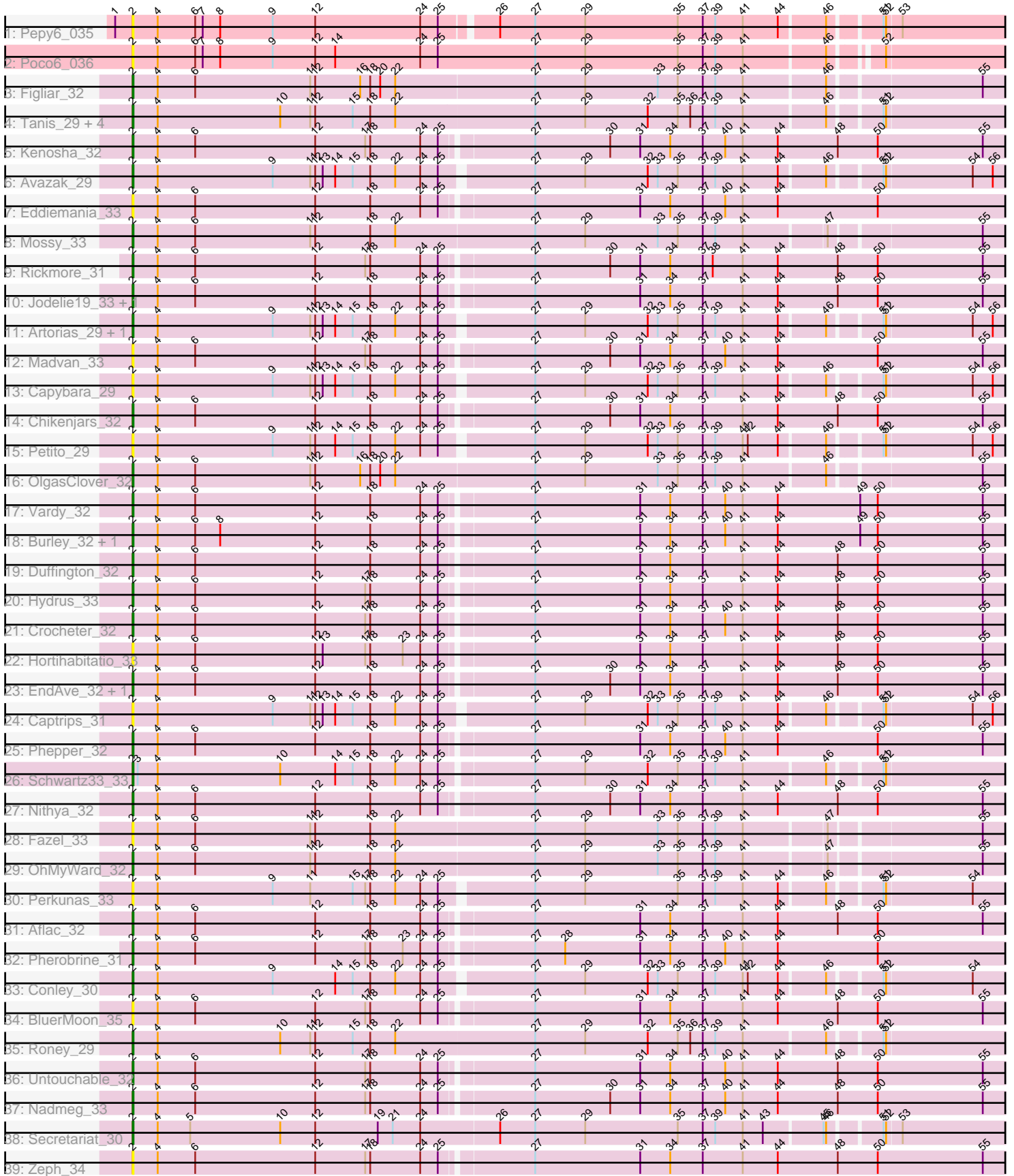


# Zoomed Pham 163689



Note: Tracks are now grouped by subcluster and scaled. Switching in subcluster is indicated by changes in track color. Track scale is now set by default to display the region 30 bp upstream of start 1 to 30 bp downstream of the last possible start. If this default region is judged to be packed too tightly with annotated starts, the track will be further scaled to only show that region of the ORF with annotated starts. This action will be indicated by adding "Zoomed" to the title. For starts, yellow indicates the location of called starts comprised solely of Glimmer/GeneMark auto-annotations, green indicates the location of called starts with at least 1 manual gene annotation.

## Pham 163689 Report

This analysis was run 04/28/24 on database version 559.

Pham number 163689 has 47 members, 14 are drafts.

Phages represented in each track:

- Track 1 : Pepy6\_035
- Track 2 : Poco6\_036
- Track 3 : Figliar\_32
- Track 4 : Tanis\_29, Gravy\_29, Odesza\_29, Gill\_29, Kerry\_29
- Track 5 : Kenosha\_32
- Track 6 : Avazak\_29
- Track 7 : Eddiemania\_33
- Track 8 : Mossy\_33
- Track 9 : Rickmore\_31
- Track 10 : Jodelie19\_33, TenaciousP\_36
- Track 11 : Artorias\_29, FortCran\_33
- Track 12 : Madvan\_33
- Track 13 : Copybara\_29
- Track 14 : Chikenjars\_32
- Track 15 : Petite\_29
- Track 16 : OlgasClover\_32
- Track 17 : Vardy\_32
- Track 18 : Burley\_32, Runhaar\_32
- Track 19 : Duffington\_32
- Track 20 : Hydrus\_33
- Track 21 : Crocheter\_32
- Track 22 : Hortihabitatio\_33
- Track 23 : EndAve\_32, AlainaMarie\_32
- Track 24 : Captrips\_31
- Track 25 : Phepper\_32
- Track 26 : Schwartz33\_33
- Track 27 : Nithya\_32
- Track 28 : Fazel\_33
- Track 29 : OhMyWard\_32
- Track 30 : Perkunas\_33
- Track 31 : Aflac\_32
- Track 32 : Pherobrine\_31
- Track 33 : Conley\_30
- Track 34 : BluerMoon\_35
- Track 35 : Roney\_29
- Track 36 : Untouchable\_32
- Track 37 : Nadmeg\_33

- Track 38 : Secretariat\_30
- Track 39 : Zeph\_34

### **Summary of Final Annotations (See graph section above for start numbers):**

The start number called the most often in the published annotations is 2, it was called in 33 of the 33 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Aflac\_32, AlainaMarie\_32, Artorias\_29, Avazak\_29, BluerMoon\_35, Burley\_32, Captrips\_31, Copybara\_29, Chikenjars\_32, Conley\_30, Crocheter\_32, Duffington\_32, Eddiemania\_33, EndAve\_32, Fazel\_33, Figliar\_32, FortCran\_33, Gill\_29, Gravy\_29, Hortihabitatio\_33, Hydrus\_33, Jodelie19\_33, Kenosha\_32, Kerry\_29, Madvan\_33, Mossy\_33, Nadmeg\_33, Nithya\_32, Odesza\_29, OhMyWard\_32, OlgasClover\_32, Pepy6\_035, Perkunas\_33, Petite\_29, Phepper\_32, Pherobrine\_31, Poco6\_036, Rickmore\_31, Roney\_29, Runhaar\_32, Schwartz33\_33, Secretariat\_30, Tanis\_29, TenaciousP\_36, Untouchable\_32, Vardy\_32, Zeph\_34,

Genes that have the "Most Annotated" start but do not call it:

- 

Genes that do not have the "Most Annotated" start:

- 

### **Summary by start number:**

Start 2:

- Found in 47 of 47 ( 100.0% ) of genes in pham
- Manual Annotations of this start: 33 of 33
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Aflac\_32 (DJ), AlainaMarie\_32 (DJ), Artorias\_29 (DJ), Avazak\_29 (DJ), BluerMoon\_35 (DJ), Burley\_32 (DJ), Captrips\_31 (DJ), Copybara\_29 (DJ), Chikenjars\_32 (DJ), Conley\_30 (DJ), Crocheter\_32 (DJ), Duffington\_32 (DJ), Eddiemania\_33 (DJ), EndAve\_32 (DJ), Fazel\_33 (DJ), Figliar\_32 (DJ), FortCran\_33 (DJ), Gill\_29 (DJ), Gravy\_29 (DJ), Hortihabitatio\_33 (DJ), Hydrus\_33 (DJ), Jodelie19\_33 (DJ), Kenosha\_32 (DJ), Kerry\_29 (DJ), Madvan\_33 (DJ), Mossy\_33 (DJ), Nadmeg\_33 (DJ), Nithya\_32 (DJ), Odesza\_29 (DJ), OhMyWard\_32 (DJ), OlgasClover\_32 (DJ), Pepy6\_035 (CC), Perkunas\_33 (DJ), Petite\_29 (DJ), Phepper\_32 (DJ), Pherobrine\_31 (DJ), Poco6\_036 (CC), Rickmore\_31 (DJ), Roney\_29 (DJ), Runhaar\_32 (DJ), Schwartz33\_33 (DJ), Secretariat\_30 (DJ), Tanis\_29 (DJ), TenaciousP\_36 (DJ), Untouchable\_32 (DJ), Vardy\_32 (DJ), Zeph\_34 (DJ),

### **Summary by clusters:**

There are 2 clusters represented in this pham: CC, DJ,

Info for manual annotations of cluster DJ:

- Start number 2 was manually annotated 33 times for cluster DJ.

### **Gene Information:**

Gene: Aflac\_32 Start: 23512, Stop: 28626, Start Num: 2

Candidate Starts for Aflac\_32:

(Start: 2 @23512 has 33 MA's), (4, 23542), (6, 23587), (12, 23731), (18, 23797), (24, 23857), (25, 23878), (27, 23980), (31, 24106), (34, 24142), (37, 24181), (41, 24229), (44, 24271), (48, 24343), (50, 24391), (55, 24517), (59, 24592), (60, 24604), (62, 24625), (71, 24730), (72, 24733), (82, 24955), (87, 25021), (94, 25111), (97, 25147), (102, 25198), (103, 25246), (106, 25258), (118, 25402), (122, 25441), (125, 25468), (138, 25630), (140, 25678), (142, 25693), (143, 25699), (146, 25717), (153, 25765), (161, 25831), (168, 25882), (169, 25894), (172, 25912), (177, 25966), (181, 26011), (183, 26032), (184, 26041), (187, 26062), (191, 26083), (197, 26137), (198, 26140), (200, 26149), (203, 26170), (204, 26182), (207, 26203), (209, 26209), (212, 26227), (216, 26263), (220, 26293), (228, 26341), (229, 26353), (230, 26359), (231, 26362), (233, 26374), (234, 26377), (239, 26398), (244, 26434), (249, 26488), (250, 26491), (253, 26512), (254, 26524), (255, 26527), (263, 26575), (267, 26590), (268, 26593), (269, 26602), (271, 26623), (276, 26650), (277, 26653), (282, 26677), (284, 26689), (285, 26710), (286, 26722), (288, 26731), (290, 26743), (293, 26770), (299, 26803), (300, 26809), (302, 26827), (306, 26881), (308, 26896), (314, 26965), (325, 27076), (339, 27187), (341, 27232), (345, 27322), (357, 27466), (360, 27529), (362, 27556), (367, 27628), (368, 27640), (369, 27649), (370, 27703), (373, 27724), (374, 27736), (387, 27898), (392, 27985), (395, 28003), (399, 28033), (401, 28051), (402, 28054), (404, 28066), (407, 28093), (411, 28204), (413, 28267), (414, 28279), (418, 28327), (422, 28381), (425, 28408), (432, 28522), (436, 28612),

Gene: AlainaMarie\_32 Start: 23499, Stop: 28610, Start Num: 2

Candidate Starts for AlainaMarie\_32:

(Start: 2 @23499 has 33 MA's), (4, 23529), (6, 23574), (12, 23718), (18, 23784), (24, 23844), (25, 23865), (27, 23967), (30, 24057), (31, 24093), (34, 24129), (37, 24168), (41, 24216), (44, 24258), (48, 24330), (50, 24378), (55, 24504), (59, 24579), (60, 24591), (62, 24612), (71, 24717), (72, 24720), (82, 24942), (87, 25008), (88, 25011), (92, 25080), (94, 25098), (102, 25185), (107, 25254), (114, 25356), (115, 25359), (118, 25386), (122, 25425), (125, 25452), (138, 25614), (140, 25662), (143, 25683), (146, 25701), (148, 25716), (153, 25749), (161, 25815), (167, 25863), (168, 25866), (171, 25887), (172, 25896), (177, 25950), (181, 25995), (183, 26016), (184, 26025), (190, 26058), (191, 26067), (193, 26091), (197, 26121), (198, 26124), (200, 26133), (201, 26145), (203, 26154), (204, 26166), (207, 26187), (209, 26193), (216, 26247), (220, 26277), (228, 26325), (229, 26337), (230, 26343), (231, 26346), (234, 26361), (239, 26382), (244, 26418), (249, 26472), (250, 26475), (252, 26487), (253, 26496), (254, 26508), (255, 26511), (257, 26526), (261, 26553), (263, 26559), (267, 26574), (268, 26577), (269, 26586), (270, 26601), (271, 26607), (274, 26622), (276, 26634), (277, 26637), (284, 26673), (285, 26694), (286, 26706), (288, 26715), (290, 26727), (293, 26754), (297, 26778), (299, 26787), (300, 26793), (302, 26811), (308, 26880), (314, 26949), (330, 27105), (345, 27306), (357, 27450), (360, 27513), (362, 27540), (367, 27612), (368, 27624), (369, 27633), (370, 27687), (373, 27708), (374, 27720), (387, 27882), (392, 27969), (395, 27987), (399, 28017), (401, 28035), (402, 28038), (404, 28050), (407, 28077), (411, 28188), (414, 28263), (418, 28311), (422, 28365), (425, 28392), (432, 28506), (436, 28596),

Gene: Artorias\_29 Start: 20505, Stop: 25607, Start Num: 2

Candidate Starts for Artorias\_29:

(Start: 2 @20505 has 33 MA's), (4, 20535), (9, 20673), (11, 20718), (12, 20724), (13, 20733), (14, 20748), (15, 20769), (18, 20790), (22, 20820), (24, 20850), (25, 20871), (27, 20973), (29, 21033), (32, 21108), (33, 21120), (35, 21144), (37, 21174), (39, 21189), (41, 21222), (44, 21264), (46, 21315), (51, 21369), (52, 21372), (54, 21471), (56, 21495), (62, 21591), (71, 21696), (72, 21699), (74, 21768), (75, 21774), (76, 21780), (84, 21957), (89, 22008), (92, 22059), (97, 22113), (98, 22116), (118, 22368),

(119, 22371), (126, 22446), (131, 22503), (136, 22587), (138, 22596), (144, 22671), (146, 22683), (148, 22698), (149, 22701), (151, 22722), (158, 22770), (161, 22797), (162, 22818), (165, 22827), (168, 22848), (169, 22860), (171, 22869), (172, 22878), (177, 22932), (178, 22935), (180, 22956), (183, 22998), (186, 23025), (189, 23034), (191, 23049), (192, 23058), (193, 23073), (194, 23085), (195, 23094), (201, 23127), (203, 23136), (215, 23220), (216, 23229), (217, 23244), (218, 23247), (221, 23265), (228, 23307), (231, 23328), (234, 23343), (236, 23349), (242, 23385), (244, 23400), (250, 23457), (252, 23469), (253, 23478), (254, 23490), (256, 23502), (257, 23508), (260, 23529), (263, 23541), (268, 23559), (269, 23568), (270, 23583), (271, 23589), (273, 23601), (282, 23643), (283, 23646), (284, 23655), (285, 23676), (286, 23688), (293, 23736), (294, 23745), (299, 23769), (300, 23775), (302, 23793), (303, 23802), (305, 23823), (309, 23892), (311, 23910), (314, 23931), (332, 24102), (339, 24153), (347, 24297), (351, 24366), (357, 24432), (359, 24483), (368, 24606), (370, 24669), (375, 24717), (376, 24723), (377, 24732), (381, 24780), (386, 24852), (389, 24912), (390, 24933), (391, 24936), (396, 24987), (397, 24996), (399, 25014), (402, 25035), (404, 25047), (409, 25140), (411, 25185), (414, 25260), (415, 25278), (416, 25299), (424, 25386), (431, 25497), (436, 25593),

Gene: Avazak\_29 Start: 20512, Stop: 25614, Start Num: 2

Candidate Starts for Avazak\_29:

(Start: 2 @20512 has 33 MA's), (4, 20542), (9, 20680), (11, 20725), (12, 20731), (13, 20740), (14, 20755), (15, 20776), (18, 20797), (22, 20827), (24, 20857), (25, 20878), (27, 20980), (29, 21040), (32, 21115), (33, 21127), (35, 21151), (37, 21181), (39, 21196), (41, 21229), (44, 21271), (46, 21322), (51, 21376), (52, 21379), (54, 21478), (56, 21502), (58, 21538), (62, 21598), (71, 21703), (72, 21706), (74, 21775), (75, 21781), (76, 21787), (84, 21964), (89, 22015), (92, 22066), (97, 22120), (98, 22123), (108, 22255), (111, 22294), (118, 22375), (119, 22378), (126, 22453), (131, 22510), (136, 22594), (138, 22603), (144, 22678), (146, 22690), (148, 22705), (149, 22708), (151, 22729), (158, 22777), (161, 22804), (162, 22825), (165, 22834), (168, 22855), (169, 22867), (171, 22876), (172, 22885), (178, 22942), (180, 22963), (181, 22984), (183, 23005), (186, 23032), (189, 23041), (191, 23056), (192, 23065), (193, 23080), (194, 23092), (195, 23101), (201, 23134), (203, 23143), (215, 23227), (216, 23236), (217, 23251), (221, 23272), (228, 23314), (231, 23335), (234, 23350), (242, 23392), (244, 23407), (250, 23464), (252, 23476), (253, 23485), (254, 23497), (256, 23509), (257, 23515), (260, 23536), (263, 23548), (265, 23557), (268, 23566), (269, 23575), (270, 23590), (271, 23596), (273, 23608), (279, 23632), (282, 23650), (284, 23662), (285, 23683), (286, 23695), (293, 23743), (294, 23752), (299, 23776), (300, 23782), (301, 23785), (302, 23800), (303, 23809), (304, 23812), (305, 23830), (309, 23899), (314, 23938), (332, 24109), (339, 24160), (347, 24304), (351, 24373), (357, 24439), (359, 24490), (368, 24613), (370, 24676), (375, 24724), (376, 24730), (377, 24739), (381, 24787), (386, 24859), (389, 24919), (390, 24940), (391, 24943), (396, 24994), (397, 25003), (399, 25021), (402, 25042), (404, 25054), (409, 25147), (411, 25192), (414, 25267), (415, 25285), (416, 25306), (424, 25393), (431, 25504), (436, 25600),

Gene: BluerMoon\_35 Start: 23509, Stop: 28623, Start Num: 2

Candidate Starts for BluerMoon\_35:

(Start: 2 @23509 has 33 MA's), (4, 23539), (6, 23584), (12, 23728), (17, 23788), (18, 23794), (24, 23854), (25, 23875), (27, 23977), (31, 24103), (34, 24139), (37, 24178), (41, 24226), (44, 24268), (48, 24340), (50, 24388), (55, 24514), (59, 24589), (60, 24601), (62, 24622), (71, 24727), (72, 24730), (82, 24952), (87, 25018), (94, 25108), (97, 25144), (102, 25195), (103, 25243), (106, 25255), (118, 25399), (122, 25438), (125, 25465), (138, 25627), (140, 25675), (143, 25696), (146, 25714), (153, 25762), (161, 25828), (168, 25879), (169, 25891), (172, 25909), (177, 25963), (181, 26008), (183, 26029), (184, 26038), (187, 26059), (191, 26080), (197, 26134), (198, 26137), (200, 26146), (203, 26167), (204, 26179), (207, 26200), (209, 26206), (212, 26224), (216, 26260), (220, 26290), (228, 26338), (229, 26350), (230, 26356), (231, 26359), (233, 26371), (234, 26374), (239, 26395), (244, 26431), (249, 26485), (250, 26488), (253, 26509), (254, 26521), (255, 26524), (263, 26572), (267, 26587), (268, 26590), (269, 26599), (271, 26620), (276, 26647), (277, 26650), (282, 26674), (284, 26686), (285, 26707), (286, 26719), (288, 26728), (290, 26740), (293, 26767), (299, 26800), (300, 26806),

(302, 26824), (306, 26878), (308, 26893), (314, 26962), (325, 27073), (339, 27184), (341, 27229), (345, 27319), (355, 27442), (357, 27463), (360, 27526), (362, 27553), (367, 27625), (368, 27637), (369, 27646), (370, 27700), (373, 27721), (374, 27733), (376, 27754), (387, 27895), (392, 27982), (395, 28000), (399, 28030), (401, 28048), (402, 28051), (404, 28063), (407, 28090), (411, 28201), (414, 28276), (422, 28378), (425, 28405), (432, 28519), (436, 28609),

Gene: Burley\_32 Start: 23250, Stop: 28361, Start Num: 2

Candidate Starts for Burley\_32:

(Start: 2 @23250 has 33 MA's), (4, 23280), (6, 23325), (8, 23355), (12, 23469), (18, 23535), (24, 23595), (25, 23616), (27, 23718), (31, 23844), (34, 23880), (37, 23919), (40, 23946), (41, 23967), (44, 24009), (49, 24108), (50, 24129), (55, 24255), (59, 24330), (60, 24342), (62, 24363), (71, 24468), (72, 24471), (92, 24831), (102, 24936), (107, 25005), (109, 25026), (114, 25107), (115, 25110), (118, 25137), (122, 25176), (125, 25203), (138, 25365), (140, 25413), (143, 25434), (146, 25452), (153, 25500), (155, 25512), (161, 25566), (168, 25617), (169, 25629), (171, 25638), (172, 25647), (177, 25701), (181, 25746), (182, 25761), (183, 25767), (184, 25776), (185, 25782), (188, 25800), (189, 25803), (190, 25809), (191, 25818), (197, 25872), (198, 25875), (200, 25884), (202, 25902), (203, 25905), (204, 25917), (207, 25938), (209, 25944), (210, 25947), (213, 25968), (216, 25998), (217, 26013), (223, 26046), (225, 26061), (228, 26076), (229, 26088), (230, 26094), (231, 26097), (233, 26109), (234, 26112), (244, 26169), (249, 26223), (250, 26226), (253, 26247), (254, 26259), (255, 26262), (263, 26310), (267, 26325), (268, 26328), (269, 26337), (271, 26358), (276, 26385), (277, 26388), (282, 26412), (284, 26424), (285, 26445), (286, 26457), (290, 26478), (293, 26505), (299, 26538), (300, 26544), (302, 26562), (305, 26592), (308, 26631), (325, 26811), (326, 26823), (336, 26892), (345, 27057), (355, 27180), (357, 27201), (365, 27330), (367, 27363), (368, 27375), (370, 27438), (373, 27459), (374, 27471), (375, 27486), (381, 27549), (387, 27633), (392, 27720), (395, 27738), (399, 27768), (401, 27786), (402, 27789), (403, 27795), (404, 27801), (407, 27828), (411, 27939), (414, 28014), (415, 28032), (422, 28116), (424, 28140), (432, 28257), (436, 28347),

Gene: Captrips\_31 Start: 20541, Stop: 25643, Start Num: 2

Candidate Starts for Captrips\_31:

(Start: 2 @20541 has 33 MA's), (4, 20571), (9, 20709), (11, 20754), (12, 20760), (13, 20769), (14, 20784), (15, 20805), (18, 20826), (22, 20856), (24, 20886), (25, 20907), (27, 21009), (29, 21069), (32, 21144), (33, 21156), (35, 21180), (37, 21210), (39, 21225), (41, 21258), (44, 21300), (46, 21351), (51, 21405), (52, 21408), (54, 21507), (56, 21531), (62, 21627), (71, 21732), (72, 21735), (74, 21804), (75, 21810), (76, 21816), (84, 21993), (89, 22044), (92, 22095), (97, 22149), (98, 22152), (111, 22323), (118, 22404), (119, 22407), (126, 22482), (131, 22539), (136, 22623), (138, 22632), (142, 22695), (143, 22701), (144, 22707), (146, 22719), (148, 22734), (149, 22737), (151, 22758), (158, 22806), (161, 22833), (162, 22854), (165, 22863), (168, 22884), (169, 22896), (171, 22905), (172, 22914), (177, 22968), (178, 22971), (180, 22992), (183, 23034), (189, 23070), (191, 23085), (192, 23094), (193, 23109), (194, 23121), (195, 23130), (201, 23163), (203, 23172), (215, 23256), (216, 23265), (217, 23280), (218, 23283), (221, 23301), (228, 23343), (231, 23364), (234, 23379), (242, 23421), (244, 23436), (250, 23493), (252, 23505), (253, 23514), (254, 23526), (256, 23538), (257, 23544), (260, 23565), (263, 23577), (268, 23595), (269, 23604), (270, 23619), (271, 23625), (273, 23637), (282, 23679), (283, 23682), (284, 23691), (285, 23712), (286, 23724), (293, 23772), (294, 23781), (299, 23805), (300, 23811), (302, 23829), (303, 23838), (305, 23859), (309, 23928), (314, 23967), (332, 24138), (339, 24189), (347, 24333), (357, 24468), (359, 24519), (368, 24642), (370, 24705), (375, 24753), (376, 24759), (377, 24768), (381, 24816), (386, 24888), (389, 24948), (390, 24969), (391, 24972), (396, 25023), (397, 25032), (399, 25050), (402, 25071), (404, 25083), (409, 25176), (411, 25221), (414, 25296), (415, 25314), (416, 25335), (424, 25422), (431, 25533), (436, 25629),

Gene: Capybara\_29 Start: 20616, Stop: 25718, Start Num: 2

Candidate Starts for Capybara\_29:

(Start: 2 @20616 has 33 MA's), (4, 20646), (9, 20784), (11, 20829), (12, 20835), (13, 20844), (14, 20859), (15, 20880), (18, 20901), (22, 20931), (24, 20961), (25, 20982), (27, 21084), (29, 21144), (32,

21219), (33, 21231), (35, 21255), (37, 21285), (39, 21300), (41, 21333), (44, 21375), (46, 21426), (51, 21480), (52, 21483), (54, 21582), (56, 21606), (62, 21702), (71, 21807), (72, 21810), (74, 21879), (75, 21885), (76, 21891), (84, 22068), (89, 22119), (92, 22170), (97, 22224), (98, 22227), (108, 22359), (116, 22461), (118, 22479), (119, 22482), (126, 22557), (131, 22614), (136, 22698), (138, 22707), (146, 22794), (151, 22833), (158, 22881), (161, 22908), (162, 22929), (165, 22938), (168, 22959), (169, 22971), (171, 22980), (172, 22989), (173, 23016), (177, 23043), (178, 23046), (180, 23067), (183, 23109), (186, 23136), (189, 23145), (191, 23160), (192, 23169), (193, 23184), (194, 23196), (195, 23205), (198, 23217), (201, 23238), (203, 23247), (215, 23331), (216, 23340), (217, 23355), (218, 23358), (221, 23376), (223, 23388), (224, 23391), (228, 23418), (231, 23439), (234, 23454), (242, 23496), (244, 23511), (250, 23568), (252, 23580), (253, 23589), (254, 23601), (256, 23613), (257, 23619), (260, 23640), (263, 23652), (268, 23670), (269, 23679), (270, 23694), (271, 23700), (273, 23712), (282, 23754), (283, 23757), (284, 23766), (285, 23787), (286, 23799), (293, 23847), (294, 23856), (299, 23880), (300, 23886), (302, 23904), (303, 23913), (305, 23934), (309, 24003), (311, 24021), (312, 24024), (314, 24042), (327, 24168), (332, 24213), (339, 24264), (347, 24408), (357, 24543), (359, 24594), (365, 24672), (368, 24717), (370, 24780), (372, 24798), (375, 24828), (376, 24834), (381, 24891), (386, 24963), (389, 25023), (390, 25044), (391, 25047), (396, 25098), (397, 25107), (402, 25146), (404, 25158), (409, 25251), (411, 25296), (414, 25371), (416, 25410), (420, 25440), (424, 25497), (431, 25608), (436, 25704),

Gene: Chikenjars\_32 Start: 23502, Stop: 28613, Start Num: 2

Candidate Starts for Chikenjars\_32:

(Start: 2 @23502 has 33 MA's), (4, 23532), (6, 23577), (12, 23721), (18, 23787), (24, 23847), (25, 23868), (27, 23970), (30, 24060), (31, 24096), (34, 24132), (37, 24171), (41, 24219), (44, 24261), (48, 24333), (50, 24381), (55, 24507), (59, 24582), (62, 24615), (71, 24720), (72, 24723), (82, 24945), (87, 25011), (88, 25014), (92, 25083), (102, 25188), (107, 25257), (114, 25359), (115, 25362), (118, 25389), (122, 25428), (125, 25455), (138, 25617), (140, 25665), (143, 25686), (146, 25704), (153, 25752), (161, 25818), (164, 25845), (165, 25848), (167, 25866), (168, 25869), (171, 25890), (172, 25899), (175, 25944), (177, 25953), (181, 25998), (183, 26019), (184, 26028), (190, 26061), (191, 26070), (193, 26094), (197, 26124), (198, 26127), (200, 26136), (201, 26148), (203, 26157), (204, 26169), (207, 26190), (209, 26196), (216, 26250), (228, 26328), (229, 26340), (230, 26346), (231, 26349), (234, 26364), (239, 26385), (244, 26421), (249, 26475), (250, 26478), (252, 26490), (253, 26499), (254, 26511), (255, 26514), (257, 26529), (261, 26556), (263, 26562), (267, 26577), (268, 26580), (269, 26589), (270, 26604), (271, 26610), (274, 26625), (276, 26637), (277, 26640), (282, 26664), (284, 26676), (285, 26697), (286, 26709), (288, 26718), (290, 26730), (293, 26757), (297, 26781), (299, 26790), (300, 26796), (302, 26814), (308, 26883), (314, 26952), (330, 27108), (345, 27309), (357, 27453), (360, 27516), (362, 27543), (367, 27615), (368, 27627), (369, 27636), (370, 27690), (373, 27711), (374, 27723), (387, 27885), (392, 27972), (395, 27990), (399, 28020), (401, 28038), (402, 28041), (404, 28053), (407, 28080), (411, 28191), (414, 28266), (418, 28314), (422, 28368), (425, 28395), (432, 28509), (436, 28599),

Gene: Conley\_30 Start: 21600, Stop: 26687, Start Num: 2

Candidate Starts for Conley\_30:

(Start: 2 @21600 has 33 MA's), (4, 21630), (9, 21768), (14, 21843), (15, 21864), (18, 21885), (22, 21915), (24, 21945), (25, 21966), (27, 22068), (29, 22128), (32, 22203), (33, 22215), (35, 22239), (37, 22269), (39, 22284), (41, 22317), (42, 22323), (44, 22359), (46, 22410), (51, 22464), (52, 22467), (54, 22566), (62, 22686), (66, 22740), (69, 22770), (71, 22791), (72, 22794), (74, 22863), (75, 22869), (84, 23052), (93, 23160), (94, 23172), (95, 23184), (97, 23208), (99, 23226), (118, 23463), (119, 23466), (122, 23502), (126, 23541), (128, 23550), (131, 23598), (136, 23682), (138, 23691), (142, 23754), (143, 23760), (144, 23766), (146, 23778), (149, 23796), (155, 23838), (158, 23865), (161, 23892), (162, 23913), (165, 23922), (168, 23943), (169, 23955), (170, 23961), (171, 23964), (172, 23973), (178, 24030), (180, 24051), (183, 24093), (186, 24120), (188, 24126), (191, 24144), (192, 24153), (193, 24168), (194, 24180), (195, 24189), (201, 24222), (203, 24231), (215, 24315), (216, 24324), (217, 24339), (221, 24360), (228, 24402), (229, 24414), (231, 24423), (234, 24438), (242, 24480),

(244, 24495), (250, 24552), (252, 24564), (253, 24573), (254, 24585), (256, 24597), (257, 24603), (260, 24624), (263, 24636), (265, 24645), (268, 24654), (269, 24663), (270, 24678), (271, 24684), (273, 24696), (276, 24711), (279, 24720), (282, 24738), (285, 24771), (286, 24783), (293, 24831), (294, 24840), (299, 24864), (300, 24870), (302, 24888), (303, 24897), (304, 24900), (305, 24918), (309, 24987), (314, 25026), (323, 25131), (324, 25134), (325, 25137), (332, 25197), (341, 25293), (342, 25305), (344, 25350), (347, 25392), (357, 25527), (367, 25689), (370, 25764), (376, 25818), (378, 25839), (386, 25947), (389, 26007), (392, 26046), (395, 26064), (396, 26067), (399, 26094), (400, 26100), (402, 26115), (403, 26121), (404, 26127), (405, 26145), (406, 26148), (410, 26253), (411, 26265), (414, 26340), (415, 26358), (416, 26379), (419, 26391), (424, 26466), (428, 26526), (433, 26622), (436, 26673),

Gene: Crocheter\_32 Start: 23642, Stop: 28753, Start Num: 2

Candidate Starts for Crocheter\_32:

(Start: 2 @23642 has 33 MA's), (4, 23672), (6, 23717), (12, 23861), (17, 23921), (18, 23927), (24, 23987), (25, 24008), (27, 24110), (31, 24236), (34, 24272), (37, 24311), (40, 24338), (41, 24359), (44, 24401), (48, 24473), (50, 24521), (55, 24647), (59, 24722), (60, 24734), (62, 24755), (71, 24860), (72, 24863), (77, 24971), (92, 25223), (102, 25328), (107, 25397), (109, 25418), (114, 25499), (115, 25502), (118, 25529), (122, 25568), (125, 25595), (135, 25736), (138, 25757), (142, 25820), (143, 25826), (146, 25844), (147, 25850), (153, 25892), (155, 25904), (156, 25913), (161, 25958), (166, 26000), (168, 26009), (169, 26021), (171, 26030), (172, 26039), (181, 26138), (183, 26159), (184, 26168), (188, 26192), (189, 26195), (197, 26264), (198, 26267), (200, 26276), (202, 26294), (203, 26297), (204, 26309), (207, 26330), (209, 26336), (210, 26339), (213, 26360), (216, 26390), (217, 26405), (220, 26420), (228, 26468), (229, 26480), (230, 26486), (231, 26489), (233, 26501), (234, 26504), (244, 26561), (249, 26615), (253, 26639), (254, 26651), (255, 26654), (262, 26699), (263, 26702), (267, 26717), (268, 26720), (269, 26729), (270, 26744), (271, 26750), (272, 26756), (276, 26777), (277, 26780), (280, 26792), (283, 26807), (284, 26816), (285, 26837), (286, 26849), (290, 26870), (293, 26897), (299, 26930), (300, 26936), (302, 26954), (305, 26984), (308, 27023), (314, 27092), (325, 27203), (326, 27215), (336, 27284), (341, 27359), (345, 27449), (357, 27593), (360, 27656), (365, 27722), (367, 27755), (368, 27767), (370, 27830), (373, 27851), (374, 27863), (376, 27884), (381, 27941), (387, 28025), (392, 28112), (395, 28130), (399, 28160), (401, 28178), (402, 28181), (403, 28187), (404, 28193), (407, 28220), (411, 28331), (414, 28406), (420, 28475), (422, 28508), (424, 28532), (432, 28649), (436, 28739),

Gene: Duffington\_32 Start: 23487, Stop: 28601, Start Num: 2

Candidate Starts for Duffington\_32:

(Start: 2 @23487 has 33 MA's), (4, 23517), (6, 23562), (12, 23706), (18, 23772), (24, 23832), (25, 23853), (27, 23955), (31, 24081), (34, 24117), (37, 24156), (41, 24204), (44, 24246), (48, 24318), (50, 24366), (55, 24492), (59, 24567), (60, 24579), (62, 24600), (71, 24705), (72, 24708), (82, 24930), (87, 24996), (94, 25086), (97, 25122), (102, 25173), (103, 25221), (106, 25233), (118, 25377), (122, 25416), (125, 25443), (138, 25605), (140, 25653), (142, 25668), (143, 25674), (146, 25692), (153, 25740), (161, 25806), (168, 25857), (169, 25869), (172, 25887), (177, 25941), (181, 25986), (183, 26007), (184, 26016), (187, 26037), (191, 26058), (197, 26112), (198, 26115), (200, 26124), (203, 26145), (204, 26157), (207, 26178), (209, 26184), (212, 26202), (216, 26238), (220, 26268), (228, 26316), (229, 26328), (230, 26334), (231, 26337), (233, 26349), (234, 26352), (239, 26373), (244, 26409), (249, 26463), (250, 26466), (253, 26487), (254, 26499), (255, 26502), (263, 26550), (267, 26565), (268, 26568), (269, 26577), (271, 26598), (276, 26625), (277, 26628), (282, 26652), (284, 26664), (285, 26685), (286, 26697), (288, 26706), (290, 26718), (293, 26745), (299, 26778), (300, 26784), (302, 26802), (308, 26871), (314, 26940), (325, 27051), (339, 27162), (341, 27207), (345, 27297), (357, 27441), (360, 27504), (362, 27531), (367, 27603), (368, 27615), (369, 27624), (370, 27678), (373, 27699), (374, 27711), (387, 27873), (392, 27960), (395, 27978), (399, 28008), (401, 28026), (402, 28029), (404, 28041), (407, 28068), (411, 28179), (414, 28254), (418, 28302), (422, 28356), (425, 28383), (432, 28497), (436, 28587),



Gene: Eddiemania\_33 Start: 24148, Stop: 29262, Start Num: 2

Candidate Starts for Eddiemania\_33:

(Start: 2 @24148 has 33 MA's), (4, 24178), (6, 24223), (12, 24367), (18, 24433), (24, 24493), (25, 24514), (27, 24616), (31, 24742), (34, 24778), (37, 24817), (40, 24844), (41, 24865), (44, 24907), (50, 25027), (59, 25228), (60, 25240), (62, 25261), (69, 25345), (71, 25366), (72, 25369), (77, 25477), (81, 25579), (94, 25747), (97, 25783), (102, 25834), (103, 25882), (118, 26038), (122, 26077), (124, 26095), (125, 26104), (138, 26266), (142, 26329), (143, 26335), (146, 26353), (147, 26359), (153, 26401), (161, 26467), (168, 26518), (169, 26530), (172, 26548), (177, 26602), (181, 26647), (183, 26668), (184, 26677), (187, 26698), (190, 26710), (191, 26719), (193, 26743), (197, 26773), (198, 26776), (200, 26785), (202, 26803), (203, 26806), (204, 26818), (207, 26839), (209, 26845), (210, 26848), (212, 26863), (213, 26869), (216, 26899), (217, 26914), (220, 26929), (227, 26974), (228, 26977), (229, 26989), (230, 26995), (231, 26998), (233, 27010), (234, 27013), (238, 27031), (244, 27070), (249, 27124), (253, 27148), (254, 27160), (255, 27163), (263, 27211), (267, 27226), (268, 27229), (269, 27238), (270, 27253), (271, 27259), (276, 27286), (277, 27289), (280, 27301), (283, 27316), (284, 27325), (285, 27346), (286, 27358), (290, 27379), (293, 27406), (299, 27439), (300, 27445), (302, 27463), (305, 27493), (308, 27532), (326, 27724), (336, 27793), (345, 27958), (357, 28102), (360, 28165), (365, 28231), (367, 28264), (368, 28276), (370, 28339), (373, 28360), (374, 28372), (375, 28387), (381, 28450), (387, 28534), (392, 28621), (395, 28639), (399, 28669), (401, 28687), (403, 28696), (404, 28702), (407, 28729), (411, 28840), (414, 28915), (420, 28984), (422, 29017), (424, 29041), (432, 29158), (436, 29248),

Gene: EndAve\_32 Start: 23502, Stop: 28613, Start Num: 2

Candidate Starts for EndAve\_32:

(Start: 2 @23502 has 33 MA's), (4, 23532), (6, 23577), (12, 23721), (18, 23787), (24, 23847), (25, 23868), (27, 23970), (30, 24060), (31, 24096), (34, 24132), (37, 24171), (41, 24219), (44, 24261), (48, 24333), (50, 24381), (55, 24507), (59, 24582), (60, 24594), (62, 24615), (71, 24720), (72, 24723), (82, 24945), (87, 25011), (88, 25014), (92, 25083), (94, 25101), (102, 25188), (107, 25257), (114, 25359), (115, 25362), (118, 25389), (122, 25428), (125, 25455), (138, 25617), (140, 25665), (143, 25686), (146, 25704), (148, 25719), (153, 25752), (161, 25818), (167, 25866), (168, 25869), (171, 25890), (172, 25899), (177, 25953), (181, 25998), (183, 26019), (184, 26028), (190, 26061), (191, 26070), (193, 26094), (197, 26124), (198, 26127), (200, 26136), (201, 26148), (203, 26157), (204, 26169), (207, 26190), (209, 26196), (216, 26250), (220, 26280), (228, 26328), (229, 26340), (230, 26346), (231, 26349), (234, 26364), (239, 26385), (244, 26421), (249, 26475), (250, 26478), (252, 26490), (253, 26499), (254, 26511), (255, 26514), (257, 26529), (261, 26556), (263, 26562), (267, 26577), (268, 26580), (269, 26589), (270, 26604), (271, 26610), (274, 26625), (276, 26637), (277, 26640), (284, 26676), (285, 26697), (286, 26709), (288, 26718), (290, 26730), (293, 26757), (297, 26781), (299, 26790), (300, 26796), (302, 26814), (308, 26883), (314, 26952), (330, 27108), (345, 27309), (357, 27453), (360, 27516), (362, 27543), (367, 27615), (368, 27627), (369, 27636), (370, 27690), (373, 27711), (374, 27723), (387, 27885), (392, 27972), (395, 27990), (399, 28020), (401, 28038), (402, 28041), (404, 28053), (407, 28080), (411, 28191), (414, 28266), (418, 28314), (422, 28368), (425, 28395), (432, 28509), (436, 28599),

Gene: Fazel\_33 Start: 22536, Stop: 27638, Start Num: 2

Candidate Starts for Fazel\_33:

(Start: 2 @22536 has 33 MA's), (4, 22566), (6, 22611), (11, 22749), (12, 22755), (18, 22821), (22, 22851), (27, 23016), (29, 23076), (33, 23163), (35, 23187), (37, 23217), (39, 23232), (41, 23265), (47, 23358), (55, 23526), (62, 23634), (63, 23646), (67, 23703), (71, 23739), (72, 23742), (74, 23811), (75, 23817), (84, 24000), (85, 24006), (92, 24102), (94, 24120), (107, 24276), (117, 24402), (118, 24411), (138, 24642), (139, 24648), (143, 24711), (146, 24729), (150, 24756), (152, 24774), (161, 24843), (163, 24867), (165, 24873), (168, 24894), (170, 24912), (171, 24915), (177, 24978), (181, 25023), (183, 25044), (186, 25071), (192, 25104), (194, 25131), (197, 25149), (198, 25152), (200, 25161), (201, 25173), (202, 25179), (203, 25182), (204, 25194), (212, 25239), (217, 25290), (223, 25323), (226, 25344), (228, 25353), (229, 25365), (231, 25374), (234, 25389), (236, 25395), (237, 25401),

(239, 25410), (240, 25425), (241, 25428), (243, 25437), (244, 25446), (247, 25482), (250, 25503), (253, 25524), (257, 25554), (259, 25569), (260, 25575), (266, 25599), (268, 25605), (269, 25614), (270, 25629), (271, 25635), (279, 25671), (282, 25689), (284, 25701), (285, 25722), (286, 25734), (290, 25755), (291, 25758), (293, 25782), (294, 25791), (299, 25815), (300, 25821), (302, 25839), (303, 25848), (304, 25851), (309, 25938), (313, 25968), (336, 26169), (341, 26244), (344, 26301), (345, 26334), (355, 26457), (367, 26640), (368, 26652), (369, 26661), (370, 26715), (375, 26763), (379, 26814), (382, 26865), (385, 26886), (388, 26934), (389, 26958), (392, 26997), (395, 27015), (401, 27063), (402, 27066), (404, 27078), (411, 27216), (414, 27291), (425, 27420), (427, 27468), (432, 27534), (433, 27573), (436, 27624),

Gene: Figliar\_32 Start: 23512, Stop: 28611, Start Num: 2

Candidate Starts for Figliar\_32:

(Start: 2 @23512 has 33 MA's), (4, 23542), (6, 23587), (11, 23725), (12, 23731), (16, 23785), (18, 23797), (20, 23809), (22, 23827), (27, 23992), (29, 24052), (33, 24139), (35, 24163), (37, 24193), (39, 24208), (41, 24241), (46, 24334), (55, 24502), (62, 24610), (63, 24622), (64, 24643), (67, 24679), (71, 24715), (72, 24718), (74, 24787), (75, 24793), (78, 24877), (82, 24940), (84, 24976), (88, 25009), (93, 25084), (94, 25096), (97, 25132), (102, 25183), (103, 25231), (106, 25243), (118, 25387), (122, 25426), (125, 25453), (138, 25615), (140, 25663), (143, 25684), (146, 25702), (153, 25750), (161, 25816), (168, 25867), (169, 25879), (172, 25897), (177, 25951), (181, 25996), (183, 26017), (184, 26026), (186, 26044), (187, 26047), (191, 26068), (197, 26122), (198, 26125), (200, 26134), (203, 26155), (204, 26167), (207, 26188), (209, 26194), (212, 26212), (216, 26248), (220, 26278), (228, 26326), (229, 26338), (230, 26344), (231, 26347), (233, 26359), (234, 26362), (239, 26383), (244, 26419), (249, 26473), (250, 26476), (253, 26497), (254, 26509), (255, 26512), (263, 26560), (267, 26575), (268, 26578), (269, 26587), (271, 26608), (276, 26635), (277, 26638), (282, 26662), (284, 26674), (285, 26695), (286, 26707), (288, 26716), (290, 26728), (293, 26755), (299, 26788), (300, 26794), (302, 26812), (306, 26866), (308, 26881), (314, 26950), (325, 27061), (339, 27172), (341, 27217), (345, 27307), (357, 27451), (360, 27514), (362, 27541), (367, 27613), (368, 27625), (369, 27634), (370, 27688), (373, 27709), (374, 27721), (387, 27883), (392, 27970), (395, 27988), (399, 28018), (401, 28036), (402, 28039), (404, 28051), (407, 28078), (411, 28189), (413, 28252), (414, 28264), (418, 28312), (422, 28366), (425, 28393), (432, 28507), (436, 28597),

Gene: FortCran\_33 Start: 20505, Stop: 25607, Start Num: 2

Candidate Starts for FortCran\_33:

(Start: 2 @20505 has 33 MA's), (4, 20535), (9, 20673), (11, 20718), (12, 20724), (13, 20733), (14, 20748), (15, 20769), (18, 20790), (22, 20820), (24, 20850), (25, 20871), (27, 20973), (29, 21033), (32, 21108), (33, 21120), (35, 21144), (37, 21174), (39, 21189), (41, 21222), (44, 21264), (46, 21315), (51, 21369), (52, 21372), (54, 21471), (56, 21495), (62, 21591), (71, 21696), (72, 21699), (74, 21768), (75, 21774), (76, 21780), (84, 21957), (89, 22008), (92, 22059), (97, 22113), (98, 22116), (118, 22368), (119, 22371), (126, 22446), (131, 22503), (136, 22587), (138, 22596), (144, 22671), (146, 22683), (148, 22698), (149, 22701), (151, 22722), (158, 22770), (161, 22797), (162, 22818), (165, 22827), (168, 22848), (169, 22860), (171, 22869), (172, 22878), (177, 22932), (178, 22935), (180, 22956), (183, 22998), (186, 23025), (189, 23034), (191, 23049), (192, 23058), (193, 23073), (194, 23085), (195, 23094), (201, 23127), (203, 23136), (215, 23220), (216, 23229), (217, 23244), (218, 23247), (221, 23265), (228, 23307), (231, 23328), (234, 23343), (236, 23349), (242, 23385), (244, 23400), (250, 23457), (252, 23469), (253, 23478), (254, 23490), (256, 23502), (257, 23508), (260, 23529), (263, 23541), (268, 23559), (269, 23568), (270, 23583), (271, 23589), (273, 23601), (282, 23643), (283, 23646), (284, 23655), (285, 23676), (286, 23688), (293, 23736), (294, 23745), (299, 23769), (300, 23775), (302, 23793), (303, 23802), (305, 23823), (309, 23892), (311, 23910), (314, 23931), (332, 24102), (339, 24153), (347, 24297), (351, 24366), (357, 24432), (359, 24483), (368, 24606), (370, 24669), (375, 24717), (376, 24723), (377, 24732), (381, 24780), (386, 24852), (389, 24912), (390, 24933), (391, 24936), (396, 24987), (397, 24996), (399, 25014), (402, 25035), (404, 25047), (409, 25140), (411, 25185), (414, 25260), (415, 25278), (416, 25299), (424, 25386), (431, 25497), (436, 25593),

Gene: Gill\_29 Start: 20616, Stop: 25730, Start Num: 2

Candidate Starts for Gill\_29:

(Start: 2 @20616 has 33 MA's), (4, 20646), (10, 20793), (11, 20829), (12, 20835), (15, 20880), (18, 20901), (22, 20931), (27, 21096), (29, 21156), (32, 21231), (35, 21267), (36, 21282), (37, 21297), (39, 21312), (41, 21345), (46, 21438), (51, 21492), (52, 21495), (62, 21714), (71, 21819), (72, 21822), (74, 21891), (75, 21897), (84, 22080), (89, 22131), (92, 22182), (97, 22236), (98, 22239), (108, 22371), (116, 22473), (118, 22491), (119, 22494), (126, 22569), (131, 22626), (136, 22710), (138, 22719), (146, 22806), (151, 22845), (158, 22893), (161, 22920), (162, 22941), (165, 22950), (168, 22971), (169, 22983), (171, 22992), (172, 23001), (173, 23028), (177, 23055), (178, 23058), (180, 23079), (183, 23121), (186, 23148), (189, 23157), (191, 23172), (192, 23181), (193, 23196), (194, 23208), (195, 23217), (198, 23229), (201, 23250), (203, 23259), (215, 23343), (216, 23352), (217, 23367), (218, 23370), (221, 23388), (223, 23400), (224, 23403), (228, 23430), (231, 23451), (234, 23466), (242, 23508), (244, 23523), (250, 23580), (252, 23592), (253, 23601), (254, 23613), (256, 23625), (257, 23631), (260, 23652), (263, 23664), (268, 23682), (269, 23691), (270, 23706), (271, 23712), (273, 23724), (282, 23766), (283, 23769), (284, 23778), (285, 23799), (286, 23811), (293, 23859), (294, 23868), (299, 23892), (300, 23898), (302, 23916), (303, 23925), (305, 23946), (309, 24015), (311, 24033), (312, 24036), (314, 24054), (327, 24180), (332, 24225), (339, 24276), (347, 24420), (357, 24555), (359, 24606), (365, 24684), (368, 24729), (370, 24792), (372, 24810), (375, 24840), (376, 24846), (381, 24903), (386, 24975), (389, 25035), (390, 25056), (391, 25059), (396, 25110), (397, 25119), (402, 25158), (404, 25170), (409, 25263), (411, 25308), (414, 25383), (416, 25422), (420, 25452), (424, 25509), (431, 25620), (436, 25716),

Gene: Gravy\_29 Start: 20616, Stop: 25730, Start Num: 2

Candidate Starts for Gravy\_29:

(Start: 2 @20616 has 33 MA's), (4, 20646), (10, 20793), (11, 20829), (12, 20835), (15, 20880), (18, 20901), (22, 20931), (27, 21096), (29, 21156), (32, 21231), (35, 21267), (36, 21282), (37, 21297), (39, 21312), (41, 21345), (46, 21438), (51, 21492), (52, 21495), (62, 21714), (71, 21819), (72, 21822), (74, 21891), (75, 21897), (84, 22080), (89, 22131), (92, 22182), (97, 22236), (98, 22239), (108, 22371), (116, 22473), (118, 22491), (119, 22494), (126, 22569), (131, 22626), (136, 22710), (138, 22719), (146, 22806), (151, 22845), (158, 22893), (161, 22920), (162, 22941), (165, 22950), (168, 22971), (169, 22983), (171, 22992), (172, 23001), (173, 23028), (177, 23055), (178, 23058), (180, 23079), (183, 23121), (186, 23148), (189, 23157), (191, 23172), (192, 23181), (193, 23196), (194, 23208), (195, 23217), (198, 23229), (201, 23250), (203, 23259), (215, 23343), (216, 23352), (217, 23367), (218, 23370), (221, 23388), (223, 23400), (224, 23403), (228, 23430), (231, 23451), (234, 23466), (242, 23508), (244, 23523), (250, 23580), (252, 23592), (253, 23601), (254, 23613), (256, 23625), (257, 23631), (260, 23652), (263, 23664), (268, 23682), (269, 23691), (270, 23706), (271, 23712), (273, 23724), (282, 23766), (283, 23769), (284, 23778), (285, 23799), (286, 23811), (293, 23859), (294, 23868), (299, 23892), (300, 23898), (302, 23916), (303, 23925), (305, 23946), (309, 24015), (311, 24033), (312, 24036), (314, 24054), (327, 24180), (332, 24225), (339, 24276), (347, 24420), (357, 24555), (359, 24606), (365, 24684), (368, 24729), (370, 24792), (372, 24810), (375, 24840), (376, 24846), (381, 24903), (386, 24975), (389, 25035), (390, 25056), (391, 25059), (396, 25110), (397, 25119), (402, 25158), (404, 25170), (409, 25263), (411, 25308), (414, 25383), (416, 25422), (420, 25452), (424, 25509), (431, 25620), (436, 25716),

Gene: Hortihabitatio\_33 Start: 22913, Stop: 28030, Start Num: 2

Candidate Starts for Hortihabitatio\_33:

(Start: 2 @22913 has 33 MA's), (4, 22943), (6, 22988), (12, 23132), (13, 23141), (17, 23192), (18, 23198), (23, 23237), (24, 23258), (25, 23279), (27, 23381), (31, 23507), (34, 23543), (37, 23582), (41, 23630), (44, 23672), (48, 23744), (50, 23792), (55, 23918), (57, 23960), (59, 23993), (62, 24026), (65, 24062), (69, 24110), (71, 24131), (72, 24134), (86, 24410), (92, 24494), (117, 24794), (118, 24803), (120, 24833), (128, 24890), (138, 25034), (139, 25040), (143, 25103), (146, 25121), (148, 25136), (152, 25166), (161, 25235), (163, 25259), (165, 25265), (166, 25277), (168, 25286), (169, 25298),

(171, 25307), (174, 25352), (177, 25370), (181, 25415), (183, 25436), (186, 25463), (191, 25487), (192, 25496), (193, 25511), (195, 25532), (198, 25544), (200, 25553), (201, 25565), (203, 25574), (205, 25592), (207, 25607), (210, 25616), (213, 25637), (216, 25667), (226, 25736), (228, 25745), (229, 25757), (230, 25763), (231, 25766), (234, 25781), (237, 25793), (240, 25817), (242, 25823), (244, 25838), (246, 25865), (248, 25886), (250, 25895), (253, 25916), (257, 25946), (261, 25973), (262, 25976), (268, 25997), (271, 26027), (272, 26033), (276, 26054), (277, 26057), (279, 26063), (284, 26093), (285, 26114), (286, 26126), (290, 26147), (293, 26174), (294, 26183), (299, 26207), (300, 26213), (301, 26216), (302, 26231), (303, 26240), (304, 26243), (305, 26261), (307, 26297), (309, 26330), (310, 26339), (313, 26360), (314, 26369), (326, 26492), (328, 26504), (332, 26540), (336, 26561), (340, 26612), (345, 26726), (351, 26804), (355, 26849), (367, 27032), (368, 27044), (370, 27107), (371, 27119), (373, 27128), (374, 27140), (376, 27161), (379, 27206), (389, 27350), (392, 27389), (399, 27437), (401, 27455), (402, 27458), (404, 27470), (411, 27608), (413, 27671), (414, 27683), (415, 27701), (420, 27752), (425, 27812), (427, 27860), (433, 27965), (436, 28016),

Gene: Hydrus\_33 Start: 24017, Stop: 29128, Start Num: 2

Candidate Starts for Hydrus\_33:

(Start: 2 @24017 has 33 MA's), (4, 24047), (6, 24092), (12, 24236), (17, 24296), (18, 24302), (24, 24362), (25, 24383), (27, 24485), (31, 24611), (34, 24647), (37, 24686), (41, 24734), (44, 24776), (48, 24848), (50, 24896), (55, 25022), (59, 25097), (60, 25109), (62, 25130), (68, 25202), (71, 25235), (72, 25238), (77, 25346), (92, 25598), (102, 25703), (107, 25772), (109, 25793), (114, 25874), (115, 25877), (118, 25904), (122, 25943), (125, 25970), (135, 26111), (138, 26132), (142, 26195), (143, 26201), (146, 26219), (147, 26225), (153, 26267), (155, 26279), (156, 26288), (161, 26333), (166, 26375), (168, 26384), (169, 26396), (171, 26405), (172, 26414), (181, 26513), (183, 26534), (184, 26543), (188, 26567), (189, 26570), (197, 26639), (198, 26642), (200, 26651), (202, 26669), (203, 26672), (204, 26684), (207, 26705), (209, 26711), (210, 26714), (213, 26735), (216, 26765), (217, 26780), (220, 26795), (228, 26843), (229, 26855), (230, 26861), (231, 26864), (233, 26876), (234, 26879), (244, 26936), (249, 26990), (253, 27014), (254, 27026), (255, 27029), (262, 27074), (263, 27077), (267, 27092), (268, 27095), (269, 27104), (270, 27119), (271, 27125), (272, 27131), (276, 27152), (277, 27155), (280, 27167), (283, 27182), (284, 27191), (285, 27212), (286, 27224), (290, 27245), (293, 27272), (299, 27305), (300, 27311), (302, 27329), (305, 27359), (308, 27398), (314, 27467), (325, 27578), (326, 27590), (336, 27659), (341, 27734), (345, 27824), (357, 27968), (360, 28031), (365, 28097), (367, 28130), (368, 28142), (370, 28205), (373, 28226), (374, 28238), (376, 28259), (381, 28316), (387, 28400), (392, 28487), (395, 28505), (399, 28535), (401, 28553), (402, 28556), (403, 28562), (404, 28568), (407, 28595), (411, 28706), (414, 28781), (420, 28850), (422, 28883), (424, 28907), (432, 29024), (436, 29114),

Gene: Jodelie19\_33 Start: 24936, Stop: 30050, Start Num: 2

Candidate Starts for Jodelie19\_33:

(Start: 2 @24936 has 33 MA's), (4, 24966), (6, 25011), (12, 25155), (18, 25221), (24, 25281), (25, 25302), (27, 25404), (31, 25530), (34, 25566), (37, 25605), (41, 25653), (44, 25695), (48, 25767), (50, 25815), (55, 25941), (59, 26016), (60, 26028), (62, 26049), (71, 26154), (72, 26157), (82, 26379), (87, 26445), (94, 26535), (97, 26571), (102, 26622), (103, 26670), (106, 26682), (118, 26826), (122, 26865), (125, 26892), (138, 27054), (140, 27102), (142, 27117), (143, 27123), (146, 27141), (153, 27189), (161, 27255), (168, 27306), (169, 27318), (172, 27336), (177, 27390), (181, 27435), (183, 27456), (184, 27465), (187, 27486), (191, 27507), (197, 27561), (198, 27564), (200, 27573), (203, 27594), (204, 27606), (207, 27627), (209, 27633), (212, 27651), (216, 27687), (220, 27717), (228, 27765), (229, 27777), (230, 27783), (231, 27786), (233, 27798), (234, 27801), (239, 27822), (244, 27858), (249, 27912), (250, 27915), (252, 27927), (253, 27936), (254, 27948), (255, 27951), (263, 27999), (267, 28014), (268, 28017), (269, 28026), (271, 28047), (276, 28074), (277, 28077), (282, 28101), (284, 28113), (285, 28134), (286, 28146), (288, 28155), (290, 28167), (293, 28194), (294, 28203), (299, 28227), (300, 28233), (302, 28251), (306, 28305), (308, 28320), (314, 28389), (325, 28500), (339, 28611), (341, 28656), (345, 28746), (355, 28869), (357, 28890), (360, 28953), (362, 28980), (367, 29052), (368, 29064), (369, 29073), (370, 29127), (373, 29148), (374, 29160), (387,

29322), (392, 29409), (395, 29427), (399, 29457), (401, 29475), (402, 29478), (404, 29490), (407, 29517), (411, 29628), (414, 29703), (418, 29751), (422, 29805), (425, 29832), (432, 29946), (436, 30036),

Gene: Kenosha\_32 Start: 24052, Stop: 29163, Start Num: 2

Candidate Starts for Kenosha\_32:

(Start: 2 @24052 has 33 MA's), (4, 24082), (6, 24127), (12, 24271), (17, 24331), (18, 24337), (24, 24397), (25, 24418), (27, 24520), (30, 24610), (31, 24646), (34, 24682), (37, 24721), (40, 24748), (41, 24769), (44, 24811), (48, 24883), (50, 24931), (55, 25057), (59, 25132), (60, 25144), (62, 25165), (71, 25270), (72, 25273), (77, 25381), (92, 25633), (102, 25738), (107, 25807), (109, 25828), (114, 25909), (115, 25912), (118, 25939), (122, 25978), (125, 26005), (135, 26146), (138, 26167), (142, 26230), (143, 26236), (146, 26254), (147, 26260), (153, 26302), (155, 26314), (156, 26323), (161, 26368), (168, 26419), (169, 26431), (171, 26440), (172, 26449), (181, 26548), (183, 26569), (184, 26578), (188, 26602), (189, 26605), (190, 26611), (197, 26674), (198, 26677), (200, 26686), (201, 26698), (202, 26704), (203, 26707), (204, 26719), (207, 26740), (209, 26746), (210, 26749), (213, 26770), (216, 26800), (217, 26815), (220, 26830), (228, 26878), (229, 26890), (230, 26896), (231, 26899), (233, 26911), (234, 26914), (244, 26971), (249, 27025), (250, 27028), (253, 27049), (254, 27061), (255, 27064), (262, 27109), (263, 27112), (267, 27127), (268, 27130), (269, 27139), (270, 27154), (271, 27160), (272, 27166), (276, 27187), (277, 27190), (280, 27202), (283, 27217), (284, 27226), (285, 27247), (286, 27259), (290, 27280), (293, 27307), (299, 27340), (300, 27346), (302, 27364), (305, 27394), (308, 27433), (326, 27625), (336, 27694), (341, 27769), (345, 27859), (357, 28003), (365, 28132), (367, 28165), (368, 28177), (369, 28186), (370, 28240), (373, 28261), (374, 28273), (375, 28288), (381, 28351), (387, 28435), (392, 28522), (395, 28540), (396, 28543), (399, 28570), (401, 28588), (402, 28591), (403, 28597), (404, 28603), (407, 28630), (411, 28741), (414, 28816), (420, 28885), (422, 28918), (424, 28942), (432, 29059), (436, 29149),

Gene: Kerry\_29 Start: 20616, Stop: 25730, Start Num: 2

Candidate Starts for Kerry\_29:

(Start: 2 @20616 has 33 MA's), (4, 20646), (10, 20793), (11, 20829), (12, 20835), (15, 20880), (18, 20901), (22, 20931), (27, 21096), (29, 21156), (32, 21231), (35, 21267), (36, 21282), (37, 21297), (39, 21312), (41, 21345), (46, 21438), (51, 21492), (52, 21495), (62, 21714), (71, 21819), (72, 21822), (74, 21891), (75, 21897), (84, 22080), (89, 22131), (92, 22182), (97, 22236), (98, 22239), (108, 22371), (116, 22473), (118, 22491), (119, 22494), (126, 22569), (131, 22626), (136, 22710), (138, 22719), (146, 22806), (151, 22845), (158, 22893), (161, 22920), (162, 22941), (165, 22950), (168, 22971), (169, 22983), (171, 22992), (172, 23001), (173, 23028), (177, 23055), (178, 23058), (180, 23079), (183, 23121), (186, 23148), (189, 23157), (191, 23172), (192, 23181), (193, 23196), (194, 23208), (195, 23217), (198, 23229), (201, 23250), (203, 23259), (215, 23343), (216, 23352), (217, 23367), (218, 23370), (221, 23388), (223, 23400), (224, 23403), (228, 23430), (231, 23451), (234, 23466), (242, 23508), (244, 23523), (250, 23580), (252, 23592), (253, 23601), (254, 23613), (256, 23625), (257, 23631), (260, 23652), (263, 23664), (268, 23682), (269, 23691), (270, 23706), (271, 23712), (273, 23724), (282, 23766), (283, 23769), (284, 23778), (285, 23799), (286, 23811), (293, 23859), (294, 23868), (299, 23892), (300, 23898), (302, 23916), (303, 23925), (305, 23946), (309, 24015), (311, 24033), (312, 24036), (314, 24054), (327, 24180), (332, 24225), (339, 24276), (347, 24420), (357, 24555), (359, 24606), (365, 24684), (368, 24729), (370, 24792), (372, 24810), (375, 24840), (376, 24846), (381, 24903), (386, 24975), (389, 25035), (390, 25056), (391, 25059), (396, 25110), (397, 25119), (402, 25158), (404, 25170), (409, 25263), (411, 25308), (414, 25383), (416, 25422), (420, 25452), (424, 25509), (431, 25620), (436, 25716),

Gene: Madvan\_33 Start: 23284, Stop: 28395, Start Num: 2

Candidate Starts for Madvan\_33:

(Start: 2 @23284 has 33 MA's), (4, 23314), (6, 23359), (12, 23503), (17, 23563), (18, 23569), (24, 23629), (25, 23650), (27, 23752), (30, 23842), (31, 23878), (34, 23914), (37, 23953), (40, 23980), (41, 24001), (44, 24043), (50, 24163), (55, 24289), (59, 24364), (60, 24376), (62, 24397), (68, 24469), (71,

24502), (72, 24505), (77, 24613), (92, 24865), (102, 24970), (107, 25039), (114, 25141), (115, 25144), (118, 25171), (122, 25210), (125, 25237), (138, 25399), (140, 25447), (143, 25468), (146, 25486), (153, 25534), (155, 25546), (161, 25600), (168, 25651), (169, 25663), (171, 25672), (172, 25681), (177, 25735), (181, 25780), (182, 25795), (183, 25801), (184, 25810), (185, 25816), (188, 25834), (189, 25837), (190, 25843), (191, 25852), (197, 25906), (198, 25909), (200, 25918), (202, 25936), (203, 25939), (204, 25951), (207, 25972), (209, 25978), (210, 25981), (213, 26002), (216, 26032), (217, 26047), (223, 26080), (228, 26110), (229, 26122), (230, 26128), (231, 26131), (233, 26143), (234, 26146), (244, 26203), (249, 26257), (250, 26260), (253, 26281), (254, 26293), (255, 26296), (262, 26341), (263, 26344), (267, 26359), (268, 26362), (269, 26371), (270, 26386), (271, 26392), (272, 26398), (276, 26419), (277, 26422), (280, 26434), (283, 26449), (284, 26458), (285, 26479), (286, 26491), (290, 26512), (293, 26539), (299, 26572), (300, 26578), (302, 26596), (305, 26626), (308, 26665), (314, 26734), (336, 26926), (341, 27001), (345, 27091), (357, 27235), (360, 27298), (365, 27364), (367, 27397), (368, 27409), (370, 27472), (373, 27493), (374, 27505), (376, 27526), (381, 27583), (387, 27667), (392, 27754), (395, 27772), (399, 27802), (401, 27820), (402, 27823), (403, 27829), (404, 27835), (407, 27862), (411, 27973), (414, 28048), (420, 28117), (422, 28150), (424, 28174), (432, 28291), (436, 28381),

Gene: Mossy\_33 Start: 24706, Stop: 29808, Start Num: 2

Candidate Starts for Mossy\_33:

(Start: 2 @24706 has 33 MA's), (4, 24736), (6, 24781), (11, 24919), (12, 24925), (18, 24991), (22, 25021), (27, 25186), (29, 25246), (33, 25333), (35, 25357), (37, 25387), (39, 25402), (41, 25435), (47, 25528), (55, 25696), (62, 25804), (63, 25816), (67, 25873), (71, 25909), (72, 25912), (74, 25981), (75, 25987), (84, 26170), (85, 26176), (92, 26272), (94, 26290), (107, 26446), (117, 26572), (118, 26581), (135, 26791), (138, 26812), (139, 26818), (143, 26881), (146, 26899), (150, 26926), (152, 26944), (161, 27013), (163, 27037), (165, 27043), (168, 27064), (171, 27085), (177, 27148), (181, 27193), (183, 27214), (186, 27241), (188, 27247), (191, 27265), (192, 27274), (194, 27301), (197, 27319), (198, 27322), (200, 27331), (201, 27343), (202, 27349), (203, 27352), (204, 27364), (217, 27460), (223, 27493), (226, 27514), (227, 27520), (228, 27523), (229, 27535), (231, 27544), (234, 27559), (236, 27565), (237, 27571), (239, 27580), (240, 27595), (241, 27598), (244, 27616), (247, 27652), (250, 27673), (253, 27694), (257, 27724), (259, 27739), (260, 27745), (262, 27754), (264, 27760), (266, 27769), (268, 27775), (269, 27784), (270, 27799), (271, 27805), (275, 27829), (279, 27841), (284, 27871), (285, 27892), (286, 27904), (290, 27925), (291, 27928), (293, 27952), (294, 27961), (299, 27985), (300, 27991), (302, 28009), (303, 28018), (304, 28021), (307, 28075), (309, 28108), (325, 28258), (326, 28270), (328, 28282), (332, 28318), (336, 28339), (341, 28414), (351, 28582), (354, 28612), (356, 28645), (362, 28738), (367, 28810), (368, 28822), (369, 28831), (370, 28885), (375, 28933), (381, 28996), (384, 29047), (387, 29080), (392, 29167), (395, 29185), (399, 29215), (402, 29236), (403, 29242), (404, 29248), (407, 29275), (408, 29302), (411, 29386), (413, 29449), (414, 29461), (423, 29572), (425, 29590), (427, 29638), (436, 29794),

Gene: Nadmeg\_33 Start: 24715, Stop: 29826, Start Num: 2

Candidate Starts for Nadmeg\_33:

(Start: 2 @24715 has 33 MA's), (4, 24745), (6, 24790), (12, 24934), (17, 24994), (18, 25000), (24, 25060), (25, 25081), (27, 25183), (30, 25273), (31, 25309), (34, 25345), (37, 25384), (40, 25411), (41, 25432), (44, 25474), (48, 25546), (50, 25594), (55, 25720), (59, 25795), (60, 25807), (62, 25828), (71, 25933), (72, 25936), (77, 26044), (92, 26296), (102, 26401), (107, 26470), (109, 26491), (114, 26572), (115, 26575), (118, 26602), (122, 26641), (125, 26668), (135, 26809), (138, 26830), (142, 26893), (143, 26899), (146, 26917), (147, 26923), (153, 26965), (156, 26986), (161, 27031), (168, 27082), (169, 27094), (171, 27103), (172, 27112), (181, 27211), (183, 27232), (184, 27241), (188, 27265), (189, 27268), (190, 27274), (197, 27337), (198, 27340), (200, 27349), (202, 27367), (203, 27370), (204, 27382), (207, 27403), (209, 27409), (210, 27412), (213, 27433), (216, 27463), (217, 27478), (220, 27493), (228, 27541), (229, 27553), (230, 27559), (231, 27562), (233, 27574), (234, 27577), (244, 27634), (249, 27688), (253, 27712), (254, 27724), (255, 27727), (262, 27772), (263, 27775), (267, 27790), (268, 27793), (269, 27802), (270, 27817), (271, 27823), (272, 27829), (276, 27850),

(277, 27853), (280, 27865), (283, 27880), (284, 27889), (285, 27910), (286, 27922), (290, 27943), (293, 27970), (299, 28003), (300, 28009), (302, 28027), (305, 28057), (308, 28096), (336, 28357), (341, 28432), (345, 28522), (357, 28666), (360, 28729), (365, 28795), (367, 28828), (368, 28840), (370, 28903), (373, 28924), (374, 28936), (376, 28957), (381, 29014), (387, 29098), (392, 29185), (395, 29203), (399, 29233), (401, 29251), (402, 29254), (403, 29260), (404, 29266), (407, 29293), (411, 29404), (414, 29479), (420, 29548), (422, 29581), (424, 29605), (432, 29722), (436, 29812),

Gene: Nithya\_32 Start: 23499, Stop: 28610, Start Num: 2

Candidate Starts for Nithya\_32:

(Start: 2 @23499 has 33 MA's), (4, 23529), (6, 23574), (12, 23718), (18, 23784), (24, 23844), (25, 23865), (27, 23967), (30, 24057), (31, 24093), (34, 24129), (37, 24168), (41, 24216), (44, 24258), (48, 24330), (50, 24378), (55, 24504), (59, 24579), (60, 24591), (62, 24612), (71, 24717), (72, 24720), (82, 24942), (87, 25008), (88, 25011), (92, 25080), (102, 25185), (107, 25254), (114, 25356), (115, 25359), (118, 25386), (122, 25425), (125, 25452), (138, 25614), (140, 25662), (143, 25683), (146, 25701), (153, 25749), (161, 25815), (164, 25842), (165, 25845), (167, 25863), (168, 25866), (171, 25887), (172, 25896), (177, 25950), (181, 25995), (183, 26016), (184, 26025), (190, 26058), (191, 26067), (193, 26091), (197, 26121), (198, 26124), (200, 26133), (201, 26145), (203, 26154), (204, 26166), (207, 26187), (209, 26193), (216, 26247), (228, 26325), (229, 26337), (230, 26343), (231, 26346), (234, 26361), (239, 26382), (244, 26418), (249, 26472), (250, 26475), (252, 26487), (253, 26496), (254, 26508), (255, 26511), (257, 26526), (261, 26553), (263, 26559), (267, 26574), (268, 26577), (269, 26586), (270, 26601), (271, 26607), (274, 26622), (276, 26634), (277, 26637), (284, 26673), (285, 26694), (286, 26706), (288, 26715), (290, 26727), (293, 26754), (297, 26778), (299, 26787), (300, 26793), (302, 26811), (308, 26880), (314, 26949), (330, 27105), (345, 27306), (357, 27450), (360, 27513), (362, 27540), (367, 27612), (368, 27624), (369, 27633), (370, 27687), (373, 27708), (374, 27720), (387, 27882), (392, 27969), (395, 27987), (399, 28017), (401, 28035), (402, 28038), (404, 28050), (407, 28077), (411, 28188), (414, 28263), (418, 28311), (422, 28365), (425, 28392), (432, 28506), (436, 28596),

Gene: Odesza\_29 Start: 20616, Stop: 25730, Start Num: 2

Candidate Starts for Odesza\_29:

(Start: 2 @20616 has 33 MA's), (4, 20646), (10, 20793), (11, 20829), (12, 20835), (15, 20880), (18, 20901), (22, 20931), (27, 21096), (29, 21156), (32, 21231), (35, 21267), (36, 21282), (37, 21297), (39, 21312), (41, 21345), (46, 21438), (51, 21492), (52, 21495), (62, 21714), (71, 21819), (72, 21822), (74, 21891), (75, 21897), (84, 22080), (89, 22131), (92, 22182), (97, 22236), (98, 22239), (108, 22371), (116, 22473), (118, 22491), (119, 22494), (126, 22569), (131, 22626), (136, 22710), (138, 22719), (146, 22806), (151, 22845), (158, 22893), (161, 22920), (162, 22941), (165, 22950), (168, 22971), (169, 22983), (171, 22992), (172, 23001), (173, 23028), (177, 23055), (178, 23058), (180, 23079), (183, 23121), (186, 23148), (189, 23157), (191, 23172), (192, 23181), (193, 23196), (194, 23208), (195, 23217), (198, 23229), (201, 23250), (203, 23259), (215, 23343), (216, 23352), (217, 23367), (218, 23370), (221, 23388), (223, 23400), (224, 23403), (228, 23430), (231, 23451), (234, 23466), (242, 23508), (244, 23523), (250, 23580), (252, 23592), (253, 23601), (254, 23613), (256, 23625), (257, 23631), (260, 23652), (263, 23664), (268, 23682), (269, 23691), (270, 23706), (271, 23712), (273, 23724), (282, 23766), (283, 23769), (284, 23778), (285, 23799), (286, 23811), (293, 23859), (294, 23868), (299, 23892), (300, 23898), (302, 23916), (303, 23925), (305, 23946), (309, 24015), (311, 24033), (312, 24036), (314, 24054), (327, 24180), (332, 24225), (339, 24276), (347, 24420), (357, 24555), (359, 24606), (365, 24684), (368, 24729), (370, 24792), (372, 24810), (375, 24840), (376, 24846), (381, 24903), (386, 24975), (389, 25035), (390, 25056), (391, 25059), (396, 25110), (397, 25119), (402, 25158), (404, 25170), (409, 25263), (411, 25308), (414, 25383), (416, 25422), (420, 25452), (424, 25509), (431, 25620), (436, 25716),

Gene: OhMyWard\_32 Start: 24046, Stop: 29148, Start Num: 2

Candidate Starts for OhMyWard\_32:

(Start: 2 @24046 has 33 MA's), (4, 24076), (6, 24121), (11, 24259), (12, 24265), (18, 24331), (22, 24361), (27, 24526), (29, 24586), (33, 24673), (35, 24697), (37, 24727), (39, 24742), (41, 24775), (47, 24868), (55, 25036), (62, 25144), (63, 25156), (67, 25213), (71, 25249), (72, 25252), (73, 25261), (74, 25321), (75, 25327), (84, 25510), (85, 25516), (92, 25612), (94, 25630), (107, 25786), (117, 25912), (118, 25921), (138, 26152), (139, 26158), (143, 26221), (146, 26239), (150, 26266), (152, 26284), (161, 26353), (163, 26377), (165, 26383), (168, 26404), (170, 26422), (171, 26425), (177, 26488), (181, 26533), (183, 26554), (186, 26581), (192, 26614), (194, 26641), (197, 26659), (198, 26662), (200, 26671), (202, 26689), (203, 26692), (204, 26704), (217, 26800), (223, 26833), (226, 26854), (228, 26863), (229, 26875), (231, 26884), (234, 26899), (236, 26905), (237, 26911), (239, 26920), (240, 26935), (241, 26938), (243, 26947), (244, 26956), (247, 26992), (250, 27013), (253, 27034), (257, 27064), (259, 27079), (260, 27085), (266, 27109), (268, 27115), (269, 27124), (270, 27139), (271, 27145), (279, 27181), (282, 27199), (284, 27211), (285, 27232), (286, 27244), (290, 27265), (291, 27268), (293, 27292), (294, 27301), (299, 27325), (300, 27331), (302, 27349), (303, 27358), (304, 27361), (309, 27448), (313, 27478), (326, 27610), (336, 27679), (345, 27844), (354, 27952), (356, 27985), (362, 28078), (367, 28150), (368, 28162), (369, 28171), (370, 28225), (375, 28273), (381, 28336), (384, 28387), (387, 28420), (392, 28507), (395, 28525), (399, 28555), (402, 28576), (403, 28582), (404, 28588), (407, 28615), (408, 28642), (411, 28726), (413, 28789), (414, 28801), (423, 28912), (425, 28930), (427, 28978), (436, 29134),

Gene: OlgasClover\_32 Start: 24235, Stop: 29334, Start Num: 2

Candidate Starts for OlgasClover\_32:

(Start: 2 @24235 has 33 MA's), (4, 24265), (6, 24310), (11, 24448), (12, 24454), (16, 24508), (18, 24520), (20, 24532), (22, 24550), (27, 24715), (29, 24775), (33, 24862), (35, 24886), (37, 24916), (39, 24931), (41, 24964), (46, 25057), (55, 25225), (62, 25333), (63, 25345), (67, 25402), (71, 25438), (72, 25441), (74, 25510), (75, 25516), (78, 25600), (82, 25663), (84, 25699), (88, 25732), (93, 25807), (94, 25819), (97, 25855), (102, 25906), (103, 25954), (106, 25966), (118, 26110), (122, 26149), (125, 26176), (138, 26338), (140, 26386), (143, 26407), (146, 26425), (153, 26473), (161, 26539), (168, 26590), (169, 26602), (172, 26620), (177, 26674), (181, 26719), (183, 26740), (184, 26749), (187, 26770), (190, 26782), (191, 26791), (197, 26845), (198, 26848), (200, 26857), (203, 26878), (204, 26890), (207, 26911), (209, 26917), (212, 26935), (216, 26971), (220, 27001), (228, 27049), (229, 27061), (230, 27067), (231, 27070), (233, 27082), (234, 27085), (239, 27106), (244, 27142), (249, 27196), (250, 27199), (253, 27220), (254, 27232), (255, 27235), (263, 27283), (267, 27298), (268, 27301), (269, 27310), (271, 27331), (276, 27358), (277, 27361), (282, 27385), (284, 27397), (285, 27418), (286, 27430), (288, 27439), (290, 27451), (293, 27478), (299, 27511), (300, 27517), (302, 27535), (304, 27547), (306, 27589), (308, 27604), (314, 27673), (325, 27784), (339, 27895), (341, 27940), (345, 28030), (357, 28174), (360, 28237), (362, 28264), (367, 28336), (368, 28348), (369, 28357), (370, 28411), (373, 28432), (374, 28444), (387, 28606), (392, 28693), (395, 28711), (399, 28741), (401, 28759), (402, 28762), (404, 28774), (407, 28801), (411, 28912), (414, 28987), (418, 29035), (422, 29089), (425, 29116), (432, 29230), (436, 29320),

Gene: Pepy6\_035 Start: 30017, Stop: 35869, Start Num: 2

Candidate Starts for Pepy6\_035:

(1, 29996), (Start: 2 @30017 has 33 MA's), (4, 30047), (6, 30092), (7, 30101), (8, 30122), (9, 30185), (12, 30236), (24, 30362), (25, 30383), (26, 30443), (27, 30485), (29, 30545), (35, 30656), (37, 30686), (39, 30701), (41, 30734), (44, 30776), (46, 30827), (51, 30881), (52, 30884), (53, 30899), (63, 31115), (68, 31175), (70, 31196), (73, 31220), (82, 31433), (84, 31469), (91, 31568), (113, 31826), (118, 31877), (122, 31916), (123, 31919), (127, 31961), (129, 31967), (130, 32012), (133, 32033), (135, 32087), (138, 32108), (150, 32222), (154, 32249), (156, 32264), (157, 32273), (159, 32300), (162, 32330), (163, 32333), (165, 32339), (170, 32378), (172, 32390), (175, 32435), (176, 32438), (181, 32489), (183, 32510), (184, 32519), (187, 32540), (192, 32570), (194, 32597), (195, 32606), (196, 32612), (203, 32648), (204, 32660), (211, 32702), (212, 32705), (214, 32717), (215, 32732), (219, 32768), (222, 32783), (228, 32819), (229, 32831), (235, 32858), (243, 32903), (244, 32912), (245, 32927), (248, 32960), (250, 32969), (251, 32975), (253, 32990), (258, 33023), (261, 33047), (265,



33062), (269, 33080), (274, 33116), (281, 33152), (283, 33158), (285, 33188), (286, 33200), (287, 33206), (290, 33221), (292, 33245), (294, 33257), (295, 33263), (297, 33272), (298, 33275), (305, 33335), (306, 33359), (313, 33434), (322, 33530), (346, 33806), (348, 33824), (349, 33830), (350, 33854), (354, 33908), (361, 34016), (363, 34043), (364, 34058), (366, 34112), (375, 34238), (380, 34298), (402, 34586), (417, 34850), (421, 34898), (428, 35000), (430, 35033), (434, 35132), (435, 35141), (437, 35246), (438, 35264), (439, 35300), (440, 35345), (443, 35627), (444, 35660), (445, 35855),

Gene: Perkunas\_33 Start: 21027, Stop: 26129, Start Num: 2

Candidate Starts for Perkunas\_33:

(Start: 2 @21027 has 33 MA's), (4, 21057), (9, 21195), (11, 21240), (15, 21291), (17, 21306), (18, 21312), (22, 21342), (24, 21372), (25, 21393), (27, 21495), (29, 21555), (35, 21666), (37, 21696), (39, 21711), (41, 21744), (44, 21786), (46, 21837), (51, 21891), (52, 21894), (54, 21993), (62, 22113), (71, 22218), (72, 22221), (74, 22290), (75, 22296), (81, 22431), (97, 22635), (98, 22638), (116, 22872), (118, 22890), (122, 22929), (125, 22956), (126, 22968), (128, 22977), (136, 23109), (138, 23118), (144, 23193), (146, 23205), (147, 23211), (158, 23292), (160, 23313), (161, 23319), (162, 23340), (165, 23349), (168, 23370), (169, 23382), (171, 23391), (172, 23400), (173, 23427), (177, 23454), (178, 23457), (180, 23478), (183, 23520), (188, 23553), (189, 23556), (191, 23571), (192, 23580), (194, 23607), (195, 23616), (198, 23628), (201, 23649), (203, 23658), (207, 23691), (215, 23742), (216, 23751), (217, 23766), (221, 23787), (224, 23802), (227, 23826), (228, 23829), (229, 23841), (230, 23847), (231, 23850), (242, 23907), (244, 23922), (250, 23979), (252, 23991), (253, 24000), (254, 24012), (256, 24024), (257, 24030), (262, 24060), (263, 24063), (265, 24072), (268, 24081), (269, 24090), (270, 24105), (271, 24111), (273, 24123), (282, 24165), (284, 24177), (285, 24198), (286, 24210), (294, 24267), (299, 24291), (300, 24297), (301, 24300), (302, 24315), (304, 24327), (305, 24345), (309, 24414), (312, 24435), (321, 24522), (332, 24624), (335, 24642), (343, 24756), (344, 24777), (347, 24819), (357, 24954), (368, 25128), (370, 25191), (372, 25209), (375, 25239), (376, 25245), (378, 25266), (386, 25374), (389, 25434), (390, 25455), (391, 25458), (396, 25509), (397, 25518), (399, 25536), (402, 25557), (404, 25569), (409, 25662), (411, 25707), (413, 25770), (414, 25782), (416, 25821), (420, 25851), (422, 25884), (424, 25908), (428, 25968), (436, 26115),

Gene: Petite\_29 Start: 21794, Stop: 26884, Start Num: 2

Candidate Starts for Petite\_29:

(Start: 2 @21794 has 33 MA's), (4, 21824), (9, 21962), (11, 22007), (12, 22013), (14, 22037), (15, 22058), (18, 22079), (22, 22109), (24, 22139), (25, 22160), (27, 22262), (29, 22322), (32, 22397), (33, 22409), (35, 22433), (37, 22463), (39, 22478), (41, 22511), (42, 22517), (44, 22553), (46, 22604), (51, 22658), (52, 22661), (54, 22760), (56, 22784), (62, 22880), (66, 22934), (69, 22964), (71, 22985), (72, 22988), (74, 23057), (75, 23063), (82, 23210), (84, 23246), (87, 23276), (92, 23348), (95, 23378), (97, 23402), (118, 23657), (126, 23735), (128, 23744), (131, 23792), (136, 23876), (138, 23885), (142, 23948), (146, 23972), (149, 23990), (151, 24011), (158, 24059), (161, 24086), (165, 24116), (168, 24137), (169, 24149), (171, 24158), (172, 24167), (177, 24221), (178, 24224), (180, 24245), (183, 24287), (186, 24314), (189, 24323), (191, 24338), (192, 24347), (193, 24362), (194, 24374), (195, 24383), (198, 24395), (201, 24416), (203, 24425), (212, 24482), (215, 24509), (216, 24518), (217, 24533), (218, 24536), (221, 24554), (228, 24596), (229, 24608), (231, 24617), (234, 24632), (242, 24674), (244, 24689), (250, 24746), (252, 24758), (253, 24767), (254, 24779), (256, 24791), (257, 24797), (260, 24818), (263, 24830), (265, 24839), (268, 24848), (269, 24857), (270, 24872), (271, 24878), (273, 24890), (279, 24914), (282, 24932), (284, 24944), (285, 24965), (286, 24977), (293, 25025), (294, 25034), (299, 25058), (300, 25064), (301, 25067), (302, 25082), (303, 25091), (304, 25094), (305, 25112), (309, 25181), (312, 25202), (320, 25280), (326, 25343), (329, 25364), (333, 25397), (342, 25499), (344, 25544), (347, 25586), (351, 25655), (357, 25721), (361, 25793), (367, 25883), (370, 25958), (376, 26012), (378, 26033), (381, 26069), (382, 26108), (384, 26120), (386, 26141), (391, 26225), (395, 26258), (399, 26288), (400, 26294), (402, 26309), (404, 26321), (410, 26447), (411, 26459), (414, 26534), (415, 26552), (416, 26573), (419, 26585), (424, 26660), (425, 26663), (436, 26870),

Gene: Phepper\_32 Start: 23282, Stop: 28393, Start Num: 2

Candidate Starts for Phepper\_32:

(Start: 2 @23282 has 33 MA's), (4, 23312), (6, 23357), (12, 23501), (18, 23567), (24, 23627), (25, 23648), (27, 23750), (31, 23876), (34, 23912), (37, 23951), (40, 23978), (41, 23999), (44, 24041), (50, 24161), (55, 24287), (59, 24362), (62, 24395), (71, 24500), (72, 24503), (92, 24863), (102, 24968), (107, 25037), (109, 25058), (114, 25139), (115, 25142), (118, 25169), (122, 25208), (125, 25235), (138, 25397), (140, 25445), (143, 25466), (146, 25484), (153, 25532), (155, 25544), (161, 25598), (168, 25649), (169, 25661), (171, 25670), (172, 25679), (177, 25733), (181, 25778), (182, 25793), (183, 25799), (184, 25808), (185, 25814), (188, 25832), (189, 25835), (190, 25841), (191, 25850), (197, 25904), (198, 25907), (200, 25916), (202, 25934), (203, 25937), (204, 25949), (207, 25970), (209, 25976), (210, 25979), (213, 26000), (216, 26030), (217, 26045), (223, 26078), (225, 26093), (228, 26108), (229, 26120), (230, 26126), (231, 26129), (233, 26141), (234, 26144), (244, 26201), (249, 26255), (250, 26258), (253, 26279), (254, 26291), (255, 26294), (263, 26342), (267, 26357), (268, 26360), (269, 26369), (271, 26390), (276, 26417), (277, 26420), (282, 26444), (284, 26456), (285, 26477), (286, 26489), (290, 26510), (293, 26537), (299, 26570), (300, 26576), (302, 26594), (305, 26624), (308, 26663), (325, 26843), (326, 26855), (336, 26924), (345, 27089), (355, 27212), (357, 27233), (365, 27362), (367, 27395), (368, 27407), (370, 27470), (373, 27491), (374, 27503), (375, 27518), (381, 27581), (387, 27665), (392, 27752), (395, 27770), (399, 27800), (401, 27818), (402, 27821), (403, 27827), (404, 27833), (407, 27860), (411, 27971), (414, 28046), (415, 28064), (422, 28148), (424, 28172), (432, 28289), (436, 28379),

Gene: Pherobrine\_31 Start: 23313, Stop: 28427, Start Num: 2

Candidate Starts for Pherobrine\_31:

(Start: 2 @23313 has 33 MA's), (4, 23343), (6, 23388), (12, 23532), (17, 23592), (18, 23598), (23, 23637), (24, 23658), (25, 23679), (27, 23781), (28, 23817), (31, 23907), (34, 23943), (37, 23982), (40, 24009), (41, 24030), (44, 24072), (50, 24192), (59, 24393), (62, 24426), (64, 24459), (69, 24510), (71, 24531), (72, 24534), (75, 24609), (81, 24744), (86, 24810), (88, 24825), (92, 24894), (94, 24912), (96, 24945), (99, 24966), (100, 24975), (102, 24999), (107, 25068), (109, 25089), (111, 25122), (112, 25125), (117, 25194), (118, 25203), (128, 25290), (132, 25350), (134, 25401), (138, 25434), (139, 25440), (143, 25503), (146, 25521), (152, 25566), (161, 25635), (163, 25659), (165, 25665), (168, 25686), (172, 25716), (177, 25770), (178, 25773), (182, 25830), (183, 25836), (188, 25869), (191, 25887), (192, 25896), (193, 25911), (194, 25923), (197, 25941), (198, 25944), (200, 25953), (201, 25965), (202, 25971), (203, 25974), (207, 26007), (211, 26028), (216, 26067), (223, 26115), (225, 26130), (226, 26136), (228, 26145), (229, 26157), (231, 26166), (233, 26178), (234, 26181), (235, 26184), (236, 26187), (237, 26193), (239, 26202), (246, 26265), (248, 26286), (250, 26295), (253, 26316), (260, 26367), (261, 26373), (262, 26376), (266, 26391), (268, 26397), (270, 26421), (271, 26427), (276, 26454), (277, 26457), (284, 26493), (285, 26514), (286, 26526), (288, 26535), (290, 26547), (293, 26574), (294, 26583), (299, 26607), (300, 26613), (302, 26631), (305, 26661), (308, 26700), (309, 26730), (313, 26760), (326, 26892), (336, 26961), (345, 27126), (354, 27234), (356, 27267), (362, 27360), (367, 27432), (368, 27444), (370, 27507), (375, 27555), (382, 27657), (385, 27678), (387, 27702), (388, 27726), (392, 27789), (395, 27807), (401, 27855), (402, 27858), (404, 27870), (407, 27897), (411, 28008), (414, 28083), (422, 28185), (425, 28212), (426, 28215), (432, 28323), (433, 28362), (436, 28413),

Gene: Poco6\_036 Start: 32036, Stop: 37891, Start Num: 2

Candidate Starts for Poco6\_036:

(Start: 2 @32036 has 33 MA's), (4, 32066), (6, 32111), (7, 32120), (8, 32141), (9, 32204), (12, 32255), (14, 32279), (24, 32381), (25, 32402), (27, 32519), (29, 32579), (35, 32690), (37, 32720), (39, 32735), (41, 32768), (46, 32861), (52, 32909), (61, 33110), (63, 33140), (75, 33311), (79, 33407), (84, 33494), (113, 33851), (118, 33902), (122, 33941), (127, 33986), (130, 34037), (133, 34058), (135, 34112), (138, 34133), (141, 34190), (150, 34247), (154, 34274), (156, 34289), (157, 34298), (159, 34325), (162, 34355), (163, 34358), (165, 34364), (172, 34415), (176, 34463), (181, 34514), (183, 34535),

(184, 34544), (187, 34565), (191, 34586), (196, 34637), (198, 34643), (201, 34664), (203, 34673), (204, 34685), (206, 34700), (211, 34727), (212, 34730), (215, 34757), (225, 34829), (228, 34844), (229, 34856), (235, 34883), (243, 34928), (244, 34937), (248, 34985), (250, 34994), (253, 35015), (258, 35048), (260, 35066), (261, 35072), (265, 35087), (266, 35090), (267, 35093), (269, 35105), (281, 35177), (283, 35183), (285, 35213), (286, 35225), (287, 35231), (289, 35240), (290, 35246), (292, 35270), (294, 35282), (295, 35288), (305, 35360), (306, 35384), (312, 35450), (313, 35459), (320, 35528), (322, 35555), (346, 35831), (348, 35849), (350, 35879), (352, 35912), (354, 35933), (361, 36041), (363, 36068), (366, 36137), (368, 36152), (394, 36542), (417, 36872), (421, 36920), (428, 37022), (435, 37163), (437, 37268), (439, 37322), (440, 37367), (441, 37433), (442, 37532), (443, 37649), (444, 37682), (445, 37877),

Gene: Rickmore\_31 Start: 21933, Stop: 27044, Start Num: 2

Candidate Starts for Rickmore\_31:

(Start: 2 @21933 has 33 MA's), (4, 21963), (6, 22008), (12, 22152), (17, 22212), (18, 22218), (24, 22278), (25, 22299), (27, 22401), (30, 22491), (31, 22527), (34, 22563), (37, 22602), (38, 22614), (41, 22650), (44, 22692), (48, 22764), (50, 22812), (55, 22938), (57, 22980), (59, 23013), (60, 23025), (62, 23046), (71, 23151), (72, 23154), (82, 23376), (86, 23430), (103, 23667), (105, 23676), (109, 23709), (110, 23721), (114, 23790), (115, 23793), (118, 23820), (125, 23886), (138, 24048), (140, 24096), (142, 24111), (143, 24117), (145, 24126), (146, 24135), (161, 24249), (168, 24300), (169, 24312), (171, 24321), (172, 24330), (173, 24357), (181, 24429), (183, 24450), (184, 24459), (189, 24486), (191, 24501), (192, 24510), (197, 24555), (198, 24558), (203, 24588), (204, 24600), (208, 24624), (211, 24642), (212, 24645), (215, 24672), (216, 24681), (218, 24699), (223, 24729), (228, 24759), (229, 24771), (230, 24777), (231, 24780), (234, 24795), (236, 24801), (244, 24852), (249, 24906), (252, 24921), (253, 24930), (254, 24942), (255, 24945), (256, 24954), (262, 24990), (263, 24993), (267, 25008), (268, 25011), (269, 25020), (271, 25041), (276, 25068), (277, 25071), (283, 25098), (284, 25107), (285, 25128), (286, 25140), (290, 25161), (293, 25188), (299, 25221), (300, 25227), (302, 25245), (304, 25257), (305, 25275), (312, 25365), (314, 25383), (315, 25386), (334, 25563), (338, 25596), (345, 25740), (347, 25749), (355, 25863), (357, 25884), (362, 25974), (367, 26046), (368, 26058), (369, 26067), (370, 26121), (373, 26142), (375, 26169), (376, 26175), (381, 26232), (383, 26274), (392, 26403), (395, 26421), (399, 26451), (402, 26472), (404, 26484), (411, 26622), (414, 26697), (422, 26799), (424, 26823), (425, 26826), (429, 26892), (432, 26940), (436, 27030),

Gene: Roney\_29 Start: 20616, Stop: 25730, Start Num: 2

Candidate Starts for Roney\_29:

(Start: 2 @20616 has 33 MA's), (4, 20646), (10, 20793), (11, 20829), (12, 20835), (15, 20880), (18, 20901), (22, 20931), (27, 21096), (29, 21156), (32, 21231), (35, 21267), (36, 21282), (37, 21297), (39, 21312), (41, 21345), (46, 21438), (51, 21492), (52, 21495), (62, 21714), (71, 21819), (72, 21822), (74, 21891), (75, 21897), (84, 22080), (89, 22131), (92, 22182), (97, 22236), (98, 22239), (108, 22371), (116, 22473), (118, 22491), (119, 22494), (126, 22569), (131, 22626), (136, 22710), (138, 22719), (146, 22806), (151, 22845), (158, 22893), (161, 22920), (162, 22941), (165, 22950), (168, 22971), (169, 22983), (171, 22992), (172, 23001), (173, 23028), (177, 23055), (178, 23058), (180, 23079), (183, 23121), (186, 23148), (189, 23157), (191, 23172), (192, 23181), (193, 23196), (194, 23208), (195, 23217), (198, 23229), (201, 23250), (203, 23259), (215, 23343), (216, 23352), (217, 23367), (218, 23370), (221, 23388), (223, 23400), (224, 23403), (228, 23430), (231, 23451), (234, 23466), (238, 23484), (242, 23508), (244, 23523), (250, 23580), (252, 23592), (253, 23601), (254, 23613), (256, 23625), (257, 23631), (260, 23652), (263, 23664), (268, 23682), (269, 23691), (270, 23706), (271, 23712), (273, 23724), (282, 23766), (283, 23769), (284, 23778), (285, 23799), (286, 23811), (293, 23859), (294, 23868), (299, 23892), (300, 23898), (302, 23916), (303, 23925), (305, 23946), (309, 24015), (311, 24033), (312, 24036), (314, 24054), (327, 24180), (332, 24225), (339, 24276), (347, 24420), (357, 24555), (359, 24606), (365, 24684), (368, 24729), (370, 24792), (372, 24810), (375, 24840), (376, 24846), (381, 24903), (386, 24975), (389, 25035), (390, 25056), (391, 25059), (396, 25110), (397, 25119), (402, 25158), (404, 25170), (409, 25263), (411, 25308), (414, 25383), (416, 25422), (420, 25452), (424, 25509), (431, 25620), (436, 25716),

Gene: Runhaar\_32 Start: 23285, Stop: 28396, Start Num: 2

Candidate Starts for Runhaar\_32:

(Start: 2 @23285 has 33 MA's), (4, 23315), (6, 23360), (8, 23390), (12, 23504), (18, 23570), (24, 23630), (25, 23651), (27, 23753), (31, 23879), (34, 23915), (37, 23954), (40, 23981), (41, 24002), (44, 24044), (49, 24143), (50, 24164), (55, 24290), (59, 24365), (60, 24377), (62, 24398), (71, 24503), (72, 24506), (92, 24866), (102, 24971), (107, 25040), (109, 25061), (114, 25142), (115, 25145), (118, 25172), (122, 25211), (125, 25238), (138, 25400), (140, 25448), (143, 25469), (146, 25487), (153, 25535), (155, 25547), (161, 25601), (168, 25652), (169, 25664), (171, 25673), (172, 25682), (177, 25736), (181, 25781), (182, 25796), (183, 25802), (184, 25811), (185, 25817), (188, 25835), (189, 25838), (190, 25844), (191, 25853), (197, 25907), (198, 25910), (200, 25919), (202, 25937), (203, 25940), (204, 25952), (207, 25973), (209, 25979), (210, 25982), (213, 26003), (216, 26033), (217, 26048), (223, 26081), (225, 26096), (228, 26111), (229, 26123), (230, 26129), (231, 26132), (233, 26144), (234, 26147), (244, 26204), (249, 26258), (250, 26261), (253, 26282), (254, 26294), (255, 26297), (263, 26345), (267, 26360), (268, 26363), (269, 26372), (271, 26393), (276, 26420), (277, 26423), (282, 26447), (284, 26459), (285, 26480), (286, 26492), (290, 26513), (293, 26540), (299, 26573), (300, 26579), (302, 26597), (305, 26627), (308, 26666), (325, 26846), (326, 26858), (336, 26927), (345, 27092), (355, 27215), (357, 27236), (365, 27365), (367, 27398), (368, 27410), (370, 27473), (373, 27494), (374, 27506), (375, 27521), (381, 27584), (387, 27668), (392, 27755), (395, 27773), (399, 27803), (401, 27821), (402, 27824), (403, 27830), (404, 27836), (407, 27863), (411, 27974), (414, 28049), (415, 28067), (422, 28151), (424, 28175), (432, 28292), (436, 28382),

Gene: Schwartz33\_33 Start: 23640, Stop: 28727, Start Num: 2

Candidate Starts for Schwartz33\_33:

(Start: 2 @23640 has 33 MA's), (3, 23646), (4, 23670), (10, 23817), (14, 23883), (15, 23904), (18, 23925), (22, 23955), (24, 23985), (25, 24006), (27, 24108), (29, 24168), (32, 24243), (35, 24279), (37, 24309), (39, 24324), (41, 24357), (46, 24450), (51, 24504), (52, 24507), (59, 24693), (62, 24726), (69, 24810), (71, 24831), (72, 24834), (74, 24903), (75, 24909), (76, 24915), (80, 25032), (81, 25044), (83, 25068), (87, 25122), (88, 25125), (90, 25179), (94, 25212), (118, 25503), (125, 25569), (130, 25635), (136, 25722), (137, 25728), (138, 25731), (142, 25794), (143, 25800), (146, 25818), (155, 25878), (161, 25932), (165, 25962), (169, 25995), (171, 26004), (172, 26013), (177, 26067), (179, 26073), (181, 26112), (183, 26133), (184, 26142), (188, 26166), (189, 26169), (190, 26175), (191, 26184), (193, 26208), (197, 26238), (198, 26241), (199, 26244), (203, 26271), (211, 26325), (216, 26364), (221, 26400), (228, 26442), (230, 26460), (231, 26463), (233, 26475), (234, 26478), (236, 26484), (239, 26499), (240, 26514), (244, 26535), (246, 26562), (250, 26592), (253, 26613), (260, 26664), (268, 26694), (269, 26703), (278, 26757), (284, 26790), (285, 26811), (286, 26823), (290, 26844), (293, 26871), (299, 26904), (300, 26910), (302, 26928), (303, 26937), (304, 26940), (309, 27027), (314, 27066), (315, 27069), (319, 27114), (326, 27189), (334, 27246), (337, 27264), (347, 27432), (349, 27453), (355, 27546), (361, 27639), (364, 27681), (367, 27729), (368, 27741), (370, 27804), (371, 27816), (374, 27837), (375, 27852), (376, 27858), (387, 27999), (393, 28095), (395, 28104), (401, 28152), (402, 28155), (404, 28167), (411, 28305), (414, 28380), (424, 28506), (436, 28713),

Gene: Secretariat\_30 Start: 22365, Stop: 27458, Start Num: 2

Candidate Starts for Secretariat\_30:

(Start: 2 @22365 has 33 MA's), (4, 22395), (5, 22434), (10, 22542), (12, 22584), (19, 22659), (21, 22677), (24, 22710), (26, 22803), (27, 22845), (29, 22905), (35, 23016), (37, 23046), (39, 23061), (41, 23094), (43, 23118), (45, 23184), (46, 23187), (51, 23241), (52, 23244), (53, 23259), (69, 23547), (71, 23568), (74, 23640), (88, 23862), (90, 23916), (93, 23937), (94, 23949), (101, 24024), (104, 24087), (109, 24126), (110, 24138), (111, 24159), (116, 24222), (118, 24240), (119, 24243), (121, 24276), (132, 24384), (134, 24435), (135, 24447), (136, 24459), (138, 24468), (143, 24537), (144, 24543), (146, 24555), (150, 24582), (153, 24603), (161, 24669), (163, 24693), (165, 24699), (169, 24732), (171, 24741), (172, 24750), (177, 24804), (181, 24849), (183, 24870), (184, 24879), (189, 24906), (191, 24921), (193, 24945), (197, 24975), (198, 24978), (201, 24999), (202, 25005), (203, 25008),

(207, 25041), (216, 25101), (226, 25170), (228, 25179), (229, 25191), (230, 25197), (231, 25200), (232, 25206), (239, 25236), (241, 25254), (243, 25263), (244, 25272), (246, 25299), (248, 25320), (250, 25329), (254, 25362), (262, 25410), (268, 25431), (269, 25440), (270, 25455), (271, 25461), (284, 25527), (285, 25548), (286, 25560), (290, 25581), (293, 25608), (294, 25617), (295, 25623), (296, 25629), (300, 25647), (302, 25665), (305, 25695), (311, 25782), (313, 25794), (316, 25815), (317, 25818), (318, 25836), (331, 25971), (333, 25980), (334, 25983), (351, 26238), (353, 26250), (355, 26283), (360, 26367), (367, 26466), (370, 26541), (371, 26553), (373, 26562), (376, 26595), (379, 26640), (392, 26823), (395, 26841), (398, 26865), (402, 26892), (403, 26898), (404, 26904), (411, 27042), (412, 27081), (414, 27117), (415, 27135), (424, 27237), (436, 27444),

Gene: Tanis\_29 Start: 20466, Stop: 25580, Start Num: 2

Candidate Starts for Tanis\_29:

(Start: 2 @20466 has 33 MA's), (4, 20496), (10, 20643), (11, 20679), (12, 20685), (15, 20730), (18, 20751), (22, 20781), (27, 20946), (29, 21006), (32, 21081), (35, 21117), (36, 21132), (37, 21147), (39, 21162), (41, 21195), (46, 21288), (51, 21342), (52, 21345), (62, 21564), (71, 21669), (72, 21672), (74, 21741), (75, 21747), (84, 21930), (89, 21981), (92, 22032), (97, 22086), (98, 22089), (108, 22221), (116, 22323), (118, 22341), (119, 22344), (126, 22419), (131, 22476), (136, 22560), (138, 22569), (146, 22656), (151, 22695), (158, 22743), (161, 22770), (162, 22791), (165, 22800), (168, 22821), (169, 22833), (171, 22842), (172, 22851), (173, 22878), (177, 22905), (178, 22908), (180, 22929), (183, 22971), (186, 22998), (189, 23007), (191, 23022), (192, 23031), (193, 23046), (194, 23058), (195, 23067), (198, 23079), (201, 23100), (203, 23109), (215, 23193), (216, 23202), (217, 23217), (218, 23220), (221, 23238), (223, 23250), (224, 23253), (228, 23280), (231, 23301), (234, 23316), (242, 23358), (244, 23373), (250, 23430), (252, 23442), (253, 23451), (254, 23463), (256, 23475), (257, 23481), (260, 23502), (263, 23514), (268, 23532), (269, 23541), (270, 23556), (271, 23562), (273, 23574), (282, 23616), (283, 23619), (284, 23628), (285, 23649), (286, 23661), (293, 23709), (294, 23718), (299, 23742), (300, 23748), (302, 23766), (303, 23775), (305, 23796), (309, 23865), (311, 23883), (312, 23886), (314, 23904), (327, 24030), (332, 24075), (339, 24126), (347, 24270), (357, 24405), (359, 24456), (365, 24534), (368, 24579), (370, 24642), (372, 24660), (375, 24690), (376, 24696), (381, 24753), (386, 24825), (389, 24885), (390, 24906), (391, 24909), (396, 24960), (397, 24969), (402, 25008), (404, 25020), (409, 25113), (411, 25158), (414, 25233), (416, 25272), (420, 25302), (424, 25359), (431, 25470), (436, 25566),

Gene: TenaciousP\_36 Start: 24936, Stop: 30050, Start Num: 2

Candidate Starts for TenaciousP\_36:

(Start: 2 @24936 has 33 MA's), (4, 24966), (6, 25011), (12, 25155), (18, 25221), (24, 25281), (25, 25302), (27, 25404), (31, 25530), (34, 25566), (37, 25605), (41, 25653), (44, 25695), (48, 25767), (50, 25815), (55, 25941), (59, 26016), (60, 26028), (62, 26049), (71, 26154), (72, 26157), (82, 26379), (87, 26445), (94, 26535), (97, 26571), (102, 26622), (103, 26670), (106, 26682), (118, 26826), (122, 26865), (125, 26892), (138, 27054), (140, 27102), (142, 27117), (143, 27123), (146, 27141), (153, 27189), (161, 27255), (168, 27306), (169, 27318), (172, 27336), (177, 27390), (181, 27435), (183, 27456), (184, 27465), (187, 27486), (191, 27507), (197, 27561), (198, 27564), (200, 27573), (203, 27594), (204, 27606), (207, 27627), (209, 27633), (212, 27651), (216, 27687), (220, 27717), (228, 27765), (229, 27777), (230, 27783), (231, 27786), (233, 27798), (234, 27801), (239, 27822), (244, 27858), (249, 27912), (250, 27915), (252, 27927), (253, 27936), (254, 27948), (255, 27951), (263, 27999), (267, 28014), (268, 28017), (269, 28026), (271, 28047), (276, 28074), (277, 28077), (282, 28101), (284, 28113), (285, 28134), (286, 28146), (288, 28155), (290, 28167), (293, 28194), (294, 28203), (299, 28227), (300, 28233), (302, 28251), (306, 28305), (308, 28320), (314, 28389), (325, 28500), (339, 28611), (341, 28656), (345, 28746), (355, 28869), (357, 28890), (360, 28953), (362, 28980), (367, 29052), (368, 29064), (369, 29073), (370, 29127), (373, 29148), (374, 29160), (387, 29322), (392, 29409), (395, 29427), (399, 29457), (401, 29475), (402, 29478), (404, 29490), (407, 29517), (411, 29628), (414, 29703), (418, 29751), (422, 29805), (425, 29832), (432, 29946), (436, 30036),

Gene: Untouchable\_32 Start: 23641, Stop: 28752, Start Num: 2

Candidate Starts for Untouchable\_32:

(Start: 2 @23641 has 33 MA's), (4, 23671), (6, 23716), (12, 23860), (17, 23920), (18, 23926), (24, 23986), (25, 24007), (27, 24109), (31, 24235), (34, 24271), (37, 24310), (40, 24337), (41, 24358), (44, 24400), (48, 24472), (50, 24520), (55, 24646), (59, 24721), (60, 24733), (62, 24754), (71, 24859), (72, 24862), (77, 24970), (92, 25222), (102, 25327), (107, 25396), (109, 25417), (114, 25498), (115, 25501), (118, 25528), (122, 25567), (125, 25594), (135, 25735), (138, 25756), (142, 25819), (143, 25825), (146, 25843), (147, 25849), (153, 25891), (155, 25903), (156, 25912), (161, 25957), (166, 25999), (168, 26008), (169, 26020), (171, 26029), (172, 26038), (181, 26137), (183, 26158), (184, 26167), (188, 26191), (189, 26194), (197, 26263), (198, 26266), (200, 26275), (202, 26293), (203, 26296), (204, 26308), (207, 26329), (209, 26335), (210, 26338), (213, 26359), (216, 26389), (217, 26404), (220, 26419), (228, 26467), (229, 26479), (230, 26485), (231, 26488), (233, 26500), (234, 26503), (244, 26560), (249, 26614), (253, 26638), (254, 26650), (255, 26653), (262, 26698), (263, 26701), (267, 26716), (268, 26719), (269, 26728), (270, 26743), (271, 26749), (272, 26755), (276, 26776), (277, 26779), (280, 26791), (283, 26806), (284, 26815), (285, 26836), (286, 26848), (290, 26869), (293, 26896), (299, 26929), (300, 26935), (302, 26953), (305, 26983), (308, 27022), (314, 27091), (325, 27202), (326, 27214), (336, 27283), (341, 27358), (345, 27448), (357, 27592), (358, 27616), (365, 27721), (367, 27754), (368, 27766), (370, 27829), (373, 27850), (374, 27862), (376, 27883), (381, 27940), (387, 28024), (392, 28111), (395, 28129), (399, 28159), (401, 28177), (402, 28180), (403, 28186), (404, 28192), (407, 28219), (411, 28330), (414, 28405), (420, 28474), (422, 28507), (424, 28531), (432, 28648), (436, 28738),

Gene: Vardy\_32 Start: 23250, Stop: 28361, Start Num: 2

Candidate Starts for Vardy\_32:

(Start: 2 @23250 has 33 MA's), (4, 23280), (6, 23325), (12, 23469), (18, 23535), (24, 23595), (25, 23616), (27, 23718), (31, 23844), (34, 23880), (37, 23919), (40, 23946), (41, 23967), (44, 24009), (49, 24108), (50, 24129), (55, 24255), (59, 24330), (60, 24342), (62, 24363), (71, 24468), (72, 24471), (92, 24831), (102, 24936), (107, 25005), (109, 25026), (114, 25107), (115, 25110), (118, 25137), (122, 25176), (125, 25203), (138, 25365), (140, 25413), (143, 25434), (146, 25452), (153, 25500), (155, 25512), (161, 25566), (168, 25617), (169, 25629), (171, 25638), (172, 25647), (177, 25701), (181, 25746), (182, 25761), (183, 25767), (184, 25776), (185, 25782), (188, 25800), (189, 25803), (190, 25809), (191, 25818), (197, 25872), (198, 25875), (200, 25884), (202, 25902), (203, 25905), (204, 25917), (207, 25938), (209, 25944), (210, 25947), (213, 25968), (216, 25998), (217, 26013), (223, 26046), (225, 26061), (228, 26076), (229, 26088), (230, 26094), (231, 26097), (233, 26109), (234, 26112), (244, 26169), (249, 26223), (250, 26226), (253, 26247), (254, 26259), (255, 26262), (263, 26310), (267, 26325), (268, 26328), (269, 26337), (271, 26358), (276, 26385), (277, 26388), (282, 26412), (284, 26424), (285, 26445), (286, 26457), (290, 26478), (293, 26505), (299, 26538), (300, 26544), (302, 26562), (305, 26592), (308, 26631), (325, 26811), (326, 26823), (336, 26892), (345, 27057), (355, 27180), (357, 27201), (365, 27330), (367, 27363), (368, 27375), (370, 27438), (373, 27459), (374, 27471), (375, 27486), (381, 27549), (387, 27633), (392, 27720), (395, 27738), (399, 27768), (401, 27786), (402, 27789), (403, 27795), (404, 27801), (407, 27828), (411, 27939), (414, 28014), (415, 28032), (422, 28116), (424, 28140), (432, 28257), (436, 28347),

Gene: Zeph\_34 Start: 23999, Stop: 29110, Start Num: 2

Candidate Starts for Zeph\_34:

(Start: 2 @23999 has 33 MA's), (4, 24029), (6, 24074), (12, 24218), (17, 24278), (18, 24284), (24, 24344), (25, 24365), (27, 24467), (31, 24593), (34, 24629), (37, 24668), (41, 24716), (44, 24758), (48, 24830), (50, 24878), (55, 25004), (59, 25079), (60, 25091), (62, 25112), (68, 25184), (71, 25217), (72, 25220), (77, 25328), (92, 25580), (102, 25685), (107, 25754), (109, 25775), (114, 25856), (115, 25859), (118, 25886), (122, 25925), (125, 25952), (135, 26093), (138, 26114), (142, 26177), (143, 26183), (146, 26201), (147, 26207), (153, 26249), (155, 26261), (156, 26270), (161, 26315), (166, 26357), (168, 26366), (169, 26378), (171, 26387), (172, 26396), (181, 26495), (183, 26516), (184, 26525), (188, 26549), (189, 26552), (197, 26621), (198, 26624), (200, 26633), (202, 26651), (203,

26654), (204, 26666), (207, 26687), (209, 26693), (210, 26696), (213, 26717), (216, 26747), (217, 26762), (220, 26777), (228, 26825), (229, 26837), (230, 26843), (231, 26846), (233, 26858), (234, 26861), (244, 26918), (249, 26972), (253, 26996), (254, 27008), (255, 27011), (262, 27056), (263, 27059), (267, 27074), (268, 27077), (269, 27086), (270, 27101), (271, 27107), (272, 27113), (276, 27134), (277, 27137), (280, 27149), (283, 27164), (284, 27173), (285, 27194), (286, 27206), (290, 27227), (293, 27254), (299, 27287), (300, 27293), (302, 27311), (305, 27341), (308, 27380), (314, 27449), (336, 27641), (341, 27716), (345, 27806), (357, 27950), (360, 28013), (365, 28079), (367, 28112), (368, 28124), (370, 28187), (373, 28208), (374, 28220), (376, 28241), (381, 28298), (387, 28382), (392, 28469), (395, 28487), (399, 28517), (401, 28535), (402, 28538), (403, 28544), (404, 28550), (407, 28577), (411, 28688), (414, 28763), (422, 28865), (424, 28889), (432, 29006), (436, 29096),