SFF150785	10SFF180725	10SGD035940
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10SFF090650	10SFF105845	10SFF135605	10SFF150815	10SFF195005	10SGD050865
10SFF090665	10SFF105860	10SFF135620	10SFF165005	10SFF195020	10SGD050880
10SFF090680	10SFF105875	10SFF135635	10SFF165020	10SFF195035	10SGD050895
10SFF090695	10SFF120005	10SFF135650	10SFF165035	10SFF195530	10SGD050910
10SFF090710	10SFF120020	10SFF135665	10SFF165050	10SFF195545	10SGD050925
10SFF090725	10SFF120035	10SFF135680	10SFF165065	10SFF195590	10SGD050940
10SFF090740	10SFF120050	10SFF135695	10SFF165530	10SFF195605	10SGD050955
10SFF090755	10SFF120065	10SFF135710	10SFF165545	10SFF195620	10SGD050970
10SFF090770	10SFF120080	10SFF135725	10SFF165560	10SFF195680	10SGD065610
10SFF090785	10SFF120095	10SFF135740	10SFF165575	10SFF195695	10SGD065625
10SFF090800	10SFF120560	10SFF135755	10SFF165590	10SFF195710	10SGD065640
10SFF090815	10SFF120575	10SFF135770	10SFF165605	10SFF210005	10SGD065655
10SFF090830	10SFF120590	10SFF135785	10SFF165620	10SFF210020	10SGD065670
10SFF090845	10SFF120605	10SFF135800	10SFF165635	10SFF210590	10SGD065685
10SFF090860	10SFF120620	10SFF135815	10SFF165650	10SFF210605	10SGD065700
10SFF090875	10SFF120635	10SFF135830	10SFF165665	10SFF210620	10SGD065865
10SFF105005	10SFF120650	10SFF135845	10SFF165680	10SFF225005	10SGD065880
10SFF105020	10SFF120665	10SFF150005	10SFF165695	10SFF225590	10SGD065895
10SFF105035	10SFF120680	10SFF150020	10SFF165710	10SFF225605	10SGD065910
10SFF105050	10SFF120695	10SFF150035	10SFF165725	10SFF225620	10SGD065925
10SFF105065	10SFF120710	10SFF150050	10SFF165740	10SGD005865	10SGD065940
10SFF105080	10SFF120725	10SFF150065	10SFF165755	10SGD005880	10SGD065955
10SFF105095	10SFF120740	10SFF150530	10SFF165770	10SGD005895	10SGD065970
10SFF105575	10SFF120755	10SFF150545	10SFF165785	10SGD005910	10SGD080595
10SFF105590	10SFF120770	10SFF150560	10SFF180005	10SGD005925	10SGD080610
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10SFF105635	10SFF120815	10SFF150605	10SFF180050	10SGD020865	10SGD080655
10SFF105650	10SFF120830	10SFF150620	10SFF180530	10SGD020880	10SGD080670
10SFF105665	10SFF120845	10SFF150635	10SFF180545	10SGD020895	10SGD080685
10SFF105680	10SFF135005	10SFF150650	10SFF180590	10SGD020910	10SGD080700
10SFF105695	10SFF135020	10SFF150665	10SFF180605	10SGD020925	10SGD080715
10SFF105710	10SFF135035	10SFF150680	10SFF180620	10SGD020940	10SGD080730
10SFF105725	10SFF135050	10SFF150695	10SFF180635	10SGD020955	10SGD080745
10SFF105740	10SFF135065	10SFF150710	10SFF180650	10SGD035865	10SGD080865
10SFF105755	10SFF135080	10SFF150725	10SFF180665	10SGD035880	10SGD080880



10SGD080895	10SGD095925	10SGD110820	10SGD125685	10SGD140550	10SGD155430
10SGD080910	10SGD095940	10SGD110835	10SGD125700	10SGD140565	10SGD155445
10SGD080925	10SGD095955	10SGD110850	10SGD125715	10SGD140580	10SGD155460
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10SGD080955	10SGD110220	10SGD110880	10SGD125745	10SGD140610	10SGD155490
10SGD080970	10SGD110235	10SGD110895	10SGD125760	10SGD140625	10SGD155505
10SGD095250	10SGD110250	10SGD110910	10SGD125775	10SGD140640	10SGD155520
10SGD095265	10SGD110265	10SGD110925	10SGD125790	10SGD140655	10SGD155535
10SGD095280	10SGD110280	10SGD110940	10SGD125805	10SGD140670	10SGD155550
10SGD095295	10SGD110295	10SGD125205	10SGD125820	10SGD140685	10SGD155565
10SGD095310	10SGD110310	10SGD125220	10SGD125835	10SGD140700	10SGD155580
10SGD095325	10SGD110325	10SGD125235	10SGD125850	10SGD140715	10SGD155595
10SGD095340	10SGD110340	10SGD125250	10SGD125865	10SGD140730	10SGD155610
10SGD095445	10SGD110355	10SGD125265	10SGD125880	10SGD140745	10SGD155625
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10SGD095505	10SGD110460	10SGD125325	10SGD125940	10SGD140805	10SGD155715
10SGD095580	10SGD110475	10SGD125340	10SGD140205	10SGD140820	10SGD155730
10SGD095595	10SGD110490	10SGD125355	10SGD140220	10SGD140835	10SGD155745
10SGD095610	10SGD110505	10SGD125370	10SGD140235	10SGD140850	10SGD155760
10SGD095625	10SGD110520	10SGD125385	10SGD140250	10SGD140865	10SGD155775
10SGD095640	10SGD110535	10SGD125400	10SGD140265	10SGD140880	10SGD155790
10SGD095655	10SGD110550	10SGD125415	10SGD140280	10SGD140895	10SGD155805
10SGD095670	10SGD110565	10SGD125430	10SGD140295	10SGD140910	10SGD155820
10SGD095685	10SGD110580	10SGD125445	10SGD140310	10SGD140925	10SGD155835
10SGD095700	10SGD110595	10SGD125460	10SGD140325	10SGD155205	10SGD155850
10SGD095715	10SGD110610	10SGD125475	10SGD140340	10SGD155220	10SGD155865
10SGD095730	10SGD110625	10SGD125490	10SGD140355	10SGD155235	10SGD155880
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10SGD095760	10SGD110655	10SGD125520	10SGD140385	10SGD155265	10SGD155910
10SGD095775	10SGD110670	10SGD125535	10SGD140400	10SGD155280	10SGD155925
10SGD095790	10SGD110685	10SGD125550	10SGD140415	10SGD155295	10SGD170190
10SGD095805	10SGD110700	10SGD125565	10SGD140430	10SGD155310	10SGD170205
10SGD095820	10SGD110715	10SGD125580	10SGD140445	10SGD155325	10SGD170220
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10SGD095850	10SGD110745	10SGD125610	10SGD140475	10SGD155355	10SGD170250
10SGD095865	10SGD110760	10SGD125625	10SGD140490	10SGD155370	10SGD170265
10SGD095880	10SGD110775	10SGD125640	10SGD140505	10SGD155385	10SGD170280
10SGD095895	10SGD110790	10SGD125655	10SGD140520	10SGD155400	10SGD170295
10SGD095910	10SGD110805	10SGD125670	10SGD140535	10SGD155415	10SGD170310



10SGD170325	10SGD185250	10SGD200595	10SGD245415	10SGD305115	10SGD395130
10SGD170340	10SGD185265	10SGD200760	10SGD260115	10SGD305130	10SGD395145
10SGD170355	10SGD185325	10SGD200775	10SGD260130	10SGD305145	10SGD395160
10SGD170370	10SGD185340	10SGD200790	10SGD260145	10SGD305160	10SGD410100
10SGD170385	10SGD185355	10SGD200820	10SGD260160	10SGD305175	10SGD410115
10SGD170400	10SGD185370	10SGD200835	10SGD260175	10SGD305190	10SGD410130
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10SGD170445	10SGD185415	10SGD215205	10SGD260220	10SGD320100	10SGD410175
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10SGD170475	10SGD185445	10SGD215235	10SGD260250	10SGD320130	10SGD425115
10SGD170490	10SGD185460	10SGD215250	10SGD260370	10SGD320145	10SGD425130
10SGD170505	10SGD185505	10SGD215265	10SGD260385	10SGD320160	10SGD425145
10SGD170520	10SGD185520	10SGD215370	10SGD260400	10SGD320175	10SGD425160
10SGD170535	10SGD185535	10SGD215385	10SGD260415	10SGD320190	10SGD425175
10SGD170550	10SGD185550	10SGD215400	10SGD275100	10SGD335085	10SGD440100
10SGD170565	10SGD185565	10SGD215415	10SGD275115	10SGD335100	10SGD440115
10SGD170580	10SGD185580	10SGD230175	10SGD275130	10SGD335115	10SGD440130
10SGD170595	10SGD185595	10SGD230190	10SGD275145	10SGD335130	10SGD440145
10SGD170610	10SGD185610	10SGD230205	10SGD275160	10SGD335145	10SGD440160
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10SGD170700	10SGD185805	10SGD230265	10SGD275220	10SGD350115	10SGD455130
10SGD170715	10SGD185820	10SGD230370	10SGD275235	10SGD350130	10SGD455145
10SGD170730	10SGD185835	10SGD230385	10SGD275250	10SGD350145	10SGD455160
10SGD170745	10SGD185850	10SGD230400	10SGD275385	10SGD350160	10SGD455175
10SGD170760	10SGD185865	10SGD230415	10SGD275400	10SGD365085	10SGD470100
10SGD170775	10SGD200190	10SGD245145	10SGD290085	10SGD365100	10SGD470115
10SGD170790	10SGD200205	10SGD245160	10SGD290100	10SGD365115	10SGD470130
10SGD170805	10SGD200220	10SGD245175	10SGD290115	10SGD365130	10SGD470145
10SGD170820	10SGD200235	10SGD245190	10SGD290130	10SGD365145	10SGD470160
10SGD170835	10SGD200250	10SGD245205	10SGD290145	10SGD365160	10SGD470175
10SGD170850	10SGD200265	10SGD245220	10SGD290160	10SGD380085	10SGD470190
10SGD170865	10SGD200280	10SGD245235	10SGD290175	10SGD380100	10SGD485115
10SGD170880	10SGD200370	10SGD245250	10SGD290190	10SGD380115	10SGD485130
10SGD170895	10SGD200385	10SGD245265	10SGD290205	10SGD380130	10SGD485145
10SGD185190	10SGD200400	10SGD245355	10SGD290220	10SGD380145	10SGD485160
10SGD185205	10SGD200415	10SGD245370	10SGD290235	10SGD380160	10SGD485175
10SGD185220	10SGD200430	10SGD245385	10SGD305085	10SGD395100	10SGD485190
10SGD185235	10SGD200445	10SGD245400	10SGD305100	10SGD395115	10SGD500115



10SGD500130	10SGD590190	10SGD680160	10SGE020075
10SGD500145	10SGD605115	10SGD680175	10SGE020090
10SGD500160	10SGD605130	10SGD695100	
10SGD500175	10SGD605145	10SGD695115	
10SGD500190	10SGD605160	10SGD695130	
10SGD515115	10SGD605175	10SGD695145	
10SGD515130	10SGD605190	10SGD695160	
10SGD515145	10SGD620115	10SGD695175	
10SGD515160	10SGD620130	10SGD710100	
10SGD515175	10SGD620145	10SGD710115	
10SGD530115	10SGD620160	10SGD710130	
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10SGD530145	10SGD620190	10SGD710160	
10SGD530160	10SGD635115	10SGD710175	
10SGD530175	10SGD635130	10SGD725100	
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10SGD545130	10SGD635160	10SGD725130	
10SGD545145	10SGD635175	10SGD725145	
10SGD545160	10SGD635190	10SGD725160	
10SGD545175	10SGD650100	10SGD725175	
10SGD560115	10SGD650115	10SGD740100	
10SGD560130	10SGD650130	10SGD740115	
10SGD560145	10SGD650145	10SGD740130	
10SGD560160	10SGD650160	10SGD740145	
10SGD560175	10SGD650175	10SGD740160	
10SGD575115	10SGD650190	10SGD740175	
10SGD575130	10SGD665100	10SGD755085	
10SGD575145	10SGD665115	10SGD755100	
10SGD575160	10SGD665130	10SGD755115	
10SGD575175	10SGD665145	10SGD755130	
10SGD575190	10SGD665160	10SGD755145	
10SGD590115	10SGD665175	10SGD755160	
10SGD590130	10SGD680100	10SGD755175	
10SGD590145	10SGD680115	10SGE005075	
10SGD590160	10SGD680130	10SGE005090	
10SGD590175	10SGD680145	10SGE005105	



## PRODUCTION BLOCK 3

The 1,288 tiles delivered with production block 3 are listed below. Two (2) tiles highlighted in yellow do not have a corresponding LAS tile due to data voids:

,		0			
10SDG950985	10SDH530855	10SDH590765	10SDH635750	10SDH695615	10SDH755615
10SDG965985	10SDH530870	10SDH590780	10SDH635765	10SDH695630	10SDH755630
10SDG980985	10SDH530885	10SDH590795	10SDH635780	10SDH695645	10SDH755645
10SDG995985	10SDH530900	10SDH590810	10SDH635795	10SDH695660	10SDH755660
10SDH425900	10SDH530915	10SDH590825	10SDH635810	10SDH695675	10SDH770555
10SDH425915	10SDH545795	10SDH590840	10SDH635825	10SDH695690	10SDH770570
10SDH440900	10SDH545810	10SDH590855	10SDH650645	10SDH695705	10SDH770585
10SDH440915	10SDH545825	10SDH590870	10SDH650660	10SDH695720	10SDH770600
10SDH455885	10SDH545840	10SDH590885	10SDH650675	10SDH695735	10SDH770615
10SDH455900	10SDH545855	10SDH590900	10SDH650690	10SDH710600	10SDH770630
10SDH455915	10SDH545870	10SDH605705	10SDH650705	10SDH710615	10SDH770645
10SDH470870	10SDH545885	10SDH605720	10SDH650720	10SDH710630	10SDH785540
10SDH470885	10SDH545900	10SDH605735	10SDH650735	10SDH710645	10SDH785555
10SDH470900	10SDH545915	10SDH605750	10SDH650750	10SDH710660	10SDH785570
10SDH470915	10SDH560780	10SDH605765	10SDH650765	10SDH710675	10SDH785585
10SDH485840	10SDH560795	10SDH605780	10SDH650780	10SDH710690	10SDH785600
10SDH485855	10SDH560810	10SDH605795	10SDH650795	10SDH710705	10SDH785615
10SDH485870	10SDH560825	10SDH605810	10SDH665630	10SDH725570	10SDH785630
10SDH485885	10SDH560840	10SDH605825	10SDH665645	10SDH725585	10SDH785645
10SDH485900	10SDH560855	10SDH605840	10SDH665660	10SDH725600	10SDH800525
10SDH485915	10SDH560870	10SDH605855	10SDH665675	10SDH725615	10SDH800540
10SDH500825	10SDH560885	10SDH605870	10SDH665690	10SDH725630	10SDH800555
10SDH500840	10SDH560900	10SDH620690	10SDH665705	10SDH725645	10SDH800570
10SDH500855	10SDH560915	10SDH620705	10SDH665720	10SDH725660	10SDH800585
10SDH500870	10SDH575750	10SDH620720	10SDH665735	10SDH725675	10SDH800600
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10SDH515825	10SDH575810	10SDH620780	10SDH680615	10SDH740600	10SDH815525
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10SEG010985	10SEG220940	10SEG295895	10SEG355850	10SEG385565	10SEG400715
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10SEG115985	10SEG235880	10SEG295955	10SEG355910	10SEG385625	10SEG400775
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10SEG415820	10SEG445235	10SEG460295	10SEG475460	10SEG505220	10SEG535085
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10SEG430505	10SEG445595	10SEG460520	10SEG490265	10SEG505445	10SEG535310
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10SEH115075	10SEH115345	10SEH130180	10SEH145165	10SEH160165	10SEH190030
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10SEH115165	10SEH130045	10SEH145030	10SEH160030	10SEH175045	10SEH190150
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10SEH115225	10SEH130120	10SEH145105	10SEH160105	10SEH175135	
10SEH115240	10SEH130135	10SEH145120	10SEH160120	10SEH175150	



## **PRODUCTION BLOCK 4**

The 2,268 tiles delivered with production block 4 are listed below. Two (2) tiles highlighted in yellow do not have a corresponding LAS tile due to data voids:

jonon do not m	ave a correspond	ing Existing due	to data voids.		
10SDH350990	10SDH485975	10SDJ245470	10SDJ260560	10SDJ275485	10SDJ290140
10SDH365990	10SDH500930	10SDJ245485	10SDJ260575	10SDJ275500	10SDJ290305
10SDH380960	10SDH500945	10SDJ245500	10SDJ260590	10SDJ275515	10SDJ290320
10SDH380975	10SDH500960	10SDJ245515	10SDJ260605	10SDJ275530	10SDJ290335
10SDH380990	10SDH515930	10SDJ245530	10SDJ260620	10SDJ275545	10SDJ290350
10SDH395930	10SDH515945	10SDJ245545	10SDJ260635	10SDJ275560	10SDJ290365
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